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Text-based Vocabulary Intervention Training Study: Supporting Fourth Graders with Low Reading Comprehension and Learning Disabilities

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Abstract

This experimental study examined the effectiveness of a text-based reading and vocabulary intervention with self-regulatory supports for 4th graders with low reading comprehension. Students with standard scores on the Gates MacGinitie Reading Test between 1.0 standard deviation (SD) and 0.5 SD below the normative sample were included (N=44) and randomly assigned to treatment condition (n=25) or no treatment comparison condition (n=19). Researchers provided the intervention to students in groups of approximately 2–3 students for eight 30 minute sessions. Students in the treatment condition made statistically significant gains on a researcher-developed measure of reading and vocabulary compared with students in the comparison condition.

Keywords

reading intervention; vocabulary; self-regulation

It is estimated that 64% of fourth graders cannot read at proficient levels (Kena et al., 2016). Under the recent implementation of the Common Core State Standards (National Governors Association Center for Best Practices, Council of Chief State School Officers, 2010), students are expected to read complex text at or above grade level across all content areas. Students in upper elementary grades are required to read more expository text that is of much greater complexity than in the primary grades (Catts, Hogan, & Adlof, 2005). The ability to understand and gain knowledge from text is a fundamental skill (Elleman, Lindo, Morphy, & Compton, 2009). Specific difficulties with reading comprehension may emerge

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for some students in the upper elementary grades (Compton, Fuchs, Fuchs, Elleman, & Gilbert, 2008). For students with low reading comprehension, the requirements under CCSS of improved content knowledge and understanding of text will require significant instructional adjustments and may have severe implications for students with low academic skills (Haager & Vaughn, 2013).

Students with reading difficulties may lag behind their average performing grade level peers in vocabulary acquisition by as much as two years by the end of 2nd grade (Biemiller, 2005). Therefore, students with low reading comprehension may benefit from interventions provided later in their educational career, specifically during upper elementary school that focus on both vocabulary and reading. The grade-level demands of text become increasingly difficult in 4th grade as indicated by the “fourth grade slump” with many 3rd grade students who were reading on grade level experience a drop in normative reading scores in 4th grade (Chall & Jacobs, 1983). More recently Compton et al. (2008) identified students with typical reading performance in 3rd grade who begin to demonstrate reading problems in 4th grade with late emerging reading disability. Since 4th grade is typically the year that students are introduced to more complex text, it is an appropriate year to consider vocabulary and reading interventions for students who have low reading comprehension.

A previous review of reading intervention research for struggling readers in the upper elementary grades reported only nine experimental and four quasi experimental studies (Wanzek, Wexler, Vaughn, & Ciullo, 2010). Of these studies, only five investigated interventions combining vocabulary and comprehension (Lederer, 2000; Mason, 2004; Miranda, Villaescusa, &Vidal-Abarca, 1997; Takala, 2006; Xin & Rieth, 2001). All of these studies used researcher-developed measures as outcomes and the interventions all utilized features of explicit instruction. The experimental study conducted by Xin and Rieth (2001) investigated student understanding of text with a focus on vocabulary words across two conditions. Students with learning disabilities in both conditions received instruction in reading passages, learning the meaning of target vocabulary followed by comprehension activities. In the second treatment condition students also received video-assisted instruction. The video assisted treatment condition outperformed the reading only condition on a researcher-developed measure of word meanings. However, there were no differences between groups on researcher-developed measures of comprehension. Mason (2004) compared the relative effects of TWA (*T*hink before reading, *W*hile reading, think *A*fter reading) to reciprocal questioning. Both interventions are based on principles of cognitive strategy instruction where students are asked to learn particular steps to implement a strategy designed to support improved reading (Rosenshine, & Meister, 1997). Results favored the TWA over the reciprocal questioning treatment on researcher-developed oral reading comprehension measures of main idea statements and text summaries. Two of the studies investigated reciprocal teaching (Lederer, 2000; Takala, 2006), which provides instruction of four cognitive strategies: summarizing, question generating, clarifying, and predicting (Palinscar & Brown, 1984). In the study by Lederer (2000) students in grades 4 – 6 either received reciprocal teaching or business as usual control condition as part of their social studies class. Results indicated statistically significant ($p < 0.05$) differences in performance on comprehension measures favoring the reciprocal teaching treatment compared to the control condition. However, findings from Takala (2006) indicated no differences ($p > 0.05$)

