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Listening Comprehension and Language as Scaffolds for Reading Comprehension with Secondary Struggling Readers

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Listening Comprehension and Language as Scaffolds for Reading Comprehension with Secondary Struggling Readers

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Dedication

This dissertation is dedicated to my children, Caitlyn, Trevor, and Tyler, for cheering me on in spite of my stress and distraction, and for my husband, Greg, who is the most steadfast person I know.

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Listening Comprehension and Language as Scaffolds for Reading Comprehension with Secondary Struggling Readers

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This experimental study examined the effects of a reading intervention using listening comprehension and oral language as scaffolds to improve reading comprehension of middle school students with reading difficulties. The study included students in 6th-8th grade randomly assigned to a reading intervention treatment or a no treatment comparison condition. Treatment students received 45-minute sessions daily for a total of 33 sessions.

Reading comprehension measures included the Woodcock Johnson Passage Comprehension subtest, State of Texas Assessment of Academic Readiness reading, and an unstandardized curriculum-based measure of summarization. Measures of inference-making included the Test of Language Competence Listening Comprehension: Making Inferences subtest and an unstandardized curriculum-based measure of inference skills. Language abilities were assessed using the Woodcock Johnston Oral Comprehension subtest, and the Clinical Evaluation of Language Fundamentals Formulated Sentences and Recalling Sentences subtests. An unstandardized vocabulary measure assessed student recall of vocabulary words.

ANCOVAs were used to estimate the treatment effects for each dependent variable using pretest scores as a covariate. The Kauffman Brief Intelligence Test II Verbal Knowledge subtest served as covariate for the unstandardized vocabulary measure. Results yielded no statistically significant effects on reading comprehension, language, or inference measures. Effects, which were calculated with Cohen's *d*, ranged from .00 to .78, with eight of nine measures favoring treatment. Findings from an unstandardized vocabulary measure indicated a statistically significant difference in favor of the treatment group. Results suggest that using oral language and listening comprehension to support reading practices of middle school students with reading comprehension difficulties may be a viable treatment for improving reading comprehension and improving content-specific vocabulary knowledge.

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CHAPTER I
INTRODUCTION

According to the 2013 National Assessment of Educational Progress, 64% of all eighth-grade students performed below the proficient level in reading and an even higher 91% of students with disabilities performed below the proficient level (NAEP, 2013). This report suggests that many eighth-graders lack the ability to comprehend text written at their grade level. These data highlight the need that many students in middle school require intervention to improve the reading comprehension skills necessary for acquiring content knowledge from what they read. Older struggling readers demonstrate a broad range of difficulties related to: a) word reading; b) understanding word meanings; c) relating content to prior knowledge or a lack of background knowledge; d) application of comprehension strategies; and e) monitoring of understanding (Biancarosa & Snow, 2004; RAND Reading Study Group, 2002).

Comprehension of informational text becomes crucial to the acquisition of knowledge and student academic success after third grade (Gajria, Jitendra, Sood, & Sacks, 2007). Content area teachers in subjects such as science and social studies convey a substantial amount of information over the course of a school year. Content-specific curricula necessitate an additional emphasis on reading comprehension and vocabulary, requiring students to demonstrate academic, discipline-specific literacy and an increased expectation to derive inferences from texts (i.e. citing specific textual evidence to integrate information and support analysis of scientific text; Common Core Standards Initiative, 2010). This shift in focus from decoding text to comprehending text and using

text to acquire knowledge frequently results in a drop in reading scores by mid-elementary school (Chall, Jacobs, & Baldwin, 1990), and indicates a need for reading comprehension interventions. Several recent syntheses examining the effects of reading comprehension interventions with older struggling readers suggest that secondary students can benefit from interventions that provide explicit comprehension instruction (Edmonds et al., 2009; Kamil et al., 2008; Scammacca, Roberts, Vaughn, & Stuebing, 2013; Solis et al., 2012.)

Theoretical Base of the Study and Key Components of the Intervention

Theoretical models can provide insight into possible underlying issues related to the reading difficulties of older students and can be used to inform frameworks for secondary reading comprehension interventions. Key components of the current intervention included accessing or building background knowledge, integrating information to make inferences, summarizing text, and engaging in text-based discourse. Two models on reading comprehension, the Simple View of Reading and the Landscape Model, provide the theoretical underpinnings for the study and choice of components selected for the intervention.

The Simple View of Reading (Gough & Tunmer, 1986; Hoover & Gough, 1990; Tunmer & Chapman, 2012) provides a component model of reading comprehension that can inform interventions designed to improve the reading comprehension of older students. The Simple View describes reading comprehension as a multiplicative process consisting of two components, decoding and language comprehension. Both are

necessary for skilled reading. According to the Simple View, word recognition translates print into language, and the language comprehension component makes sense of this information. Both components of reading are interdependent; the acquisition of skill in one area augments the impact on reading skills in the other area. However, while both components are needed for comprehension to occur, they do not contribute equally to comprehension across time. By the time students reach the 8th grade, as many students have become more proficient at decoding text, listening comprehension outweighs word recognition abilities in terms of significance, and most poor readers exhibit deficits in listening comprehension (Catts, Hogan, Adlof, & Barth, 2003; Garcia & Cain, 2013).

In the large-scale, longitudinal study of more than 500 children, Catts, Hogan, and Adlof (2005) used multiple regression to examine the unique and shared contributions of decoding and listening comprehension to the reading comprehension of students in grades two, four, and eight. As predicted in the Simple View, word recognition and listening comprehension abilities accounted for a majority of the variance in reading comprehension across these grades, with listening comprehension explaining 9% of the variance in second grade increasing to 36% of the variance by eighth grade. Adlof, Catts, and Little (2006) later used these same data to examine word recognition accuracy, word recognition speed, listening comprehension, and reading comprehension as latent factors in a structural equation model, and found that by eighth grade, listening comprehension and reading comprehension formed a single construct. Therefore, according to these data and the Simple View, interventions for older students that affect listening comprehension

should impact reading comprehension as well. Studies that systematically scaffold reading comprehension through the use of oral language and listening comprehension warrant investigation. To date, little research on reading comprehension has explicitly targeted the use or oral language and listening comprehension as a mechanism to improve the reading comprehension of secondary struggling readers.

Whereas the Simple View provides theoretical support for the current study's use of scaffolding language to improve reading comprehension, the Landscape Model (van den Broek, 2005) provides support for the choice of the study's key components. The Landscape Model, like other process models of reading comprehension (e.g., Construction-Integration model; Kintsch, 1988; Structure-Building Framework; Gernsbacher, Varner, & Faust, 1990) describes the processes used to construct representations of text during reading. The reader must employ cognitive processes to integrate information between sentences in text as well as textual information with his world or topic knowledge. Memory-based processes are the automatic, passive accessing of information available in memory. On the other hand, constructionist processes are effortful, requiring active guidance by the reader. Memory-based processes provide input to constructionist processes, which then determine whether the memory-based input is sufficient to maintain a coherent understanding of text. If it is not, the reader may then employ more strategic constructionist processes to maintain or improve comprehension. As a result, constructionist processes lead to deeper understanding of text but require intentional effort on the part of the reader (van den Broek, 2005).

Within the Landscape Model, the reader is described as bringing "standards of coherence" to a reading task (van den Broek , Risden, & Huseby-Hartmann, 1995). Standards of coherence refer to what a reader knows and believes comprises good comprehension (van den Broek, Helder, & Van Leijenhorst, 2013; van den Broek, Virtue, Everson, Tzeng, & Sung, 2002). Standards of coherence impact to what extent a reader will engage in more effortful constructionist processes. For example, a reader with lower standards of coherence for a reading task is less likely to engage in constructionist processes. Secondary struggling middle school readers may possess more relaxed standards of coherence (van den Broek, 2005), suggesting a need for instructional practices designed to encourage these students to engage in more strategic constructionist processes, such as retrieving information from earlier text, slowing down, or searching background knowledge (van den Broek, 2010). Students who struggle with comprehension may benefit from explicit instruction in how to retrieve knowledge about a topic and integrate that knowledge with incoming text information. A highly interactive, oral language-based intervention may encourage the effortful constructionist processes described in the Landscape Model, while extensive verbal interaction may challenge students to increase their standards of coherence while reading text.

Purpose of Study

The purpose of the study was to investigate the effects of an intervention aimed at improving reading comprehension by utilizing listening comprehension and oral language as scaffolds to support building background knowledge, inference making,

summarizing skills, and text-based discourse in middle school students with reading comprehension difficulties. The study sought to explore whether adding listening comprehension and language supports in a small-group intervention would improve reading comprehension for struggling middle school students.

Research Questions:

1. What are the effects of treatment on the reading comprehension of middle school struggling readers?
2. What are the effects of treatment on proximal and distal measures of inference-making?
3. What are the effects of treatment on the listening comprehension and language skills of middle school struggling readers?
4. What are the effects of treatment on student recall of vocabulary words?

CHAPTER II

REVIEW OF LITERATURE

This chapter presents a) an overview of recent syntheses on reading interventions for students in upper elementary through 12th grade; b) an overview of oral language and listening comprehension research; and c) a review of previous reading comprehension intervention research on key components chosen for the study.

Recent Syntheses of Adolescent Reading Intervention Research

Four recent syntheses have reported on reading practices for older struggling readers (Edmonds et al., 2009; Kamil et al., 2008; Scammacca et al., 2013; Solis et al., 2012). Kamil et al. (2008) reviewed effective practices for improving comprehension of students in grades 4-12. The authors recommended explicit comprehension strategy instruction, generative and non-generative approaches to vocabulary instruction, extended discussion, and an increase in students' motivation and engagement.

In their examination of 29 studies with students in grades 6-12 that addressed word study, fluency, comprehension, and multicomponent approaches to improving reading comprehension, Edmonds et al. (2009) found an overall moderate mean weighted effect favoring students in the treatment conditions. Multi-component reading treatments (e.g., Bryant et al., 2000; Strong, Wehby, Falk, & Lane, 2004) were shown to be effective when compared to control conditions on reading comprehension outcomes for students with reading difficulties. The authors identified reading interventions in comprehension and word reading strategies as potentially effective practices. The results of this study

suggest that adolescent students with reading difficulties can improve their reading comprehension when taught reading comprehension practices.

Similar results were found in a synthesis by Solis et al. (2012) of studies conducted with middle school students summarizing findings from 12 reading comprehension interventions between 1979-2009. Treatment conditions included strategy instruction, mapping, questioning, reviewing, and self-monitoring. A majority of treatments used instruction related to main idea or summarization. The studies reviewed included several instructional methods for teaching summary such as self-questioning or mnemonic devices with which to remember strategy steps, and were often supported through self-monitoring tools such as checklists or cue cards.

Scammacca et al. (2013) updated and extended an earlier meta-analysis (Scammacca et al., 2007) examining reading intervention studies from 1980-2004 for grades 4-12. The updated meta-analysis analyzed reading intervention studies in grades 4-12 between 2005-2011. Effects from all reading comprehension measures in the 2013 meta-analysis indicated a mean effect size of 0.24. Reading comprehension interventions were associated with significantly higher effects than were fluency interventions. Fewer studies focused exclusively on vocabulary interventions than in the 1980-2004 group, but a majority of the 2005-2011 multi-component interventions included some vocabulary instruction. These data continue to confirm that teaching reading comprehension strategies to late elementary through high school struggling readers is beneficial. However, the effect sizes found in this meta-analysis were somewhat smaller than those

seen in earlier syntheses. The authors speculate that this decrease could be attributed to treatments increasingly being compared to an alternative intervention rather than a true no-treatment control group. Taken together, these syntheses suggest that struggling older readers derive benefit from several instructional practices, including strategy instruction, which explicitly teaches struggling readers to engage in the productive reading behaviors seen in proficient readers (Duke & Pearson, 2002).

Prior Research on Oral Language and Listening Comprehension

Language interventions typically focus on young children (e.g. Vasilyeva, Huttenlocher, & Waterfall, 2006), and target a specific language domain such as phonology, semantics, syntax/morphology, and broader language skills (Cirrin & Gillam, 2008). While the current study examined the use of oral language and listening comprehension to improve reading comprehension, it included participants in the middle grades and did not narrowly focus on improving language by targeting a specific language domain. Therefore, this section does not provide a comprehensive review of language intervention research but instead highlights research on oral language and listening comprehension relevant to the current study.

Although most empirical language studies focus on specific language targets, only one study was located that, similar to the current study, examined the broader use of language to improve reading comprehension. Clarke, Snowling, Truelove, and Hulme (2010) conducted a randomized controlled trial comparing the effectiveness of three treatments intended to improve reading comprehension with a no-treatment control

condition. Participants were 8- and 9-year-olds with reading comprehension difficulties. The text-comprehension (TC) lessons included metacognitive strategies, reciprocal teaching with text, making inferences from text, and written narrative. The oral language (OL) training included vocabulary, reciprocal teaching with spoken language, figurative language, and spoken narrative. The TC and OL training combined (COM) condition integrated all components from both the TC and OL training conditions but moved at a faster pace so that total treatment time remained the same as other conditions.

