Published in final edited form as:

Sci Stud Read. 2020 ; 24(5): 365–379. doi:10.1080/10888438.2019.1684925.

The Effects of a Paraphrasing and Text Structure Intervention on the Main Idea Generation and Reading Comprehension of Students with Reading Disabilities in Grades 4 and 5

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Abstract

This study examined the effects of a small group intervention targeting paraphrasing and text structure instruction on the main idea generation and reading comprehension of students with reading disabilities in Grades 4 and 5. Students ($N = 62$) were randomly assigned to receive the Tier 2-type intervention or business-as-usual instruction. Students in the intervention received 25, 40-minute lessons focused on paraphrasing sections of text by identifying the main topic and the most important idea about that topic. Students utilized the text structure organization to inform their main idea generation. Results yielded statistically significant, positive effects in favor of the intervention group on near-transfer and mid-transfer measures of text structure identification ($g = 0.75$) and main idea generation ($g = 0.70$), but no statistically significant effect on a far-transfer measure of reading comprehension. These findings provide initial support for utilizing this instruction to improve students' main idea generation on taught and untaught structures.

Keywords

reading comprehension; intervention; main idea generation; reading disability; elementary

Main idea generation and summarizing have been identified as critical elements in improving adolescent reading comprehension (i.e., Grades 4 through 12; Goldman, 2012; Kamil et al., 2008; Vaughn et al., 2011); however, instruction often consists of telling students to find the most important idea without showing students *how* to do so (Williams,

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The authors declare there is no conflict of interest.

2006) or incorporating an explicit process to assist readers with extracting the most important information. Identifying main ideas and summarizing texts are challenging for students with reading disabilities because readers must engage in conscious, active text processing by monitoring their understanding while identifying important information and eliminating irrelevant details (Duke & Pearson, 2008; Jitendra, Chard, Hoppes, Renouf, & Gardill, 2001). Unfortunately, students with reading disabilities may not actively process the meaning of text as they read because their eyes “glaze over the words on the page” (Kamil et al., 2008, p. 17). Limited working memory capacity (Compton, Fuchs, Fuchs, Lambert, & Hamlett, 2012) may further complicate the task and impact the integration of main ideas across longer sections of text. Students may also have difficulty recognizing text structure (Rapp, van den Broek, McMaster, Kendeou, & Espin, 2007; Williams, 2006, 2018) and may not use the text’s organizational framework to assist with generating the main idea or organizing their recall (McGee, 1982; Meyer, Brandt, & Bluth, 1980; Taylor, 1980).

Recent research indicates students with reading disabilities respond favorably to targeted reading interventions (e.g., Scammacca, Roberts, Vaughn, & Stuebing, 2015). Stevens, Park, and Vaughn (2018) conducted a review of 30 summarizing and main idea interventions between 1978 and 2016. A meta-analysis of the group design studies resulted in a statistically significant mean effect ($ES = 0.97$) in favor of main idea and summarizing interventions on measures of oral and written retell. For students with reading disabilities, interventions that utilized paraphrasing improved main idea identification and recall across grade levels; interventions that utilized text structure instruction improved recognition of text structure and text recall (Stevens, Park, & Vaughn, 2018). Studies investigating main idea and summarization practices that were associated with improved reading comprehension have not explored the effects of combined text structure and paraphrasing instruction on the reading comprehension performance of students with reading disabilities (Stevens et al., 2018).

Models of Reading Comprehension Processing

Two theoretical models of comprehension processing informed our intervention development: The Construction Integration Model (Kintsch, 1988; Kintsch & van Dijk, 1978) and the Landscape Model (van den Broek, Rapp, & Kendeou, 2005). In the Construction Integration Model, the reader integrates new information (i.e., local coherence) with (a) background knowledge and (b) previously processed information to gain a deeper understanding of the text (i.e., global coherence; Kintsch & van Dijk, 1978). The reader constructs macrostructures via connections across the microstructure in the text, forming a situation model. The model undergoes revisions as new macrostructures are constructed and integrated across longer sections of text to develop global coherence.

The Landscape Model (van den Broek et al., 2005) highlights the importance of working memory and the reader’s purpose in the iterative development of the situation model. A reader’s working memory influences text processing as new macrostructures are integrated into the reader’s current situation model, knowledge impacts inference-making, and the reader’s purpose influences attention allocation. Constructionist processing is effortful in that the reader strategically integrates the current cycle of text with the previous cycle,

background knowledge, and the existing situation model. More strategic text processing occurs when readers integrate information across longer sections of text, when readers are reading to learn, or when information from previous text is not readily available in working memory.

Intervention Components Integrated within Models of Comprehension

We utilized both models in the development of this intervention, supporting the efficient construction of a situation model that integrates the reader's background knowledge, previous macrostructures, and the current cycle of text (see Figure 1). In the following section we describe each component of the intervention, the way in which each component connects with the theoretical models, and a rationale for how these components work together to support more efficient and effective text processing.

Paraphrasing text to identify the macrostructure.

