

Instruction in Reading Comprehension for Primary-Grade Students: *A Focus on Text Structure*

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The studies described here are designed to teach reading comprehension to at-risk students in the second and third grades. The focus is on text structure. First, there is an evaluation of a program that teaches students to identify themes of stories and apply those themes to real life; this instruction goes beyond the plot-level focus of typical primary-grade instruction. Second, an instructional program that teaches a common expository text structure, compare/contrast, is evaluated in a series of studies; content similar to science content typically taught at the primary level is used. The results of these studies suggest that at-risk children in the primary grades can achieve gains in comprehension, including the ability to transfer what they have learned to novel texts, when they are given highly structured and explicit instruction that focuses on text structure.

According to the National Assessment of Educational Progress (NAEP), about one third of American fourth graders read proficiently at their grade level. Another third have only partial mastery of the knowledge and skills appropriate for reading at the fourth-grade level, and the bottom third of the population fails to reach even that low level of performance (National Center for Education Statistics, 2004). The need for better reading instruction is clear.

We are making progress toward our goal of effective instruction in beginning reading. Research evidence supports the use of a structured, explicit approach to instruction (National Reading Panel, 2000). This type of approach is likely to be especially valuable for children who have learning disabilities, attention-deficit disorders (ADD), or speech and language disorders or who are otherwise at risk for academic failure (Gersten, Fuchs, Williams, & Baker, 2001).

We are much further behind in the area of reading comprehension. For many years it was thought that once children acquired the basic ability to read, they would, automatically and without specific instruction, be able to understand whatever they could decode. We have discovered, however, that this is not the case; there are sources of comprehension difficulties that are independent of inadequate basic decoding and fluency skills, and researchers are beginning to recognize the need for a specific instructional focus on comprehension.

The National Reading Panel (2000) highlighted two general topics within comprehension: vocabulary and comprehension strategies. The work reported here focuses on comprehension strategies. However, although vocabulary plays only a minor role in our work, we recognize it as a crucial

component of comprehension that should be included in any comprehensive reading program.

A rationale for teaching comprehension strategies is that readers derive more meaning from text when they engage in intentional thinking. That is, when people run into difficulties in understanding what they have read, the application of specific strategic cognitive processes will improve their comprehension. Studies have shown that instruction in comprehension strategies is effective in helping students learn strategies, and that when the strategies are applied, better comprehension follows (Pressley & McCormick, 1995).

The goal for this sort of instruction is for the reader to internalize the strategy so that its use becomes automatic. Then, in situations in which comprehension is a problem, the strategy can be brought to consciousness and applied. However, it is not a simple matter to move from this conceptualization, which has been empirically supported in laboratory-like studies, to the design of effective strategy instruction in the classroom. Strategies are notoriously difficult to teach in a way that will ensure their effective use in authentic reading situations, and in addition, teaching teachers how to implement strategy instruction is often a challenge (National Reading Panel, 2000; Williams, 2002).

The constructivist theory that has influenced comprehension instruction over the past 2 decades has led to instruction that is quite unstructured (Williams, 1998). It often incorporates strategic instruction of a highly metacognitive nature, emphasizing reflection and self-monitoring. This instruction has been effective at the middle school level and above (Allington, Guice, Michelson, Baker, & Li, 1996), but such

an approach is contraindicated for younger children and those at risk for academic failure. We argue that a structured and explicit approach is required for these children. In such an approach, the overall conceptualization of a reading strategy remains the same, but it is interpreted more directly. That is, more emphasis is given to text signals and patterns and less to metacognitive processing.

This is the same approach that has been found to be effective in teaching other academic content to at-risk children. It is exemplified in the work of my colleagues in the Center on Accelerating Student Learning (CASL), Doug Fuchs in beginning reading, Steve Graham and Karen Harris in writing, and Lynn Fuchs in mathematics. Like them, I endorse the classic principles of good instructional design; we introduce content in small increments, moving from the simple to the complex, providing (a) modeling by the teacher, (b) scaffolding that fades as instruction progresses, and (c) at each step, substantial practice with feedback, first guided and then independent. In the same spirit, the instructional materials (the texts) that I have used in this reading comprehension work are simple and are sometimes developed specifically for the instruction, so that they exemplify with clarity the particular textual patterns that are the focus of the instruction.

The Importance of Text Structure

Well-structured text enhances recall and comprehension for those who have acquired sensitivity to structure (Pearson & Dole, 1987), and many studies have shown that instruction designed to teach students to recognize the underlying structure of text improves comprehension (Gersten et al., 2001). This instruction typically involves teaching students to identify the important structural elements of a particular type of text and then to memorize a list of generic questions that cue a search for those important elements. It involves acquiring knowledge about text and using this knowledge strategically.

Different types of text are organized in different ways. Narrative text typically follows a single general structural pattern (often called story grammar; Mandler & Johnson, 1977). Expository text comes in a variety of patterns (e. g., description, sequence, compare–contrast, cause–effect, and problem–solution).

Children develop sensitivity to narrative structure early and use it to comprehend simple stories before they enter school. That is, they note the setting, the main character, the important conflicts (actions and reactions of the characters), and the story resolution as they read. But this story grammar structure encompasses narrative only at the plot level, and many stories have meaning beyond the plot level. Mature comprehension involves generalization beyond the story characters and events to real-life people and events. Traditional instruction at the elementary level has focused almost entirely on the concrete plot level.

Expository text comprises a variety of structures. Because of this, and also because it more often deals with unfamiliar content, expository text is generally more difficult to comprehend (Kucan & Beck, 1997). It has been considered so challenging for young children that until recently, one rarely saw any expository text in K–3 classrooms.

Arguments have been made that because only a small proportion of authentic text actually follows any single specific structure, there is little reason to spend much instructional time on text structure. However, to base early instruction on what proficient readers read, as many recommend, is not necessarily the best approach to take. For example, proficient readers do not sound out individual letters in words; they process larger units (Perfetti, 1985). Yet synthetic phonics is an effective way to teach beginning reading (National Reading Panel, 2000). Similarly, it is reasonable to suggest that early comprehension instruction might well be more effective when it is not based strictly on a model of proficient reading. Texts that are well structured and prepared specifically for particular instructional purposes are likely to be quite useful.

