

**VOCABULARY INSTRUCTION: THE IMPACT OF DIRECT AND INDIRECT
INSTRUCTION**

by

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ABSTRACT

The development of vocabulary knowledge is essential in order to effectively communicate both in writing and orally (Howell, 2008). Research indicates that that vocabulary instruction is more effective when multiple strategies are employed (e.g., NICHD, 2000, Shanahan, 2006). The current study utilized a single-subject design with curriculum-based assessments for progress monitoring. The intervention combined indirect instruction through a repeated reading with phrase drill procedure (Joseph, 2008) with direct instruction of morphology. Support was found for both hypotheses. The participant had gains in reading fluency, comprehension, and morphological awareness.

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CHAPTER I

Introduction

Overview

Knowledge of vocabulary is vital in order to communicate effectively in writing and conversation (Howell, 2008). Vocabulary development is not something innate; it is learned through the environment in school and home settings (Biemiller, 2003). Not all children grow up in the same environment, causing some to have a more advanced vocabulary than others (Shanahan, 2006). If a child does not acquire the necessary vocabulary skills in primary grades, their vocabulary in intermediate and secondary grades will be compromised (Howell, 2008). As noted by the National Reading Panel (National Institute of Child Health and Human Development; NICHD, 2000), research is not as prevalent on interventions for vocabulary as other types of reading components such as basic word reading, but specific types of interventions including indirect instruction and direct instruction of morphology have been supported by research (e.g., Bowers, Kirby, & Deacon 2010; Vadasy & Sanders, 2008).

Reading Components

Speaking a native language is thought of as a *natural act* that we learn with ease (Gough & Hillinger, 1980). Gough and Hillinger (1980) note, however, that learning to read is significantly more complex. Reading begins as something that must be learned and promptly becomes a tool used to evaluate and interpret complex text (Howell, 2008). Wise (2009) states that reading is imperative for learning other fundamental skills (i.e., mathematics, science, and English). Failure in reading can have detrimental consequences that affect later school performance and self-confidence related to

academics (Armbruster, Lehr, & Osborn, 2006). According to the National Reading Panel, research has demonstrated that effective reading instruction includes the following: (a) phonemic awareness; (b) phonics; (c) reading fluency; (d) vocabulary development; and (e) reading comprehension strategies (NICHD, 2000).

Basic word reading. Basic word reading is comprised of skills such as being (a) able to manipulate and identify sounds in language, (b) identify sounds that are associated with printed letters, (c) decode written language, and (d) read words in isolation (Tennessee Department of Education, 2013). In a research review by Hosp and MacConnell (2008) they noted that reading difficulties largely result from poorly developed word recognition skills. Without basic word reading skills, different domains of academic achievement are compromised (Fletcher, Lyon, Fuchs, & Barnes, 2007). These are two primary components of basic word reading: (a) phonological awareness; and (b) phonics (NICHD, 2000).

Phonological awareness. Phonological awareness is the ability to identify and break down sounds in a word, which is vital for reading (Shanahan, 2006). It includes using metacognitive skills to understand that words have structure based on individual speech sounds, or phonemes (Fletcher et al., 2007). Phonological awareness includes a subcategory called *phonemic awareness* (Armbruster et al., 2006). Armbruster and colleagues (2006) describe phonemic awareness in a more specific sense (i.e., identifying and manipulating individual sounds in words) and phonological awareness in a broader sense (i.e., rhyming words and manipulating larger parts of language). The phonological

structure is the basis for the alphabetic principle (Armbruster et al., 2006). When the relation between sound and print is not understood, the reading process will continue to be delayed (Fletcher et al., 2007).

Phonics. If one can demonstrate how to decode a word or make letter-sound associations within a word, they have an understanding of phonics (Joseph, 2008). According to Hosp and MacConnell, (2008) phonics includes grasping the idea that there is a systematic and predictable relationship between particular letters, graphemes (letter shapes), and spoken sounds (phonemes), in written language. It has been proven that systematic and explicit instruction of phonics is most important during the early school years particularly between kindergarten and third grade (Armbruster et al., 2006). Also, phonics is referred to as a method used to teach the alphabetic principle, or an understanding of how letters correspond with sounds (Hosp & MacConnell, 2008). It is imperative to develop these skills at a young age so children can continue to grow in the reading process by decoding unfamiliar words, and reading words effortlessly and automatically (Fletcher et al., 2007; Joseph, 2008).

Reading fluency. A student with the ability to read text effortlessly, accurately, and with correct expression, is thought of as a fluent reader (Fletcher et al., 2007). According to the National Reading Panel (NICHD, 2000) readers who simply possess word recognition skills are not necessarily fluent. If students have the ability to read most words at their grade level, but do so slowly and with little expression, fluency should be the target of instruction (Joseph, 2008). Fluency is vital due to the bridge it creates

between word recognition and comprehension (Armbruster et al., 2006). Reading accurately, quickly, and with proper expression allows the reader to have a better understanding of the passage (NICHD, 2000).

Rate, accuracy, and prosody. There are three skills related to reading fluency: (a) rate; (b) accuracy; and (c) prosody; (e.g., Fletcher et al., 2007; Kuhn & Stahl, 2003; NICHD, 2000). Rate is associated with speed, and refers to the number of words read (Hosp & MacConnell, 2008). Hosp and MacConnell (2008) describe accuracy as the percent of words read correctly in a sentence or passage. Those struggling with accuracy usually struggle with rate as well, but some who are at grade-level with accuracy may also struggle with rate (Berninger & Wagner, 2008). Prosody includes the ability to read with appropriate expression, intonation, and phrasing (Fletcher et al., 2007). It entails reading words in a meaningful tone; dealing with pitch as well as the way words are grouped together (Armbruster et al., 2006; Kuhn & Stahl, 2003). Overall, it is important for a reader to gain fluency so that cognitive resources can be spent on understanding the meaning of text (Armbruster et al., 2006).

Reading comprehension. Reading comprehension is a process that requires the ability to interpret and understand information within a text (Shanahan, 2006). Reading comprehension involves a complex set of multiple processes (Fletcher et al., 2007). It includes strategies involving metacognition, or complex thinking, and is necessary in order for learning to occur while reading (Howell, 2008). It also includes abilities such as (a) summarizing text into one's own words, (b) finding and connecting main and central ideas, (c) making inferences, and (d) remembering the important aspects of text

(Armbruster et al., 2006; Fletcher et al., 2007). Research has shown that effective instruction to improve comprehension consists of two broad areas: (a) text comprehension strategies; and (b) vocabulary knowledge (NICHD, 2000).