Paraphrasing instruction provides an explicit process for identifying main ideas that results in improved main idea identification and recall (e.g., Bakken, Mastropieri, & Scruggs, 1997; Mason, 2004). Paraphrasing supports the cyclical, ground-up process of identifying macrostructures using the text's microstructure that aligns with the Construction Integration Model. The reader processes shorter sections of text, identifying main ideas that are integrated with previously processed main ideas to develop a global understanding of the text. Limited working memory may impact previous information stored in short-term memory, thus limiting connections that can be made between new and previously processed information as well as students' development of a coherent situation model (Oakhill, Cain, & Bryant, 2003; van den Broek et al., 2005). We utilize text structure instruction to support attention allocation while reading, providing readers with efficient strategies for chunking and segmenting information that may reduce the demands placed on working memory and free up cognitive resources to focus on text comprehension (Hebert, Bohaty, Nelson, & Brown, 2016; Kieras, 1978).

Utilizing text structure to identify macrostructures.

Text structure instruction (e.g., description, compare/contrast, sequence, cause/effect; Meyer & Freedle, 1984) may support the paraphrasing process because the main idea is closely aligned to the text structure (McGee, 1982; Meyer, Brandt, & Bluth, 1980; Meyer & Freedle, 1984; Taylor, 1980). Prior research suggests students who receive text structure instruction are better able to generate main ideas (McGee, 1982; Meyer et al., 1980; Meyer & Freedle, 1984; Taylor, 1980; Williams et al., 2016). Text structure awareness allows the reader to approach the text with an existing pattern in mind (i.e., a hierarchical model for the macrostructure; Cain, Oakhill, & Bryant, 2004; Hebert et al., 2016; Kintsch & van Dijk, 1978; Meyer & Freedle, 1984; Wijekumar, Meyer, & Lei, 2017) and serves as an efficient memory guide for remembering the key information (Wijekumar et al., 2012, 2014, 2017). Expository text structure instruction is associated with improved reading comprehension outcomes (Hebert et al., 2016), and these effects are moderated when instruction includes additional structures.

Building background knowledge.

The extent of successful text processing depends on the characteristics of the text (i.e., challenging texts may be more difficult to process, resulting in fewer propositions processed at a time) and characteristics of the reader, in particular working memory and background knowledge (Cain et al., 2004; Oakhill et al., 2003; van Dijk & Kintsch, 1983). A reader's background knowledge may also impact the extent to which inferences can be made across propositions in the text; limited background knowledge may cause difficulty for struggling readers such that they will not develop a coherent macrostructure (Rapp et al., 2007; van Dijk & Kintsch, 1983). If the reader fails to connect new information with previous information, the reader may need to search all of the previous propositions (i.e., not just those stored in short term memory) or reread the text. For these reasons, we included a background-building component in each intervention lesson.

How the components work together to support conscious text processing and idea integration.

Theoretically, efficient comprehension processing occurs in a way that would be supported by text structure instruction because the text structure provides a top-down framework to guides the reader's goals, selection and chunking of information, and subsequent main idea generation (Kintsch & van Dijk, 1978; Wijekumar et al., 2017). We propose that these components work together to support bottom-up process of connecting ideas across sentences and paragraphs (i.e., paraphrasing) while also providing a top-down framework as to the text's organization and overarching main idea (i.e., text structure). Students may be able to use bottom-up and top-down processing to more effectively identify the most important ideas and integrate those ideas across sections of text.

In this paper, we examine the effects of an intervention that targets paraphrasing and text structure instruction in order to: (a) provide a process for teaching students to generate the most central ideas across longer sections of text (i.e., showing students *how* to generate main ideas rather than telling them to 'find it'), (b) utilize text structure instruction as a mechanism for selecting, chunking, and supporting main idea generation that fosters consideration of the text's hierarchical structure and frees up cognitive resources for text processing, and (c) supports deeper understanding of content area text by engaging students in conscious text processing and idea integration in a way that we believe aligns with reading comprehension theory. We addressed the following research question: What is the effect of a small group, paraphrasing and text structure intervention compared to business-as-usual (BAU) instruction on measures of (a) text structure identification and main idea generation, (b) strategy use, and (c) general reading comprehension?

Method

Participants

The Institutional Review Board (IRB) reviewed and subsequently approved the study to ensure the research aligned with ethical principles and complied with federal regulatory requirements for protecting the rights of human subjects. Participants were recruited from two urban, public charter schools located in the south-central region of the United States;

each campus included students in Grades K through 5. Any fourth or fifth-grade student who did not pass the 2017 State-level reading assessment *or* received a score within one standard error of measurement (SEM) above the failing score was eligible to participate. This resulted in a potential pool of 87 participants; of those students, 62 returned parental consent and provided assent to participate in the study. Within each school, qualifying participants were randomly assigned to the treatment condition ($n = 31$) or a BAU condition ($n = 31$). Table 1 presents the demographic characteristics of the sample. There were no significant differences between the treatment and BAU conditions on gender [$X^2(1) = 0.62, p = .43$], grade [$X^2(1) = 4.17, p = .04$; Fisher's Exact Test $p = .07$], ethnicity [$X^2(1) = 3.09, p = .21$], English learners [$X^2(1) = 0.62, p = .43$], free or reduced price lunch [$X^2(1) = 0.57, p = .45$], or special education status [$X^2(1) = 2.07, p = .15$]. One student assigned to the treatment condition withdrew from the campus, resulting in a final sample of 61 students. The overall (1.6%) and differential (3.2%) attrition rates resulted in a low level of potential bias according to the What Works Clearinghouse attrition standard (Institute of Education Sciences, 2017).