We talk about text structure, but these specific structures are not limited to text; they are rhetorical structures that reflect universal cognitive processes. The thinking of young children exhibits forms of all these structures. By the time children enter school, they tell stories, compare and contrast objects, order events in a temporal sequence, and attribute causality (Carey, 1990). But children have not had sufficient experience to be able to use these structures with ease, and sometimes they do not even recognize opportunities for using them to enhance their comprehension (Goldman & Rakestraw, 2000). The hope is that helping students to recognize the structure inherent in text—and match it to their own cognitive structures—will help them understand and produce not only text but also spoken discourse. Then, when they encounter text with complex structure or text that is poorly organized, they will be able to simplify or reorganize it in order to better comprehend it.

Comprehension of Narrative Text: Our Work Prior to CASL with Older Students

Our initial CASL study built on earlier work we had done on developing children's understanding of narrative text beyond simple plot comprehension, at the advanced level of *theme*. There have been very few instructional studies of theme, and even at the high school level, theme is the most difficult component of story grammar to teach (Gurney, Gersten, Dimino, & Carnine, 1990). I had developed an instructional program in theme identification and had evaluated it successfully with middle school children with and without learning disabilities. The constructivist theory, influential in current comprehension instruction, views a reader as one who brings a unique

knowledge base to the reading of a text and ends with a unique understanding of the text (Au & Carroll, 1997; Rosenblatt, 1978). This understanding integrates the text meaning with concepts and experiences that are personally meaningful to the individual reader. The instruction that follows from this theoretical stance is typically organized around discussion, in which students contribute their individual interpretations so that all can expand and refine their own meaning construction. Teachers serve as facilitators who contribute their own interpretations, without imposing them on the group.

This is relatively unstructured instruction. It presumes that all students have stable knowledge bases and interpretations to begin with, so that the class discussions can effectively modify and refine the interpretations and understanding of individual students. We believe that this constructivist approach cannot fully meet the needs of students who are having difficulty learning to read. Thus, we designed our theme scheme program to incorporate constructivist goals of comprehension instruction with the direct, structured instructional approach that is effective for students with learning disabilities and others at risk.

The purpose of our instructional program is to help students learn about the concept of theme, identify theme in stories, and apply themes to real life. The instruction follows the paradigm of teacher explanation and modeling, guided practice, and independent practice. It focuses on teaching plot-level components via organizing (schema) questions, as previous studies have done. Then it teaches theme identification via additional questions. A final set of questions helps students generalize the theme to relevant life situations. We use simple stories with single, clear, and accessible themes. Some of the theme concepts we have used include perseverance, cooperation, greed, and honesty. All of the themes are expressed in a simple, common format: "We should cooperate"; "We should not be greedy."

Before CASL started in 1999, we conducted three randomized evaluation studies. The first involved fifth- and sixth-grade students in urban classrooms that included both normally achieving students and those with mild learning disabilities. The second evaluation involved students with learning disabilities and seventh- and eighth-grade nonmainstreamed, special education classrooms (Williams, Brown, Silverstein, & deCani, 1994). We also evaluated the program in a study involving students with learning disabilities in nonmainstreamed junior high school classrooms (Wilder & Williams, 2001).

The Theme Scheme for Primary-Grade Students

The research literature suggests that with adequate instruction, children at the elementary level might also be taught to go beyond the plot level to the lesson or theme of the story. Developmental studies such as that of Lehr (1988) have

shown that even preschool children can identify theme concepts such as friendship or courage in stories if they are given simple tasks like sorting or matching. Our own studies had shown that older, poor readers could benefit from systematic instruction on theme identification and, moreover, that this led to transfer to identifying and applying themes from stories that had not been seen during instruction. This suggested that our program might also be successful with at-risk primary-grade students.

During the course of the earlier studies, we learned how best to present the stories, teach the strategies, and arrange the sequence of instruction for maximal transfer. We were able to carry over most of the components of our program to the version for younger children (Williams et al., 2002). The only substantive modification we made was in the materials: We selected new stories that we thought would be especially appealing to younger children. The three theme concepts we worked with were *perseverance*, *greed*, and *honesty*.

The program consisted of a series of 14 lessons—2 introductory lessons and 12 theme lessons. Each theme lesson was organized around a single story and consisted of the following: (a) introduction and prereading discussion of the theme concept; (b) reading of the story ("read aloud"); (c) discussion of the important story information using organizing (theme scheme) questions as a guide, leading to theme identification; (d) transfer and application of the generalized theme to other story examples and to real-life experience, using discussion and additional organizing questions; (e) review; and (f) enrichment activity.

The two introductory lessons focused on particular plot components (problem-solution and outcome), not on theme. The purpose of these lessons was to ensure that students were able to comprehend key plot components before moving on to the more difficult task of identifying the theme. Each of the subsequent 12 lessons consisted of the following six parts.

Introduction and Prereading Discussion

In the first part of each lesson, the concept of theme was defined, the value of understanding themes was discussed, and the background for the specific story for that lesson was introduced. These components were incorporated because both explaining the purpose of instruction and activating prior knowledge improve comprehension (Baumann, 1984).

The instruction made use of the principle of scaffolding. Initially, teachers modeled each step, and later, students took responsibility, with the teachers modeling and prompting only as necessary (Palinscar & Brown 1984). Specifically, in Lessons 3 through 6, teachers defined the *theme* and directly introduced students to the theme of that lesson: "The theme for today's lesson is _____." Starting in Lesson 7, the students offered definitions of *theme*, led the discussions themselves, and identified the theme independently. In this manner, the intervention included a combination of direct instruction and interaction scaffolding (Pressley et al., 1992).