between reciprocal teaching and business as usual control condition on researcher-developed measures of selecting the best title and main idea, and generating questions. Miranda et al. (1997) compared a self-instruction reading (SI) intervention, self-instruction reading plus attribution (SIA) training and a business as usual control condition. The SI intervention consisted of the following components: prior knowledge, preview, self-question, clarify, and mapping ideas. The SIA intervention included all the SI components with the addition of attribution training. The instructor modeled positive and negative attributions prior to asking the students to make attributions regarding their success or failure with using the reading strategies. Results indicated statistically significant differences on a measure of main idea statements for SI compared to control condition (*ES* = 1.93) and SIA compared to control condition (*ES* = 1.37). Although self-regulation and attribution interventions have been demonstrated to be effective in improving students' performance and achievement (Berkeley, Mastropieri, & Scruggs, 2011; Chan, 1996), less is known about how the use of these interventions might specifically improve the efficacy of vocabulary and reading interventions.

Theoretical and Conceptual Framework

The five studies reviewed derive from models of cognitive strategy instruction (Lederer, 2000; Mason, 2004; Miranda, Villaescusa, &Vidal-Abarca, 1997; Takala, 2006; Xin & Rieth, 2001). Cognitive strategy approaches are more aligned with models of thinking and learning (i.e., Symons, Snyder, Cariglia-Bull, & Pressely, 1989). While researchers have provided much evidence in support of several cognitive strategies (Swanson, Hoskyn, & Lee, 1999), it is often difficult for teachers to implement these strategies effectively or to make decisions regarding which strategy to choose from (Vaughn et al., 2011). For example, it was reported in a study using strategy instruction that teachers were often unfamiliar with and struggled using think aloud procedures and how to provide feedback of main idea summaries compared to expert models (Vaughn et al., 2011). A second approach to reading comprehension intervention is based content processing approaches which are aligned with models of text-processing (e.g., Kintsch, 1974; van den Broek, Young, Tzeng, & Linderholm, 1998). These approaches focus more directly on students acquiring knowledge from the text followed by integration of the ideas through discussion to promote better understanding (e.g., Applebee, Langer, Nystrand, & Gamoran, 2003; Beck & McKeown, 2006). The development of this pilot intervention was influenced by text processing models of reading comprehension and findings from empirical studies derived from those models (Gersten, Baker, Smith-Johnson, Dimino, & Peterson 2006; McKeown, Beck, & Blake, 2009; Vaughn et al., 2013). We chose this approach based on evidence that text-processing approaches are feasible for use within general education settings (Vaughn et al., 2013). This study served as pilot work for a larger study designed to integrate content area learning within small-group instruction. The idea being that if similar instructional routines can be used across content area instruction and intervention instruction, the students are much more likely to apply the text-processing components to reading more consistently.

Rationale and Purpose

We conducted this pilot study to evaluate the effects of multi-component intervention that combined components of vocabulary, text-based reading, with self-regulation supports. The purpose of this study was to compare the effectiveness of this intervention on vocabulary and reading outcomes compared to a no treatment comparison condition when using content-based vocabulary words and text-based reading instruction. We hypothesized that students in the treatment condition would outperform students in the comparison condition on a proximal vocabulary and reading measure.

Method

Setting and Participants

Setting—The study took place in two elementary schools in two rural school districts outside a major metropolitan area in the southwestern part of the United States. The first district consisted of one high school, three middle schools, and eight elementary schools, which together served approximately 11,000 students. The ethnicity of students attending the district consisted of 11.9% African American, 7.0% White, 80.1% Hispanic, 0.3% Native American, and 0.8% Asian/Pacific Islander. The second district consisted of two high schools, two middle schools, two intermediate schools and six elementary schools, which together served approximately 9,400 students. The ethnicity of students attending the second district consisted of 8.2% African American, 43.8% White, 46.8% Hispanic, 0.5% Native American, and 0.7% Asian/Pacific Islander.