Text comprehension strategies. Text comprehension strategies include a variety of organized steps readers use to understand and gain meaning from text (Armbruster et al., 2006). Text comprehension requires strategies that come before, during, and after reading (Howell, 2008). Because the meaning a reader gains from a text is greatly influenced by the experiences and background knowledge that reader has, strategies that activate prior knowledge are examples of evidence-based pre-reading activities that improve comprehension (NICHD, 2000). Another pre-reading strategy involves generating questions to answer while reading (NICHD, 2000). Monitoring one's own comprehension is an evidenced-based strategy that would occur while reading (NICHD, 2000). Summarizing, answering questions about the text, and metacognitive activities such as restating difficult sentences and/or passages in one's own words are examples of evidence-based strategies that occur after one has read (NICHD, 2000). Additionally, since understanding a text requires processes that are sensitive to how the text is organized (Fletcher et al., 2007), effective text comprehension strategies also include the use of graphic and semantic organizers (NICHD, 2000).

Vocabulary knowledge. We are not able to understand or communicate information effectively without the use of vocabulary (Howell, 2008). Vocabulary can be defined as knowledge of word meaning (Shanahan, 2006). It is commonly stressed that understanding word meaning plays a crucial role in comprehension (Howell, 2008). Possessing knowledge in vocabulary along with word identification skills strongly

influence comprehension (Biemiller, 2003). Fluent readers with high vocabulary knowledge have been found to read more efficient overall (Armbruster et al., 2006). On the other hand even if a reader has enough skill to decode words, but if he or she does not grasp the meaning of terms, they will struggle with comprehension (Fletcher et al., 2007).

Vocabulary Development

Development of vocabulary is vital to participation in almost any activity involving language (Shanahan, 2006). In a review of the literature, Biemiller (2003) noted that vocabulary is not something that is learned innately; it takes influence from both home and school settings. Children learn most vocabulary words in an indirect manner (Armbruster et al., 2006). They mainly use vocabulary that is necessary in conversation (Biemiller, 2003). For example, Shanahan (2006) noted that a child who plays baseball may know a lot of baseball-related terms (i.e., bat, helmet, and glove), as well as words related to similar ideas (i.e., sport, goal, and referee). Vocabulary also is developed through an expressive and receptive relationship (Armbruster et al., 2006; Howell, 2008). By speaking and listening in a conversation, children gain a lot of word meanings (Armbruster et al., 2006).

Relationship between oral and written vocabulary. It is extremely important for readers to make the connection between spoken and written words (Berninger & Wagner, 2008). Most vocabulary is learned equally through an oral and written manner (Howell, 2008). Oral vocabulary development can be supported through forms of written language such as pictures, text, and story sequences and development (Goodson & Layzer, 2009). As a child begins to read, written vocabulary is mapped to their knowledge of oral vocabulary, so the reader learns to associate print with speech

(NICHD, 2000). The National Reading Panel found that talking to children about vocabulary words and their meaning prior to reading a text which included those words, improved word knowledge and understanding of what was read (NICHD, 2000). Overall, the National Reading Panel explains the relationship between oral and written vocabulary as a *middle ground* for learning to read.

Vocabulary issues in intermediate and secondary grades. Not all children receive the same amount of support through their environment, and this can cause many differences in level and acquisition of vocabulary (Shanahan, 2006). Howell (2008) noted that if a student does not acquire the necessary vocabulary skills in primary grades, their reading progress in intermediate and secondary grades will be compromised. A child above grade 2 with low vocabulary may have to learn up to 4 words a day to catch up with *average* peers (Biemiller, 2003). Biemiller (2003) also noted that it may take some children with low vocabulary 5 or 6 years to catch up to peers if they have not had proper support in primary grades. Intermediate and secondary grades tend to have texts that include more fluctuating vocabulary and unpredictable story structures (Howell, 2008). For children in secondary grades to be functioning on grade level in vocabulary, they must have knowledge in (a) morphology, (b) complexity of vocabulary, and (c) context specific vocabulary (Howell, 2008).

Morphology. Knowledge of morphemes can help students decipher the meaning of many unfamiliar words (Armbruster et al., 2006). Morphemes, or units of meaning, are known as the building blocks of both written and spoken language (Berninger & Wagner, 2008; Bowers & Kirby, 2010). Morphemes include bases, prefixes, and suffixes, and provide the reader with a cue for an unknown word (Bowers & Kirby, 2010). By

combining morphemes to refer to things, actions, or characteristics, words can be made (Muse, Tannerbaum, & Wagner, 2007). For example, simply by learning the four most common prefixes (*un-*, *re-*, *in-*, *dis-*), readers will have important clues to the meanings of two-thirds of English words that contain prefixes (Armbruster et al., 2006). Morphemes are helpful for readers to be aware of when they come across unknown vocabulary words (Berninger & Wagner, 2008). Berninger and Wagner (2008) give the example of how the words *sign* and *signature* share a common morpheme that could help a reader decipher the meaning of the more difficult word. Free morphemes, or morphemes that can stand alone, and bound morphemes, or morphemes that can not stand alone, build on words to provide meaning (i.e., *lover* and *lovely* build on the word *love* but have different meanings) (Muse et al., 2007). Muse and colleagues (2007) also note that having a mental representation of bound and free words is necessary to learn morphologically complex vocabulary words.

Complexity of vocabulary. As students begin reading more complex texts, promoting word meaning and the way words are used in a particular sentence becomes necessary for comprehension (Armbruster et al., 2006). Words can have shades of meaning, which require the reader to distinguish the fine gradations of the word (Shanahan, 2006). Many times, words with multiple meanings can be very confusing to students in intermediate and secondary grades that do not have a broad understanding of vocabulary (Armbruster et al., 2006; Howell, 2008). Students' ability to use problem-solving skills to infer word meaning should develop dramatically as children move through elementary and middle school years (Muse et al., 2007).

Content specific vocabulary. As students leave primary grades and enter intermediate and secondary grades, they may need to know vocabulary specific to the material they are learning (NICHD, 2000). Readers in these grades need to know two types of vocabulary: (a) academic, and (b) topic specific (Howell, 2008). Academic terms are also referred to as mortar words, and topic specific terms are referred to as brick terms (Howell, 2008). Mortar words often hold brick words together. Howell (2008) explains that academic vocabulary is made up of words that are used across subjects whereas topic specific vocabulary is focused to one area or discipline. Academic vocabulary is thought of as the vocabulary that holds the terms students learn across subjects in place, or allows students to differentiate between subjects. Howell (2008) also explains that familiarity with academic vocabulary is essential for understanding terms in specific topics. Therefore, having a vast academic vocabulary is especially important for students in upper and intermediate grades. Talking to students about words they are about to encounter in class is important for learning content specific vocabulary (Shanahan, 2006). The National Reading Panel reported that this can help student's academic vocabulary growth in areas such as language arts and social studies (NICHD, 2000).