Reading the Story

Next, the teacher read the story aloud. At various points during the reading, the teacher interposed questions. These questions were designed to encourage students to process the text actively (i. e., to make associations between their own knowledge and the text information). The teacher asked the students to make predictions about what would happen next in the story and to explain major story events. Student responses were discussed, and students were encouraged to ask their own questions. After reading the story, the class developed a summary of the story highlighting the first four steps of the theme scheme (main character, problem, solution, and outcome).

Discussion Using Organizing (Theme Scheme) Questions

Teacher and students discussed eight questions designed to help organize the important story components and derive the thematic material. The teacher encouraged students to internalize these generic questions over the course of the lesson series (e. g., by having the class repeat the questions aloud in unison, by having a student ask the class the questions).

The first four organizing questions focused on the important plot components from which a theme concept would be derived: main character, problem, solution, and outcome. The questions were as follows: Who is the main character? What is the main character's problem? What did the main character do about the problem? And then what happened?

The answers reflected the content of the story summary. Thus, the questions directed students to focus on the important information and enabled them to develop and internalize questions to help extract and organize important plot components independently (Carnine & Kinder, 1985). Again, instruction was scaffolded so that teachers initially modeled, both asking and answering the questions. This responsibility was then transferred to students, with additional modeling as needed.

The next four questions included two questions and two theme statements. These questions—statements were designed to encourage students to make the judgments that, when combined with the theme concept, led to theme identification. These questions—statements were as follows: Was what happened good or bad? Why was it good or bad? The main character learned that he/she should _____. We should _____. Through Lesson 6, teachers modeled the way in which their own answers to the eight questions led to a theme, and they stated the theme. After Lesson 7, responsibility for identifying and stating the theme was gradually transferred to the students.

Transfer and Application of the Theme to Other Story Examples and to Real-Life Experience

Teachers introduced students to a vignette (one paragraph long) that provided another example of the theme. Teachers

and students discussed the example by referring to the eight organizing questions. Teachers then taught students to ask two additional questions to help generalize the theme to other relevant life situations: When is it important to _____. In what situation is it easy/difficult to _____?

Review

Teachers reviewed the eight organizing questions and encouraged students to think about other examples of how the theme could be demonstrated.

Activity

An enrichment activity was included at the end of each lesson to heighten student interest and focus on the theme of the story. Activities included writing, drawing, discussion, and role-playing.

The Evaluation of the Theme Scheme

Five second-grade and five third-grade inclusion classes in public schools in Harlem participated in the study (Williams et al., 2002). Approximately 98% of the students received state aid in the form of free or reduced-rate lunches; over 80% were African American. We selected 120 students for data analysis out of the 140 students who received permission to be tested. Within each grade level, three classrooms were randomly assigned to the theme scheme group and two to a comparison condition called the story comprehension program. This was a condition in which children received traditional instruction emphasizing vocabulary and plot. The same stories and the same amount of instruction were given in both programs. (Our previous studies had also included a no-treatment control; we decided that we did not need one in this study.)

Our program was effective. First, the students in the theme scheme classrooms learned what we had taught them explicitly. They understood the concept of *theme* better than the students in the story comprehension classrooms; they also better understood the three instructed theme concepts of *perseverance*, *greed*, and *honesty*. The students also showed superiority on near transfer. That is, they were superior at identifying the three instructed themes in posttest stories to which they had not been exposed during instruction. Effect sizes for the significant comparisons ranged from 0.68 to 2.71.

However, the students did not transfer to a novel, unstructured theme ("We should cooperate"). This is an interesting finding, as the seventh- and eighth-grade students with rather severe learning disabilities in the Wilder and Williams (2001) study did exhibit such far transfer. This discrepancy in outcome is an indication of the difficulty that abstract thinking poses for younger children.

These findings held up when the data were analyzed separately for students at high, average, and low achievement lev-

els. Although absolute scores on the near transfer measures were not high and there was no far transfer, the results actually demonstrated a level of transfer that represents substantial achievement for young children at risk for academic failure. Overall, our results indicated that young students at risk for academic failure are able to respond positively to an integrated approach to comprehension when it is well structured.

Differences in Responsiveness to Instruction

Positive findings based on comparisons of group means are certainly important, but one should also look further. Given the fact that more and more schools are moving toward an inclusion model, in which students having widely disparate achievement levels receive their instruction together in one classroom, it is important to find out how well individual children are responding to the instruction (Al Otaiba & Fuchs, 2002). It is especially important to determine whether the children with special education status are responding satisfactorily to the regular classroom curriculum. Therefore, we looked to see what the characteristics were of children who did not make much progress in our program (nonresponders).

We chose two measures, one that assessed an explicit teaching outcome and one of near transfer. On the basis of the score distributions on the measures, we determined criteria for designating nonresponders. Ten second graders and four third graders were identified as such, and we examined their characteristics. We found that they had lower reading scores (both word identification and passage comprehension) and lower listening comprehension scores than the other students. There was no relationship between nonresponders and special education status.

Of course, there is no consensus in the field of comprehension instruction as to the criterion of acceptable level of performance (e. g., a level that would predict further academic success) as there is in other subject areas such as beginning reading. However, the analysis of individual differences in responsiveness is also useful in order to improve a program that is under development or to decide where or when to use it.

Supplemental Activities

One of the most valuable features of the CASL consortium was the opportunity it provided to advance one's own work via the research of other project principal investigators. As a supplement to the theme scheme program, we developed a series of activities. The first type of activity, partner practice, was patterned after the work of Doug Fuchs and Lynn Fuchs on peer-assisted learning strategies (PALS; D. Fuchs, Fuchs, Mathes, & Simmons, 1997; D. Fuchs et al., 2001). It included partner reading (taking turns reading and coaching), defining

theme concepts, reviewing the theme scheme strategy questions, and answering story-related questions.

The second type of activity, writing and self-regulation, was derived from the work of Karen Harris and Steve Graham on self-regulated strategy development (SRS; Graham, Harris, & Troia, 2000; Harris & Graham, 1999). It included three activities, each of which involved a step in the process of improving students' writing abilities and their ability to evaluate their own work.