Tutors—Two White female tutors with experience providing interventions consisting of vocabulary and reading instruction in small groups provided the instruction. The tutors were hired, trained, and supervised by an experienced researcher. Both tutors had previous teaching experience (7 years and 14 years) and were certified in elementary education.

Students—A total of 50, 4^{th} grade students with low reading comprehension participated. Of the 50 students who started the intervention, 44 students completed the pre/posttest battery (T=25, C =19). The participants included 44% females, 56% males, 31% were English language learners, 10% received special education services, and 8% received free and reduced lunch. See Table 1 for the reported number and percentages of students in the treatment and comparison condition by gender, ethnicity, English and a second language, and special education status.

Measures

The *Gates MacGinitie Reading Test* (MacGinitie, 2000) was administered as an initial screener at the beginning of the school year. The curriculum-based vocabulary measure was administered as a pre- and post-test measure of vocabulary and reading. The self-regulation measure was given at post-test only and a fidelity intervention validity checklist was administered throughout the intervention. All pretests were administered in May one day prior to the intervention and all posttests were administered in June one day following the

intervention. Trained research assistants administered all assessments at the two elementary schools.

Curriculum-based measure—A researcher-developed, proximal measure of reading and vocabulary consisted of 12 multiple-choice questions of vocabulary assessing content words and academic words taught during the intervention, followed by two reading passages each including four multiple-choice questions of reading content. The reading passages were selected from a bank of passages initially identified by the research team for consideration as part of the intervention materials. The passages were not used during the intervention, but did cover content associated with passages used for the intervention. Vocabulary acquisition was assessed by determining the students' ability to pick correct definitions from multiple-choice questions of the vocabulary words that were directly taught that represented the key ideas found in text.

Gates-MacGinitie Reading Test (GM-RT; MacGinitie, 2000)—The Gates-MacGinitie Reading Test (GM-RT) is a group-administered, norm-referenced reading test for grade K-adult. We administered the Reading Comprehension subtest. Students are provided with expository and narrative reading passages followed by multiple-choice questions. Questions address facts, inferencing, and drawing conclusions. Internal consistency reliability ranges from .91 to .93 and alternate form reliability is reported as .80 to .87. Concurrent validity correlations for the GM-RT range from 0.72 to 0.87 (Morsy, Kieffer, & Snow, 2010).

Intervention Materials

Materials used for the intervention consisted of eight lesson plans, expository text readings, teacher and student vocabulary materials, and student self-regulation checklist.

Reading and vocabulary materials—The topic of all the passages was Colonial America. We chose this topic because it was a unit of study that took place during general education Social Studies instruction. Readings were selected from grade-level U.S. History textbooks and supplementary reading materials provided by one of the schools. All the passages were modified to improve readability by shortening of sentences and simplifying word choice. After the passages were identified, the research team identified a list of 24 vocabulary words that were represented within the text. The list was a combination of 13 words directly related to the content (e.g. boycott, treason) and 11 words considered high-utility words according to the *Academic Word List*, (Coxhead, 2000). For each word, a teacher vocabulary document was developed which consisted of the word and its simplified definition, a picture or image depicting the word's meaning, related words, and sample sentences using the word. Each student got a vocabulary card with the simplified definition on the front and a place to write related words on the back.

Self-regulation materials—A self-regulation checklist was developed and provided to each student in the intervention condition. The self-regulation checklist consisted of sections to establish goals of vocabulary learning, monitor learning through self-monitoring statements before and after the lesson, and reflect on goal attainment. Students completed

the self-regulation checklist for each lesson. See Figure 1 for an example of the self-regulation materials.