Acquisition and Prevalence of Vocabulary

The amount of vocabulary a child acquires is largely influenced by support at home and instruction at school (Biemiller, 2003). Howell (2008) noted that children in primary grades can learn up to three words per day. Biemiller (2003) further noted that by the end of grade 2, there are huge gaps in vocabulary sizes among students. By the end of elementary school, it is estimated that most children have learned around 9,000 root words. At the end of 5th grade, many students in the lowest quartile have not learned

7,100 root words – the level reached by high vocabulary students in the 2nd grade. When students begin to reach intermediate grades, those with high vocabularies are continuing to learn words at a much faster rate than children with low vocabularies (Howell, 2008).

Evidence Based Interventions for Vocabulary

The National Reading Panel and What Works Clearinghouse assessed many studies looking at the impact of vocabulary instruction on readers (Shanahan, 2006). Shanahan (2006) noted that while students in grades K-12 have been examined, but most studies focus on students in grades 3-8. Although some instructional methods are proven to be strongly effective in improving vocabulary, they can be difficult to categorize (NICHD, 2000). One reason is that there are only a small number of studies, so differences in methods tend to be noticed over similarities. Secondly, the similarities in studies have not been systematically arranged at an abstract level. Based on the research, the National Reading Panel attempted to categorize vocabulary interventions into 5 methods: (a) indirect instruction, or picking up on definitions simply by exposure; (b) explicit instruction, which uses some kind of method to teach vocabulary directly; (c) multimedia methods, which uses media methods other than text alone; (d) capacity methods, which focuses on using leftover cognitive capacity to learn vocabulary rather than written or oral methods; and (e) association methods, or picking up on unknown vocabulary words by using known vocabulary words. The panel also noted that using multiple strategies for vocabulary instruction was better than any single strategy alone.

Indirect instruction. During indirect instruction, it is assumed that the reader will pick up on meaning of words they do not know given opportunities to hear or see the words in context (NICHD, 2000). Indirect instruction includes things such as learning

that is done incidentally through reading, and oral interaction with others such as simple conversation (Shanahan, 2006). Shanahan (2006) noted that incidental learning of vocabulary largely depends on the amount of experience a child has had with different contexts.

Indirect instruction through listening. Stahl, Richek, and Vandevier (1991) examined the effects of indirect instruction on vocabulary knowledge among 6th grade students ($N = 43$). No student read below the 4th grade level according to the *Iowa Test of Basic Skills* (ITBS), with grade equivalent scores ranging from 4.2 to 9.7. The students were read aloud one of two passages chosen from a 7th grade literature anthology by an experimenter during their language arts class. Both passages were about 1,000 words in length and took about 10 minutes to read out loud. The reader did not tell the students they would be tested later and the reader made no attempts to highlight any specific words or meanings. Two days later, all students were given a 30 item multiple-choice exam testing subjects' knowledge of word meanings. Fifteen words that were considered potentially difficult were selected from each passage and were combined to make up the 30-item exam. Half of the students took the test in a written form; the other half of each class had the test read aloud as they followed along on their protocol. This was done incase a student was able to recognize a word in print but not by only hearing it.

Results showed a statistically significant difference (6.6%); participants recognized an average of 53.5% of the words in the passage they heard, versus 46.9% of the words in the passage they did not hear. This showed there was an indirect effect on learning. Hierarchal multiple regression analysis revealed that the difference between modes of testing (listening, reading) were not statistically significant, meaning the

students were not affected by whether the test items were written or oral. This possibly means that words students hear also can be recognized in their written form. The study further examined if differences in readers explain some of the variations found. The correlation between previous word knowledge and learning from the context was significant ($p < .05$). The greatest gains from listening to the passages were made by students who knew the fewest amount of words before hearing the passage (i.e., fewer words recognized in the unheard passage). Overall, this study reveals that learning word meanings by listening can be more advantageous for a student who struggles with vocabulary.

Indirect instruction through reading. Herman, Anderson, Pearson, and Nagy (1987) examined the effects of incidental vocabulary acquisition on a group of 8th graders from the Midwest ($N = 309$). All participants were given the *Anderson-Freebody Checklist Vocabulary Test* 2 weeks before the intervention. The checklist tested their knowledge of specific vocabulary words without giving away their meaning. The participants were not told about the study, and did not know they would be reading passages 2 weeks later. Participants were assigned to read one of two stories. Both stories came in four different forms, each becoming more descriptive and explicit. The four versions of the passages included: (a) original form; (b) macrostructure revision; (c) microstructure revision; and (d) elaborated revision. The *macrostructure version* included revisions made in the titles, topic sentences, and organization to explicitly alert the reader to the intent of the passage. The *microstructure version* made information explicit that was only implicit in the macrostructure version. Adding phrases, clauses, or sentences to compare or contrast information made the passage more explicit. All changes made in the

previous revisions were carried over into the *elaborated version*. This version added information to the text about key concepts and how they were related by explaining important concepts, specifying relations between concepts, and adding examples. Group differences were statistically controlled for in the study. Student ability was measured using the *Comprehensive Test of Basic Skills* (CTBS) earlier that year. Acquisition of word knowledge was measured using the multiple-choice test and by looking at the interaction effect of text read and text tested. The multiple-choice test contained 46 target words that appeared twice in the text, at two levels of difficulty.

This study explored whether student ability influenced indirectly acquiring word knowledge. There was a statistically significant interaction effect between the text read and the text tested. Students who read text A and took the test on text A scored higher ($M = 54\%$) than students who took the test on text A but read the text B ($M = 43\%$). Similarly, students who read text B scored higher ($M = 55\%$) on text B compared to students who read text A, but took the text B test ($M = 47\%$). The researchers in this study also explored the indirect acquisition of vocabulary and its relation to ability, prior knowledge, and text structure. Hierarchical multiple regression revealed significant effects between the relations of vocabulary growth and ability, prior knowledge, and text structure. Specifically, a significant interaction effect was found between ability, as measured by comprehension percentile scores on the *Comprehensive Test of Basic Skills*, and vocabulary gains. Students with higher ability scores had higher vocabulary knowledge on the *Multiple-choice Test* than the students with lower ability scores. Additionally, prior knowledge, as measured by the checklist administered 2 weeks prior to the intervention, was found to have a significant effect on vocabulary gains. This

means that students performed better on the posttest if they knew more words on the pretest. Finally, the elaboration text structure was found to lead to higher gains in indirect vocabulary acquisition than any other text structure utilized in the study. Interestingly, both able and less able student benefited from this text version.