We introduced our program, including these activities, in seven classrooms in two public schools. (These classrooms did not take part in the four studies in which we evaluated the program.) One of the schools was a large school in Harlem whose student population was 95% Hispanic. The other school, located in a small suburban community on Long Island, was populated predominantly by Caucasian students. We observed the ways in which the teachers used the activities and also the reactions of the students. We gathered suggestions from the teachers about how to improve the activities or their presentation, and we revised the activities on the basis of this work.

Comprehension of Expository Text

Although many children start school with an awareness of narrative text structure, few have an awareness of expository text structure. This is in part because most of the reading that parents do with their preschool children is from storybooks. However, this in turn is probably because expository text is more difficult. The relationships among ideas that are presented in expository text are not the simple sequences of familiar events that are depicted in many narratives; typically, they depict abstract logical relationships (Stein & Trabasso, 1981).

Expository text is also difficult to comprehend because it appears in a variety of organizational structures. Anderson and Armbruster (1984) listed six such structures: description, temporal sequence of events, explanations of concepts, definition and example, compare-contrast, and problem-solution-effect. Other authors (e. g., Meyer, Brandt, & Bluth, 1980) have similar lists. Moreover, most texts do not represent a single structure but rather mix two or more of them (Meyer & Poon, 2001). Historical sequences exemplify a particularly common type of mixed structure, incorporating problem-solution-effect, description, and narrative (Perfetti, Britt, & Georgi, 1995).

These organizing structures have been shown to affect comprehension. For example, Beck, McKeown, Sinatra, and Loxterman (1991) modified passages from history textbooks, reordering the content so that the passages followed a narrative sequence (problem-action-effect). They found that fourth- and fifth-grade students who read the revised texts had better recall and answered more questions correctly than did those who read the original textbook passages. A review by Dickson, Simmons, and Kameenui (1998) describes 17 studies fo-

cused on the relationship between text organization and comprehension; the authors concluded that knowledge of text organization affects comprehension especially in terms of the identification and recall of the most important information in a text.

It might be expected that, given the documentation of students' difficulties with reading comprehension in general and with text structure in particular, there would be great efforts to provide suitable instruction. However, there have not been. Until 2 or 3 years ago, there was a dearth of instruction focused on expository text in the early grades. In fact, there is little exposure to expository text in these grades. Hoffman et al. (1994) pointed out that basal readers typically include a very small proportion of expository text, and Duke (2000), who examined 20 first-grade classrooms across 10 different school districts, found a scarcity of informational texts in all of them. It is likely that this lack of experience with expository text contributes to the fourth-grade slump in reading achievement noted by Chall, Jacobs, and Baldwin (1990).

Armbruster, Anderson, and Ostertag (1987) conducted an instructional study in which middle school students who were given explicit instruction in the problem-solution structure recalled more information on an essay test than students who received more traditional instruction that included general comprehension questions and summarization. In addition, the structure-trained students identified more main ideas than did the other students, indicating that explicit instruction in structure facilitates the development of a well-structured mental representation.

Overall, the few instructional studies that exist, though far from conclusive, suggest that instruction, especially if geared to a single text structure, is effective in improving students' ability to comprehend expository text. Dickson (1999), for example, found that the compare-contrast structure could be taught successfully in middle school general education classrooms. Much more work in this area needs to be done. Few instructional programs have been developed, and there is almost no work that focuses on generalization to structures different from the ones used in training.

A Study of Second Graders' Awareness of Text Structure

Our first step was to determine whether students at the second-grade level, who are just beginning to read independently, are sensitive to text structure. If so, we proposed to capitalize on this sensitivity to develop instruction that would improve their reading comprehension.

We conducted a study (Lauer, Williams, Hall, Stafford, & DeSisto, 2003) in New York City public schools in which we worked with problem-solution text. We compared students' comprehension of two text structures, one in which the information was organized according to a narrative sequence and one in which it was organized according to a typical text-

book sequence, to determine whether second graders were sensitive to text structure variations in the same way that Beck et al.'s (1991) older students were.

We also looked at content familiarity, another variable that has been shown to have powerful effects on reading comprehension in adults and older students (Alexander & Jetton, 2000). Many investigators have manipulated content familiarity by selecting a specific domain, such as baseball, with which the participants are not familiar, and then teaching half the participants about the domain. The participants who were taught almost invariably comprehended novel text in that domain better than those who were not taught (Pearson & Fielding, 1991).

We chose to focus instead on more general knowledge. We wrote texts that had to do with actions and events that could likely occur in children's everyday lives, and we also wrote texts that depicted actions and events that do not commonly occur in their everyday lives. We had adults who were knowledgeable about elementary school children confirm that these texts involved generally familiar and generally unfamiliar content. Finally, we identified one additional variable of interest—reading comprehension ability. Because the range of comprehension skills within an elementary classroom is wide (Chambliss & Calfee, 1998), we were interested in whether the effects of text structure and content familiarity differed for students who were proficient in comprehension ability and those who were not proficient.

Participants were second-grade students at risk for academic failure similar in demographics to those we worked with in our previous studies. They were randomly assigned to one of the two text structure conditions (narrative sequence and textbook sequence); all students received both familiar content texts and unfamiliar content texts. Reading ability was determined on the basis of Woodstock Reading Mastery Passage Comprehension (Woodcock, 1998) subtest scores.

Examples of our texts (in two of the four experimental versions) are shown in the Appendix. After reading each text, students were asked to summarize it and answer questions. We found that all three variables—text structure, content familiarity, and reading comprehension ability—affected performance. Moreover, the effects of each variable were independent of the effects of the other variables. The effects of each variable were different, however. High reading ability led to better performance on all tasks. Content familiarity helped the students answer questions concerning the important, but not the unimportant, content. Text presented in narrative sequence helped them on a wider range of tasks, not only on the questions concerning important (but not unimportant) content but also on the summarization tasks. That is, the narrative sequence helped them select important information to be included in their summaries. This was true for both familiar and unfamiliar content.

