

Developing a New Intervention to Teach Text Structure at the Elementary Level

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The ability to gain information from text is a crucial skill in today's information age. To succeed in college and in the workforce, students need to develop critical thinking skills and to understand the languages used in disciplines such as math, history, and science (Moss, 2005). To use the Internet to access, evaluate, and synthesize information, they need to be able to understand the text on websites, most of which is expository (Kamil & Lane, 1997). Additionally, the current emphasis on standards-based education, standardized test performance, and technological literacy has made it more important than ever that students be able to read and comprehend expository texts (Moss, 2005).

Duke and Bennett-Armistead (2003) argue that early exposure to expository texts is essential for laying the foundation for students' understanding. This is especially important because by the time students are in sixth grade, more than 75% of their school reading assignments deal with expository texts (Moss, 2005). Additionally, experience with expository texts has important implications for students' background knowledge: Reading expository texts increases domain knowledge, which in turn increases vocabulary, fluency, and motivation (Guthrie, Anderson, Alao, & Rinehart, 1999). However, perhaps the most critical reason for teaching expository texts is sim-

ply that they are especially challenging for struggling young readers. When children—especially those with language difficulties or deficits—do not receive sufficient exposure to and instruction about expository texts, they have increasing difficulties in reading and in meeting academic demands (Hidi & Anderson, 1986; Kucan & Beck, 1997; Williams & Pao, 2011).

There are several reasons why children find expository texts especially difficult. First, students come to school less experienced with expository text than with narrative text; children are exposed to narrative structure via real-life activities such as watching television and movies, having adults read to them, and listening to adults' conversations (Williams & Pao, 2011). Second, unlike narrative text, which tends to follow a single structure in which plot events are sequenced along a causal-temporal line, expository text is structured several different ways, in terms of description, sequence, compare-contrast, cause-effect, problem-solution, argument, and explanation (Calfee & Chambliss, 1987; Meyer, 1985). Third, expositions often deal with unfamiliar content; not only are the ideas less familiar but they are also often more complex (Hidi & Anderson, 1986; Kucan & Beck, 1997). Together, these reasons underscore the importance of having teachers help students

begin to navigate expository texts. Unfortunately, recent studies reveal that they often do not.

In a study of first-grade classrooms, Duke (2000) found that first-grade students spent only 3.6 minutes on average with expository text per day. Moss and Newton (2002) examined basal readers used in the second, fourth, and sixth grades and noted that only 20% of the pages contained expository text. Armbruster and colleagues (1991) observed 192 lessons in fourth-grade science and social studies classrooms and found no examples of explicit instruction in how to read and learn with text. This lost opportunity to learn from expository text is both a cause and a consequence of students' problems with text structure.

Because content-area textbooks are often poorly organized and badly written, teachers often read them aloud rather than teach students how to read the materials themselves (Armbruster et al., 1991). Of course, this practice assumes that students can understand ill-structured texts when they listen to them, which may not be the case. Having students listen rather than read may eliminate comprehension difficulty due to problems such as decoding, but other problems, such as lack of familiarity with structure, still remain.

Fortunately, findings from intervention research suggest that instruction designed to teach students to recognize the underlying structure of text can improve comprehension, and also that with systematic and intensive instruction, low-achieving students, as well as others, can benefit (Gersten, Fuchs, Williams, & Baker, 2001). When students are taught to use the organization and structure of expository texts, their comprehension and retention of information improve (Goldman & Rakestraw, 2000; Pearson & Duke, 2002). Bakken, Mastropieri, and Scruggs (1997) found that explicit strategy instruction in text structure is effective for middle school students with and without learning disabilities.

Close Analysis of Texts with Structure

In this chapter, we report on some studies from our research program (Williams, Hall, & Lauer, 2004; Williams et al., 2005, 2007),

which focuses on developing and evaluating second- and third-grade interventions that feature expository texts and text structure training. With support from the Institute of Education Sciences (IES), we are currently developing an intervention that embeds reading comprehension training within content-area instruction (science and social studies). Designed for second graders at risk for academic failure, its instructional focus is on enabling students to use the structure of expository text to aid their comprehension. The final version of this intervention comprises a series of instructional modules, each of which focuses on a different text structure: sequence, compare-contrast, cause-effect, description, and problem-solution (Meyer, 1985).

The instruction takes a structured and explicit approach that has been found to be effective in teaching at-risk children, and it follows classic principles of good instructional design: We introduce content in small increments, moving from the simple to the complex, and provide modeling by the teacher, scaffolding that fades as instruction progresses, and substantial opportunity for practice and feedback (Foorman & Torgesen, 2001; Harn, Linan-Thompson, & Roberts, 2008; Simmons et al., 2007; Torgesen, 2002; Williams, 2003). The intervention is aligned with New York State learning standards in English language arts and social studies.