All intervention groups made significant improvements on a standardized measure of reading comprehension compared to no-treatment control group. While gains were maintained at follow-up in the TC and COM groups, the OL group made greater gains than the other groups between the end of the intervention and follow-up. Furthermore, the OL and COM groups also made significant improvements in expressive vocabulary compared with the control group. This study provides support for the potential of an oral language-based intervention to improve reading comprehension, while illustrating how language studies tend to focus on young children. There is a notable absence of language interventions for middle and high school students (Cirrin & Gillam, 2008).

Researchers have long suggested that listening comprehension and reading comprehension share similar processes (e.g. Berger & Perfetti, 1977; Carroll, & Freedle, 1972; Chaudron & Richards, 1986; Kintsch & Kozminsky, 1977; Lund 1991). Listening comprehension, like reading comprehension, requires the acquisition of linguistic

information, which the reader then connects to a wider context to construct a coherent mental model (Kintsch , 2005). Little research has been conducted focusing on the listening comprehension of secondary struggling readers. Much of the listening comprehension research has focused on very young children or with second language learners (e.g., Aarnoutse, Brand-Gruwel, & Oduber, 1997; Chang & Millett, 2014; Garner & Bochna, 2004; Paciga, 2013).

One area of experimental research focusing on listening comprehension examined the benefits of having students listen to text as they read it. Results have been mixed. Reading while Listening (RWL) has been found to improve fluency in the primary grades (McMahon, 1983; Tedjaatmadja, 2012), reading comprehension in students whose first language is not English (Chang, 2011; Gobel, 2011), and reading comprehension with older struggling readers (Verlaan & Ortieb, 2012). Verlaan and Ortlieb (2012) compared the effects of RWL and silent reading on the reading comprehension performance of students enrolled in a 10th grade high school English class. Students read portions of a novel, alternating between reading while listening and reading silently, and took assessments following the completion of each type of reading activity. Results indicated that RWL yielded statistically significant increases on unstandardized measures of reading comprehension for not only the entire sample but an even greater improvement for struggling readers.

In contrast, other studies of RWL have found the practice had no significant impact on reading comprehension (Schmitt, Hale, McCallem, & Mauck, 2011) or that it

improved the reading comprehension of poor readers while actually worsening the reading comprehension of proficient readers (Holmes, 1985). Hence, while previous research seems to suggest that RWL might benefit some subgroups of readers, the question of whether secondary students with poor reading comprehension would derive benefit from having text read aloud to them while they read the text silently remains largely unanswered. It is possible that this practice alone is insufficient, and that additional reading comprehension instruction could enhance the effectiveness of RWL.

Despite the increased importance of listening comprehension to reading comprehension by the middle grades, little is known about the effect of using oral language and listening comprehension as scaffolds towards improving reading comprehension in older students. Although language continues to play a significant role in the reading comprehension of older students, a gap remains in the literature examining using language as a vehicle to improve reading comprehension.

Prior Research Related to Components of the Intervention

Key components of the current intervention included accessing or building background knowledge, integrating information to make inferences, summarizing text, and engaging in text-based discourse. Perfetti and Adlof (2012) describe "pressure points" of comprehension that represent malleable targets for intervention that should take priority over other, less malleable targets. They also describe comprehension outcomes, which include specific procedures (i.e. strategies) that enhance comprehension, as well as comprehension supports (i.e. graphic organizers). Accessing

knowledge and inference making were two "pressure points" included as components in the current intervention, while summarization served as a comprehension outcome and text-based discourse functioned as a comprehension support. This section provides a review of relevant literature around each of these components. Several of these intervention studies included some use of oral language or listening comprehension, but none were specifically designed to utilize oral language or listening comprehension as a mechanism for improved reading comprehension.

Background knowledge. Prior knowledge is associated with better reading comprehension (McNamara & Kintsch, 1996; National Reading Panel, 2000). Reading is often described as a two-stage process of activating and integrating information to form mental models (Kintsch, 1988). Both listening comprehension and reading comprehension share many of the same processes, with the goal of developing an accurate mental model. In both listening and reading, the listener/reader must absorb incoming information and integrate/reconcile it with previous knowledge to continually update the mental model. A reader with good comprehension activates prior knowledge and then integrates it with incoming textual information and linguistic knowledge to continually update a coherent mental representation of text (Coyne et al., 2010; Gernsbacher et al., 1990; Kamalski, Kintsch 1988; Sanders, & Lentz, 2008). Consistent with these observations about good comprehenders, students with reading comprehension problems frequently show deficits in background knowledge (McNamara & McDaniel, 2004). The Landscape Model illustrates the dynamic and interactive nature of both

stages, making explicit how the processes share a reciprocal relationship that leads to text comprehension (van den Broek, 2005). Without activation of a reader's background knowledge, text would be largely incomprehensible, because the meaning of text emerges through these interactive processes between reader and text (Marmolejo-Ramos, Juan, Gygax, Madden, & Roa, 2009). For example, consider a text that introduces the topic of radioactive decay by talking about energy loss, parent nuclides, and daughter nuclides. A reader with no background knowledge of these concepts or vocabulary would have little comprehension of the text. However, students with some prior knowledge of the concepts are far more likely to comprehend the text. Reading comprehension interventions, therefore, often include practices designed to teach students how to access prior knowledge, and build knowledge where it is lacking.

Reading comprehension interventions often aim to activate prior knowledge by having students preview textual features and textual content prior to reading (Cates, Thomason, Havey, & McCormick, 2007; Vaughn et al., 2011) or through the pre-teaching of vocabulary words essential to passage comprehension (Burns, Dean, & Foley, 2004; Vaughn et al., 2013). Previewing text is one way for students to access prior knowledge and more successfully develop mental representations. For example, as a before-reading activity, Collaborative Strategic Reading (CSR; Vaughn et al., 2011) teaches students to scan for text features such as headings, subheadings, and graphs to brainstorm what they already know about the text. Students next make a prediction about what they think they are going to learn from the passage, priming them to integrate new

knowledge with existing knowledge. CSR embeds the use of oral language with students working together in small groups to make meaning of text; however, the goal of CSR is not to promote, leverage, or support oral language.

Other studies have examined the effect of an intervention on the ability to make better use of existing prior knowledge during reading. Alfassi (2004) found that students who were less adept at accessing previous knowledge prior to reading demonstrated greater reading comprehension benefits from a combined strategy intervention than did students who were better able to retrieve prior knowledge. None of the students participating in this intervention were classified as having poor comprehension. The intervention combined reciprocal teaching (Palincsar & Brown, 1984) and direct explanation (Duffy et al., 1987) for a 20-session intervention with 277 sophomores across multiple content classes. The combined strategy intervention resulted in improved student ability to answer explicit and implicit questions on a research-developed reading comprehension measure after receiving the intervention. Alfassi (2004) suggests that a combined strategy instruction can enhance student ability to retrieve prior knowledge while reading, and that it can provide older students with tools to help them apply higher order processes while they learn from text.

Students with poor comprehension, however, frequently possess insufficient background knowledge to make sense of what they read (Gersten, Fuchs, Williams, & Baker, 2001). For these students, the issue is not their inability to access prior knowledge but an overall deficiency in knowledge. Secondary students who have had reading

problems for a number of years have likely read less text, resulting in a lack of overall world knowledge (Cunningham & Stanovich, 1997). Activities designed to activate prior knowledge are less effective with these students because they possess too little knowledge to activate, and therefore tend to create incomplete or incoherent mental representations. In this case, students can benefit from activities designed to build background knowledge, including vocabulary words (Dole, Valencia, Greer, & Wardrop, 1991).

The relationship between background knowledge and reading comprehension is clear. Burns, Hodgson, Parker, and Fremont (2011) examined how a method for accessing prior knowledge compared to a method for building background knowledge in terms of their relative efficiency. The authors compared previewing text to pre-teaching keywords in a small group counterbalanced design study with middle school students. Participants performed a preliminary reading task that served as a control condition. Measures included number of correct answers to comprehension questions from the passages in each condition, and efficiency was computed by timing the intervention sessions.

In the preview condition, instructors provided students with a short, oral preview of text (Graves, Cooke, & LaBerge, 1983) through brief questions and statements related to themes and ideas in the text, a description of major story elements (i.e. setting, characters); and a review of index cards with names and descriptions of main characters. For the keyword condition, the instructor presented a list of keywords prior to reading.

Keywords were determined in advance to be crucial to the comprehension of the passage. The instructor presented these keywords on flash cards by first orally stating the word, having students repeat the word orally, and finally asking students to orally provide sentences using the word. Each word was then rehearsed using the Incremental Rehearsal approach (IR; Tucker, 1989), with repeated exposures to the word.

The authors found a statistically significant difference on a researcher-developed measure of reading comprehension over baseline for both of the approaches (Preview approach $d = 0.74$; Keyword approach $d = 1.09$), with a non-significant difference between the conditions. Efficiency was operationally defined as the number of comprehension questions answered correctly for each of the two conditions divided by the number of instructional minutes. The keyword pre-teaching method was found to be more efficient, which the authors deemed an important consideration when making school-based decisions about use of available resources for interventions. Both studies incorporated the use of oral language, but the language component was incidental—a byproduct of the interventions—and not systematically used or assessed.

In summary, reading comprehension is impacted by background knowledge and within background knowledge, word knowledge or vocabulary (Compton, Miller, Elleman, and Steacy, 2013; Cromley & Azevedo, 2007). Teachers can provide students direct instruction in how to connect prior knowledge to desired knowledge about a particular topic through activities such as small group discussion (Alfassi, 2004), previewing text or keywords (Burns et al., 2011), or brainstorming and predicting

(Vaughn et al., 2011). However, while several of the reviewed studies included the use of oral language, none systematically targeted listening comprehension and oral language to help readers connect prior knowledge with new knowledge to continually update understanding of text.

Inference making. When making an inference, the reader generates meaningful links between different parts of a text and/or uses prior knowledge to fill missing details (Cain, 2010). Kintsch (1998) posited that this process of reconciling prior information with incoming new information facilitates reading comprehension, and that various factors such as textual features, language skills and domain knowledge influence a reader's ability to form well-structured meaning. As a reader proceeds through the text, the reader's working memory is continually updated. Some of the existing information in working memory remains a focus while some of the information is replaced by new incoming information. The processes involved in comprehending while reading a text directly affect the reader's learning from the text, and are in part determined by the standards of coherence a reader brings to text (van den Broek, 2010). A reader's standards of coherence can sometimes be met entirely by memory-based processing, while in other cases the reader may need to actively pursue representation of text through constructionist processing (van den Broek, 2005). It is likely that students who demonstrate poor comprehension have difficulty distinguishing relevant from less important information in the structure-building process (Gernsbacher et al., 1990), and may overly rely on memory-based processing. Because the ability to integrate

information within and across text is so essential to reading comprehension, making inferences is frequently addressed in interventions aimed at improving reading comprehension.

For example, an intervention might teach students to first identify relevant information from text as they are reading (i.e. identify the main idea), and then integrate this information across multiple paragraphs to form a coherent summary of text (e.g. Berkeley, Mastropieri, & Scruggs, 2011; Vaughn et al., 2011). Another way to incorporate inference-making is in the form of generating and answering inferential questions. In both the Berkeley et al. (2011) and CSR (Vaughn et al., 2011) studies, students were taught to generate questions about text. Berkeley et al. (2011) asked students to formulate questions based on text features such as headings or subheadings, and then answer the questions after reading each section. Vaughn et al. (2011) taught students to generate questions after reading text. Questions were literal ("right there") or required various degrees of integrating information within and beyond the text ("think and search" or "author and you"). An additional way to practice integrating information is for the instructor to ask inferential questions about text (Vaughn et al., 2013).

In contrast to more integrated approaches to inferential processing, Fritschmann, Deshler, and Schumaker (2007) provided explicit steps to use in answering inferential questions in a multiple-baseline across-subjects design with eight students in grade 9 with learning disabilities. The strategy taught participants five steps to answering an inferential question, using the mnemonic INFER: a) "Interact with the passage and the questions"

(e.g. note title and length of passage, identify whether the question is factual or inferential), b) “Note what you know” (e.g. recognize relevant background knowledge or experience, underline key words in the question), c) “Find the clues” (e.g. read the passage and underline clues directly related to key words in the question), d) “Explore more details” (e.g. look for additional clues), and e) “Return to the question” (e.g. select an answer to the question).

Unstandardized measures included a strategy-use test, a comprehension test, and a strategy knowledge test. Standardized measures included the Sentence Completion and Passage Completion subtests of the Group Reading Assessment and Diagnostic Evaluation (GRADE; Williams, 2001). Results on unstandardized measures indicated an increase in students’ use and mastery of the strategy as well as a positive change in their ability to answer inferential questions. Posttest scores on the GRADE were significantly higher after inferential strategy instruction, with a large effect size ($r = 0.91$).