Procedures

Participant selection and screening criteria—Students in the 4th grade with standard scores between 86–93 on the *Gates-MacGinitie Reading Test* (GM-RT) administered earlier in the year were eligible for participation. We defined low reading comprehension as being ½ standard deviation or seven standard score points below 100. We constrained the range of standard scores on the GM-RT as means of controlling the heterogeneity of the instructional groups since the focus of the study was the feasibility of integrating self-regulation into vocabulary and reading instruction. Students were randomly assigned 1:1 to either an intervention condition or a comparison condition. A t-test comparing scores of treatment and control participants indicated no significant differences between groups on pretest GM-RT scores $t(26) = -0.768$, $p = 0.22$)

Tutor training—The tutors completed eight hours of training on reading components and four hours of training on the self-regulation component. During the researcher-led training, tutors were given the teacher and student materials of the lessons to guide their implementation of each strategy. The reading components workshop included strategies to implement: (a) the text-based reading approach, (b) the introduction and review of vocabulary words, and (c) scaffolding for student reading and answering comprehension questions of the text. The self-regulation component workshop included strategies to implement: (a) student learning of the attribution statements, (b) the use of the self-monitoring card, (c) student goal setting, and (d) meaningful discussions with the students to allow for appropriate reflection at the end of each lesson.

Intervention—The intervention condition included ten instructional groups (5 each tutor) of two-three students who received the intervention instead of the comparison condition. Students in the intervention condition received eight, 30 min sessions over a two-week period. One additional day prior to and following instruction was used for pre-and post-testing. Each instructional session was organized according to four basic sections: introduction of self-monitoring (2–3 minutes), vocabulary instruction (10 minutes), text-based reading (15 minutes), and conclusion of self-monitoring (2–3 minutes). The intervention components were designed to facilitate opportunities for students to read and re-read text to gain knowledge as a primary focus of the instruction in line with the conceptual framework. The self-regulation component was designed to support teachers and students with feedback performance and self-management.

The introduction of the self-regulation component consisted of goal-setting prior to reading, attribution statements and a self-monitoring checklist to support the use of use of attribution statements during reading. Prior to the reading and vocabulary instruction, students established a vocabulary learning goal and self-assessed their ability to implement attribution statements. The self-monitoring checklist included a goal of how many vocabulary words would be learned in the lesson and a pre- and post- self-assessment of

attribution statements: (a) *"Believe,"* (b) "*Evaluate: What do I need to do,"* (c) *"Stay with it,"* and (d) "*Think: What can get in the way.*

Following the self-monitoring introduction, the vocabulary routine was taught using instructional routine sheets that included vocabulary words and definitions from the readings. The routine consisted of the tutoring presenting a simplified definition of the word, brief discussion of the visual representation, use of related words, and discussion models of word-use in text. Three new vocabulary words were introduced and two previously taught words were reviewed each day.

After the vocabulary instruction, a text-based approach to reading instruction was taught students, which encouraged finding and supporting answers from content of the text. This was accomplished by referring students back to the text to reread to answer summarization questions (i.e., What is this section of the text about?), and literal and inferential question from the text. Based on student response, the instructors provided appropriate scaffolds to restrict the amount of text the student had to address to find the answer. Instructors started with a section of the text. If there was no response to questions students were asked to re-read, then the instructor re-asked the question and directed the students to the paragraph, sentence, and/or word level of the text.

Following the vocabulary and reading instruction, students were assessed on the pre-established vocabulary goal that was identified by each student at the start of the lesson. Next, students self-assessed implementation of their attribution statements. Assessment of the vocabulary words learned was based on the student's ability to accurately use the vocabulary in a sentence. Self-assessment of the implementation of the attribution statements allowed students to reflect on their use of attribution statements. They could then relate their self-assessment to meeting or not meeting a vocabulary goal.

Comparison Condition—Students in the comparison group did not participate in the intervention. These students continued to receive the typical instructional programming provided by the schools.