Materials and Procedures

Tutors and Treatment Condition.

Of the five tutors providing the treatment, four were doctoral students in special education and one completed a Ph.D. in early childhood education. The lead researcher provided a four-hour training to the tutors on the rationale of the study, the use of the materials, and the practices. Students randomly assigned to the intervention received 25 lessons, approximately 45 minutes each, provided in groups of 4 to 6 students two to three times per week.

Intervention materials.

Passages for each intervention lesson were drawn from three resources: [Readworks.org](https://www.readworks.org) website, *QuickReads* (i.e., Level C Books 1, 2, and 3 and Level D Books 1, 2, and 3; Hiebert, 2012), and three National Geographic leveled readers (Jerome, 2003, 2006; Jones, 2006) using the following criteria: (a) the text represented one of the targeted text structures (i.e., compare-contrast, problem-solution, and description) and (b) aligned with 4th and 5th grade social studies and science content. The selected passages represented third through fifth grade reading levels and Lexile® levels ranging from 400 to 1070. The reading level, length, and complexity of texts increased throughout the intervention. Based on an analysis of text structures used in high stakes assessments, we selected the three primarily used: description, problem-solution, and compare-contrast text structures.

Lesson structure.

Lessons were developed combining text structure and paraphrasing instruction by (a) providing a hierarchical structure for organizing passage ideas that also served as an efficient memory guide for remembering the key information, (b) allowing for chunking key information across longer sections of text, (c) actively engaging with the text and comprehension monitoring, and (d) utilizing fix-up practices for the flexible application of strategies across text structures and difficulty. Each lesson contained the following practices: (a) lesson opening to provide an opportunity to share application of skills learned outside of

the group (3 min); (b) building background knowledge using a visual (5 min); (c) text reading (15-20 min); (d) explicit instruction with Get the Gist to generate main ideas while reading (see subsequent section for paraphrasing steps in Get the Gist; 15-20 min); (e) application of fix-up practices during Get the Gist to prompt students to reread, check the headings, and utilize text structure to inform main idea statements (included as part of gist writing); and (f) lesson closing that included a review of the day's learning, a preview of the next lesson's learning, and a reminder to apply skills learned in other reading opportunities (2 min).

Embedding text structure instruction within the paraphrasing process.

The treatment lessons used in this study were designed to: (a) teach text structure patterns, and (b) prompt students to think about the text structure, with the intention of drawing students' attention to the hierarchical organizational pattern to inform main idea statements. To inform the selection of text structures used in this intervention, we reviewed state and national standards to identify text structures included on those standards as well as the text structures represented on the corresponding high stakes assessments. We identified description, problem-solution, sequence, and compare-contrast structures most commonly represented in these assessment passages. Three text structures were taught because we recognized that the integration of paraphrasing with text structure instruction may be challenging for upper-elementary students with reading disabilities and therefore wanted to determine students' capacity for acquiring proficiencies with a limited number of text structures prior to incorporating instruction in all five structures.

Previous research on text structure instruction uses signal words (e.g., different, alike, similarly for compare-contrast) to teach students how to identify the text structure (Weisberg & Balajthy, 1989; Wijekumar et al., 2012, 2017; Wijekumar et al., 2014); consequently, texts are often written to clearly represent these signal words, potentially reducing generalization to authentic text. Hebert and colleagues (2016) found signal word instruction did not significantly moderate the effects of text structure instruction, suggesting signal words may not be a more advantageous approach to teaching text structures over and above other approaches (e.g., graphic organizers, targeted questions; Williams, 2018). One concern is that students might overgeneralize the rules for signal words (e.g., 'first' signifies a sequence passage anytime the student encounters the word 'first'; Hebert et al., 2016). Another concern is that students scan the text and focus on individual words in a paragraph, potentially ignoring the connection among ideas across sentences and the context of the paragraph as a whole (Hebert et al., 2016). For these reasons, the text structure instruction in this study focused on building students' understanding of the top-level structure for the description, problem-solution, and compare-contrast structures, and then cueing students to consider the way in which the text was organized when identifying the most important information in the passage (i.e., the main idea). We incorporated writing and multiple text structures as these features result in significantly greater effects than interventions that including only one structure or no written component (Hebert et al., 2016).

Students initially learned the paraphrasing steps in Get the Gist [i.e., (1) Who or what is this section about? (2) What is the most important idea about the who or what? (3) Write the

gist.], applied those steps while reading short passages, and learned to apply fix-up practices (i.e., reread the text or check the heading for clues) when encountering difficulty with steps 1 or 2 of Get the Gist. Tutors introduced the description and problem-solution structure in Lesson 6, which included an explanation of the structure, a guiding question (e.g., Does the passage tell about a problem and a solution related to the who/what?) to assist with identifying the correct structure, a corresponding gesture, and sentence frames to assist students with writing the main idea aligned to the text structure. Students used the text structure as a fix-up practice to inform the main idea generation (e.g., if it's a problem-solution passage, the main idea will tell the problem and the solution about the who/what). In lesson 11 students were introduced to the compare-contrast text structure, guiding question, gesture, and sentence frames. In lessons 16-25 students read all three text-structure types and wrote main ideas for each passage, using the text structure to inform main idea generation (See Stevens & Vaughn, 2018 for sample lessons).