Our intervention is also based on the theoretical framework of text processing research (Kintsch, 1998; Kintsch & van Dijk, 1978). The order in which the information in a text is presented provides a basic structure. As new information appears, it becomes attached to previously established concepts. Sentences that have many subsequent sentences connected to them become superordinate, and these are the ones that are retained in memory and connected to further incoming information. In addition, various linguistic cues highlight certain pieces of the information and point to relations among them. These cues can help readers select the important information, organize it into a coherent representation, and integrate it with prior knowledge (Mautone & Mayer, 2001). An extensive review of the literature by Goldman and Rakestraw (2000) has provided strong evidence that

making readers aware of the specific structure of a text improves comprehension and learning.

We describe here the development and evaluation of three of the modules (compare–contrast, cause–effect, and sequence). The other two are currently in development. Based on empirical evidence, we chose four strategies to focus on in our instructional programs. The first three strategies, clue words, generic questions, and graphic organizers, have been studied extensively (Goldman & Rakestraw, 2000). For example, Lorch, Lorch, and Inman (1993) demonstrated the effectiveness of clue words. Carnine and Kinder (1985) showed that teaching students to generate questions is an effective comprehension strategy. Researchers have also found that graphic organizers can facilitate comprehension of expository text in students with and without learning disabilities (Bos & Vaughn, 2002; Kim, Vaughn, Wanzenek, & Wei, 2004). The fourth strategy we included, analysis of well-structured text, is a procedure of text analysis that is unique to our program. It is designed to help students recognize relationships within paragraphs as highlighted by the signals throughout the text (Lorch & Lorch, 1995; Meyer, 1985).

Since many students in the second grade are not yet fluent readers, we included a mix of listening–speaking and reading–writing tasks in the instruction. Our goal is to improve students' comprehension of both oral and written language, as well as their production of oral and written summaries.

The Student with Learning Disabilities

There are many reasons why children may find it difficult to learn: They may be economically disadvantaged, have low English language proficiency, suffer from emotional or behavioral difficulties, or they may have received poor academic instruction (Donovan & Cross, 2002; Fletcher & Vaughn, 2009). With respect to reading, some children have difficulties because they were not taught basic skills for fluent reading and deep processing (Roberts, Torgesen, Boardman, & Scammacca, 2008).

There are also students who do not fall into any of these categories, children who continue to struggle with one or more of the components of reading at the word, sentence,

paragraph, or whole-text level, despite having received good instruction (Roberts et al., 2008; Torgesen et al., 2007). These students are typically thought of as having a learning or reading disability. There is no sharp distinction between a “learning disability” and a “reading disability,” although the former term is more encompassing. While most students with learning disabilities find reading difficult, there are some students whose primary challenges come from other areas, such as mathematics.

Simple labeling aside, there is a great deal of controversy regarding the nature of reading disability. According to one point of view, reading disabilities are caused by specific structural or functional anomalies in the brain; as such, a reading disability is something a child either has or does not have (Rutter & Yule, 1975). Sometimes, but not always, a specific etiology is posited. For example, there is debate over whether reading disability is a neurodevelopmental disorder (Liederman, Kantrowitz, & Flannery, 2005) or a language disorder (Catts, Fey, Zhang, & Tomblin, 1999; Chan, Ho, Tsang, Lee, & Chung, 2007). A second point of view holds that reading disabilities are *quantitative*, not *qualitative*; that is, disabilities occur along a continuum of severity, and there is a gradation of risk for becoming disabled that depends on the child's unique profile of cognitive strengths and weaknesses (Coltheart & Prior, 2007; Shaywitz, Escobar, Shaywitz, Fletcher, & Makuch, 1992; Stanovich, 1999; Vellutino et al., 1996).

Some researchers talk about dyslexia as a specific disability that is not part of the general learning disability category (Lyon, Shaywitz, & Shaywitz, 2003). *Dyslexia* is defined as a constellation of word recognition, spelling, and decoding problems (Gabel, Gibson, Gruen, & LoTurco, 2010), and theories of dyslexia are usually qualitative rather than quantitative (Vellutino, Fletcher, Snowling, & Scanlon, 2004). Most descriptions of reading disabilities are more inclusive than the description of dyslexia; other spelling and writing impairments are added to the list of problems (Gabel et al., 2010). Many recent definitions, such as the one proposed by Katzir and colleagues (2006), add comprehension to the list of possible difficulties under the reading disabil-

ity umbrella. These definitional issues are important and are rightly the focus of much research activity. However, in this chapter we are not bound by any of these definitions. In our work, we focus on instruction and are concerned with a widely inclusive category: children who have difficulty reading and are at risk for academic failure.