Direct instruction. Direct instruction has been found to be extremely effective in helping students make gains in reading (Shanahan, 2006). It involves teaching the definitions of words using some kind of explicit method (NICHD, 2000). This can include directly teaching students the meaning of words before reading, using external cues to help students learn words from content, and teaching root words or affixes to help determine word meaning (Shanahan, 2006; NICHD, 2000).

Semantic mapping. Mapping definitions or word concepts can be done using a type of direct instruction called semantic webs (Joseph, 2008). These webs can be used to teach concepts before or after a passage is read by sorting words by their shared meaning (Joseph, 2008). Instruction using semantic mapping goes beyond simple text by using multiple connections to enhance vocabulary learning (NICHD, 2000).

In a study by Margosein, Parscarella, and Pflaum (1982), junior high students were given a semantic mapping vocabulary intervention. Participants included students that were in 7th and 8th grade, 23 were assigned to a context clue treatment group, and 21 were assigned to a semantic mapping treatment group. The students were given the *Iowa Test of Basic Skills* prior to the intervention, and had a grade equivalent reading level of 6.7 for both groups. For the intervention, both groups were presented with the same three words, three days a week, for 16-minute sessions, lasting a total of 8 weeks. The context clues group was provided with short paragraphs that had clues to help students learn the

word's meaning. For example, to help students in this group learn the word *solitude*, the words *alone*, *lonely*, and *quiet* were used as context clues in the short paragraph they read. The semantic mapping group studied the same words as the context clues group, but in a different manner. For example, if the students were learning the word *solitude*, they were taught to learn the word through the discussion of words with similar meaning such as *quiet*, *lonely*, and *alone*. Students were then asked to predict the meaning of a new word by using other words as clues. The students were given the Weekly test for semantic mapping, which included being asked to match the new words to their short meanings. The pre-treatment measure given to the students included the *Gates-MacGinitie Test*. Post-treatment measures included the *Treatment Test*, the *Definition Test*, the *Gates-MacGinitie Test* and the standardized tests of vocabulary and comprehension. The *Treatment Test* was an 18-item test that used 72 random words that were taught to participants, and used an identical format as the *Weekly Tests* the students were given. The *Definition Test* required students in both groups to define 36 randomly selected words through writing.

Multiple hierarchical regression was used to determine treatment effectiveness on both groups. Results of the study indicated that the semantic mapping group showed significantly higher scores ($p \leq .05$) on the *Weekly Tests*, the *Treatment Tests*, and the *Gates-MacGinitie Vocabulary Subtest* compared to the context clue group. The mapping group also scored higher on the *Treatment Tests* and showed a mean difference of 6.72 points higher on the *Weekly Test* and 2.2 points higher on the post-treatment *Gates-*

MacGinitie Vocabulary Test. It appears that the semantic mapping intervention had a larger impact on both generalized and specific vocabulary acquisition when compared to the context clue intervention ($p < .05$).

Morphology. It has been found that teaching affixes (i.e., prefixes and suffixes) of root words can help students gain knowledge of word meaning (Armbruster et al., 2006). Bowers and Kirby (2010), examined the effects of morphological instruction on vocabulary acquisition. Participants included a total of 81 students in 4th and 5th grade. The experimental group contained 38 students and the control group contained 43 students. Participants were excluded from the study if they were identified as having a learning disability, language impairment, or autism.

Prior to the intervention, all participants were administered the *Peabody Picture Vocabulary Test III (PPVT-III)*, which measures receptive vocabulary knowledge. The study also used two posttest measures after the intervention that consisted of Base Identification and Morphological Vocabulary. During Base Identification, the participant was first shown how to identify multi-morphemic words (i.e., running, enjoyment) with help and feedback from the examiner during a teaching task. They were asked to circle the *main* part of the word. For example, for the word *running*, the student should circle *run*, because the main part of *running* was *run*. After the child circled the word, they were given a short description of the meaning of that word. The students were then presented with the test consisting of 30 total words. Each item had a 3-point scale, (2 points for the base and 1 point for the affix). Morphological Vocabulary was used directly after each Base Identification task to assess if participants could explain the meaning of the word used in the Base Identification measure. After they completed

circling the *main* part of the word in the Base Identification task, they were asked what the word means. If the student could not give an answer or the answer was unclear, they were asked if they could use the word in a sentence or add more detail. A total of 3 points could also be earned by showing an understanding of the base, affix, using the word correctly in a sentence, or providing a definition. The experimental group participated in three or four sessions lasting 50 minutes each week until 20 total sessions were completed. Instruction covered concepts and key terms about morphology and orthography. The students were taught principles to understand word parts including bases, prefixes, and suffixes. Word matrices were used in lessons to support instruction about morphological structure and concrete word representations. The goal was to include multiple sensory channels to learn word parts (i.e., prefixes, affixes, suffixes) both in writing and orally by emphasizing morphemic and graphemic units.

The two groups were not significantly different in amount of vocabulary known prior to the intervention as measured by the PPVT-III pretest. For Base Identification, the effect was significant for vocabulary $F(1, 78) = 4.57, (p < .05)$. There was also a significant effect of group, meaning on the Base Identification measure, the experimental group performed higher than the control group $F(1, 78) = 36.53, (p < .001)$. Morphological Vocabulary also had a significant effect on vocabulary $F(1, 79) = 30.81, (p < .001)$, and the experimental group performed higher than the control group $F(1, 79) = 3.99, (p < .05)$. This study shows that teaching morphology knowledge and skills provides students with skills to develop vocabulary beyond the words they are taught.

Review of morphology literature. In a meta-analysis by Bowers, and colleagues (2010), 22 studies were reviewed using effect size (*Cohen's d*) to measure effectiveness of morphological interventions. Participants were students in grades preschool through 8th grade. Fifteen studies included students in grades three to eight. Studies were assessed to understand the effects morphological instruction has on various aspects of reading, as well as what type of instruction was the most successful. Overall, the results of morphological instruction on vocabulary had a small effect on the experimental versus the control group ($d = 0.35$). However, when these researchers looked at whether integrated instruction in morphology was more beneficial than isolated instruction. They found that there was a large effect on integrated instruction ($d = 1.25$) compared to a small effect on isolated morphological instruction ($d = 0.24$).

Integrated instruction. Shanahan (2006) notes that it is important when teaching vocabulary, students are given multiple ways to learn. The National Reading Panel suggests the use of multiple strategies over one single method when implementing vocabulary instruction (NICHD, 2000). A variety of indirect and direct instruction is thought to be most effective (NICHD, 2000).