Comparison condition (BAU).

Students in the comparison (BAU) condition at Campus 1 attended their business-as-usual academic block, which consisted of science instruction (fourth graders) and social studies instruction (fifth graders). Of the 24 students in the BAU condition at Campus 1, 10 students received additional reading intervention during the school day. Seven students received explicit decoding intervention in a large group (i.e., five to 10 students) for 45-minute sessions five times per week and three students received the same intervention for 90-minute sessions five times per week. At Campus 2, students received the intervention after school at the request of the administration, so the students in the BAU condition participated in their usual after-school activities (e.g., the extended-day after school program on site). Of the seven students in the BAU condition at Campus 2, three received Tier 2 small group reading intervention and three received Tier 3 small group reading intervention during their regular English language arts block. Students received intervention three to four times per week for 30 to 45 minutes per session during the course of the project.

Data Collection and Measures

Trained assessors with previous experience administered the pre-test and post-test measures within two weeks of the start and the end of the intervention; assessors were unaware of students' group assignment and did not participate in any way in the treatment.

Gates-MacGinitie Reading Test 4th edition.—The reading comprehension subtest (*GMRT-RC*; MacGinitie, MacGinitie, Maria, Dreyer, & Hughes, 2000) is a group-administered, 35-minute assessment of generalized reading comprehension. Internal consistency reliability ranges from .91 to .93 and the alternate-form reliability coefficient is .80 to .87. Students were administered Form S at pre-test and Form T at post-test.

Structure identification and main idea generation test (*SIMIG*).—The *SIMIG* is a researcher-developed (Hebert, Bohaty, Nelson, & Roehling, 2018; adapted with author permission), group-administered measure of students' skill in text structure and main idea generation adapted from an assessment used in related intervention research (Hebert et al., 2018). The passages represent problem-solution, compare-contrast, and description text

structures with Lexile® levels ranging from 500-900, mean sentence length ranging from 9.14 to 13.67, and word count ranging from 64 to 136. Students read each passage, identify the text structure, and write a main idea statement. There is a maximum of 10 points for the text structure identification and 30 points for main idea generation. The open-ended items of the *SIMIG* were scored on a scale from 0 to 3. Experienced assessors, who were unaware of students' condition, independently scored the main idea statements on 20% of the sample, achieving inter-rater reliability of 98%.

Strategy use measure (SUM).—The development of the *SUM* was informed by the approaches used in studies of theoretical models of comprehension (e.g., Cromley & Azevedo, 2007; Meadows Center for Preventing Educational Risk, 2008). In Part 1, students read three leveled passages and then answer open-ended questions that assess their knowledge and use of two specific comprehension strategies: question-generation and main idea generation. In Part 2, students read the same passages and select the best possible main idea statement from four choices. It takes approximately 20 minutes to administer with a total of 21 possible points for both sections. Scammacca (2017) examined the reliability and validity of the *SUM* with inter-rater reliability of over 95% agreement. A confirmatory factor analysis indicated the measure consisted of two factors (i.e., question generation and main idea identification) that were moderately correlated ($r = .71$). The validation study reported positive construct validity for the *SUM* measuring students' question generation and main idea identification.

Fidelity of Implementation

All intervention lessons were audio-recorded for a total of 146 recordings. Using a fidelity protocol and code sheet, implementation fidelity was rated based on procedural fidelity, overall quality (i.e., instruction, classroom management), and dosage (i.e., average instructional minutes provided). The first author served as the gold standard and trained two research assistants to conduct fidelity ratings on 20% of the total observations, randomly selected from within each tutoring group ($n = 30$). Reliability (i.e., agreements divided by the agreements plus disagreements) yielded 100% and 95% agreement for the two coders. Fidelity of implementation results are reported in Table 2. The first author conducted observations (i.e., via audio recordings) of each tutoring group after lesson 8 and lesson 16 in order to provide specific feedback on implementation and instructional quality throughout the course of the intervention. Implementation fidelity data demonstrated high procedural fidelity for text reading, Get the Gist paraphrasing process, and the use of fix-up practices during paraphrasing. Building background knowledge and lesson closure received lower procedural fidelity ratings because one tutor routinely skipped over the background-building component and most tutors ran out of time at the end of the lessons and thus skipped or forgot to provide the lesson closure. In spite of these scores, the global observation fidelity data yielded high quality of implementation for instruction and classroom management.

Results

Descriptive statistics were calculated for all measures with pre-test and post-test means, standard deviations, and Hedges' g effect sizes reported in Table 3. Multiple regression

analyses were conducted to examine the relationship between group assignment and scores on the outcome measures while controlling for pre-test scores on the outcome measure of interest. Data were examined for violations of the assumptions of multiple regression, including (a) a linear relationship between each predictor and the criterion variable, (b) homoscedasticity of residuals, (c) independence of residuals, and (d) normally distributed residuals; all assumptions were met. Multicollinearity was assessed by examining the correlations among predictor variables.