Our work aligns with a response-to-intervention (RTI) model, a multi-tiered approach to instruction that serves as a means of identifying and providing early intervention to students at risk for academic failure (Fuchs, Compton, Fuchs, Bryant, & Davis, 2008; Fuchs & Fuchs, 2006). In a typical three-tiered RTI model, Tier 1 is the general education program in which the teacher implements evidence-based instruction in a whole-class setting (Al Otaiba & Fuchs, 2006; Vaughn & Fuchs, 2003). Tier 2 instruction is more intensive, more frequent, occurs in small groups, and is typically conducted by someone other than the classroom teacher (Al Otaiba & Fuchs, 2006). Tier 3 involves the evaluation and identification of learning disabilities, as well as the recommendation for and implementation of special education services (Vaughn & Fuchs, 2003; Vaughn, Linan-Thompson, & Hickman, 2003).

Tier 3 calls for instruction that is even more intensive than Tier 2 instruction; it often involves one-to-one tutoring. The issue of how to identify children who are appropriate for Tier 3 (i.e., for special education) is a complex one (see other chapters in this volume); suffice it here to say that researchers generally agree on three criteria for classification: (1) inadequate response to sound, evidence-based instruction; (2) sustained low achievement, and (3) absence of other types of disability, such as visual or auditory impairment or emotional problems (Bradley, Danielson, & Hallahan, 2002; Fletcher & Vaughn, 2009). The instructional programs we describe and evaluate here represent Tier 1 intervention (i.e., whole-class, teacher-led, evidence-based instruction) that uses expository text structure strategies to enhance reading comprehension.

The Text Structures

We follow Meyer and Freedle's (1984) framework of common structures. These universal

rhetorical structures exist in rudimentary form very early in life (Dickson, Simmons, & Kame'enui, 1998). Toddlers and even infants seem to be able to learn them. Many years ago, Piaget (1952) showed that as they get older, children exhibit their growing knowledge of these structures both in action and in language. For example, the concept of causality, possibly the most difficult of the three structures we are dealing with here (Ciardiello, 2002), is appreciated by 2-year olds, who can make rudimentary causal predictions and provide causal explanations (Gopnik et al., 2004). However, when more complex instances of cause-effect (or any other rhetorical structure) are introduced, the challenge of comprehending increases greatly. The task for beginning readers is to tap into underlying knowledge structures and map textual information onto their existing representation of the structure.

Compare-Contrast

Comparison is a structure in which ideas are organized on the basis of similarities and differences. According to Meyer and Freedle's (1984) framework, the comparison structure involves, first, the listing of details about a topic, then an additional level of organization in which the details of the topic are grouped according to how they are alike or not alike. For our second graders, we defined *compare-contrast* as how things are the same and different.

Cause-Effect

In the causation structure, items and events may be grouped by association and by sequence; the core of this structure is based on causal or logical relationships (Meyer & Freedle, 1984). In our program, we defined *cause-effect* as things that happen and why those things happen.

Sequence

In Meyer and Freedle's (1984) framework, the sequence structure is described as a slightly more organized version of a list. In the sequence structure, ideas are grouped by order or time (Meyer, 2003). Our students were taught that *sequence* is the order in which things happen.

Overview of Our Instructional Program

The Compare–Contrast Program

The content goal of the compare–contrast program was to teach students how to classify animals into classes of vertebrates according to their basic features (e.g., whether they are warm- or cold-blooded). The program comprises a series of nine lessons (Williams et al., 2005). Lessons 1–3 were each taught in a single 45-minute session, while Lessons 4–9 were each taught in two 45-minute sessions. Each lesson comprised the following nine sections:

1. *Introduction.* At the beginning of each lesson, the teacher introduced the purpose of the lesson.

2. *Clue words.* Teachers reviewed the compare–contrast clue words (*alike, both, and, compare, but, however, than, and contrast*).

3. *Trade book reading and discussion.* Teachers read aloud excerpts about the two animals that were the focus of the lesson from either an animal encyclopedia or another type of trade book, or both. Teachers also directed students in a discussion about the two animals. The purpose of this section was to heighten students' interest in learning about animal classification.

4. *Vocabulary.* Teachers introduced vocabulary concepts related to animal classification (*warm-blooded, cold-blooded, oxygen, hair, scales, and feathers*) by explaining concepts, discussing examples, and helping students generate sentences using the vocabulary words.