Intervention Fidelity—A second researcher observed both tutors for two of the eight the intervention sessions for all of their assigned groups. Utilizing the gold standard method (Gwet, 2001) the two observers coded recorded lessons until an agreement of 90% or higher was obtained from separate study that utilized the same instructional components with the exception of the self-regulation and attribution. The two observers then reviewed case studies of implementation of the self-regulation and attribution components and completed codesheets based on the information until an agreement of 90% or higher was obtained. The codesheets were coded for fidelity by rating each instructional component on a 4-point Likert-type rating scales ranging from 1 (low), 2 (mid-low), 3 (mid-high), to 4 (high). Fourteen fidelity observations occurred across both tutors with a minimum of one observation per group for the following instructional components: introduction of self-monitoring, vocabulary instruction, text-based reading, and conclusion of self-monitoring. Overall global observations of fidelity (e.g., quality of instruction, classroom management, and implementation) were also rated on the same 4-point Likert-type scale. The mean

implementation score across instructional components and across tutors was 3.81 (SD = 0.64, range 0.00 to 4.00). The mean implementation score for global observations of quality was 3.85 (SD = 0.40, range 2.00 to 4.00).

Data Analysis—Repeated-measures analysis of variance (RM-ANOVA) was run to test the hypothesis that students in the treatment group would outperform students in the comparison group. At post-test, an error made when photocopying the curriculum-based measure resulted in items 15 and 16 (two vocabulary items connected to the first reading passage) not being administered to students at one school (n=11 in the treatment group; n=6 in the control group). To aid in determining if the data were missing completely at random (MCAR) or not, we conducted the RM-ANOVA with these items dropped and with data imputed for the missing values. The imputation was done using a regression model that imputed a value for missing responses to items 15 and 16 based on pre-test responses to all items and post-test responses to items 1–14 and 17–20.

Results

RM-ANOVA results calculated on total scores for the curriculum-based measure with items 15 and 16 dropped indicated that the improvement in scores from pre-test to post-test differed significantly between groups, with the treatment group outperforming the comparison group. $F(1,42)=9.27$, $p=.004$, partial $\eta^2 = 0.18$. The RM-ANOVA was re-run to determine if results would differ when items 15 and 16 were included and responses were imputed for the 17 students with missing data at post-test on these items. The results based on total scores with missing data imputed also resulted in a statistically significant difference between groups in improvement in scores from pre-test to post-test that favored the treatment group, $F(1, 42)=13.50$, $p=.001$, partial $\eta^2 = 0.24$, with a slightly larger effect size. In both analyses, groups did not differ significantly in their pre-test scores. See Table 2 for the means and standard deviations for both analyses. Based on the similarity of results in both analyses, we determined that the missing data at post-test was MCAR.

Discussion

The purpose of this study was to examine the effectiveness of a vocabulary and text-based reading intervention with self-regulatory supports for 4th graders with low reading comprehension. Overall, findings revealed statistically significant results and clinically significant gains associated with students in the intervention on a curriculum-based measure of vocabulary and reading. These gains were acquired in a relatively short period of time (i.e., 8 days of intervention), suggesting that the combination of vocabulary instruction, text-based reading, and self-regulatory supports did improve vocabulary and reading outcomes for fourth graders with low reading comprehension. For purposes of analysis, partial eta squared effect sizes were defined in the following manner: small ($\eta^2= .03$), medium ($\eta^2= .06$), and large ($\eta^2= .10$), as suggested by Cohen (1988). Under this suggested definition, the findings from this study indicate a large effect size ($\eta^2 = 0.18$) in favor of the intervention.

The self-monitoring portion of the intervention (2–3 minutes per lesson) guided readers in establishing learning goals prior to vocabulary and text-based reading activities and also

helped them to reflect on the extent to which they attained their goal following completion of the lesson. Past research on the establishment and monitoring of learning goals, indicates that academic performance as well as behavioral performance is significantly improved when students are active participants in the learning process (Carr & Punzo, 1993; Dunlap et al., 1994; Osborn, Broadfoot, Planel, & Pollard, 1997). Specifically, this study further confirms the feasibility of infusing components of self-regulation and attribution within reading interventions for struggling readers (Berkeley, Mastropieri, & Scruggs, 2011; Miranda et al., 1997). It extends this area of research by demonstrating the feasibility of a vocabulary development and a text-based approach to intervention rather than cognitive strategy instruction. Overall, the results of this study are line with some of the previous literature of reading and vocabulary interventions for upper elementary students with reading difficulties. Miranda et al., (1997), and Xin and Reith, (2001) both reported large effect sizes on researcher-developed measures of vocabulary and reading in favor of the intervention group (Miranda et al., 1997; Xin & Reith, 2001). However, other studies of vocabulary and reading comprehension interventions have reported no differences between treatment and comparison groups (Lederer, 2000; Takala, 2006).