Integrated instruction with Quick Reads. Vadasy and Sanders (2008) explored the effects of *Quick Reads*, which uses direct instruction of vocabulary combined with reading in connected text program on a sample of 4th and 5th grade students. Students were found to perform in the *at-risk* range on DIBELS, Oral Reading Fluency. The final sample consisted of 54 students in the treatment group and 65 students in the control group.

The treatment group was given supplemental *Quick Reads* tutoring, while the control group received no tutoring and typical classroom instruction only. The *Quick Reads* program included passages designed for grades 2-6 with large numbers of unknown difficult words. Students in the treatment group were given small group intervention 30 minutes a day, 4 days a week, for 20 weeks. One or two high frequency, tier 2 words were identified from each passage. A total of about 60 words were identified for the tutors to introduce and review with the students. Each tutoring session had 7 important steps. Step 1 involved introducing the new vocabulary word to the student. Step 2 involved the tutor introducing the passage and the main idea to the students, and they take turns reading the passage. Step 3 included the student and tutor reading the passage aloud together twice, while the tutor acted as a model for reading smoothly and fluently. Step 4 involved the student completing a timed reading lasting 1-minute. Step 5 had the student and tutor read aloud 2 comprehension questions that went along with each passage. Step 6 included the tutor reviewing vocabulary from the previous passage. In step 7, students completed steps 1 through 5 for a second passage, so students read at least 2 passages per session.

A series of pretests and posttests were given to each student measuring vocabulary, word comprehension, and passage comprehension. Vocabulary was assessed with a pretest and posttest using a multiple-choice, curriculum-based measure. Eighty initial items were constructed using 20 words from each of the four levels of *Quick Reads*. Words were chosen if they appeared in at least three of the passages and were high in utility or content. Word comprehension was assessed using the *WRMT/NU Word Comprehension* subtest, which measures knowledge of antonyms, synonyms, and

analogies. Passage comprehension was measured using the *WRMT/NU Passage Comprehension* subtest. This required students to supply a missing word in a sentence that would make sense with the context.

A series of one-way ANOVAs were used to detect group differences before and after treatment. Prior to intervention, no group differences were found on the three pretest measures ($p > .05$). Posttest results from hierarchical linear regression revealed there were significant treatment effects for vocabulary, word comprehension, and passage comprehension. Students in the treatment group scored an average of 3-points higher than students in the control group on the vocabulary measure ($d = .42$). Students in the treatment group scored 4-points higher on passage comprehension ($d = .50$). Similar to previous studies, students with scores at least one standard deviation above the mean on pretest measures also scored higher than the mean on posttest measures. Pretest scores accounted for all significant variation in posttest scores ($p < .001$). Overall, use of the *Quick Reads* program led to significant gains for the treatment group in measures of vocabulary, word comprehension, and passage comprehension.

Integrated instruction using morphology and context clues. In a study by Baumann, Edwards, Bolland, Olejnik, and Kame'enui (2003), effects of morphemic and contextual analysis were compared to the effects of textbook vocabulary instruction among a group of 157 students in the 5th grade. Vocabulary instruction was integrated into the students' textbook-based social studies curriculum using unfamiliar, tier 2 words. The students were divided into two groups.

Instruction of meaning and concepts of certain vocabulary items (TV) were given to 79 of the participants in four classrooms. These students received instruction in

specific content textbook words. Rather than being taught independent word-learning strategies, they were taught content-central vocabulary from the textbook. They also were shown how to use context clues while reading. This included taking unknown words and instructing students how to use synonym, antonym, example, and general context clues to understand meaning. The TV group was given one kind of vocabulary lesson called *Textbook Vocabulary*. This consisted of 39 words from the textbook lessons, which were selected by how relevant they were to the content.

The other 78 students in four classrooms were given instruction in morphemic and contextual analysis strategies (MC) that also were based off of content textbook words. This group was taught context and word part clues including root word, prefix, and suffix instruction. For example, the students in this group were instructed on the “*Not*” prefix family such as *un*, *dis*, *in*, *im*. The MC group was given two types of vocabulary instruction. *Anchor Vocabulary* lessons consisting of 54 words used to teach morphemic and contextual analysis strategies. *Instructional Vocabulary* consisted of 147 words used to extend lessons by giving multiple opportunities to practice and apply the morphemic and contextual analysis strategies.

Both groups went through a total of thirty-three, 45-minute lessons, which covered the same social studies content from highly trained teachers. Both groups spent 15 minutes on each lesson and were given the same pretests and posttests. Pretest Measures including Degrees of Word Meaning and Content Pretest were given to all students before treatment. Four types of words were used to evaluate both groups of students’ vocabulary knowledge. *Textbook Assessment Vocabulary* consisted of a subset of vocabulary words. *Morphemic Assessment Vocabulary* consisted of morpheme-based

transfer words that included the morphemic elements taught to MC classes. *Assessment Vocabulary in Context* consisted of words embedded into short text and taken verbatim from words in the textbook content. *Passage Vocabulary* consisted of novel words used to assess comprehension of text. Posttest measures after treatment included: the *Textbook Vocabulary Test*, *Word Part Test*, which required students to write meanings for the Morphemic Assessment Vocabulary, *Immediate Vocabulary in Context Test*, which required students to write the meanings for the Assessment Vocabulary in Content, *Comprehension Test*, which included a 12-item multiple choice assessment of specific word meanings that could be inferred through morphemic or contextual analysis, *Chapter Tests*, which consisted of two 20-item multiple choice tests from the textbook assessment program, and *Delayed Vocabulary in Context Test*.

No significant difference between vocabulary levels before the intervention was found among participants. Multiple MC versus TV ANCOVAs were completed. While there was not a statistically significant difference on immediate ability to infer meanings in novel text passages, there were significant treatment differences on delayed effects. Specifically, students in the MC group scored significantly higher statistically ($p = .000$), and there was a large effect (.423) when compared to students in the TV group. Students receiving the MC intervention scored an average of 9.27 points higher than students in the TV group. While looking at students' ability to infer meanings of morphemically and contextually decipherable transfer vocabulary presented in novel textbook experts, results indicate a statistically significant difference ($p = .015$) and a small effect size (.016). Students in the MC group scored an average of 1.84 points higher than students in the TV group.