Baseline Equivalence

We conducted independent-samples *t* tests that resulted in no statistically significant differences between the intervention and BAU groups on the following measures given at pre-test: *GMRT-C* [$t(60) = 0.20, p = .84$], the researcher-developed *Structure Identification* [$t(60) = -1.68, p = .10$] and *Main Idea Generation Test* [$t(60) = -0.17, p = .87$], the *SUM Part 1* [$t(60) = 1.27, p = .21$], and the *SUM Part 2* [$t(60) = 1.57, p = .12$]. We examined effect sizes between the intervention and the BAU condition at pre-test using the What Works Clearinghouse guidelines and standards (Institute of Education Sciences, 2017). Effect sizes at pre-test were below 0.05 on the Gates MacGinitie reading comprehension subtest as well as the main idea portion of the *SIMIG*. We report adjusted post-test means for the remaining outcomes in which the ES exceeded 0.05.

Main Effects

Five multiple regression analyses examined the relationship between group assignment and each outcome controlling for pre-test scores on the outcome measure of interest. For each analysis, the model contained two predictors, the pre-test scores on the outcome of interest and condition (i.e., dummy coding was used to identify the treatment students and the BAU students). The regression coefficients and standard errors are reported in Table 4.

Group membership in the intervention significantly predicted main idea generation [$g = 0.70; B = 2.98, \beta = 0.33, t(58) = 2.95, p = .003$] and text structure identification [$g = 0.75; B = 1.49, \beta = 0.37, t(58) = 2.94, p = .003$] after controlling for pre-test performance on the *Structure Identification and Main Idea Generation* test.

The intervention significantly predicted question and main idea generation on Part 1 of the SUM after controlling for pre-test scores [$g = 0.62; B = 1.97, \beta = 0.27, t(58) = 2.43, p = .009$], but did not significantly predict main idea identification on Part 2 [$g = 0.45; B = 0.42, \beta = 0.23, t(58) = 2.95, p = .042$].

Students in the comparison group were found to have higher means at post-test than students in the intervention group on the *GMRT-RC*. The intervention did not significantly predict generalized reading comprehension performance on this measure after controlling for pre-test performance [$g = -0.19; B = -1.84, \beta = -0.10, t(58) = -0.86, p = .198$].

Discussion

This study examined the effects of an integrated paraphrasing and text structure intervention on the main idea generation and reading comprehension of 4th and 5th graders with reading

disabilities. We discuss the findings of this study related to the near-transfer, mid-transfer, and far-transfer measures used, and then position the findings relative to the current literature base on text structure and paraphrasing interventions for students with reading disabilities.

We consider the *SIMIG* a near-transfer measure because it assessed the effect of the intervention on students' main idea generation and text structure identification using original passages representing the three text-structures taught in the intervention. Findings revealed that students in the treatment condition significantly outperformed students in the comparison condition on main idea generation and text structure understanding with effect sizes of 0.75 and 0.70 respectively. These effect sizes are meaningful and suggest that upper elementary students with reading disabilities, including English learners, benefit from structured opportunities to learn and practice paraphrasing and text structure recognition in order to generate macrostructures and integrate those macrostructures across sections of text. These results are consistent with previous text structure instruction findings, suggesting students with reading disabilities can improve their understanding of text structure and reading comprehension on proximal measures (Hebert et al., 2016).

We determined the effect of the intervention on students' main idea generation, question generation, and main idea identification using the *SUM* (Meadows Center for Preventing Educational Risk, 2008), a measure that is less aligned to the intervention than the *SIMIG* because it includes untaught text structures (e.g., narrative nonfiction, sequence) and question generation, which was not a focus of the intervention. For these reasons, we consider the *SUM* a mid-transfer measure of students' main idea generation to unfamiliar or untaught text structures. On main idea and question generation in Part 1, the intervention significantly predicted outcome scores over and above pre-test performance with an effect size of 0.62; however, the intervention did not significantly predict students' main idea identification on multiple choice questions in Part 2 ($g = 0.45$; $p = .042$).

The findings from the *SUM* are promising because they suggest that the intervention may improve students' main idea generation on untaught text structures, as well as their question-generation. Hebert et al. (2016) found positive effects for the transfer of comprehension from taught to untaught structures, suggesting that instruction in one structure may influence text structure understanding in other, untaught structures because of the similarity between these text structure types (e.g., the first/then nature of the cause/effect structure may be similar to the temporal nature of the sequence structure). One possible explanation for the current findings might be that the problem-solution structure, which is temporally related in that the problem precedes the solution, may have improved students' understanding of the sequence structure included on the *SUM*. Another possible explanation is that the text structure instruction more generally heightened students' awareness that information texts are often organized in a particular manner, thus enabling students to generalize generating main ideas to untaught structures.