It should also be noted that there were very high levels of implementation and global quality according to findings from the fidelity data. Some potential factors involved included tutors who were already experienced with many of the instructional components, small groups of two to three students, and also the homogeneity of the groups based the selection criteria controlling for differences within groups of reading performance may also have factored into high levels of implementation and quality.

Implications

Findings suggest several implications for practice. One implication is that teachers may be more likely to include in their instruction a relatively simple, generalizable, and efficient goal setting strategy such as the strategy employed in this study. This strategy could be applied to many different types of academic tasks (e.g., spelling, math computation). Second, the increased performance of students in the intervention demonstrates the feasibility of using combined interventions (vocabulary and text-based reading) within small group instruction that a previous study suggests is also feasible within general education classroom settings (Vaughn et al., 2013). Within the framework of multi-tiered system of support (MTSS), the results of this small group reading intervention should be considered within tier 2 and tier 3 interventions designed to remediate the skill deficits of students who are at-risk or students with disabilities. This study also supports the idea of using content-based readings (i.e., Social Studies) for supplemental reading instruction as a means of supporting better learning outcomes within content area instruction.

Limitations and Future Directions

The sample in this study is small, though not unusual for studies of this type (e.g., efficacy trial). Although, only 25 students were assigned to treatment and control conditions, a large effect size (partial $\eta^2 = 0.18$) was obtained after only 8 days of intervention. Results suggest that future research should examine the effect of this type of intervention for a longer duration of time and with sample that is powered to detect moderate effects of intervention.

Second, support for the combined self-regulation and vocabulary intervention is based on a curriculum based measure of vocabulary and reading that assesses mastery of taught words and main ideas from passages. No standardized measures of vocabulary were included. Future research should consider examining the extent to which an intervention of this nature leads to significant improvements on standardized assessments of general word and world knowledge and over longer durations of time. Finally, the study did not examine the extent to which an intervention that targets self-regulation and vocabulary impacts general reading comprehension. Past research suggests that direct instruction in vocabulary increases reading comprehension, especially for struggling readers (Elleman et al., 2009). However, this body of literature does not discern which method of vocabulary instruction is most efficient or effective at promoting gains in reading comprehension. Of great value would be a study that compares a more traditional vocabulary intervention with this intervention that combines self-regulation and explicit instruction in vocabulary. Future research should also consider how customizing interventions for students to align with their basic reading processes or executive functioning needs might impact vocabulary and reading comprehension outcomes.

In summary, explicit instruction that targets the acquisition of content area vocabulary and text-based reading plus self-regulation and attribution may be important to enhance the performance of students who are at-risk for academic failure and students low reading comprehension. Future research should evaluate the value added of combined interventions (i.e., self-regulation plus vocabulary) among students with learning disabilities in relation to students who are at-risk and typically developing students to assess the impact among at-risk students as well as the extent to which such this intervention approach may lead to enhanced generalization on far transfer tasks.

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References

Applebee AN, Langer JA, Nystrand M, Gamoran A. Discussion-based approaches to developing understanding: Classroom instruction and student performance in middle and high school English. American Educational Research Journal. 2003; 40(3):685–730.

Beck, IL., McKeown, MG. Improving comprehension with questioning the author: A fresh and enhanced view of a proven approach. New York: Scholastic; 2006.

Berkeley S, Mastropieri MA, Scruggs TE. Reading comprehension strategy instruction and attribution retraining for secondary students with learning and other mild disabilities. Journal of Learning Disabilities. 2011; 44(1):18–32. [PubMed: 21335506]

Biemiller, A. Size and sequence in vocabulary development: Implications for choosing words for primary grade vocabulary instruction. In: Hiebert, A., Kamil, M., editors. Teaching and learning vocabulary: Bringing research to practice. Mahwah, NJ: Erlbaum; 2005. p. 223-242.