Integrating information while reading is fundamental to making the cohesive and complete mental representations of text necessary for successful reading comprehension. Many factors such as textual features and domain knowledge affect the degree of integration that can occur. Inference making can be incorporated into a variety of reading tasks and is often taught through the generating and answering of questions about text. However, no study has yet examined how the systematic use of oral language and listening comprehension contributes to the effectiveness of inference training.

Main idea and summarization. Explicit instruction in how to identify main ideas and summarize within paragraphs and across text is associated with better reading comprehension in secondary students (Kamil et al., 2008). In order to produce a coherent summary, students identify essential information within a paragraph or text, and delete less relevant information (Gajria & Salvia, 1992; Kintsch & van Dijk, 1978). Identifying relevant information (e.g., main idea) within text is often a during-reading activity, followed by the integration of that information into a summary after reading. Main idea information therefore informs summarizing.

Two intervention studies (Malone & Mastropieri, 1992; Mastropieri et al., 1996) utilized self-questioning techniques to teach students how to summarize text. In the Malone and Mastropieri (1992) study, middle school students were taught to stop after each paragraph of text and ask, "Who or what is the paragraph about?" and "What is happening to them?" The answers to these questions were used to form a summary statement. Students in the control group read stories, practiced vocabulary, and answered questions about the text. Findings indicated that the students who were taught the summarization strategy outperformed the students in the control condition ($M = 1.77$) on an unstandardized measure of reading comprehension.

Mastropieri et al. (1996) also investigated the use of questioning to identify important ideas in text. After each sentence, the researcher asked questions to help students check their understanding and reflect on the meaning of text (e.g. "Why does that make sense?") Corrective feedback was provided for incorrect answers until mastery

of the concept was achieved. The comparison group focused on remembering factual information. Measures included tests of factual recall and providing explanations about the text. Differences on the factual recall measure were not significant (ES = 0.05), but the treatment condition outperformed the control condition (ES = 0.89) on the text explanation measure. The questions and feedback provided by the researcher were processed orally; however, the use of oral language was not the focus of the intervention nor was it measured in any way. Oral language was present, but it is unclear to what extent it contributed to study effects.

Other summarization techniques teach students to restate or retell a text in their own words. The RAP strategy (Schumaker, Denton, & Deshler, 1984), researched for more than two decades, is a method for paraphrasing expository text. Students are taught to RAP (Read a paragraph, Ask yourself what the paragraph was about, Put the main idea and two details in your own words. The RAP strategy has demonstrated effectiveness for students with LD (Graves, 1986). An intervention investigating use of RAP (Graves & Levin, 1989) found a large effect in favor of the treatment group on an unstandardized reading comprehension measure (ES = 2.39); moreover, when RAP included the addition of self-monitoring, gains were very large (ES = 4.59).

Similar gains were noted in more recent studies that investigated use of the RAP strategy with older students (Cantrell, Almasi, Carter, Rintamaa, & Madden, 2010; Hagaman & Reid, 2008). A single subject study (Hagaman & Reid, 2008) utilizing a multiple baseline across participants was designed to investigate the effects of RAP when

paired with self-regulated strategy development (SRSD; Harris & Graham, 1996). Participants included three sixth-grade students with identified reading comprehension difficulties. Results on a researcher-developed measure suggested an improvement in all three participants' ability to recall information read and answer text explicit and short-answer inference questions.

A yearlong study with sixth and ninth graders incorporated the RAP strategy as part of a larger, multicomponent intervention (Cantrell et al., 2010). A group of students did not receive the intervention and served as a control group. Treatment students practiced RAP with a variety of texts, and the teacher encouraged students to think about how the strategy could be used in various contexts, including their content classes. Findings indicated the sixth grade students in the treatment group outperformed the sixth graders in the control group (ES = 0.22) on a standardized measure of reading achievement. There were no significant differences on the standardized reading measure between the ninth grade treatment and control groups. Of the studies reviewed utilizing the RAP strategy, the amount of time spent orally processing the strategies was inconsistently reported, and it is equally unclear how much, if any listening comprehension practice was incorporated into the interventions. Even when an oral language component was present (e.g., Cantrell et al., 2010), it is not possible to know to what extent processing the RAP strategy orally contributed to intervention effects.

Summarization was taught through an explicit four-step process as part of a study examining the effects of Reading Comprehension Strategy (RCS) instruction with and

without attribution training (AR) on the reading outcomes of 7th-9th grade students with learning disabilities (Berkeley et al., 2011). Students in a traditional reading class with a focus on fluency and comprehension served as a comparison group (C). Students learned to ask themselves who (or what) the section of the article was about, and what were they supposed to learn from the section, list most important words from this section (no more than 10 words), and finally write a summary of the text (no more than 2 sentences). Students in the RCS+AR treatment group were taught to distinguish positive from negative thoughts, compose self-taught statements, use self-talk during lessons, and received attribution feedback from the teacher. On a summary task measure, both treatment groups (RCS and RCS+AR) scored significantly higher than the comparison group representing large effect sizes for both the RCS (ES = 0.94) and RCS+AR (ES = 1.44) groups. The difference between the two treatment groups was not significant. A delayed posttest of the summary measure revealed that gains were moderately maintained for both RCS (ES = 0.71) and RCS+AR (ES = 1.21) treatment groups. A passage-specific content test did not yield significant differences between any of the groups.

Summarizing is a complex skill that requires students to be actively engaged in the reading process (Berkeley et al., 2011). Students must be able to distinguish important information from details of less importance, and integrate this information with prior knowledge and what was previously read. Strategies to support main idea identification and summarization have demonstrated a positive impact on student reading comprehension and are often included in a majority of reading interventions for middle

school struggling readers (Solis et al., 2012). While several of the reviewed reading interventions included some amount of oral language in the teaching or practicing of summarization strategies (e.g. Berkley et al., 2011; Cantrell et al., 2010; Mastropieri et al., 1996), none specifically targeted the use of listening comprehension and oral language to improve student summarization of text.

Text-based discourse. Oral discourse has been included within numerous reading interventions in the form of collaborative groups, partner discussion and peer tutoring. Interventions in which students participated in these discussion activities yielded moderate improvements to adolescent reading comprehension (Kamil, et al., 2008). However, the focus of group discussion is frequently the application of reading strategies. Scholars have expressed increased skepticism about the practice of prescribing strategy-based instruction to improve the reading skills of students with reading disabilities (Compton et al., 2013; McKeown, Beck, & Blake, 2009; Solis et al., 2012). Compton et al. (2013) argue that strategy instruction can result in low-level representations of text and subsequently an inadequate or incomplete situation model of text. McKeown et al. (2009) suggest that one of the issues with strategy-based approaches is that "strategy prompts create a path that is not directly into text, but once removed" (p. 31). They argue that strategy approaches require students to focus on procedures around the application of a strategy, taking their attention away from the text itself. The focus of discussion becomes the strategy rather than the active processing of text.

While strategy instruction has a strong research base, other approaches to reading intervention have emerged in response to growing concern about isolated strategy use. A text-focused approach, characterized by text-based discourse, reflects an acknowledgement that reading comprehension is not a single skill but a set of complex higher-level mental processes (Kamhi, 2009). Available research on studies utilizing a text-focused approach is much sparser than research on strategy use, but can be seen in previously discussed studies examining Questioning the Author (QtA; Beck, McKeown, Sandora, Kucan, & Worthy, 1996), as well as the Promoting Adolescent Comprehension of Text (PACT) study (Vaughn et al., 2013). Questioning the Author requires students to reflect on an author's message to better build a mental representation of this information. As students read text, they respond to teacher questions (i.e. "What do you think the author means by that?"). Questions posed are deliberately broad, eliciting deeper thinking than retrieval-based questions. Components of a QtA approach include: a) the use of general probes intended to assist in interpreting text meaning, b) question-asking that occurs within the context of processing text, and c) active collaboration to construct meaning. Beck et al. (1996) conducted a yearlong study examining the effects of QtA with 23 fourth-grade students compared to baseline data. By the end of the year, the authors noted the amount of purposeful student talk had doubled in the QtA classrooms compared to baseline. The authors also found positive changes in how the students engaged with text on a constructing meaning task.

Vaughn et al. (2013) utilized a text-focused instructional approach within a more rigorous intervention design with eighth graders in general education social studies classes. PACT employed a within-teacher design, meaning teacher participants taught using the treatment components in approximately 50% of the classes and continued with typical instruction as a control group for the other 50% of their classes. The intervention included activities to access or build background knowledge, vocabulary instruction, text-focused approach to reading instruction, inference making, and team-based learning. Team-based learning (TBL; Michaelsen & Sweet, 2008) is a text-focused approach seen primarily in postsecondary level pharmaceutical and medical programs. At the college level, the primary goal of TBL is to increase student acquisition and depth of content knowledge. Vaughn et al. adapted TBL to focus on improved reading comprehension as well. Students were assigned to teams for several activities, including a culminating activity that applied knowledge acquired through the unit of study. Tasks were structured to foster interdependence between group members and extended discussion around text. During reading, students were taught to stop and check their understanding of text through teacher-facilitated discussion. As students proceeded through text, the teacher continued to probe their understanding and ask them to connect new information to previously read information. Students in the treatment condition statistically outperformed a control condition on a measure of content learning (ES = 0.29) and a standardized measure of reading comprehension (ES = 0.20).

In their study comparing a content approach to a strategy approach, McKeown et al. (2009) conducted a two-year study comparing the effectiveness of a strategy approach, a content approach, and a control condition that utilized typical basal instruction. Participants were all fifth graders at a low-performing school. The strategy approach included instruction on summarizing, predicting, drawing inferences, generating questions, and comprehension monitoring. The content approach included an adaptation of the QtA method of processing text. Measures included the Sentence Verification Technique (SVT; Royer, Hastings, & Hook, 1979) for each text of the five lessons implemented in the study, an analysis of the discourse during the lessons in both approaches, a measure of oral recall on two of the five lessons, a comprehension-monitoring task, and a strategies knowledge task.

The results indicated no significant differences on the SVT between groups, but on the oral recall measure the content group produced significantly longer and higher quality retells than did the strategy approach group. Furthermore, post-hoc tests conducted for text-related student talk revealed a higher proportion of text-based student discussion in the content approach group (94%) than the strategy approach group (75%; $p = .005$). The authors suggest that a content approach provides comparable reading comprehension benefits to a strategy approach.

While a text-focused approach shows promise for improving reading comprehension, studies examining this approach have not systematically and explicitly used listening comprehension and oral language practice within the interventions. For

many studies, the actual amount of talk around text is inconsistently reported or not described. For example, students might read silently to themselves and then engage in the text-based discourse characteristic of a text-focused approach. Often the way text is read (i.e. aloud, silently, by the teacher or by the student) is not specified. In these studies, it is likely that the focus is not on the means of reading text, and is often left up to the discretion of the tutor. Adding specificity to the amount and use of listening comprehension and oral language within a text-focused approach to reading instruction could potentially enhance the quantity and quality of text-based discourse, resulting in more productive discussion and subsequently improved reading comprehension.

Finally, a strong research base supports strategy instruction, yet there is growing concern about potential limitations of the prescriptive application of a strategy approach (Compton et al., 2013). A text-focused approach, informed by cognitive theory and characterized by student and teacher talk around text, provides an alternate approach to reading comprehension instruction. Less is known about the effectiveness of this approach, although there is some preliminary evidence of its potential to improve reading comprehension (Beck et al., 1996; McKeown et al., 2009; Vaughn et al., 2013). While text-based discourse is essential to a text-focused approach to reading instruction, the systematic scaffolding of listening comprehension and oral language within this approach could produce higher quality discussion and possibly improved reading comprehension in secondary students.

Summary

An overview of several recent syntheses reveals that secondary students can derive benefit from interventions that include a number of practices that informed the proposed study: a) accessing or building background knowledge, b) inference making, c) summarization; and d) text-based discourse. Critical to the proposed study is the systematic and explicit use of listening comprehension and language to support and increase the efficacy of these practices. Background knowledge is associated with reading comprehension (Compton et al., 2013), suggesting that explicit teaching aimed at accessing or increasing domain knowledge can improve reading outcomes, particularly in secondary students. Moreover, explicit instruction in recognizing key information in text and the synthesizing of this information to produce a cohesive summary has been associated with improved reading comprehension in secondary students (Kamil et al., 2008). Woven throughout effective reading interventions for adolescents are the inferential processes critical for reading comprehension to occur. Inference practice can include generating questions or answering questions that require a reader to combine prior knowledge about the text with new information to form an accurate mental representation of text. While background knowledge, summarizing, and inference making have been studied in previous interventions, the proposed study differs from other interventions in its purposeful use of listening comprehension and language to scaffold these activities in support of improved reading comprehension.

Finally, a text-focused approach to reading intervention provides an alternative approach for secondary students, although more research is needed to better understand its efficacy. An intervention that utilizes listening comprehension and oral language as a scaffold for improving students' ability to access background knowledge, make inferences, summarize, and engage in text-based discourse may in turn improve the reading comprehension of middle school students with reading comprehension difficulties.