Summary

Development of vocabulary is vital to participation in almost any activity involving language (Shanahan, 2006). If children do not receive support through their environment, acquisition of vocabulary may be slow or at a different level than same age peers who have received supports (Shanahan, 2006). This is extremely important for children in intermediate and secondary grades because they may be trying to catch up with peers reading at grade-level (Biemiller, 2003; Howell, 2008). The National Reading Panel mentioned that using multiple strategies for vocabulary instruction is better than using one single strategy (NICHD, 2000). Various studies (e.g., Baumann et al., 2003; Bowers et al., 2010; Vadasy & Sanders, 2008) found instruction in morphology paired with another type of integrative instruction, allows for the most gains in vocabulary among students in intermediate and secondary grades. It is shown that knowledge of morphemes can help students decipher the meaning of words (Armbruster et al., 2006). In the meta analysis completed by Bowers and colleagues (2010), as well as the study by Bowers and Kirby (2009), it was found that instruction in morphology led to gains in vocabulary knowledge. According to the research by Shanahan (2006), larger gains are expected when direct instruction, versus indirect instruction, is in place. Additionally, in their meta-analysis, Bowers and colleagues (2010) found that instruction in morphology alone had a small effect size ($d = .24$), but when morphology was integrated with other reading instruction, the effect was significantly larger ($d = 1.25$).

Purpose of the Current Study. The current study investigated the effectiveness of a multiple component intervention that combined indirect instruction through oral reading with direct instruction of morphology. Specifically, the intervention utilized

repeated guided oral reading with phrase drills for the indirect component and combined it with direct instruction of morphology; the intervention took place over six sessions.

Hypothesis 1. The participant would have a positive effect size (*g-index*) for the trend in the data on the formative assessment measures (i.e., progress monitoring probes) for reading fluency and comprehension. Specifically, the student's rate of improvement on the oral reading fluency probes and maze probes would show a positive effect.

Hypothesis 2. The participant would show a positive effect size (*g-index*) for the trend in the data related to understanding of morphology. Specifically, the student's rate of improvement on the affix identification probes would show a positive effect

CHAPTER II

Method

Participant

The participant was a 9th grade student who has been identified as having reading difficulties. His current reading instructional range was found to be at the 8th grade level. The participant was recruited from a local educational center that provides academic tutoring.

Measures

Multiple measures were used over the course of 6 intervention sessions to assess student growth, specifically in areas of fluency and morphology.

Progress monitoring assessments.

Reading fluency. The participant was administered Oral Reading Fluency (Howell, 2008; Hosp & MacConnell, 2008) probes during the intervention as a formative assessment probe of reading fluency. Oral Reading Fluency (ORF) is an individually administered assessment of accuracy and fluency of reading within a connected text. The participant was given a reading passage, based on his instructional reading level and the number of words read correctly in 1 minute was his oral reading fluency rate.

Reading comprehension. The participant was also given maze passages during the intervention to formatively assess reading comprehension. Maze passages are intended to measure reading fluency, vocabulary knowledge and reading comprehension within an instructional level reading passage (Hosp, Hosp & Howell, 2007). The participant was administered a passage based on his instructional reading level. For every seventh word in the passage, the participant was given a choice of three words (2

incorrect choices and 1 correct choice) and asked to circle the correct word for that sentence. The interventionist times the participant as the participant read silently and selected the most appropriate word option to complete the sentences within the maze passage. The appropriate answer key was then used to score the student's word replacement selections. The interventionist then calculated a score, which was graphed. The participant was given a 3 minute time limit on each passage.

Morphology. To measure growth in morphological awareness the participant completed a morpheme identification task (i.e., *Affix Identification Task*) adapted from Apel, Brimo, Diehm, & Apel, 2013). It was intended to measure awareness of affixes and the modifications that occur to affixes when they are added to a base word. This CBM involved presenting the participant with a list of nonsense words that contain real affixes. He was then required to identify all the affixes by circling them (see Appendix A). The score on each probe was the number of the affixes identified correctly in 1 minute.

Pre/post perception surveys. The participant completed a brief 4 point Likert-scale survey to express his perceptions about reading. There were two surveys, one that was given before the intervention began and one given after the intervention was completed. The questions on both surveys were adapted from previous surveys about reading (adapted from McKenna & Kear, 1990).

Intervention

Design. This study used a single-subject, multi-element design. Single-subject experimental designs include a dependent variable that is measured multiple times before (i.e., baseline), and throughout (i.e., formative assessment) the intervention (Brown-Chidsey, Steege, & Mace, 2008). Single-subject designs are well suited to evaluate the

effectiveness of academic interventions (Brown-Chidsey et al., 2008). Additionally, a multi-element design was used. The effect of each component of the intervention (i.e., indirect instruction through repeated reading with phrase drill error correction and direct instruction of morphology) were assessed with different curriculum-based measures (i.e., ORF probes, maze probes, and affix identification probes). After baseline data was collected on the curriculum-based measures, the intervention was implemented for six sessions.

Indirect instruction component of the intervention. Indirect instruction of vocabulary knowledge occurred through a repeated reading with phrase drill (RRPD) procedure (Joseph, 2008). During this part of the intervention session, the participant read an instructional level passage aloud. The interventionist recorded on a separate copy of the passage any words he read incorrectly. The interventionist then modeled reading the word correctly embedded in the phrase it occurred in the text. The participant then read the phrase three times. Once all of the words read incorrectly had been practices, the participant read the passage again. This procedure continued until the passage was read with 90% accuracy.

Direct instruction component of the intervention. The second part of each intervention session focused on direct instruction of morphology. The direct instruction was done using lessons from the *Vocabulary Through Morphemes* curriculum (Ebbers, 2004). According to the authors, the curriculum focuses on structural analysis, affixes, roots, analogies, and word relationships. The curriculum had four major goals: (a) increase student interest and engagement with words; (b) to understand the meanings of key morphemes and foster fluent reading of morphologically complex words; (c) increase

vocabulary knowledge; and (d) help students infer unknown word meanings while reading independently. One lesson was completed each session.

Procedures

Once IRB approval was obtained (see Appendix B), a local educational tutoring service was used to recruit a student appropriate for the intervention (a student instructional at the 4th grade reading level or higher). Before the intervention began parental consent and participant assent was obtained.