Carr SC, Punzo RP. The effects of self-monitoring of academic accuracy and productivity on the performance of students with behavioral disorders. Behavioral Disorders. 1993; 18(4):241–250.

Catts, HW., Hogan, TP., Adlof, SM. Developmental changes in reading and reading disabilities. In: Catts, HW., Kamhi, AG., editors. The connections between language and reading disabilities. Mahwah, NJ: Laurence Erlbaum; 2005. p. 25-40.

Chall JS, Jacobs VA. Writing and reading in the elementary grades: Developmental trends among low SES children. Language Arts. 1983; 60:617–626.

Chan LK. Combined strategy and attributional training for seventh grade average and poor readers. Journal of Research in Reading. 1996; 19(2):111–127.

Cohen, J. Statistical power analysis for the behavioral sciences. 2. Hillsdale, NJ: Erlbaum; 1988.

Compton DL, Fuchs D, Fuchs LS, Elleman AM, Gilbert JK. Tracking children who fly below the radar: Latent transition modeling of students with late-emerging reading disability. Learning and Individual Differences. 2008; 18(3):329–337.

Coxhead A. A new academic word list. TESOL quarterly. 2000; 34(2):213–238.

Dunlap G, DePerczel M, Clarke S, Wilson D, Wright S, White R, Gomez A. Choice making to promote adaptive behavior for students with emotional and behavioral challenges. Journal of Applied Behavior Analysis. 1994; 27(3):505–518. [PubMed: 7928792]

Elleman AM, Lindo EJ, Morphy P, Compton DL. The impact of vocabulary instruction on passage-level comprehension of school-age children: A meta-analysis. Journal of Research on Educational Effectiveness. 2009; 2(1):1–44.

Gersten R, Baker SK, Smith-Johnson J, Dimino J, Peterson A. Eyes on the prize: Teaching complex historical content to middle school students with learning disabilities. Exceptional Children. 2006; 72(3):264–280.

Gwet, KL. Handbook of inter-rater reliability: How to estimate the level of agreement between two or multiple raters. Gaithersburg, MD: STATAXIS Publishing Company; 2001.

Haager D, Vaughn S. The common core state standards and reading: Interpretations and implications for elementary students with learning disabilities. Learning Disabilities Research & Practice. 2013; 29(1):5–16.

Kintsch, W. The representation of meaning in memory. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc; 1974.

Lederer JM. Reciprocal teaching of social studies in inclusive elementary classrooms. Journal of Learning Disabilities. 2000; 33(1):91–106. [PubMed: 15505959]

MacGinitie, WH. Gates-MacGinitie reading tests. Itasca, IL: Riverside; 2000.

Mason LH. Explicit self-regulated strategy development versus reciprocal questioning: Effects on expository reading comprehension among struggling readers. Journal of Educational Psychology. 2004; 96(2):283–296.

McKeown MG, Beck IL, Blake RGK. Rethinking reading comprehension instruction: A comparison of instruction for strategies and content approaches. Reading Research Quarterly. 2009; 44(3):218–253.

Miranda A, Villaescusa MI, Vidal-Abarca E. Is attribution retraining necessary? Use of self-regulation procedures for enhancing the reading comprehension strategies of children with learning disabilities. Journal of Learning Disabilities. 1997; 30(5):503–512. [PubMed: 9293232]

Morsy, L., Kieffer, M., Snow, C. Carnegie Corporation of New York. 2010. Measure for measure: A critical consumers' guide to reading comprehension assessments for adolescents. Final report from carnegie corporation of New York's council on advancing adolescent literacy.

Kena G, Hussar W, McFarland J, de Brey C, Musu-Gillette L, Wang X, Barmer A. 2016The Condition of Education 2016. NCES 2016–144. National Center for Education Statistics.

National Governors Association Center for Best Practices & Council of Chief State School Officers. Common Core State Standards. Washington, DC: Authors; 2010.

Osborn M, Broadfoot P, Planel C, Pollard A. Social class, educational opportunity and equal entitlement: Dilemmas of schooling in England and France. Comparative Education. 1997; 33(3): 375–393.