CHAPTER III

METHOD

Overview

This study examined the effects of an intervention aimed at improving reading comprehension by using listening comprehension and language as scaffolds to improve the use of knowledge, summarization skills, inference making, and text-based discourse of middle school students with reading comprehension difficulties. Students in grades 6–8 who did not pass the state reading assessment for the 2012–2013 school year were randomly assigned to either a treatment group that participated in the intervention or a comparison group that did not participate in the intervention.

Research Questions

This study addressed the following research questions: a) What are the effects of the treatment on the reading comprehension of middle school struggling readers? b) What are the effects of the treatment on proximal and distal measures of inference-making? c) What are the effects of treatment on the listening comprehension and language skills of middle school struggling readers? d) What are the effects of the treatment on student recall of vocabulary words?

Participants

The sample consisted of 18 sixth-grade, 26 seventh-grade, and 11 eighth-grade students for a total of 55 participants. Students were eligible for the study if they were enrolled in grades 6-8, failed or received a score one-half standard error of measurement

above the state-established passing score on the reading State of Texas Assessments of Academic Readiness (STAAR®; Texas Education Agency, 2012) in the previous school year, and provided written consent from a parent or guardian for participation in this study. The participating middle school provided a formal reading course for 60 students in grades 6-8 who scored the poorest on the STAAR; students enrolled in this additional reading class were excluded from participation in the current study. An experienced independent researcher not affiliated with the research team completed the computerized randomization. Treatment groups consisted of 3-5 students for a total of seven groups. The initial sample size was 59 students (30 treatment, 29 control). After attrition, the final sample for the study consisted of 55 students (26 treatment, 29 control).

Obtaining Consent

Prior to conducting the study, school personnel were informed about the logistics and components of the intervention. The study was approved through the district application process and the institutional review board (IRB) at The University of Texas at Austin. The research team met with eligible students and explained the purpose of the study and what the requirements were for participation. An initial pool of 96 students was identified who met the criteria for participation prior to screening. Research staff sent parental consent and student assent (see Appendix A) forms home to all 96 students. Of the 21 forms returned, 16 provided permissions for participation. As a follow-up, district personnel and the research team made phone calls home. A telephone script explaining the study was provided to the district personnel completing the calls. Calls were made to

59 parents of students who did not return a form by the initial deadline. Consent for participation was obtained for 43 additional students, bringing the total initial sample size to 59 students.

Student Information

The treatment and control groups were compared on the demographic variables of ethnicity, English as a second language (ESL) status, and age from data provided by the district. Table 3.1 represents the frequency of different ethnicities by experimental condition.

Table 3.1 *Ethnicity*

Group assignment	Ethnicity	Frequency	Percentage
Treatment	Hispanic	19	73.07
	Caucasian	6	23.08
	Two or more races	1	3.85
	Total	26	100.00
Control	Hispanic	23	79.31
	Caucasian	6	20.69
	Two or more races	0	0.00
	Total	29	100.00

The majority of participants were Hispanic (76.36% of the total sample) and Caucasian (21.82% of the total sample). The remaining portion of the sample (1.82%) was identified as two or more races. Students in the treatment condition participated in 50-minutes sessions, five times a week for eight weeks beginning in March 2014 until the middle of May 2014. The intervention was implemented daily with the exception of days in which there was a grade-wide assessment or school holiday. Groups received 33 total sessions of the intervention. Students from both treatment and control groups were posttested within five days of the end of the intervention.

A description of students by special education and English as a second language (ESL) status is presented in Table 3.2. The largest numbers of students (25.45% of the total sample) were identified as having ESL status. The special education group comprised approximately 5% of the total sample.

Table 3.2 *Student Demographic Information*

Group assignment	SPED status	ESL status
Treatment (n = 26)	0.00% (n = 0)	30.77% (n =8)
Control (n = 29)	10.34% (n = 3)	20.69% (n = 6)

Note. SPED = special education; ESL = English as a second language

Tutors

Intervention tutors hired by the university provided the instruction for the intervention. Tutors had a master's degree as well as school teaching experience and/or experience providing small group reading instruction.

Training

Intervention tutors participated in eight hours of training over a two-week period prior to the start of the intervention. Training included the instructional routines and techniques associated with the intervention (i.e. use of an overarching question, reading of text, making inferences, and an application activity). Training of tutors also included techniques of effective instruction, including brisk pacing, providing explicit feedback, managing small groups, and scaffolding instruction. Tutors were provided full sets of lesson plans and participated in practice sessions prior to beginning implementation. Tutors met several times per week to discuss student progress and implementation-related issues.

Materials

Tutors received a complete set of lessons for the eight weeks of implementation. Lessons were the same for all groups, using Lexile® ("Get a Lexile Text", 2013) levels to estimate the difficulty of reading passages. All necessary materials were provided, including vocabulary cards, picture cards, reading passages, white dry-erase boards, and any materials required of the application activities.

Measures

Pretest and posttest measures for both treatment and control groups included the Passage Comprehension and Oral Comprehension subtests of the Woodcock-Johnson III (WJ-III); the Listening Comprehension: Making Inferences subtest of the Test of Language Competence-Expanded Edition (TLC-E); the Recalling Sentences and Formulating Sentences subtests of the Clinical Evaluation of Language Fundamentals (CELF-5); and researcher-developed curriculum-based measures of summarizing and making inferences (CBM). The Verbal Knowledge subtest of the Kauffman Brief Intelligence Test-II (KBIT-2) and the Test of Word Reading Efficiency (TOWRE-2) were administered to both treatment and control groups at pretest only. An unstandardized measure of vocabulary recall was administered to both treatment and control groups at posttest only. Measures are summarized in Table 3.3. A five-member assessment team administered the assessments to the students. Two weeks prior to the beginning of implementation, testers attended three hours of initial training on administration protocols and attended an additional 90-minute reliability session prior to working with students in the study to ensure that test administration is conducted consistently. While testing, testers were supervised for a portion of test administration time by an assessment coordinator. To ensure independence of test data, the investigator did not participate directly in post-testing.

Table 3.3 *Measures in the Study*

Construct	Measure	Pretest	Posttest
Reading comprehension	WJIII-PC	X	X
	STAAR-R	X	X
	CBM-S	X	X
Inferencing	TLC	X	X
	CBM-Inf	X	X
Language abilities	WJIII-OC	X	X
	CELF-5 (FS)	X	X
	CELF-5 (RS)	X	X
Vocabulary recall	Vocabulary Measure		X
Verbal knowledge	KBIT-2	X	
Word reading skills	TOWRE-2	X	

Note. All measures were administered to both treatment and comparison groups; WJIII-PC = Woodcock Johnson III Passage Comprehension subtest; STAAR-R = State of Texas Assessment of Academic Readiness Reading; CBM-S = Currriculum-based Measure of Summarization; WJIII-OC = Woodcock Johnson III Oral Comprehension Subtest; TLC = Test of Language Competence Listening Comprehension: Making Inferences subtest; CBM-Inf = Curriculum-based Measure of Inferencing; CELF-F = Clinical Evaluation of Language Fundamentals Formulating Sentences subtest; CELF-R = Clinical Evaluation of Language Fundamentals Recalling Sentences subtest; KBIT-2 = Kauffman Brief Intelligence Test II Verbal Knowledge subtest; TOWRE-2 = Test of Word Reading Efficiency 2 composite

Woodcock-Johnson III Passage and Oral Comprehension Subtests (WJ-III). The Woodcock Johnson III Test of Achievement (WJ-III; Woodcock, McGrew, & Mather, 2001) Passage Comprehension subtest is an individually administered cloze-based assessment in which students read a passage and fill in a missing word based on

overall context. The Oral Comprehension subtest is an individually administered test of oral language measuring the ability to comprehend a short passage and then supply the missing word using syntactic and semantic clues. This oral cloze procedure requires the use of listening, reasoning, and vocabulary abilities. Reliability for these subtests ranges from 0.85 to 0.88.

Test of Language Competence-Expanded Edition Listening Comprehension: Making Inferences Subtest (TLC). The Listening Comprehension: Making Inferences subtest of Test of Language Competence-Expanded Edition (TLC; Wiig & Secord, 1989) is individually administered and provides a measure of a student's ability to make permissible inferences based on existing causal relationships or chains within short paragraphs. It is comprised of 12 items, each one describing an event chain in which one or more causal links are missing. For each item the student is required to make two plausible inferences based on two spoken sentences describing the lead-in and the conclusion of the causal event chain. The student selects the two plausible inferences from four answer choices, designed to elicit a yes or no answer accordingly to the student's judgment of correctness. Reliability ranges from 0.75 to 0.82.

Clinical Evaluation of Language Fundamentals Formulating Sentences and Recalling Sentences Subtests (CELF-5). Two subtests were administered from the Clinical Evaluation of Language Fundamentals-5 (CELF-5; Semel, Wiig, & Secord, 2013), a comprehensive battery of individually administered language assessments. The Recalling Sentences subtest provides information about a student's ability to utilize

knowledge of linguistic rules. A student is required to repeat a long sentence that requires a mastery of underlying grammatical structures rather than memory alone. The Recalling Sentences subtest has a test-retest reliability of 0.87. The Formulated Sentences provides information about a student's ability to construct a sentence without auditory cues, and has a test-retest reliability of 0.94.

Curriculum-based Summary Measure (CBM-S). An unstandardized curriculum-based measurement (CBM) was administered approximately five minutes per individual student at the end of each instructional unit and as a pretest and posttest. The CBM was proximal to the instruction provided to gauge students' level of mastery of how to summarize text. The tutor read a passage aloud while the student silently read along on his own copy of the text. The tutor then asked the student to summarize the passage in his own words when he was ready. After the student finished summarizing the text, the tutor asked the student if he had anything else to add.

Curriculum-based Inference Measure (CBM-Inf). Immediately after each student completed the CBM-S, the tutor asked the student two text-based inferential questions over the passage. The only prompting that occurred was whether the student had anything else to add or to ask if the student would like an inferential question repeated.

Vocabulary Measure. At posttest only, an unstandardized measure of vocabulary words was administered. This research-developed, multiple-choice measure included 25 words that were introduced and encountered across the thematic units during

the intervention. Each question stem provided a sentence using the vocabulary word and underlined. Four answer choices were provided, and the student was asked choose the answer that best defined the word as it was used within the context of the sentence. This procedure was similar to vocabulary instruction within the lessons.

Kauffman Brief Intelligence Test II Verbal Knowledge Subtest (KBIT-2). The verbal knowledge subtest of the Kauffman Brief Intelligence Test-II (KBIT-2; Kaufman & Kaufman, 2004) was used to provide descriptive data about general word knowledge for the study sample and serve as a covariate for the unstandardized vocabulary measure. This subtest is an individually administered, norm-referenced, untimed test of receptive vocabulary and general word knowledge. Test–retest reliabilities range from 0.80 to 0.95 in the age range of the students in this study.

Test of Word Reading Efficiency (TOWRE-2). The TOWRE-2 (Torgesen, Wagner, & Rashotte, 1999) measures the ability to read words out of context. It includes two separate, individually administered, timed assessments. Sight Word Efficiency measures the ability to recognize common words quickly, and Phonemic Decoding Efficiency measures the ability to sound out words quickly and accurately. The student reads aloud as many sight words or pseudo-words as possible in 45 seconds. Raw scores can be converted into percentiles, standard scores, and age- and grade-equivalent scores. Reliability coefficients range from 0.85 to 0.90.

Description of Intervention

The 8-week intervention consisted of four 7-10 day thematic units using science-related texts, vocabulary and activities. Tutors delivered instruction in small groups of 3-5 students. Groups met daily for approximately 50 minutes per tutoring session for a total of 33 sessions. The intervention explicitly and systematically used oral language and listening comprehension to scaffold reading comprehension. Oral responses made transparent student retrieval and integration of information, providing tutors access into students' comprehension processes. By completing all activities orally, tutors were able to provide an immediate response and corrective feedback. For example, if a student's oral summary was missing important information or demonstrated a misinterpretation of text, the tutor immediately directed the student back to the text and assisted him in reprocessing the information.

All text was read orally. Approximately 90% of the time, the tutor read the text aloud while students read along with their own copy of the text. Occasionally, students asked to read aloud for the group. No text was read silently. As the text was read, students listened with the purpose of recognizing relevant information and continually updated their mental model of text. The overarching question provided a further purpose for listening, as students knew that by the end of the unit all text reading would contribute to the answering of the question. Cue cards with the words "who", "what", "when", "where", "how", "why", and "major supporting detail" were kept in plain sight to remind students the kind of information that is typically important in text. As they listened to text

being read aloud, students underlined important information in their copy of the text. As text length increased, students had the option to take brief notes to record key words or ideas.