These findings, which showed clear comprehension differences between the two text structures, demonstrated that young readers with either low or high comprehension ability,

as early as the second grade, are sensitive to variations in text structure. This suggested that introducing instruction on text structure in the primary grades, at least at Grade 2 and above, would be useful, and also that, given the particularly poor performance on text presented in textbook sequence, this instruction should focus on expository text.

The Text Structure Program

We developed an instructional program to improve second graders' comprehension of expository text. The instruction focuses on a single structure, compare-contrast, and follows the same structured, explicit model as was used in our theme scheme program.

We taught students three strategies. They were taught how to use (a) clue words to identify a text as a compare-contrast text; (b) a graphic organizer to lay out the relevant information in the text; and (c) a series of questions to help them focus on the important information in the text.

Even though our main purpose was to teach text structure, our program would inevitably be presenting content. We chose animal classification as the content; our goal was to teach students the characteristic features of each of the five classes of vertebrates (mammals, birds, fish, reptiles, and amphibians). To this end, we selected one animal as a prototypical example of each of the five classes (lion, eagle, shark, crocodile, and frog). This content is included in the standards for elementary-level science curricula in New York State.

The books we used included a comprehensive animal encyclopedia and a trade book about each of the five animals. In addition, we prepared short target paragraphs to be read and analyzed. Each of these paragraphs contained several comparative statements about two of the five animals using information that was the basis for categorizing them into the five vertebrate classes. These paragraphs became longer as the program proceeded. Toward the end of the program, they also included distractor sentences, that is, general information about one of the two animals that could not be put together with any other information in the paragraph to construct a comparative statement.

Here are two examples of target paragraphs:

1. Eagles and crocodiles are wild animals. Eagles are warm-blooded; however, crocodiles are cold-blooded. Eagles and crocodiles both lay eggs.
2. Lions and sharks are interesting animals. Lions have hair covering their bodies, but sharks have scales. Sharks have fins to help them swim. Lions are warm-blooded; however, sharks are cold-blooded. Sharks get oxygen to breathe from the water, but lions get oxygen to breathe from the air. Lions live in groups called prides. Lions have babies; however, sharks lay eggs. Lions and sharks both have sharp teeth to help them hunt for food.

The program consisted of nine lessons, which were taught in 15 sessions. Each lesson focused on two of the five prototypical animals and contained the following sections: (a) clue words, (b) trade book reading and discussion, (c) vocabulary development, (d) reading and analysis of target paragraph, (e) graphic organizer, (f) compare-contrast strategy questions, (g) summary (with a paragraph frame as support), and (h) lesson review. The first lesson focused on two very familiar animals (cats and dogs) to help introduce students to the procedure without distracting them with new content.

Clue Words. At the beginning of each lesson, the teacher previewed the purpose of the lesson and introduced the eight clue words (*alike, both, and, compare, but, however, than, and contrast*). The teacher wrote the clue words on the board and elicited sentences that used one of the clue words.

Trade Book Reading and Discussion. During the next part of the lesson, teachers read to the class about the two animals from the encyclopedia and the trade books. Teachers then directed a discussion about the animals. This part of the lesson provided information about the animals beyond the specific information contained in the target paragraphs. It was also designed to heighten motivation, which is particularly important because difficulty in comprehending expository text may, in part, be attributed to lack of student interest (Armbruster et al., 1987).

Vocabulary Development. Teachers then introduced vocabulary concepts related to animal classification (oxygen, hair, scales, feathers, warm-blooded, cold-blooded).

Reading and Analysis of a Target Paragraph. The students read the target paragraph silently, and then the teacher reread it as students followed along in their own copy. Students then analyzed the text, focusing on the compare-contrast structure. Students identified the individual sentences that represented the similarities and the differences. They then circled all the clue words. Finally, they took turns generating sentences that described how the two animals in the paragraph were the same or different. The teacher encouraged them to use well-structured comparative statements, that is, sentences that were based on accurate information from the paragraph and that included a clue word.

Graphic Organizer. Next, students organized the paragraph's content with the help of a matrix, the graphic organizer that best represents the compare-contrast structure (Calfee & Chambliss, 1987). An individual matrix was used for each animal feature that was compared in the paragraph. Students then wrote a well-structured comparative statement to match the content organized in the matrix. Paragraphs in earlier lessons contained less information (and therefore there were fewer matrices) than paragraphs in later lessons.

Compare-Contrast Questions. The students then organized the statements they had generated according to the following three questions: (a) What two things is this paragraph about? (b) How are they the same? and (c) How are they different?

Summary. Next, students wrote summaries of the paragraph. Summarization skills are complex, so students were provided with a paragraph frame to use as a prompt. This structured approach to writing is particularly helpful to young children who are just beginning to develop their writing skills (Harris & Graham, 1999). In the later lessons, no frame was provided.

Review. At the end of each lesson, the teacher and students reviewed the vocabulary and the strategies (clue words, graphic organizer, and compare-contrast questions).

The First Evaluation of the Text Structure Program

We evaluated the effectiveness of our program by comparing it with a program that was more traditional in orientation and that did not emphasize text structure (K. M. Hall et al., 2003). Both programs covered the same content. As a control, we also looked at students who received neither program. The main purpose of the study was to determine whether instruction focused on text structure helped second-grade students to improve their comprehension of compare-contrast expository text. We also had a further question. The school day contains a finite amount of time, and choices must be made as to how to use that time. If teaching students about text structure means that they will learn less content, then we must be prepared to make a trade-off. But there might be no decrease in content learning, which would be a happier outcome. Therefore, we asked whether this type of instruction on text structure would detract from students' ability to learn new content.

Teachers of 10 second-grade classes in three New York City public schools volunteered to participate. We randomly assigned the 10 intact classes to one of the three treatments (text structure, $n = 4$; content, $n = 4$; and no instruction, $n = 2$).