CHAPTER III

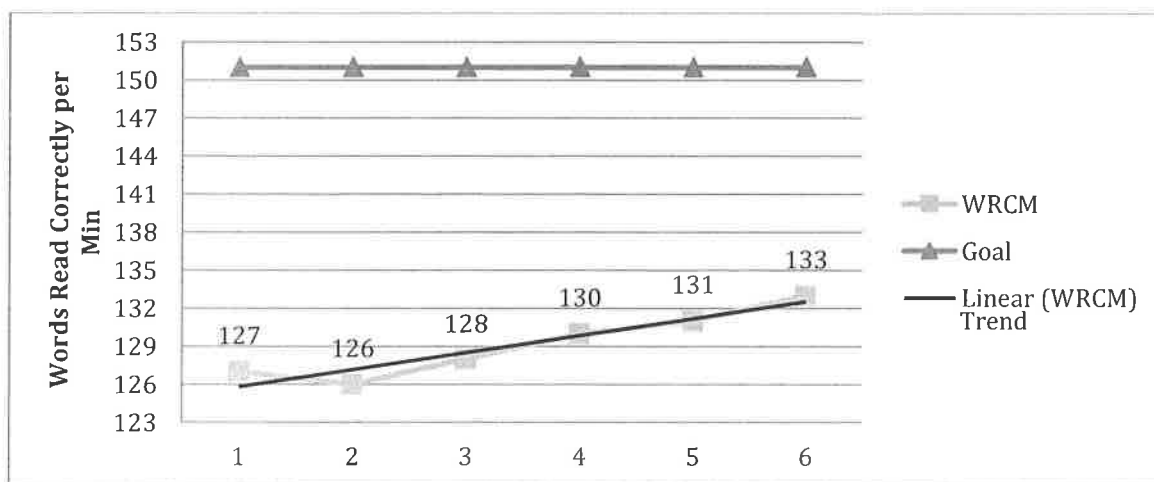
Results

Hypothesis 1

It was hypothesized that the participant would have a positive effect size (*g-index*) for the trend in the data on the formative assessment measures for reading fluency as assessed by ORF probes and comprehension as assessed by Maze probes. As can be seen in Table 1 and 2, the student's rate of improvement on the ORF probes and maze probes showed a positive trend. Specifically, his *g-index* on the ORF probes was +0.66 and on the maze probes was +1.0.

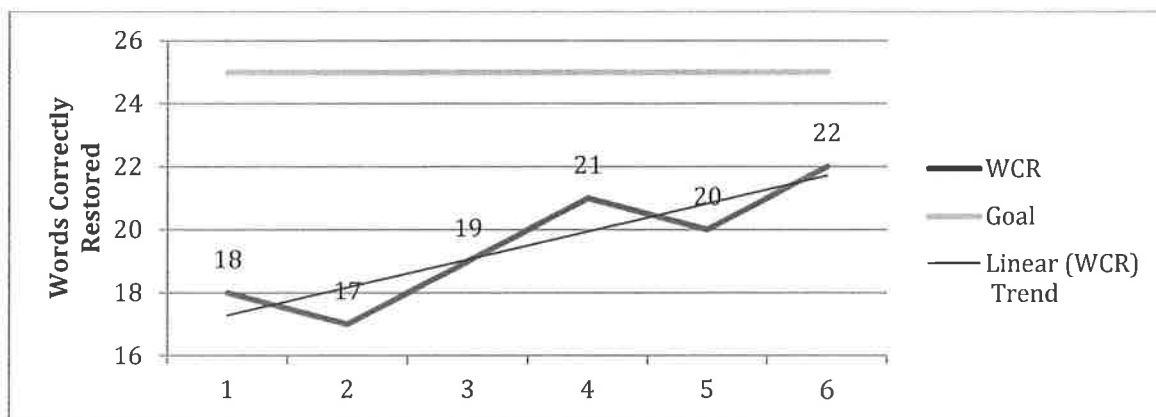
Table 1.

Formative Assessment of ORF



Note. Words read correctly per minute (WRCM) on 8th grade ORF passage.

Table 2.

Formative Assessment of Maze Probes

Note. Words correctly restored per 3 minute (WCR) on 8th grade Maze passage.

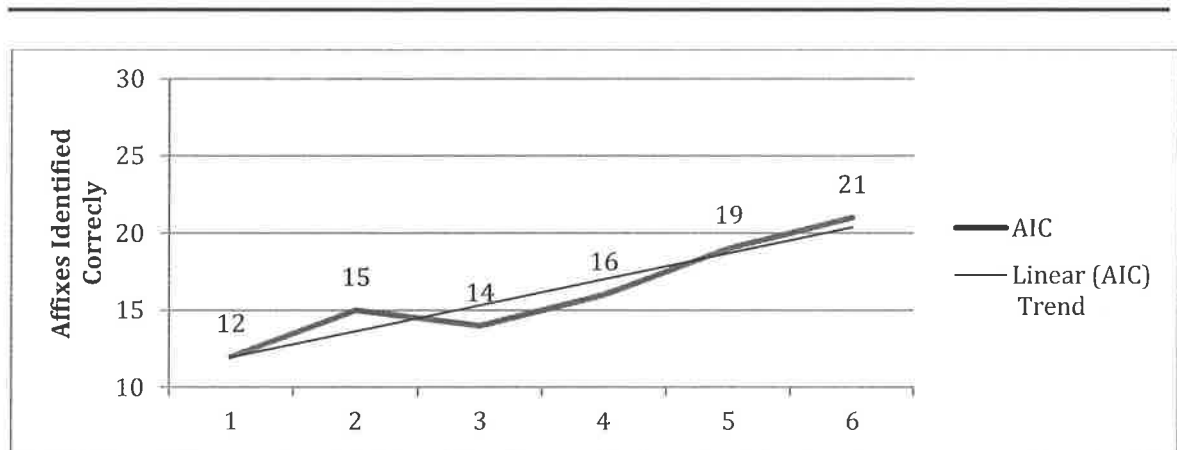
Hypothesis 2

It was hypothesized that the participant would show a positive effect size (*g-index*) for the trend in the data related to understanding of morphology. As can be seen in Table 3, the student's rate of improvement on the affix identification probes showed a positive trend. Specifically, his *g-index* on the affix identification probes was +0.5.

Additional Analyses

The participant completed a 4 point Likert-scale pre-post survey to assess any changes in his perceptions toward reading as well as his feelings about the intervention. As can be seen in Table 4 the participant had a positive perception of the intervention.

Table 3.

Affix Identification Rate of Improvement

Note. Affixes identified correctly per minute (AIC).

Table 4.

Pre-Post Intervention Reading Perception Survey

Items	Pre	Post
How do you feel if you get a book as a present?	2	2
How do you feel when someone asks you to read aloud?	2	2
How do you feel when you have to take a reading test?	2	3
I enjoy reading.	2	2
How do you feel about reading for fun?	2	2
How do you feel when you start reading a new book?	2	2
How do you feel when you read a book during summer vacation?	2	2
How do you feel when someone reads out loud to you?	3	3
How do you feel when we work on your reading skills?	--	3
How do you feel when it is time to come for reading intervention ?	--	3

Note. 4-point Likert scale from 1 (*very negative*) to 4 (*very positive*).