Key Components of Research Intervention

Accessing and building background knowledge. The units included use of authentic, curriculum-related text rather than the teaching of discrete skills in isolation. Comprehension of text in the context of actual content (e.g. science, social studies) may help students increase their reading proficiency in addition to their content knowledge (Duke & Pearson, 2002; Reutzel, Smith, & Fawson, 2005; Williams, Stafford, Lauer, Hall, & Pollini, 2009). Moreover, the use of science text acknowledges the fact that many states now include science in their state-mandated assessments (Marx & Harris, 2006; National Academy of Science, 2005). Unit themes were selected based on their prevalence in the state science standards for grades 6-8.

On the first day of each unit, tutors introduced an overarching question that required critical thinking and guided the unit. As part of the introduction of this overarching question, the tutor showed the group a picture of thematic-related picture. The tutor modeled how to retrieve background knowledge about the topic and integrate it with information seen in picture to form a summary, and then had students practice explaining what they knew about the topic/picture. Students reviewed the overarching question and pictures daily and, using what they had read and discussed in previous tutoring sessions, updated their description of what they knew about the topic related to

the picture (Gersten, Baker, Smith-Johnson, Dimino, & Peterson, 2006; Vaughn et al., 2013). If a student had difficulty retrieving information, the tutor guided the student back to the text, engaged the student in a brief discussion of key ideas, and guided the student to update his mental model of the text. By the end of each unit, the goal was to be able to integrate new knowledge with evidence found within and across texts that they had read to provide a proficient answer to the overarching question and contribute to a culminating application activity.

Providing support for essential vocabulary words functioned to serve the primary goal of comprehending text. Each unit targeted seven high-utility words whose meanings were integral to the comprehension of accompanying text. Because of the importance of these words to the understanding of science concepts in general, students encountered and interacted with the target words throughout each unit and across multiple units (Coyne et al., 2010, Coyne, McCoach, & Kapp, 2007; Silverman, 2007). Tutors briefly introduced target words by providing a student-friendly definition of the words on index cards (McKeown & Beck, 2011) with a simple hand gesture (Glenberg & Kaschak, 2002) or picture to aid in recall of target words when they appeared in text. Index cards and pictures remained in plain sight as tools to assist in text comprehension throughout lessons.

Making inferences. Daily practice making inferences enabled students to better maintain a cohesive mental model of text. In addition to processing text by orally summarizing and discussing key information, students used information from text read

each day as well as on previous days to discuss inferential questions (Cain, Oakhill, & Bryant, 2004). Tutors reminded students to use their tools (i.e. the cue cards and their underlined information in texts). If students had difficulty, the tutor assisted them in retrieving this information by rereading text aloud to them or orally reviewing cue cards, target words, gestures, pictures, and previously underlined information in text.

Summarizing text. Summarization served as a means for students to integrate information and regularly update their mental model of text. Students were taught to underline key ideas during and directly after reading text, so that this information could be readily retrieved. Students had the text in front of them while it was read aloud and given one or two minutes to organize their summary in their mind. Students were given the option to jot down key ideas or words from the text in the text margin. The tutor had them cover up the text and asked students to take turns summarizing the important parts using their list of key words and referring back to the text as little as possible. This practice prevented the simple recitation of text and encouraged students to use their oral language to explain how their mental model was being updated. This routine also aligned with the end-of-unit CBM-Summary.

The tutor verbally provided brief, targeted, corrective feedback. Students listened to one another's summaries, compared their own interpretation of important text information to that of their peers, and offered feedback as well. Because of the conceptual importance of targeted vocabulary words, they were frequently heard in

student summaries. If students misused a target word, tutors quickly referred them back to the text, vocabulary cards, gestures, or pictures.

Text-based discourse practice. In addition to the daily discussion of text, on the final two days of each unit, students participated in an extended text-based discourse culminating activity, integrating information from text across the thematic unit to demonstrate their ability to answer the unit's overarching question. Meaningful discussion around text can increase comprehension and problem solving (Anderson, Chinn, Waggoner, & Nguyen, 1998; Wegerif, Mercer, & Dawes, 1999), and includes listening and linking to others' ideas, as well as providing evidence from the text to support one's thinking (Wolf, Crosson, & Resnick, 2004). This collaborative discussion gave students the opportunity to discuss information from multiple texts through a purposeful activity.

Progress Monitoring

On the final day of each unit, the tutor assessed student progress using a research-designed curriculum-based measure (CBM). Tasks required to complete the CBM were aligned with the tasks practiced during the implementation of lessons. The tutor orally read a text related to the unit theme that the student had not previously read. The student formulated an oral summary of the text and orally answered two inferential questions about the text, which the tutor audio recorded with no feedback. When students were not orally reading/summarizing one-on-one with the tutor, they remained in a separate part of the room completing an open response self-reflection form about perceived progress and

challenges encountered during the intervention and previous day's application activity. The tutor assessed the quality and accuracy of the CBM summaries and inference question answers using a rubric designed by the primary researcher (see Appendix B).

Fidelity of Implementation

A fidelity plan was developed that followed the recommendations set forth by Gersten et al. (2005). An Implementation Validity Checklist (IVC; Vaughn et al., 2011) was used to ensure consistency of implementation across both tutors. An example of the IVC is included in Appendix C. The IVC provided documentation of the presence or absence of expected major instructional activities as well as global indicators of instructional quality.

Tutors wore a digital audio recorder and audiotaped every tutoring group daily for the duration of the intervention. Twenty-five percent of each tutor's lessons across groups were randomly selected for fidelity coding using the IVC checklist. Each tutor also kept a daily log of lesson components completed, student difficulties and improvements.

Coders received training and reached inter-observer agreement using the gold standard method (Gwet, 2001). The primary researcher served as an expert coder, establishing a set of correct observation codes, against which training observations were compared. Percent agreement was calculated and scores compared. Coders who used the IVC form reached at least 90% agreement prior to completing any coding.

Comparison Condition

The comparison group did not participate in any specialized, small-group activities or receive additional reading instruction. Students in the comparison condition continued to attend all of their regularly scheduled elective classes and received business-as-usual instruction.

Data Analysis

An a priori power analysis was calculated using the G*Power tool (Faul, Erdfelder, Buchner, & Lang, 2009) to determine the sample size needed to allow for accurate and reliable statistical conclusions. Calculations assumed a power of 0.80, a family-wise alpha of 0.05 and a correlation of 0.70. A Bonferroni correction was applied for five tests, adjusting the alpha level for the power analysis to 0.01. Effect size statistics used in the power analysis calculations were adjusted to account for the correlation between the covariates and the outcome variables (Rogers & Hopkins, 1988). Based on the power analysis, I determined that a sample size of 49 would be necessary for each group, providing an effect size of .25.

Research in related areas report effect sizes ranging from 0.22 – 0.31 (Cantrell et al., 2010; Graves, Duesbery, Pyle, Brandon, & McIntosh, 2011). Cantrell et al. report an overall effect of 0.22 (when converted to *d*) on the Group Reading Assessment and Diagnostic Evaluation (GRADE), which is considered small. Like the proposed intervention, the Cantrell et al. study included explicit instruction and practice summarizing text, as well as extensive oral practice. However, effects were found only

with sixth grade participants. The study included students in grades 6–8. Furthermore, the Cantrell et al. study took place over the course of an entire school year, while the proposed study lasted eight weeks. Unlike the Cantrell et al. and Graves et al. studies, which trained general classroom teachers or graduate students to implement the interventions, the study was researcher-implemented, increasing the likelihood of high fidelity and quality of implementation.

Graves et al. (2011) reported an overall effect of 0.31 (when converted to *d*) on passage comprehension of the Woodcock Reading Mastery Test. The study took place for approximately 30 hours over the course of 10 weeks, a timeframe comparable to that of the current study. Additionally, several instructional components were similar to those found in the present study (i.e. summarizing text, using pictures and student-friendly definitions in support of vocabulary). Unlike this intervention, Graves et al. also included instruction in decoding and fluency which might have contributed to the reading comprehension gains.

Moreover, in a meta-analysis of reading interventions from 1980-2011, Scammacca et al. (2013) found an overall effect of 0.30 on standardized reading comprehension measures for students in grades 6–8. Based on the literature, an estimated effect size of 0.25 for the current intervention was appropriate given that the intervention is eight weeks in duration and used primarily standardized reading outcome measures.

Descriptive data were calculated for all measures. Inferential statistics were used to evaluate any differences in pretest and posttest scores between groups. Preliminary

analyses of the data were conducted to examine the ANCOVA assumptions of homogeneity of regression slopes, homogeneity of variances, independence, linearity, and normality. The Chi-square statistic and the *t* test for independent samples were employed to compare the research intervention group and the business as usual group on the demographic variables and the pretest measures. A series of analysis of covariance (ANCOVA) estimated treatment effects for each dependent variable separately, because each of the variables (WJ-III, CELF-5, TLC, CBM) is an independent language or reading measure that assesses different abilities. The Kauffman Brief Intelligence Test II (KBIT-2) Verbal Knowledge subtest served as a covariate for the unstandardized vocabulary measure. Further analyses included using a two-way ANCOVA to estimate differential treatment effects for the two distal measures of reading comprehension based on initial word reading ability, and a one-way ANCOVA to determine whether there were treatment effects for English language learners.

CHAPTER IV

RESULTS

This study investigated the effects of an intervention aimed at improving reading comprehension through the use of listening comprehension and oral language as scaffolds to support the summarizing skills, inference making, and text-based discourse of middle school students with reading comprehension difficulties. Students in grades six through eight demonstrating poor reading comprehension qualified for the study. Fifty-five students were randomly assigned to a treatment group or a no-treatment comparison group. The intervention was provided 50 minutes daily for eight weeks. Measures of reading comprehension, inference skills, and language skills were administered at pretest and posttest. A vocabulary measure was administered at posttest. The following research questions were addressed in this study:

1. What are the effects of treatment on the reading comprehension of middle school struggling readers?
2. What are the effects of the treatment on proximal and distal measures of inference-making?
3. What are the effects of treatment on the listening comprehension and language skills of middle school struggling readers?
4. What are the effects of treatment on student recall of vocabulary words?

Data Analysis

Preliminary analyses were conducted to examine the ANCOVA assumptions of homogeneity of regression slopes, homogeneity of variance, independence, linearity, and normality. A Chi square analysis was used to compare the treatment group to the control group on demographic variables. The *t* test for independent samples was used to compare the research intervention group and comparison group on pretest measures. To answer the research questions, separate ANCOVAs were conducted using the following dependent variables with each pretest score used as a covariate: the Woodcock Johnson Passage Comprehension (WJIII-PC) and Oral Comprehension (WJIII-OC) subtests, the Clinical Evaluation of Language Fundamentals Formulating Sentences (CELF-5 (FS)) and Recalling Sentences (CELF-5 (RS)) subtests, the Test of Language Competence Listening Comprehension: Making Inferences (TLC) subtest, curriculum-based measures of summarization (CBM-S) and inferencing (CBM-Inf). For the vocabulary measure that was administered at posttest only, an ANCOVA was conducted using the KBIT-2 Verbal Knowledge (KBIT-2) pretest score as a covariate. For the State of Texas Assessment of Academic Readiness Reading exam (STAAR-R), the previous year's standard score served as a covariate. Cohen's *d* was computed to estimate effect sizes. For purposes of analysis, Cohen's *d* effect sizes were defined in the following manner: $d = 0.20$ (small effect), $d = 0.50$ (medium effect), and $d = 0.80$ (large effect).

Tests of Assumptions

Homogeneity of regression slopes. A preliminary analysis evaluating the homogeneity of regression slopes assumption indicated that the relationship between the

covariates (pretest scores) and the dependent variable did not differ significantly as a function of the independent variable (group) on the WJIII subtests, CELF subtests, TLC, STAAR-R and CBMs. The non-significant interactions demonstrated that this assumption was met for each of these dependent variables.

Homogeneity of variances. Levene's test of equality of error variances showed that the assumption of homogeneity of variances was met for all dependent variables.

Independence of observations. The independence of observations assumption was met in this study. Students were assigned to either a treatment or control group, with different participants in each group and no participant in more than one group.

Linearity. The relationship between covariates and the dependent variables was tested with visual examination of scatterplots. Visual inspection and fit lines indicated the assumption of linearity was met for all dependent variables.

Normality. Absolute values of skewness and kurtosis were within an acceptable range (West, 1996), indicating the assumption of normality was met for all dependent variables.

Analysis of Pretest Data

A *t* test for independent samples showed no statistically significant differences between the treatment group and the control group on the pretests for the CELF-5 (FS), CELF-5 (RS), WJIII-PC, WJIII-OC, CBM-S, and CBM-Inf, $p > .05$. On the STAAR-R, the groups did not show statistically significant differences between the treatment group and the control group on the previous year's scores, $p > .05$. The groups did differ significantly on the mean pretest scores on the TLC in favor of treatment students, $t(55) =$

3.07, $p = .03$. A Chi-square test of independence was conducted to compare demographic variables of the treatment and control groups. There were no significant differences between treatment and control groups on demographic variables.