A total of 128 students participated. Across the three schools, the enrollment included approximately 56% Hispanic children, 41% African American, 2% Caucasian, and 1% Asian. Almost 90% of the children received state aid in the form of free or reduced-rate lunch. Approximately 6% of the students were enrolled in special education services.

The Content Program

The comparison content program was designed to correspond to more traditional content-area instruction and was intended to be a viable program. We expected that students participating in this program would learn important content that would

enable them to comprehend novel paragraphs about similar content.

The materials for this program, that is, the actual texts used (encyclopedia, trade books, and target paragraphs), were the same as those used in the text structure program. As in the text structure program, there were 15 sessions, so that overall, the same amount of time was given to the instruction. Each lesson consisted of the following sections: (a) background knowledge, (b) trade book reading and discussion, (c) information web (a graphic organizer that organizes information topically), (d) vocabulary development, (e) a reading of target paragraph, (f) general content discussion, (g) summary (with paragraph frame), and (h) lesson review.

Results and Strategy Measures

Following the lessons, we interviewed students individually, asking them to respond to questions both orally and in writing. First, we wanted to determine whether they had learned the three strategies that we taught them. Several measures evaluated the acquisition of the strategies taught in the text structure program. We assessed recall of clue words; the ability to identify the clue words in a paragraph; the ability to generate sentences (oral and written) based on information students had graphically organized; and finally, recall of the three compare-contrast questions. On the first three of these measures, the students who received the text structure instruction did significantly better than the students in the other two groups. On the fourth measure, recall of the three compare-contrast questions, there was no effect of treatment.

The comparison content program included one strategy, a graphic organizer, that is, an information web. There were no differences among the three treatment groups in their proficiency in this strategy. All groups achieved relatively high scores, indicating second graders' familiarity with the web strategy.

Outcome Measures

Next, we turned our attention to outcome measures. Did the students really improve in their ability to apply what they had learned? There were two types of outcome measures. The first type addressed the text structure goals of the study; these measures assessed students' ability to gain information from expository text. The second type evaluated the content, the specific information about animals that the students had learned from the instructional program.

First, what was learned about text structure? We first looked at the students' ability to summarize a compare-contrast paragraph that contained material explicitly taught in the program, that is, information about two of the five instructed animals. The test paragraph compared two animals that had been directly compared during the instruction. We asked for written summaries and counted the number of summary statements that both were accurate and included an appropriate clue

word. The text structure group outperformed the other two groups.

Then we investigated the students' ability to *transfer*. The goal of reading comprehension instruction is to improve students' ability to read novel content, not simply to reread material on which they have already practiced. Therefore, we developed a series of three compare-contrast texts that were structured in the same way as those used in the instruction. However, the content was different. In each of these three paragraphs, the content became further removed from the content used in the instruction.

First, we wrote a paragraph that contained information about two of the instructed animals, but two that had not been directly compared in any of the lesson target paragraphs (sharks and crocodiles). We considered this a measure of performance on a novel combination of material taught in the program. The second paragraph also contained information concerning animal classification, but it contained information about two animals that had not been mentioned during the instruction (elephants and turtles). This we considered a measure of *near transfer*. The last paragraph in the series contained information unrelated to animal classification; it compared bikes and cars. We considered this a measure of *far transfer*. We asked for oral summaries.

Transfer Results

We found that across the three paragraphs, the text structure group scored significantly higher than either of the other two groups not only on the instructed paragraph but also on the transfer paragraphs. These findings indicated that the text structure students had in fact transferred what they had learned. We were pleased with these results. As mentioned earlier, it is not uncommon to find that after reading comprehension instruction, students do better on tests that involve the same material on which they were instructed. However, it is less common to find positive effects of the instruction when the tests involve new material not seen during instruction.

Now let us turn to the second type of outcome measure, which focused on how much of the content about animals had been learned. We were interested in two types of content learning. First, did the students learn the vocabulary concepts (such as *oxygen* and *warm-blooded*) that we taught them? They did. Here, we found a different pattern of results from what we found on the text structure outcome measures: The text structure group attained a higher score on the vocabulary measure than did the content group; but in addition, the content group did better than the no-treatment control group. In our other content outcome measure, we asked the students one detail question about each of the five target animals. These questions tapped information that was presented in the read-alouds that were the basis for the class discussions. On this measure, there was no effect of instructional group.

These findings concerning the amount of content learned are important because they indicate that spending substantial

instructional time on text structure training did not detract from the amount of content the students learned. The content group, whose instruction focused solely on content, did not acquire more information about animals than the text structure group.

Our final outcome measure looked at transfer of another type, the ability to transfer to a new text structure. We asked whether, if second graders were given highly structured, intensive training in one text structure, they would also read and comprehend another type of expository text better than would noninstructed students. To achieve transfer with children of this age, it is often necessary to incorporate transfer-producing variables into training (L. Fuchs et al., 2003; Salomon & Perkins, 1989). However, given the dearth of instructional studies in reading comprehension, we felt that it was important to explore the potential of our program for both content and structure transfer by simply assessing the transfer effects as the program was originally developed.

We wrote a paragraph that followed a pro/con structure; it included arguments for and against keeping animals in zoos. Both the compare-contrast and pro/con strategies conform to a simple associative structure (which is different from a causality structure). We asked the children to read the paragraph and to give us an oral summary. We found no differences in ability to use structure among the three instructional groups. These results indicate that instruction in one particular text structure does not automatically transfer to other text structures, even if the two structures are related.

Differences in Responsiveness to Instruction

We looked further, beyond comparisons of classroom means, to determine how well individual children were responding to the instruction. On the basis of certain posttest outcome measures that assessed strategy application and transfer, we categorized the participants as either responders or nonresponders (Al Otaiba & Fuchs, 2002). We established two sets of criteria for acceptable performance on these measures, one stringent and the other more lenient. Regardless of which criteria we used, we found that the students who had not performed as well as the others had lower listening and lower reading comprehension scores. However, there was no relationship between nonresponding and special education status. That is, it was no more likely that a student with an Individualized Education Program or a referral for one would be a nonresponder than would a student who was in neither of these categories.