Students did not improve significantly over and above the BAU group when identifying main ideas via a multiple-choice format. One reason for the lack of significant findings on *identifying* main ideas might be attributed to lack of practice identifying main ideas via a

multiple-choice format in the intervention. In the classroom, students may receive more extensive instruction – or test preparation – on identifying main ideas on multiple-choice questions in order to prepare for high stakes assessments. We incorporated written main idea statements because writing has been associated with improved text comprehension in previous studies examining text structure instruction (Hebert et al., 2016). Another possible explanation for this finding might be that selecting the main idea from a list of choices is a lower level activity than producing main idea statements when reading and thus did not differentiate students in BAU and intervention conditions. Students were expected to write the main topic and the most important idea about that topic aligned to the text structure; this represents a deeper level of comprehension requiring synthesis of information as well as generalization of information to make broader statements about the details included in that passage (Murnane, Sawhill, & Snow, 2012). Consequently, instructing students to produce written main ideas may support comprehension and engagement with text at a more advanced level than is required by asking students to identify the main ideas from a list of choices.

Many researchers consider standardized traditional reading comprehension measures as the gold standard for determining the efficacy of reading instruction because these measures have known psychometric properties providing confidence regarding generalizing findings to reading comprehension broadly. Because the *GMRT-RC* has been used in many reading instruction studies over the decades, we administered it to describe this sample relative to other samples of students with reading disabilities in previous studies. The participants in this study scored nearly one and one-half standard deviations below the standardized mean, which equates to the 9th percentile in reading comprehension. Group membership did not significantly predict outcome scores on the *GMRT-RC* after controlling for pre-test scores, with an effect size of -0.19 (MacGinitie et al., 2000). The findings on the *GMRT-RC* align with recent research with larger samples of struggling readers and interventions provided for longer periods of time reporting a similar pattern of null findings on distal measures of reading comprehension for upper elementary students (e.g., Fuchs et al., 2018; Roberts et al., 2018; Vaughn, Solis, Miciak, Taylor, & Fletcher, 2016; Wanzek et al., 2016). Hebert and colleagues (2016) found text structure instruction significantly improved performance on far-transfer, standardized measures of reading comprehension ($ES = 0.13$); however, this finding was not specific to students with reading disabilities or significant reading problems.

There are several considerations when interpreting findings from the *GMRT-RC*. First, as Fuchs and colleagues point out (2018), we may be overly enamored with distal measures of reading comprehension and under-relying on more intervention-linked assessments. We think this is an important point to consider relative to the interpretation of this study's findings on the *SIMIG* (i.e., near-transfer) and the *SUM* (i.e., mid-transfer), particularly given these measures assessed transfer of students' main idea generation skill to unfamiliar passages, content, and untaught structures. Second, the *GMRT-RC* may be a broad measure of other related constructs (e.g., word and world knowledge) and not a particularly well-suited measure of students' main idea generation and integration. Some students in the BAU condition received science and social studies instruction while the treatment students attended intervention; it may be that these students improved in background knowledge and oral language skills such that they outperformed students in the treatment group at post-test,

though not statistically significantly so. Finally, Fuchs and colleagues (2018) commented on the “disjunction” between intervention programs and far-transfer reading comprehension assessments, such as the *GMRT-RC*. End-of-year high stakes reading assessments often include main idea and summarization questions, but closer inspection of the *GMRT-RC* revealed no questions that explicitly ask students to identify the main idea of the text or summarize a passage (Fuchs et al., 2018; MacGinitie et al., 2000). Given these considerations, we hope the findings on these near-transfer and mid-transfer measures are given credence as (a) an assessment of the *application* of the evidence-based practices taught in the intervention that aligns with our theory of change and (b) a way in which to inform future intervention development.

How Does this Study Contribute to the Existing Literature Base?

Previous research identifies text structure instruction and paraphrasing as effective instructional practices for improving struggling readers’ reading comprehension (Hebert et al., 2017; Stevens et al., 2018). This study contributes to and extends the text structure and paraphrasing literature in several important ways. First, these practices have not yet been combined in previous research, particularly for students with reading disabilities. We integrated text structure instruction within the paraphrasing process specifically with the intention of supporting struggling readers’ generation of macrostructures across sections of text; that is, we utilized text structure awareness as a mechanism for selecting information, chunking information, and formulating the main idea that reflects the most important information in the text. As Wijekumar and colleagues suggest (2017), we hypothesized text structure awareness would support students with a hierarchical model for extracting the most important information, and that structure would also serve as a memory guide for repairing misunderstandings (e.g., rereading the text to look for the solution to the problem presented in the text). Once students learned the structures, they followed the paraphrasing steps and considered the text organization when they encountered difficulty generating the main idea (i.e., used the guiding questions to identify the text structure and used the corresponding sentence frames to guide the gist formation). The results of this study suggest that paraphrasing and text structure instruction improved main idea generation for students with reading disabilities who are also English learners.