Palinscar AS, Brown AL. Reciprocal teaching of comprehension-fostering and monitoring strategies. Cognition and Instruction. 1984; 1:117–175.

Rosenshine, B., Meister, C. Cognitive strategy instruction in reading. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc; 1997.

Swanson, HL., Hoskyn, M., Lee, C. Interventions for students with learning disabilities. New York, NY: Guilford Press; 1999.

Symons, S., Snyder, BL., Cariglia-Bull, T., Pressley, M. Why be optimistic about cognitive strategy instruction?. In: McCormick, CB.Miller, GE., Pressley, M., editors. Cognitive strategy research: From basic research to educational applications. New York: Springer; 1989. p. 3-32.

Takala M. The effects of reciprocal teaching on reading comprehension in mainstream and special (SLI) education. Scandinavian Journal of Educational Research. 2006; 50(5):559–576.

van den Broek, P., Young, M., Tzeng, Y., Linderholm, T. The landscape model of reading: Inferences and the on-line construction of a memory representation. In: van Oosendorp, H., Goldman, SR., editors. The construction of mental representations during reading. Mahwah, NJ: Erlbaum; 1998. p. 71-98.

Vaughn S, Klingner JK, Swanson EA, Boardman AG, Roberts G, Mohammed SS, Stillman-Spisak SJ. Efficacy of collaborative strategic reading with middle school students. American Educational Research Journal. 2011; 48(4):938–964.

Vaughn S, Martinez LR, Linan-Thompson S, Reutebuch CK, Carlson CD, Francis DJ. Enhancing social studies vocabulary and comprehension for seventh-grade English language learners: Findings from two experimental studies. Journal of Research on Educational Effectiveness. 2009; 2(4):297–324.

Vaughn S, Swanson EA, Roberts G, Wanzek J, Stillman Spisak SJ, Solis M, Simmons D. Improving reading comprehension and social studies knowledge in middle school. Reading Research Quarterly. 2013; 48(1):77–93.

Wanzek J, Wexler J, Vaughn S, Ciullo S. Reading interventions for struggling readers in the upper elementary grades: A synthesis of 20 years of research. Reading and writing. 2010; 23(8):889–912. [PubMed: 21072128]

Xin JF, Rieth H. Video-assisted vocabulary instruction for elementary school students with learning disabilities. Information Technology in Childhood Education Annual. 2001:87–104.

I am going to do my BEST!!! Goals: Use _____ new words. Use _____ old words.	BEST	
	I Can!	I Did!
Believe	Yes/ No	Yes/ No
Execute	Yes/ No	Yes/ No
Stay with it	Yes/ No	Yes/ No
Think: What can get in the way	Yes/ No	Yes/ No
Did I achieve my goal: Yes/ No I will use _____ new words and _____ old words tomorrow!		

Figure 1.
An example of the self-regulation materials.

Table 1

Participant Characteristics by Condition

	Treatment		Comparison	
Gender	**N**	**%**	**N**	**%**
Female	14	53.8	8	33.3
Male	12	46.2	16	66.7
Ethnicity *				
Hispanic	11	44.0	11	45.8
Caucasian	3	12.0	4	16.7
African American	1	4.0	1	4.2
Other	10	40.0	8	33.3
ESL	9	34.6	7	29.2
Special Education	1	3.8	4	16.7
FRE	24	92.3	22	91.7

Note. ESL= English as second language; FRE = free and reduced lunch

* One student's ethnicity data was missing from the treatment condition

Table 2

Descriptive statistics for curriculum-based measure.

		Mean	SD	N
Number correct on pretest (item 15 & 16 dropped)	Comparison	6.11	1.97	19
	Treatment	6.36	1.85	25
Number Correct on posttest (item 15 & 16 dropped)	Comparison	5.58	2.46	19
	Treatment	8.16	3.09	25
Number Correct on pretest (all items)	Comparison	7.37	2.56	19
	Treatment	7.20	2.06	25
Number Correct on posttest (missing data imputed for items 15 & 16)	Comparison	6.63	2.75	19
	Treatment	9.40	3.21	25