The Second Evaluation Study: Refining and Extending the Text Structure Program

We decided that our findings were sufficiently positive to warrant further work. The first goal of our next study was to re-

fine the program and replicate our findings. To that end, we made some small modifications in the program in response to teachers' comments or to our own classroom observations. We simplified the graphic organizer, which, we had observed, was cumbersome to teach, and we put more emphasis on the three strategy questions.

One additional modification was more an extension than a refinement of the program. In our first study, when posttest items required a summary of what had just been read, we provided the students with a paragraph frame to help guide their summaries. This reflected the design of the lessons, which used such a frame. In the revised version of the program, we removed this scaffold at the midpoint of the program. After that point, students had to generate their summaries without the support of the frame. The revised posttest items did not include a frame and required a more independent response than had been required in our first study.

We also made two further extensions. We were pleased with the transfer effects we had found in our earlier study. In that study, all test paragraphs were written to conform to the clear pattern that we were attempting to teach. Since one of the reasons typically given for not teaching text structure in the classroom is that a large proportion of real-life text is not well structured, we decided that it was important to establish a transfer effect to authentic text. So in the second study, we added to the posttest a compare-contrast paragraph that was taken from an authentic trade book written at the second-grade level and focused on the instructional content (animals).

We also assessed recall of the specific information about the animal features that had been taught in the program. This was a third content outcome measure, in addition to the amount of detail information recalled and knowledge of the vocabulary concepts.

Our final purpose grew out of the finding that whereas our initial evaluation of the program had shown transfer to different content, it had not shown any transfer to the related pro/con structure. So we asked whether introducing a small amount of explicit training on this second structure would lead to improvement in performance. If so, that would suggest that a text structure program might effectively be developed to encompass more than one expository structure without involving a substantial amount of additional training. We introduced four pro/con clue words, *good*, *advantage*, *bad*, and *disadvantage*, into the final three lessons (six class sessions) of the program. We taught no other strategy for pro/con comprehension. The paragraphs on which the students did their text analysis during these three lessons were of a mixed structure; that is, they contained both compare-contrast and pro/con sentences. Because of this mixture, they more clearly approximated authentic text.

The revised version of the program consisted of 12 lessons taught in twenty-two 45-minute sessions. Fifteen second-grade classrooms (the total number of students was 215) in schools similar in demographics to those in the first study were randomly assigned to the text structure, content, and no-

treatment groups. The results were clear. This time, the text structure group was significantly better on all three of the text structure strategies (clue words, graphic organizer, and strategy questions). Again, all three groups performed at a high level, and not differently, on the content strategy (the information web).

Our findings on all the outcome measures concerning structure were replicated. Students who had gone through the text structure program were better than the other students on orally constructing well-structured comparative statements. Moreover, this time, they were also significantly better on their written summaries. In addition, we found that there was transfer to authentic text, although the level of performance was not as high as it was in the other test paragraphs that conformed more closely to the structure of the paragraphs used in instruction. Also, the students who received the content program were not significantly different from those who received the text structure program in the content outcomes, including the new measure (the number of animal features that they had learned).

Finally, we found that adding a limited amount of instruction on the pro/con structure was effective; performance on the pro/con test item was better for treatment students. Scores were not as high, however, as scores on the compare-contrast text paragraphs. This finding provides information useful for later development of an instructional program that would cover a variety of expository text structures. It appears from the present results that an instructional program would have to devote a substantial amount of practice to each structure—or at least to the second one taught—if high performance levels are to be achieved.

The Third Evaluation Study: Incorporating Content Goals Into the Text Structure Program

These first two studies convinced us that we had found an effective way to teach text structure, and so we turned our attention to content goals. Up to this point, we had demonstrated that our text structure program did not detract from the amount of content required. But our content, animal classification, had served simply as a vehicle for delivering the text structure instruction. We had not addressed the issue of how much content could be acquired in the context of a program that was primarily focused on the comprehension of compare-contrast text. We decided to revise the program to ensure that students would not only achieve our text structure goals but also learn a specified amount of information about animal classification.

In order to encompass both our structure and new content goals within the time permitted for classroom evaluation (about 10 weeks of instruction), we narrowed our focus. We decreased the number of vertebrate classes taught from five to three (mammal, bird, and reptile). This allowed us to develop lessons that incorporated sufficient focus on the content

as well as on text structure. We presented six animals, two from each class (lions, bears, turtles, crocodiles, eagles, and parrots), over the course of the program.

Our focus on text analysis of target compare–contrast paragraphs remained. We added three descriptive paragraphs listing the features that make an animal a mammal, a bird, or a reptile; the ones that were relevant to each lesson's target animals were reviewed in that lesson. This gave the students practice on the features that define each vertebrate class.

In addition, we changed the graphic organizer from an activity designed to teach a strategy for text structure analysis to one that supported our new content goals. Given that we were not doing a componential analysis in which we could determine which instructional components were contributing to the outcomes, we necessarily based our decision to change the organizer on teachers' comments and our classroom observations. We decided that the other two structure strategies (the clue words and the strategy questions) were sufficient to lead students to produce well-structured and accurate comparative statements in their summaries.

We did, however, wish to include a graphic organizer in the program; children respond well to such activities, so we included an organizer designed to reinforce the content of the program. Also, in an effort to streamline the program, we eliminated the instruction on the pro/con structure. We felt that our question as to the effects of incorporating limited instruction on a second structure had been answered.

Again, we randomly assigned classrooms to the text structure program ($n = 4$ classrooms), the content program ($n = 4$), and the no-instruction program ($n = 3$). A total of 173 students participated. The students were drawn from schools whose demographics were similar to those of the earlier studies, except that there were more Hispanic students (51%) than African Americans (46%) in this study. The programs consisted of nine lessons taught in nineteen 45-minute sessions.