Second, this intervention was a departure from previous text structure instructional approaches in that (a) we used authentic texts rather than writing our own texts, and (b) we utilized guiding questions to teach students to consider the text’s organization rather than teaching signal words (e.g., Williams et al., 2016; Wijekumar et al., 2012, 2017; Wijekumar et al., 2014). We made these instructional decisions for several reasons. First, previous text structure instruction utilizing well-structured texts did not result in transfer to authentic texts (e.g., Williams et al., 2007), so we were interested in exposing students to authentic texts that more accurately reflected those students might encounter when reading in their classrooms, with the intention of supporting transfer of main idea generation skill to these texts. Second, we hypothesized utilizing guiding questions to identify the text structure would support students with considering the organization of the text as a whole – rather than focusing on individual words – and provide the top-down framework needed to support main idea generation (Hebert et al., 2016). The results of the *SIMIG* and the *SUM* suggest using

authentic texts during intervention may improve students with reading disabilities' transfer of main idea generation skill to other unfamiliar passages and texts containing unfamiliar text structures. Overall, the results of this study suggest improvement in main idea understanding can be achieved when text structure is embedded as a fix-up practice.

Third, this study extends the literature in that previous research in text structure instruction has been provided as a whole-class approach in general education classrooms with limited frequency (i.e., Tier 1 setting provided once or twice a week; Williams et al., 2014, 2016; Wijekumar et al., 2012, 2017; Wijekumar et al., 2014). In contrast, this study provides initial support for the integration of paraphrasing and text structure practices as a Tier 2-type intervention specifically for students with reading disabilities who are also English learners in the upper elementary grades. We interpret the results of this study as suggesting that (a) students' main idea generation and text structure identification can be improved – significantly – with relatively little time in small group intervention (two to three times per week across 10 to 12 weeks), and (b) it is possible for students to make gains in these skills when being instructed in small groups of four to six students each. These findings are promising considering most of the students in the BAU group received daily reading intervention in addition to their daily English language arts instruction – thus, a robust comparison condition.

Limitations and Future Research

While the findings from this study suggest promise for providing text structure and paraphrasing instruction for students with reading disabilities, it is unknown whether instruction in just one of these practices would yield similar results compared to a combined treatment in paraphrasing and text structure instruction. Extended time in intervention with more developed background building and vocabulary knowledge was beyond the scope of this current study (i.e., ten to 12 weeks of intervention for 40-minute sessions), but it would be valuable to investigate the effects of a paraphrasing and text structure intervention with (a) longer duration, (b) greater background building, and (c) the incorporation of main ideas across paragraphs to summarize texts. Given the importance of vocabulary knowledge for understanding text, future iterations of this work might also include – in addition to background building – explicit vocabulary instruction that supports key understandings within the expository texts.

We were unable to identify a measure that examined the effects of paraphrasing and text structure instruction on students' combining multiple main ideas across sections of text to generate summaries. We think that the development of a reliable and valid measure of students' main idea generation and subsequent summarization of longer sections of text would allow future researchers to better assess not only main idea generation but also summarization. In this study, students were asked to write the main idea or the gist of the passage. With the intent of further promoting generation of main idea across texts, it may be beneficial to vary the way in which students are asked about the main ideas in text.

The results suggest that students' text structure identification can be improved by considering the hierarchical organization as a whole using guiding questions. This study did

not examine the differential effects of the type of text structure instruction (i.e., providing signal word instruction versus teaching students to consider the text as a whole using guiding questions). It would be valuable to determine how the current approach for teaching text structure compares with the signal word approach. Further research might also examine the extent to which text structure instruction generalizes to untaught structures, and which text structures yield the greatest benefit for improving reading comprehension.

It should be noted that the sample represents primarily low-income Hispanic students from two charter schools in a south-central region of the United States and highly trained PhD students provided the Tier-2 type intervention for a limited duration (i.e., 25 lessons across 10 to 12 weeks). The findings should be considered relative to these study features and participant characteristics. Further research with larger and varied samples would enhance our understanding of the potential impact of these combined practices on the reading comprehension outcomes for students with reading disabilities.

Summary

This study examined the effects of a small group intervention targeting paraphrasing and text structure instruction on the main idea generation and reading comprehension of students with reading disabilities in Grades 4 and 5. Multiple regression analyses yielded statistically significant, positive results in favor of the intervention on near-transfer and mid-transfer measures of text structure identification and main idea generation. There is some evidence to suggest that this type of instruction, when delivered in small group settings, may improve students' main idea generation on untaught structures. Future research might investigate further iterations of paraphrasing and text structure intervention with larger, more heterogeneous samples in order to assess the generalizability of the results.

Acknowledgments

This research was supported in part by the Institute of Education Sciences, U.S. Department of Education, through Grants R305F100013 and R305A150407 and by the Eunice Kennedy Shriver National Institute of Child Health and Human Development through grant 2P50 HD052117-11 to The University of Texas at Austin. The opinions expressed are those of the authors and do not represent views of the Institute of Education Sciences, the U.S. Department of Education, or the Eunice Kennedy Shriver National Institute of Child Health and Human Development.