Analysis of Intervention Effects

An analysis of covariance (ANCOVA) was performed to compare the treatment group and the comparison group on each of the dependent variables. A pretest of the dependent variable was used as a covariate, except for the vocabulary measure, which was administered only at posttest. For the vocabulary measure, the KBIT-2 Verbal Knowledge subtest served as a covariate. For the STAAR-R, the previous year's standard score was used as a covariate. Results of intervention effects are organized by research question.

Research Question 1

What are the effects of treatment on the reading comprehension of middle school struggling readers?

Measures used to assess reading comprehension included the WJIII-PC, the STAAR-R, and the CBM-S. No statistically significant differences were found between the groups on the WJIII-PC at posttest, $F(1, 52) = 0.92$, $p > .05$. The effect size of adjusted posttest means was small in favor of the treatment group ($d = 0.26$). Results of the WJIII-PC are summarized in Table 4.1. No statistically significant differences were found between the groups on the STAAR-R at posttest $F(1,52) = 2.64$, $p > .05$. The effect size of adjusted posttest means was small to medium in favor of the treatment ($d = 0.44$). Results of the STAAR-R are summarized in Table 4.2. No statistically significant

differences were found between the groups on the CBM-S at posttest $F(1, 56) = 1.17$, $p > .05$. The effect size of adjusted posttest means was small in favor of the treatment ($d = 0.29$). Results of the CBM are summarized in Table 4.3.

Table 4.1 *Group Comparison on Woodcock Johnson III Passage Comprehension Subtest*

	Pretest		Posttest		Adjusted	
Group	M	SD	M	SD	M	SE
Intervention (n = 26)	83.81	7.57	88.92	7.65	87.40	1.17
Comparison (n = 29)	80.07	12.22	84.38	11.86	85.75	1.24

Table 4.2 *Group Comparison on State of Texas Assessment of Academic Readiness-Reading*

	Pretest		Posttest		Adjusted	
Group	M	SD	M	SD	M	SE
Intervention (n = 26)	1461.19	66.72	1545.31	82.10	1541.28	11.65
Comparison (n = 29)	1449.93	70.44	1511.59	67.96	1515.20	11.03

Table 4.3 *Group Comparison on Curriculum-based Measure—Summary*

	Pretest		Posttest		Adjusted	
Group	M	SD	M	SD	M	SE
Intervention (n = 26)	8.93	6.35	14.63	8.43	14.76	1.27
Comparison (n = 29)	9.38	6.20	12.93	7.11	12.80	1.29

Research Question 2

What are the effects of the treatment on proximal and distal measures of inference-making?

Measures used to assess inference making included the TLC and the unstandardized CBM-Inf. No statistically significant differences were found between the groups on the unstandardized measure $F(1, 56) = 0.07$, $p > .05$, or the TLC at posttest $F(1, 52) = 2.48$, $p > .05$. The effect size on the TLC was small to medium, $d = 0.43$. Results of the inference measures are summarized in Tables 4 and 5.

Table 4.4 *Group Comparison on Curriculum-based Measure—Inference*

	Pretest		Posttest		Adjusted	
Group	M	SD	M	SD	M	SE
Intervention (n = 26)	2.47	1.96	3.43	2.10	3.43	0.34
Comparison (n = 29)	2.45	1.02	3.55	1.96	3.56	0.35

Table 4.5 *Group Comparison on Test of Language Competence Listening Comprehension: Making Inference Subtest*

	Pretest		Posttest		Adjusted	
Group	M	SD	M	SD	M	SE
Intervention (n = 26)	8.19	2.43	9.19	2.97	8.79	0.48
Comparison (n = 29)	6.55	1.45	7.34	1.97	7.71	0.45

Research Question 3

What are the effects of treatment on the listening comprehension and language skills of middle school struggling readers?

Language was assessed using the CELF-5(FS) and CELF-5(RS) subtests, and the WJIII-OC subtest. No statistically significant differences were found between the groups on the CELF-F subtest at posttest, $F(1, 52) = 1.09$, $p > .05$. The effect size of adjusted posttest means was small ($d = 0.28$). The results of the CELF-5(FS) subtest are summarized in Table 4.6. No statistically significant differences were found between the groups on the CELF-5(RS) subtest at posttest $F(1, 52) = 0.94$, $p > .05$. The effect size of adjusted posttest means was also small for this subtest ($d = 0.26$). Results of the CELF-5(RS) subtest are summarized in Table 4.7. No statistically significant differences were found between the groups on the WJIII-OC subtest at posttest $F(1, 52) = < .001$, $p > .05$. Results of the WJ-III Oral Comprehension subtest are summarized in Table 4.8.

Table 4.6

Group Comparison on Clinical Evaluation of Language Fundamentals Formulating Sentences Subtest

	Pretest		Posttest		Adjusted	
Group	M	SD	M	SD	M	SE
Intervention (n = 26)	8.88	2.25	9.53	2.50	9.32	0.52
Comparison (n = 29)	8.14	2.97	8.38	3.35	8.57	0.49

Table 4.7

Group Comparison on Clinical Evaluation of Language Fundamentals Recalling Sentences Subtest

	Pretest		Posttest		Adjusted	
Group	M	SD	M	SD	M	SE
Intervention (n = 26)	7.62	2.37	8.31	2.35	8.11	0.27
Comparison (n = 29)	7.10	2.08	7.59	1.80	7.76	0.25

Table 4.8

Group Comparison on Woodcock Johnson III Oral Comprehension Subtest

	Pretest		Posttest		Adjusted	
Group	M	SD	M	SD	M	SE
Intervention (n = 26)	88.85	9.34	94.50	8.83	95.03	1.5
Comparison (n = 29)	90.17	10.09	95.48	11.96	95.01	1.4

Research Question 4

What are the effects of treatment on student recall of vocabulary words?

Students' recall of vocabulary words was assessed using an unstandardized vocabulary measure. Statistically significant differences in favor of the treatment group were found on the measure at posttest, $F(1, 52) = 8.21$, $p < .01$. The effect size of adjusted posttest means was medium to large ($d = 0.78$). Results of the vocabulary measure are summarized in Table 9.

Table 4.9

Group Comparison on Vocabulary Measure

	Posttest		Adjusted	
Group	M	SD	M	SE
Intervention (n = 26)	19.88	3.90	19.27	0.64
Comparison (n = 29)	16.14	3.81	16.69	0.61

Further Analyses

In addition to the main effects analysis on measures of reading comprehension, inference making, language, and recall of vocabulary, two interactive effects were evaluated. Because student levels of word reading varied considerably, an analysis was conducted to examine possible differential treatment effects for distal reading comprehension measures based on initial word reading ability. A 2-way ANCOVA was

performed comparing the treatment and comparison group on the STAAR-R and WJIII-PC with the Test of Word Reading Efficiency (TOWRE-2) measure as an added factor. Pretests of the measures served as covariates. For the second factor, the following groups were identified based on their pretest TOWRE-2 scores: poor decoders (< 90 on TOWRE-2), or adequate decoders (90 or above on TOWRE-2). For the 2-way ANCOVA, all assumptions were met.

There were no statistically significant differences between the treatment and control groups at pretest on either reading comprehension outcome measure, $p > .05$. There was not a statistically significant main effect of treatment group on the STAAR-R or the WJIII-PC, $p > .05$. However, the adjusted posttest means indicated a trend in favor of treatment on the WJIII-PC for the poor decoder group, $F(1, 49) = 2.25$, $p > .05$, with a medium effect size ($d = 0.41$).

To examine whether there were differential effects of treatment on English language learners, a 1-way ANCOVA was performed comparing the treatment and comparison groups on STAAR-R and WJIII-PC for this subgroup. A pretest of each dependent variable was used as a covariate. There were no statistically significant differences between the treatment and control groups at pretest on either reading comprehension outcome measure, $p > .05$. There were no statistically significant main effects of treatment group on any outcome measure at posttest, $p > .05$.

Fidelity of Implementation

Table 4.10 presents percentage scores for each of the treatment components as coded by two experienced members of the research team. The 69 fidelity audio

recordings indicated high levels of implementation for all of the components of the intervention. For the quality indicators of global observations, 95% of the scores were five, 5% of the scores were four, and there were no scores lower than a four on a 5-point likert-type scale.

Table 4.10 *Fidelity Observation Percentage Score Data for Treatment Implementation and Quality*

	Access /Build Knowledge		Synthesize Information		Integrate Information	
	n (69)	%	n (69)	%	n (69)	%
Implementation						
5-All or nearly all of the elements and procedures	69	100%	53	77%	66	96%
4-More than half of the elements and procedures	0	0%	14	20%	3	4%
3-Approximately half of the elements and procedures	0	0%	2	3%	0	0%
2-A few of the elements and procedures	0	0%	0	0%	0	0%
1-Elements not completed	0	0%				
	Teacher Instruction		Group Management		Oral Language Support	
	n	%	n	%	n	%
Quality Ratings						
5-High	66	96%	69	100%	61	88%
4	3	4%	0	0%	8	12%
3-Average	0	0%	0	0%	0	0%
2	0	0%	0	0%	0	0%
1-Low	0	0%	0	0%	0	0%

CHAPTER V

DISCUSSION

Many secondary school students demonstrate poor comprehension of grade-level text. The Simple View of reading (Gough & Tunmer, 1986) describes reading as a multiplicative process in which word recognition translates print into language, and the language comprehension component makes sense of this information. However, while both components are needed for comprehension to occur, they do not contribute equally to comprehension across time. By middle school, listening comprehension outweighs word reading ability in terms of significance, and most poor readers demonstrate listening comprehension deficits (Catts, Hogan, Adlof, & Barth, 2003; Garcia & Cain, 2013). Despite this shift, there is a lack of empirical studies that investigate the effects of using oral language and listening comprehension to support reading comprehension in struggling readers beyond the elementary grades.

This study examined the effects of an intervention intended to improve reading comprehension through the use of listening comprehension and oral language as scaffolds to support the summarizing skills, inference making, and text-based discourse of middle school students with reading comprehension difficulties. Students were randomly assigned to either an intervention or no treatment comparison group, and students in the treatment condition were provided daily small group instruction (50 minutes, 5 times/week) by the primary researcher and a tutor trained and hired by the research team. Overall the results of the reading intervention yielded no statistically significant effects on language or reading comprehension measures, although the adjusted means favored

the treatment condition on eight out of nine measures. Among a subgroup of poor decoders, a trend was observed in which students in the treatment group had higher posttest means those in the comparison group on the Woodcock Johnson III-Passage Comprehension (WJIII-PC) subtest. These findings suggest an intervention that scaffolds oral language and listening comprehension to support other reading practices has the potential to improve the reading comprehension of struggling secondary readers and warrants further exploration.

Findings linked to Research Questions

This study addressed four research questions. The first question examined the effect of treatment on reading comprehension. Results indicated that difference in adjusted posttest scores between treatment and comparison groups were not statistically significant on the WJIII-PC, Curriculum-based summarization measure (CBM-S), and State Assessment of Academic Readiness-Reading (STAAR-R), although the adjusted means favored the treatment group. Visual inspection of posttest means on the WJIII-PC (T, M = 88.92; C, M = 84.38) shows a posttest difference of over five standard score points in favor of treatment condition. Increases in standard scores on the WJIII-PC and STAAR-R, rather than raw scores, suggests growth in treatment students.

A secondary analysis examining whether there were differential effects of treatment on students with poor or adequate word reading ability helps further explains these mean differences. Results indicated non-significant differences in favor of the treatment group for students with poor decoding skills on the STAAR-R and WJIII-PC. However, visual inspection of posttest means of the WJIII-PC in the poor decoder group

reveals a posttest difference of nearly eight standard score points in favor of treatment condition. This finding, although not statistically significant, is of note because while this subgroup of students exhibited difficulty in both word reading and comprehension, the intervention did not include any instruction in word reading. It might be hypothesized that simply reading all of the text aloud to the students removed a potential barrier of word reading for poor decoders. Studies examining Reading While Listening (RWL) have compared the effects of reading aloud with text to reading silently with text, with no explicit reading comprehension instruction in either condition (Chang, 2011; Gobel, 2011; McMahon, 1983; Tedjaatmadja, 2012; Verlaan & Ortieb, 2012). In the Verlaan and Ortlieb (2012) study, text was read aloud to the RWL group while they read it silently, and the comparison group read the same text silently. Reading comprehension was measured by having students answer post-reading comprehension questions; the RWL group was asked questions orally, and the silent reading group was asked questions in writing.

Findings indicated that students with poor decoding skills might benefit from having all text reading activities completed orally. However, in the current study, the access to text provided through oral reading does not explain poor decoders' gains on an assessment that requires them to read silently. One explanation for this improvement may be that, in addition to having students read while listening, the treatment provided explicit reading comprehension instruction and practice daily, which was absent in the RWL study. It is possible that the combination of oral reading and extensive oral practice in identifying and synthesizing information, making inferences, and updating mental models

of text provided poor decoders learning opportunities they might not have gotten otherwise.