CHAPTER IV

Discussion

Reading comprehension is a complex process that is influenced by reading fluency and vocabulary knowledge (e.g., Armbruster et al., 2006; Biemiller, 2003, Fletcher et al., 2007; Howell, 2008). While people generally learn most vocabulary words indirectly, picking up on definitions simply by exposure (Armbruster et al., 2006) findings from the National Reading Panel revealed that utilizing multiple strategies for vocabulary instruction led to better outcomes than using any single strategy (NICHD, 2000). One type of direct instruction for vocabulary development that has been found to lead to gains is teaching morphology (e.g., Bowers et al., 2010; Vadasy & Sanders, 2008). In a meta-analysis Bowers and colleagues (2010) found that morphology instruction that was combined with other reading instruction lead to the largest gains in vocabulary ($d = 1.25$).

In the current study, direct instruction of vocabulary through morphology instruction was paired with indirect instruction through repeated reading with phrase drills for error correction. As hypothesized, the participant had a positive trend in the data for (a) reading fluency as measured by ORF probes , (b) in comprehension and vocabulary as measured by Maze passages, and (c) in his morphological awareness as measured by the Affix Identification task. Trend refers to analyzing data to look at increases or decreases in performance across time (Hixson, Christ, & Bradley-Johnson, 2008). Additionally, all effect sizes (g-index) were positive indicating he did gain skills

in these areas even though he had not reached the long-term goal on ORF or Maze passages. He also indicated that he had a positive perception of participating in the intervention.

Limitations

Case studies have contributed to applied psychology, but the methodology has many limitations that must be recognized. The threats to internal validity include (a) history, (b) maturation, (c) testing, (d) instrumentation, (e) regression, and (f) mortality (Hixson et al., 2008). History includes anything going on in the child's life at the same time as the intervention (Hixson et al., 2008). This can be, for example, receiving instruction in vocabulary and fluency in the classroom along with after-school intervention. Maturation refers to improvements that normally follow exposure to routine events, such as general daily education in school (Hixson et al., 2008). Testing suggests repeated exposure to a testing method or instrument begins to effect how the participant responds. Instrumentation refers to inconsistent use of progress monitoring methods that produce a bias in data over time (Hixson et al., 2008). Regression can occur when the student begins testing at a low point in performance, and great improvements can be seen due to normal variability. Finally, mortality can happen when the assessment is disturbed or stopped prematurely. This can create findings that are unrepresentative of student performance, which is why controls must be in place (Hixson et al., 2008). In the current study, a major limitation would be the number of sessions the participant received. Although he did make gains, he was still performing two grade levels below his current placement. He will continue to need morphology and fluency instruction to close this gap.

Future Directions

In the future, the study could be made stronger by including a larger sample size of participants. This would include adding participants, both older and younger, in order to demonstrate how students in different grade levels would respond to the intervention. This would increase generalizability to different populations of students. It also would be useful to measure how students of different backgrounds and socio-economic statuses benefit from this particular intervention. It would be helpful to show if students of different SES and backgrounds benefited in different ways from the intervention. Additionally, it would have been helpful to work with the student for a longer period of time to show greater gains. A better understanding of the effect of the intervention over a longer term would be beneficial.

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APPENDICES

Appendix A

Sample Affix Identification Task

1. transover	18. repage	35. transvoice
2. dianew	19. unworld	36. woodly
3. soundful	20. formship	37. diatophood
4. exworkless	21. needous	38. exfly
5. preyear	22. inlast	39. roadful
6. justable	23. missive	40. preplane
7. postknow	24. nonriver	41. frontless
8. backsome	25. contrarunage	42. factable
9. goodish	26. counterbud	43. postdone
10. misthinkness	27. everent	44. ballsome
11. ensay	28. fishic	45. misfullish
12. helpment	29. antitold	46. enrest
13. proeven	30. reachy	47. baseness
14. instramust	31. diswind	48. prohotment
15. endfully	32. norther	49. intradry
16. readist	33. dekingist	50. heatist
17. spellian	34. subsouth	51. boxian

Appendix B

IRB Approval

IRB INSTITUTIONAL REVIEW BOARD

Office of Research Compliance,
010A Sam Ingram Building,
2269 Middle Tennessee Blvd
Murfreesboro, TN 37129
IRBN001 Version 1.3 Revision Date 03.06.2016



IRBN001 - EXPEDITED PROTOCOL APPROVAL NOTICE

Investigator(s): Aimee Holt (PI), Julie Davenport (student) and Lindsey Jurek (Student)
Investigator(s) Email(s): aimee.holt@mtsu.edu; jad7q@mtmail.mtsu.edu; laj3e@mtmail.mtsu.edu
Department: Psychology
Study Title: ***Fluency and vocabulary tutoring***
Protocol ID: **16-2237**

Dear Investigator(s),

The above identified research proposal has been reviewed by the MTSU Institutional Review Board (IRB) through the **EXPEDITED** mechanism under 45 CFR 46.110 and 21 CFR 56.110 within the category (7) *Research on individual or group characteristics or behavior*. A summary of the IRB action and other particulars in regard to this protocol application is tabulated as shown below:

IRB Action **APPROVED** for one year from the date of this notification

Participant Size **2 (TWO)**

Participant Pool **Minor participants enrolled in Jubilee Education Services**

Exceptions **Signature waiver for assent forms from minors less than 9 years of age**

Restrictions **Signed parental consent and child assent process**

Comments **NONE**

This protocol can be continued for up to **THREE** years by obtaining a continuation approval. Refer to the following schedule to plan your annual project reports and be aware that you may not receive a separate reminder to complete your continuing reviews. Failure in obtaining an approval for continuation will automatically result in cancellation of this protocol. Moreover, the completion of this study **MUST** be notified to the Office of Compliance by filing a final report in order to close-out the protocol. Continuing Review Schedule: Reporting Period Requisition Deadline IRB Comments
The investigator(s) indicated in this notification should read and abide by all of the post-approval conditions imposed with this approval. Refer to the post-approval guidelines posted in the MTSU IRB's website. Any unanticipated harms to participants or adverse events must be reported to the Office of Compliance at (615) 494-8918 within 48 hours of the incident. Amendments to this protocol must be approved by the IRB. Inclusion of new researchers must also be approved by the Office of Compliance before they begin to work on the project. All of the research-related records, which include signed consent forms, investigator information and other documents related to the study, must be retained by the PI or the faculty advisor (if the PI is a student) at the secure location mentioned in the protocol application. The data storage must be maintained for at least three (3) years after study completion. Subsequently, the researcher may destroy the data in a manner that maintains confidentiality and anonymity. IRB reserves the right to modify, change or cancel the terms of this letter without prior notice. Be advised that IRB also reserves the right to inspect or audit your records if needed.

Sincerely,
Institutional Review Board
Middle Tennessee State University