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Figure 1.
Reading Comprehension Processing Model

Table 1

Participant Demographic Information

Characteristic	Intervention (<i>n</i> = 31)		Comparison (<i>n</i> = 31)		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Gender						
Female	13	41.9	10	32.3	23	37.1
Male	18	58.1	21	67.7	39	62.9
Grade						
Fourth	18	58.1	10	32.3	28	45.2
Fifth	13	41.9	21	67.7	34	54.8
Ethnicity						
African American	1	3.2	4	12.9	5	8.1
Asian	0	0.0	1	3.2	1	1.6
Hispanic	30	96.8	26	83.9	56	90.3
English learners	21	67.7	18	58.1	39	62.9
FRPL	28	90.3	26	83.9	54	87.1
SPED						
Learning Disability	2	6.5	0	0.0	2	3.2
Age <i>M</i> (<i>SD</i>)	9.73 (.74)		10.2 (.69)		10.0 (.74)	
2017 State Reading Test <i>M</i> (<i>SD</i>)	1331.4 (66.0)		1354.3 (64.3)		1342.8 (65.7)	

Note. FRPL = receiving free/reduced-price lunch; SPED = receiving special education services

Table 2**Implementation Fidelity Data**

Procedural Fidelity of Lesson Components	<i>N</i>	Range	<i>M</i>	<i>SD</i>
Lesson opening: Generalization share-out and objective	30	1-4	3.23	0.97
Build background knowledge	30	1-4	3.03	1.22
Text reading	30	3-4	3.97	0.18
Get the Gist to generate main ideas ^a	26	3-4	3.92	0.27
Application of fix-up practices during Get the Gist ^b	29	1-4	3.59	0.73
Lesson closure: Review learning, reminder to generalize skills, preview next lesson's learning	30	1-4	2.67	1.42
Quality of Implementation: Global Observation				
Global instruction	30	1-5	4.40	1.00
Global classroom management	30	1-5	4.43	1.07
Fidelity of Dosage				
Mean instructional minutes provided across all sessions	146	19-54	39.23	5.78

Note. *N* = total number of observations;

^a = four randomly selected audios included lessons 6 and 11 in which text structures were introduced and identified, but students did not use Get the Gist to generate main idea;

^b = one randomly selected audio was lesson three, in which fix-up practices had not yet been introduced.

Table 3
Pre-test and post-test means and standard deviations for the three outcome measures

Outcome Measure	Pre-test <i>M</i> (<i>SD</i>)		Post-test <i>M</i> (<i>SD</i>)		Adjusted post-test <i>M</i> (<i>SD</i>)		Hedge's <i>g</i>
	Comparison (<i>n</i> = 31)	Intervention (<i>n</i> = 31)	Comparison (<i>n</i> = 31)	Intervention (<i>n</i> = 31)	Comparison (<i>n</i> = 31)	Intervention (<i>n</i> = 30)	
<i>GMRT-RC Standard Scores</i>							
Structure Identification and Main Idea Generation (<i>SIMIG</i>)	80.13 (10.09)	79.60 (10.59)	83.48 (9.99)	81.62 (9.24)			−0.19
Structure Identification	2.65 (1.56)	3.29 (1.47)	3.68 (1.97)	5.20 (1.86)	3.70 (1.95)	5.18 (1.96)	0.75 *
Main Idea Generation	4.06 (3.38)	4.19 (2.61)	6.52 (3.57)	9.63 (5.11)			0.70 *
Strategy Use Measure (<i>SUM</i>)							
Part 1: Question and main idea generation	7.13 (4.07)	5.77 (4.30)	6.39 (3.70)	7.77 (3.70)	6.10 (3.15)	8.10 (3.15)	0.62 *
Part 2: Main idea identification	1.61 (0.92)	1.26 (0.86)	1.61 (0.95)	1.97 (0.85)	1.58 (0.91)	2.00 (0.91)	0.45

Note. Baseline equivalence established for the GMRT-RC and the Structure Identification and Main Idea Generation (*SIMIG*) tests, so we report Hedge's *g* on the unadjusted post-test means for these outcomes; *n* = number of students; *M* = mean; *SD* = standard deviation

* = statistically significant at $p < .01$; raw score means are reported for all measures except for the *GMRT-RC*

Table 4

Results of the Multiple Regression Analyses

Outcome Measure	<i>B</i>	<i>SE_B</i>	β	<i>t</i>	<i>p</i>	95% CI for <i>B</i>
<i>GMRT-RC</i>	-1.84	2.14	-0.096	-0.86	<i>p</i> = 0.198	[-6.12, 2.45]
<i>SIMIG</i>						
Structure Identification	1.49	0.51	0.365	2.94	<i>p</i> = .003 *	[0.47, 2.50]
Main Idea Generation	2.98	1.01	0.325	2.95	<i>p</i> = .003 *	[0.96, 5.01]
<i>SUM</i>						
Part 1: Question and Main Idea Generation	1.97	0.81	0.266	2.43	<i>p</i> = .009 *	[0.34, 3.59]
Part 2: Main Idea Identification	0.42	0.24	0.229	1.76	<i>p</i> = .042	[-0.06, 0.89]

Note. *B* = unstandardized regression coefficient; *SE_B* = standard error of the unstandardized regression coefficient; β = standardized coefficient; *GMRT-RC* = Gates Macginitie Reading Test Reading Comprehension subtest; *SIMIG* = Structure and Main Idea Generation Test; *SUM* = Strategy Use Measure;

* = statistically significant at *p* < .01