It is somewhat surprising that students did not make larger gains on the CBM-S, as curriculum-based measures are highly aligned with treatment and typically yield higher effects than standardized measures (Swanson et al., 1999). However, it is possible that the implementation of the lessons in this intervention was less aligned with the CBM-S measure than intended. The CBM-S measure required students to listen with the text in front of them while it was being read aloud and then compose an oral summary that paraphrased key ideas into a concise summary. Tutors reported that students had initial difficulty accurately identifying key ideas within text, requiring lessons to focus more on this skill for several sessions before progressing to the synthesizing of key information into a summary. Examination of fidelity data confirms this report. To earn the highest score of a five on any given day for the synthesizing component of the fidelity measure, both students and tutors had to have been observed composing a summary. While fidelity of implementation was high overall, this component yielded the lowest fidelity scores. Twenty-three percent of the lessons sampled earned a four or a three on this component, meaning that students and/or tutors did not get to the point of actually summarizing text in nearly one-fourth of the lessons.

The CBM-S broke down the act of summarizing into three scored components (identifying key words, expressing the main idea, and synthesizing this critical information into their own words). In addition to administering the CBM-S as a pre and post measure, the CBM-S served as a progress-monitoring tool at four time points during

the intervention. Close examination of the mean scores of the three components at each of these time points reveals that, while students showed improvement in all three components, they demonstrated the largest gains in paraphrasing by the end of the intervention. This trend corresponds with the increased amount of time spent practicing paraphrasing as the intervention progressed. Had the intervention been longer in duration, perhaps student summarization skills on the CBM-S would have demonstrated greater improvement.

The second research question examined the effect of treatment on proximal and distal measures of inference making. There were no significant differences in posttest scores between the treatment and comparison group on the Test of Language Competence Listening Comprehension: Making Inferences subtest (TLC). A close examination of the types of inferences addressed within the intervention and the types of inferences measured on the TLC helps with the interpretation of these findings. Bowyer-Crane and Snowling (2005) investigated the relative performance of skilled and less-skilled comprehenders on questions that represented different inference types. They found that different reading tests tap different types of inferencing skills, and suggested that the reading comprehension difficulties experienced by some children may be mediated by a difficulty with specific inference types. Inferences can be broadly categorized into two types. Text-connecting inferences occur when a reader integrates information explicitly provided by the text to establish cohesion between different sentences, while gap-filling inferences also require a reader to incorporate information knowledge beyond that which is provided in the text to fill in missing details (Cain & Oakhill, 1999).

Approximately 60% of the inference instruction provided in this intervention fell into the category of making text-connecting inferences. Students were explicitly taught to recognize key information within text and connect it with other key information within and across texts. For example, in the following excerpt from a text in the thematic unit about space, students read about the different planets:

> Venus is a deadly world where the surface temperature is hot enough to cook a meal in mere minutes. There is nowhere to hide from this ever- present furnace. And with the atmosphere containing mostly carbon dioxide, it makes Venus a highly toxic place. No living thing would ever be able to survive on Venus.
>
> Earth is a rocky planet, also known as a terrestrial planet, with a surface of mountains, valleys, canyons, plains and so much more. What makes Earth different from the other terrestrial planets is that it is also an ocean planet: 70 percent of the Earth's surface is covered in oceans.

As the tutor read aloud, students underlined key ideas and wrote down key words in the margin of their passage. After discussing these key ideas, the tutor asked, "Is Venus an ocean planet? How do you know?" Students were required to recognize the key characteristics of each planet and how they differ from one another. While the text does not explicitly state whether Venus is an ocean planet, it provides sufficient information with a signal phrase ("what makes Earth different") so that the reader can connect and integrate this information to make the correct inference.

During the current intervention, students were also taught to think about what they knew about a topic and relate it to each day's text. They were asked gap-filling inference questions after reading. Approximately 40% of the inference instruction involved gap-filling inferences. The TLC requires the student to fill in missing

information based on their world knowledge. For example, the reader might be presented with a scenario in text in which a person eating at a restaurant does not leave a tip. The reader is given four choices of reasons why the person might not have left a tip, and has to recognize which two of the four reasons are plausible. Neither plausible answer is specifically mentioned in the text itself. Perhaps a greater emphasis within the intervention on how to answer gap-filling inference questions would have yielded better results on the TLC for the treatment group. Although the findings were not statistically significant, the adjusted posttest means still favored the treatment group on the TLC, suggesting that students in the treatment group improved in their ability to make gap-filling inferences even though it was not the larger focus of inference instruction.

In addition, students with reading comprehension difficulties have been found to read very literally and passively rather than actively developing integrated mental representations of what they read (Yuill & Oakhill, 1991). In the current study, students were required to actively engage in text and participate in extended group discussions about how to recognize relevant within the text and how to integrate that information other information. This active engagement with text might have assisted students in making both types of inferences.

It is somewhat unexpected that there were no statistically significant differences on the unstandardized proximal measure of making inferences (CBM-Inf), as it asked only text-connecting inference questions that required the reader to integrate information found within text to answer questions. However, one explanation for this anomaly may be that the unstandardized measure had a restricted range of scores possible with just two

inference questions included per passage, making it difficult to detect changes in performance.

The third research question concerned the effect of treatment on the listening comprehension and language skills of middle school struggling readers. Oral language skills can be divided into four domains: phonology, semantics, syntax/morphology, and broader language skills, and language interventions typically target a specific language domain (Cirrin & Gillam, 2008), but the current study did not focus on improving language addressing a specific language domain. Scaffolding language within the intervention (i.e. purposeful listening to text, emphasis on discourse) functioned to support the primary goal of improved reading comprehension. Nevertheless, I chose to measure language skills through the CELF subtests at both pre- and post- because so little research has been done exploring the impact of language supports on the reading comprehension of older students. Longitudinal studies demonstrate that language contributes more than decoding to reading comprehension by middle school (Catts, Hogan, Adlof, & Barth, 2003), but less is understood about how to effectively use language as a mechanism towards improved reading comprehension.

Results of the Clinical Evaluation of Language Fundamentals Formulating Sentences (CELF-5(FS)) and Recalling Sentences (CELF-5(RS)) subtests indicated that the difference between the posttest scores of the treatment and comparison groups were not statistically significant, although the adjusted means on both subtests were higher for the treatment condition. The effect size in favor of the treatment group on the CELF-5(FS) ($d = 0.28$) was similar to that on the CELF-5(RS) ($d = 0.26$). One explanation for

the effects on both CELF subtests is that the tests measure language in ways that were practiced in the intervention. For example, on the CELF-5(FS), students are asked to formulate a sentence about a picture using a targeted word or phrase. The intervention included practice using expressive language, with daily practice in formulating sentences using visual prompts and summary production. The CELF-5(RS) requires students to repeat verbatim a sentence read aloud to them without the text in front of them. In the current study, students learned to actively listen with text in front of them as it was being read, noting key ideas from that text, and underlining this important information as they listened. As students became more proficient with these practices, they were encouraged to refer less frequently at the text when summarizing key information.

The final research question concerned the effect of treatment on student recall of vocabulary words. Results of an unstandardized vocabulary measure indicated that the difference in posttest scores between treatment and comparison groups was statistically significant in favor of treatment, with a medium to large effect size (d = .78.) This is an interesting finding since vocabulary instruction was not a primary focus within this intervention, with instruction of specific words taking place for only 3-5 minutes of each intervention session. Words were chosen based on their high utility to science in general and to each corresponding unit theme, with students initially being introduced to the definition of a word with an accompanying gesture or picture. Beyond this initial introduction, any review of target words was a function of text reading and practice in updating a mental model of text. Because the words were integral to the understanding of the unit topics and commonly needed to understand science text in general (e.g., “adapt”,

"function", "characteristic"), vocabulary words were easily embedded in instruction (Coyne et al., 2007), while providing students multiple exposures and use of the words throughout a unit rather than practice of vocabulary in isolation.

Implications for Practice

The instructional components of this intervention were chosen because of their strong theoretical and experimental research base, and then adapted to include extensive discussion and oral feedback. Through ongoing group discourse as they read science text, students were explicitly taught to recognize key information and link this information in their own words to compose an oral summary. In addition, students were asked to integrate their background knowledge with new information and to describe out loud how this integration helped them update a mental model of text.

The findings of the vocabulary measure suggest that minimal instruction and amount of time spent on vocabulary words can result in word learning. Secondary content area classes are laden with vocabulary demands. Some highly specific words are encountered infrequently or used for a single lesson, while others are instrumental to conceptual understanding of content. The targeted words included in the study were parsimoniously chosen based on their high utility to general science knowledge and subject matter, and were applicable across multiple, meaningful contexts. The significant differences of group means at posttest supports prior research suggesting that multiple exposures to words is effective for word learning (Coyne et al., 2007; Coyne et al., 2010; Silverman, 2007), and that in particular, students who struggle with reading comprehension benefit from instruction of words that represent larger concepts (Ebbers

& Denton, 2008). The findings of this study may reflect an efficient but effective approach to vocabulary instruction.

Although this study provided small group instruction, many of the instructional practices could be incorporated into whole-class instruction. Clearly an advantage of any small group instruction is that students are able to contribute more fully to discussion and tutors are able to provide more immediate and individualized feedback to participants. However, even for a larger group, teachers could increase the amount of time they spend reading aloud while explicitly teaching students how to identify, note and synthesize key information in text. Teachers can also include collaborative small group activities within a larger class, structuring the tasks and circulating among groups to facilitate the discussion.

Limitations

Several factors limit interpretation of overall findings of this study. Despite the use of a rigorous design, the results should be interpreted within the limitations inherent in a researcher-delivered, school-based intervention. One limitation was the low number of participants in the study. Students were eligible for participation in the study based on their performance on the STAAR-R; however, students already enrolled in a school-provided reading class were excluded from the current intervention, restricting the total number of students available to participate. Also, the sample size was limited by the number of consent forms obtained, leaving a smaller than anticipated sample. To participate, students were asked to give up an elective class for eight weeks to work on academic tasks. Therefore, many students declined participation in the study. A larger

sample size would have (a) increased the power to levels that could better detect effects, (b) allowed for close examination of specific groups of students, and (c) yielded more generalizable findings.

Second, in this study the effects of small group instruction were compared with whole class instruction. Intervention students received reading comprehension instruction within a small group of three to five students. Comparison students did not receive any additional reading comprehension instruction within small groups, introducing a confounding variable that makes it difficult to distinguish the effects of participating in small group instruction from the effects of the intervention.

A third limitation involved the short duration of the intervention. While few studies have examined the effects of interventions lasting longer than one school year (Vaughn & Wanzek, 2014), there is evidence to suggest that sustained (e.g., multiple year), intensive interventions are needed to support older students with significant reading difficulties (Vaughn & Fletcher, 2012). The current intervention provided students approximately 33 sessions of instruction. Perhaps greater intervention effects of the current treatment could be realized if the instruction were provided over an entire school year or longer.

Recommendations for Future Research

This study suggests that instruction using oral language and listening comprehension as instructional scaffolds may hold promise for improving reading comprehension. Findings illustrate that a variety of students could benefit from this type of instruction. In the present study, participants were included based on their performance

on the state reading assessment. Therefore, while all participants demonstrated poor reading comprehension, they represented a range of word reading and language skills. While the results of this study suggest differential effects for students based on their initial decoding ability, further research is needed to better understand this finding. Future research may explore which subgroups of students may derive the most benefit from this treatment, such as ELL students or students with learning disabilities.

Also, although vocabulary instruction was not a major focus of the study, the results of the vocabulary measure demonstrate that treatment students learned specific words related to instruction. While previous research on vocabulary instruction demonstrates the effectiveness of instructional practices that provide multiple exposures to vocabulary words, the results of this study suggest a need for further research examining the effects of vocabulary instruction.

Summary

The purpose of this study was to examine the effects of an intervention intended to improve reading comprehension through the use of listening comprehension and oral language as scaffolds to support the accessing of knowledge, summarizing skills, inference making, and text-based discourse of middle school students with reading comprehension difficulties. The results of this study indicate that using oral language and listening comprehension to support the reading practices of middle school students with reading comprehension difficulties may be a viable treatment for improving reading comprehension.

Appendix A: Parental Consent

PARENTAL PERMISSION FOR CHILD PARTICIPATION
CHILD ASSENT

Reading for Understanding: Reading Comprehension Instruction for Students in Grades 4 – 8

Conducted By: Dr. Sharon Vaughn and Dr. Elizabeth Swanson of The University of Texas at Austin: *The Meadows Center for Preventing Educational Risk / 408D*; Telephone: 512-232-2320

We would like to invite your child to participate in a research study. We are interested in learning more about how to help students in grades 6-8 better understand and remember what they read. We will use what we learn to write new programs that teachers can use to help students understand what they read. It is important that students understand and remember what they read not only in school, but also for college, training, and jobs after high school. This form provides you with information about the study. The person in charge of this research will also describe this study to you and answer all of your questions upon request. Please read the information below and ask any questions you might have before deciding whether or not to take part.