We found that our revised text structure program, even with its heavy dose of content instruction, significantly improved the comprehension of compare–contrast text. With respect to strategy acquisition, performance on the text structure strategy measures indicated very high scores on the part of the text structure group. There was no significant difference between the two instructional groups on the content graphic organizer.

Turning to the outcome measures, the text structure condition was significantly superior to the other two conditions on both the oral and the written measures (ability to provide well-structured and accurate comparative sentences in their summaries, including transfer measures containing content both related and unrelated to the instructional text). In this study, the differences on the authentic text passage missed significance ($p < .061$), although they had reached significance in the previous study. However, the effect size for this test item was substantial (1.58). Overall, effect sizes ranged from 1.64 to 14.06 for the significant comparisons. Note that we used *classroom* as the unit of analysis. Doing this makes an unpre-

dictable difference in the effect sizes obtained (J. A. Hall, Tickle-Degnen, Rosenthal, & Mosteller, 1994). Thus, these effect sizes cannot be meaningfully interpreted in terms of the effect sizes obtained from studies using *student* as the unit of analysis.

Results were also positive with respect to the content goals. On both vocabulary concepts and content measures assessing knowledge about animal classification, both the text structure and the content groups performed significantly better than the no-treatment group; there was no difference between the text structure and the content groups. Thus, the text structure program did not detract from the students' acquisition of the content that represented the focus of the content goals. However, the results on the third content measure, detail questions, showed a different pattern of performance. This measure, which tapped content tangential to the program's content goals, showed significantly superior performance on the part of the content students.

We conclude from these findings that instruction in text structure that also seeks to impart a serious amount of content does not reduce the acquisition of the content that is central to the goals of the program. A program that focuses only on content acquisition, however, will lead to acquisition of more tangential content along with the central content of the program. Of course, there will be no improvement in knowledge of text structure from such a program.

Conclusions

These findings clearly support the hypothesis that highly structured and explicit reading comprehension instruction is appropriate for early elementary school children at risk for academic failure. In developing reading comprehension instruction, one can follow the same theoretical paradigms and use the same pragmatic strategies that have been shown to be successful in teaching beginning reading, writing, and mathematics. We have shown that children at risk can respond well to instruction that requires higher order processing if it is designed appropriately.

However, when programs like these are evaluated as "successful," we cannot assume that every child exposed to them will succeed. It would be rare to find any instructional program that met such a high criterion of success. Certainly, every time we have evaluated either of our programs, there have been a few—not many, but a few—students whose post-test performance indicates that they did not gain very much from the instruction. It is necessary to note this in the evaluation of any program and to work further to develop other methods and techniques to ensure that all children have an opportunity to achieve.

Moreover, a child who is found to achieve well in well-structured programs cannot necessarily be considered to have moved out of the at-risk category. Some children, even with a very congenial instructional approach, will continue to need

more than average instructional support as they move from grade to grade. It is the job of the instructional designer to continue working toward the goal of providing suitable instruction for these children at every step of the way.

We have not yet asked all the questions that warrant investigation. For example, we do not have evidence as to how long-lasting the effects of our instruction might be. This question of maintenance is conceptually easy enough to answer, but in the real world there are concerns of feasibility. For us to have scheduled a meaningful delayed posttest would have meant arranging a session with each child at the beginning of the third grade. In New York City, the pressure arising from the need to administer standardized tests in the third grade meant that we could not get permission after our first study to work at that grade level. Thus, it was not feasible to administer a delayed posttest.

The question of sustainability is not completely answered either, although we believe that this will not be a major concern. In our studies, it is the regular classroom teachers who do the instruction. The fact that they are the ones who administer the program (and do it quite effectively) without an inordinate amount of training suggests that the program can be implemented without the support of an ongoing research study. We believe, too, that teaching the program can help make teachers aware of the value of structured, explicit comprehension instruction; perhaps they may borrow some of our teaching strategies to use in other instruction.

Our programs deal primarily with cognition. It is also essential to design instruction that appeals to students and engages them. Our programs provide interesting reading content and a variety of instructional activities, in order to keep children's attention well focused during the lessons. In every study we have done, we have attempted to determine how the students are responding affectively. In our posttest interviews, students have reported that they enjoyed the program very much. But second graders are still generally enthusiastic about school, and when questioned directly, they rarely indicate displeasure with what is offered to them in instruction. We also have observational data that are perhaps more substantive: Those data indicate that children are typically highly engaged in the program activities.

We also have conducted debriefing interviews with the teachers, and they have reported satisfaction on two fronts. First, they feel that students do respond with positive affect to the programs. Second, teachers themselves report that they like the programs; they like the explicitness, the built-in repetition and reviews, and the organization. They feel that the programs are well designed and easy to teach. It goes without saying that positive feelings of the teacher go a long way toward making a program successful, in terms of both how motivated the students are and how well they learn from it.

Overall, it has been a privilege to have been involved in the Center on Accelerating Student Learning, to have had the opportunity to collaborate with other investigators who share not only a common goal but also a common research orienta-

tion, and to have had the support of the Office of Special Education Programs. That support was not only financial; we thank Ingrid Oxaal, our program officer, for her wise and enthusiastic counsel throughout the project.

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Appendix

History Textbook Sequence, Unfamiliar Content

George Eastman loved taking pictures. George read about taking pictures. He learned how to make film. He made the first film that did not need many liquids. He put his new film rolls in a much smaller camera. The cameras cost 25 dollars. A person could take 100 pictures with these new cameras. It no longer took George a long time to make his film. Before, George had had to wet it. Then he had had to use other kinds of liquids. It had taken a long time and had been very messy.

Narrative Sequence, Familiar Content

Ann Wilson went to Food Land to buy food. She filled her grocery cart all the way to the top. When she got home, she worried about lifting the cart up the steps by herself. She lived on the third floor. She had to get her food to her apartment. Ann saw a large piece of wood nearby. She put the wood over the steps. She used the wood as a ramp. Ann pushed the cart up the ramp. She got her groceries into her apartment.