Your participation is entirely voluntary. You can refuse to participate without penalty or loss of benefits to which you are otherwise entitled. You can stop your participation at any time and your refusal will not impact current for future relationships with UT Austin or your child's school. To do so simply tell the researcher you wish to stop participation. The researcher will provide you with a copy of this consent for your records.

The purpose of this study is to test the effectiveness of an 8-week intervention intended to help students improve their comprehension of expository science text.

If you agree for your child to be in this study, we will ask your child to do the following things:

- Participate in reading assessments given at the beginning and end of the study. (3 hours total).
- Allow audio/video recording of your child during intervention lessons. (no additional time requirement)
- Allow demographic and state assessment data to be collected from the school. (no additional time requirement)

I**f you agree for your child to be in this study,** he or she may be randomly chosen to receive extra tutoring in reading. This is similar to tossing a coin; out of all the students whose parents agree for them to participate, some will receive extra tutoring and others will not. Students who do not receive extra tutoring will stay in their regularly scheduled

classes, but we will still do reading assessments at the beginning and end of the eight weeks to see if his/her reading comprehension is improving.

If your child is randomly selected to receive the extra tutoring, some activities will include:

- ✓✓ Help with reading text similar to what they see in their science classes
- ✓✓ Instruction about how to pick out important information when reading text
- ✓✓ Instruction about how to summarize and make inferences about text
- ✓✓ Interactive activities during which students apply what they have learned

If you do not agree or your child to be in this study, we will collect no data from your child. Your child will not complete any assessments. Audio/video recordings will not be collected of your child. There is no negative consequence associated with deciding not to agree to study participation.

No additional time outside of the school day is necessary to participate in the study.

Risks of being in the study

- There may be a slight risk for breach of confidentiality. However, these risks are expected to be no greater than everyday life.

Benefits of being in the study

- There is no direct benefit to you or your child when participating in the study. However, you will be contributing to scientific knowledge about reading comprehension. What we learn from this study will improve school outcomes for students across the nation.

Compensation:

- There is no charge or compensation for participation.

Confidentiality and Privacy Protections:

- The team at UT and your child's school will be using the assessment results to evaluate the effectiveness of the instruction provided by the UT tutor.
- These assessments will NOT affect students' grades in their classes
- Results will be available only to school personnel and to the UT researchers.
- You will be provided a copy of the results upon request.
- Your child's participation in all study events is voluntary.
- You may request that he or she not participate or withdraw from study events at any time by contacting your child's school or Dr. Vaughn, using the contact information below.
- If your child withdraws from study, we will not collect any data after the date of withdrawal. Data collected prior to the withdrawal will be destroyed.
- The data resulting from your child's participation may be made available to other

researchers in the future for research purposes not detailed within this consent form. In these cases, the data will contain no identifying information that could associate you with it, or with your participation in any study.

- All data will be coded so that no personally identifying information is visible on them. Data will be kept in a secure place (e.g. a locked file cabinet in the investigator's office). Data will be heard or viewed only for research purposes by the investigator and his or her associates. Audio and video tapes will be retained for future analysis.

The **records** of this study will be stored securely and kept confidential. Authorized persons from The University of Texas at Austin, and members of the Institutional Review Board have the legal right to review your child's research records and will protect the **confidentiality** of those records to the extent permitted by law. All publications will exclude any information that will make it possible to identify you as a subject. Throughout the study, the researchers will notify you of new information that may become available and that might affect your decision to remain in the study.

Contacts and Questions:
If you have any questions about the study please ask now. If you have questions later, want additional information, or wish to withdraw your child's participation call the researchers conducting the study. Their names, phone numbers, and e-mail addresses are at the top of this page. If you have questions about your child's rights as a research participant, complaints, concerns, or questions about the research please contact **Jody Jensen, Ph.D., Chair, The University of Texas at Austin Institutional Review Board for the Protection of Human Subjects** at (512) 232-2685 or the Office of Research Support at (512) 471-8871 or email: orsc@uts.cc.utexas.edu.

You may keep the copy of this consent form.

You are making a decision about allowing your (son/daughter/child/infant/adolescent youth) to participate in this study. Your signature below indicates that you have read the information provided above and have decided to allow him or her to participate in the study. If you later decide that you wish to withdraw your permission for your (son/daughter/child/infant/adolescent youth) to participate in the study, simply tell me. You may discontinue his or her participation at any time.

_____
Printed Name of (son/daughter)

_____ _____
Signature of Parent(s) or Legal Guardian Date

_____ _____
Signature of Investigator Date_____

CHILD ASSENT FORM (ages 13-17)

"I have read the description of the study titled ***"Reading for Understanding: Reading Comprehension Instruction for Students in Grades 4 – 8***" that is printed above and I understand want the procedures are and what will happen to me in the study. I have received permission from my parent(s) to participate in the study, and I agree to participate in it. I know that I can quit the study at any time."

_____	_____
Child's Signature	Date
_____	_____
Signature of Researcher	Date

Appendix B: Curriculum-based Measures

Text	Main Idea	Important words	Accurate Main Idea	Important words	Paraphrased	Sub--total
Cicadas are not ordinary bugs. Unlike ants or grasshoppers, they rarely walk the earth. Most of their lives are spent deep underground.	Cicadas are unusual bugs that live underground for most of their lives.	• cicadas • unusual • underground	0 1 2	0 1 2	0 1 2	
Once they are fully grown, cicadas emerge above ground to mate and lay eggs. They travel together in groups known as broods. The reason that cicadas are so noisy is that the male bugs call out to the females to attract a mate. It's a competition where each male tries to call louder than the next. After mating and laying eggs for the next generation, they die soon after.	They come above ground to reproduce, then they die.	• above ground • mate • die	0 1 2	0 1 2	0 1 2	
Cicadas help nature in several ways.	Cicadas help nature.	• help • nature	0 1 2	0 1 2	0 1 2	
After the females lay their eggs in trees and shrubs, many weak twigs and branches fall off. The extra weight from cicada eggs actually helps to remove weak or	Cicadas help trees and shrubs stay healthy by causing weak branches to fall off.	• help • trees • branches	0 1 2	0 1 2	0 1 2	

dead tree limbs. This results in stronger and healthier trees and shrubs.						
In addition, when cicadas tunnel up to the earth's surface, the soil is turned over and gets more air.Also, when cicadas die, their decomposing bodies enrich the soil.	They improve soil.	• help • soil	0 1 2	0 1 2	0 1 2	
Finally, cicadas are an important link on the food chain. They provide food to other animals like birds, sqirrels, raccoons, possums, and other insects.	They are a food source for other animals.	• food • animals	0 1 2	0 1 2	0 1 2	
Suppresses extraneous details (score on following page):						
Total score:						

Note: adequate and appropriate synonyms are okay

Suppresses extraneous details:		
• Cicadas travel in groups known as broods. • More than one example of animals that eat cicadas (i.e., birds, squirrels, raccoons, possums, other insects). • They are unlike ants or grasshoppers		
More than 2 extraneous details included 0	1---2 extraneous details included 1	No extraneous details included 2

Code Book

Main Idea
0 = Gist is completely inaccurate or not expressed at all
1 = Gist is expressed but is partially inaccurate or is incompletely expressed
2 = Gist is accurately and completely expressed

Important Words
0 = Student included no important words or used words NOT in relation to main idea
1 = Student included some of the important words in relation to the main idea

2 = Student included all of the important words in relation to main idea

Paraphrasing*
0 = Student paraphrased little to no key information
1 = Student paraphrased some of the key information (paraphrasing information unrelated to key info is not acceptable)
2 = Student paraphrased all or nearly all key information

* Inclusion of important words is not reading verbatim. This section assesses how students link the important words together.

Summary Directions: "I'm going to read a paragraph out loud while you look at the text (hold up the text briefly but do not put it in front of the student). I'd like you to listen and then summarize this paragraph in your own words. Do not talk about other things that you have read or heard, only the information in this paragraph. When you are ready to summarize, let me know and I will record. Remember: Do not read from the text but summarize the main details in your own words."

Inference Question(s) Directions: "Now I am going to ask you some questions about the paragraph I just read. If you need to, you may look back at the paragraph to answer them."

Cicadas are not ordinary bugs. Unlike ants or grasshoppers, they rarely walk the earth. Most of their lives are spent deep underground. Once they are fully grown, cicadas emerge above ground to mate and lay eggs. They travel together in groups known as broods. The reason that cicadas are so noisy is that the male bugs call out to the females to attract a mate. It's a competition where each male tries to call louder than the next. After mating and laying eggs for the next generation, they die soon after.

Cicadas help nature in several ways. After the females lay their eggs in trees and shrubs, many weak twigs and branches fall off. The extra weight from cicada eggs actually helps to remove weak or dead tree limbs. This results in stronger and healthier trees and shrubs. In addition, when cicadas tunnel up to the earth's surface, the soil is turned over and gets more air. Also, when cicadas die, their decomposing bodies enrich the soil. Finally, cicadas are an important link on the food chain. They provide food to other animals like birds, squirrels, raccoons, possums, and other insects.

Question #1: You can hear cicadas from your bedroom and you wonder if the cicadas live in your yard or your neighbor's yard. Your yard consists of a large lawn without any plants or trees. Where do you think the cicadas live? Explain.

Question #2: Cicadas lay their eggs in trees and shrubs. What might happen to trees and shrubs if cicadas did not lay their eggs there?

CBM Pretest Inference Rubric (CICADAS)

Question #1

You can hear cicadas from your bedroom and you wonder if the cicadas live in your yard or your neighbor's yard. Your yard consists of a large lawn without any plants or trees. Where do you think the cicadas live? Explain.

0	1	2	3
• Unrelated to the text • Unrelated to the question • No response	• Text---based • Incorrect or incompatible support for question • No support	• Text---based • Correct support for question • Slightly inaccurate or incomplete	• Text---based • Correct, accurate and complete support
		In the neighbor's yard, because they have to have like, the environment for stuff, like mating and stuff like that.	In the neighbor's. Cause you don't have trees or grass and probably the neighbors are going to have them and since they're loud you'd hear them far away.

Question #2

Cicadas lay their eggs in trees and shrubs. What might happen to trees and shrubs if cicadas did not lay their eggs there.

0	1	2	3
• Unrelated to the text • Unrelated to the question • No response	• Text---based • Incorrect or incompatible support for question • No support	• Text---based • Correct support for question • Slightly inaccurate or incomplete	• Text---based • Correct, accurate and complete support
		They would die. Because, um, if they didn't lay their eggs they wouldn't remove the weak or dead tree limbs and stuff like that.	The trees will be like, more weak since the eggs help most of the trees.

Appendix C: Implementation Validity Checklist

Oral Language Implementation Validity Checklist 2013-2014

Teacher: _____ Date: _____

Class Period: _____ Length of Audio: _____

Coder: _____

Unit _____

Lesson in Unit: ☐ 1 ☐ 2 ☐ 3 ☐4 ☐5 ☐6 ☐7 ☐8 ☐9 ☐10

Global Observation					
Overall, I consider this tutor's instruction to be:	**Highest Quality**		**Average**		**Lowest Quality**
	5	**4**	**3**	**2**	**1**
Overall, I consider this tutor's implementation of the intervention to be:	**5**	**4**	**3**	**2**	**1**
Overall, I consider this tutor's implementation of oral language instruction to be:	**5**	**4**	**3**	**2**	**1**

**This form was adapted from the Collaborative Strategic Reading IVC (Vaughn, Klingner, Swanson, Boardman, Roberts, et al., 2011), and Vaughn & Linan-Thompson (2002). Some items were also adapted from the English-Language Learner Classroom Observation Instrument (Baker, Gersten, Hagger, Graves, & Goldberg, 2001) and the Classroom Observation Checklist (Stanovich & Jordan, 1998); Features of Effective Reading Instruction in Special Education (Klingner, Urback, Golos, Brownell & Menon, 2010).*

Implementation:

5: High
4: Mid High
3: Mid Low
2: Low
1: Not observed

Procedural Fidelity & Quality of Implementation

Access/Build Knowledge	Implementation				
	5	**4**	**3**	**2**	**1**
• Access background knowledge (i.e. discuss pictures related to student experience, discuss Big Question, review target vocabulary) • Build knowledge (i.e. introduce new target vocabulary, read text, analyze pictures)					
Notes:					

Synthesize Information	Implementation				
	5	**4**	**3**	**2**	**1**
• Model how to identify important information in text • Model how to synthesize important information into summary • Practice identifying important information in text (i.e. drawing, underlining, discussing) • Practice synthesizing important information into a summary					
Notes:					

Integrate Information	Implementation				
	5	**4**	**3**	**2**	**1**

• Discuss answers to inference questions within and across texts • Update mental model (i.e. discuss pictures relative to new information from text read, discuss Big Question)					
Notes:					

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Vita

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