5. *Reading and analysis of the target paragraph.* Students read one of nine compare–contrast paragraphs written specifically for the program. Each of the paragraphs included three to five comparative statements about paired animals. Paragraphs used in later lessons also included “distracter statements,” that is, general information about animals that could not be used to compare the animals. The length and complexity of the paragraphs increased as the lessons progressed. The following paragraph was used in Lesson 7:

Frogs and crocodiles are interesting animals.
Frogs and crocodiles are alike; they are cold-

blooded. Frogs can jump very far and they have long sticky tongues. Frogs have smooth skin, but crocodiles have scales. Crocodiles get oxygen to breathe from the air. They can't breathe underwater. However, frogs get oxygen to breathe from the air and from the water.

Students first read the paragraph silently, then the teacher reread the paragraph aloud as students followed along on their own copies. Students analyzed the text by labeling each individual sentence with either an *S* or a *D* (for similarity or difference, respectively) and by finding and circling all of the clue words. Finally, students generated comparative sentences that described how the two animals in the paragraph were similar or different.

6. *Graphic organizer.* Students used a matrix to organize the content of the paragraph into a graphical representation. Each of the four matrices corresponded to one of the features used to classify the animals into classes. Students used check marks to indicate whether a specific feature applied to each of the animals described in the paragraph. After making a judgment about whether the animals were the same or different on that feature, they provided a well-structured comparative statement based on the content of the matrix. Figure 19.1 presents an example of a compare–contrast graphic organizer.

7. *Compare–contrast questions.* Teachers introduced the following three compare–contrast questions to help students organize the statements they generated from the matrices:

What two things is this paragraph about?

How are they the same?

How are they different?

Students reviewed the questions and wrote their matrix sentences into a t-chart, divided

Animal	What type of body covering does the animal have?			
	Hair	Scales	Smooth	Feathers
Lion	✓			
Crocodile		✓		

FIGURE 19.1. Sample compare–contrast graphic organizer.

into a similarities column and a differences column.

8. *Summary.* Students used the t-chart to write summaries of the text using the following paragraph frame:

This paragraph is about _____
and _____. In some ways they are the
same. _____.
In other ways they are different. _____.

9. *Lesson review.* At the end of each lesson, the teacher reviewed the eight clue words, vocabulary, matrices, and compare-contrast questions.

The Cause-Effect Program

The content goal of the cause-effect program was to teach students about early American communities and some of their basic features (e.g., homes, schools, and jobs). The program comprised a series of 22 lessons, each taught in a 45-minute session (Williams et al., 2007). First, an introductory lesson introduced the general concept of cause-effect, as well as the program content (living in a community). Then, there were three units, each comprising seven lessons and focusing on one of three communities: colonists, pioneers, and immigrants. Each lesson comprised the following 10 sections:

1. *Introduction.* Teachers introduced the definition of *cause* and *effect*. *Effect* was defined as a thing or event that happens, and *cause* as the person, thing, or event that makes the effect happen. Students developed their understanding of these concepts through cause-effect activities such as matching, picture cards, and cloze activities.

2. *Clue words.* Teachers reviewed the cause-effect clue words (*because, so, since, and therefore*).

3. *Trade book reading and discussion.* Teachers read aloud excerpts about the community that was the focus of the lesson from either a biography or another type of trade book, or both. Teachers also directed students in a discussion about the community.

4. *Vocabulary.* Teachers introduced vocabulary concepts related to the communities (*community, home, school, job, pioneer, colonist, immigrant, sod house, keep-*

ing room, tenement, schoolhouse, Dame School, public school, farmer, blacksmith, and sweatshop) by explaining concepts, discussing examples, and helping students generate sentences using the vocabulary words.

5. *Reading and analysis of the target paragraph.* Students read one of the 10 cause-effect paragraphs written specifically for the program. Each of the paragraphs comprised several causation sentences. The program included a combination of one cause-one effect paragraphs (in which each sentence included one cause, one effect, and a clue word) and one cause-multiple effects paragraphs (in which the cause and each effect appeared in separate sentences). The following one cause-one effect paragraph was used in Lesson 5:

The first school that colonial children went to was called Dame School. Children had to read books written for grown-ups because there were no storybooks for kids. In school, there were no pencils; therefore, children wrote with a piece of lead. Girls needed to learn how to spin, cook, and clean the house; thus, they stayed home after they finished Dame School. After Dame School, most boys continued to go to school, since the law said they had to go.

Students first read the paragraph silently, then the teacher reread the paragraph aloud as students followed along on their own copies. Students analyzed the text by using blue crayon to circle cause clue words and underline causes, and green crayon to circle effect clue words and underline effects.

6. *Graphic organizer.* Students used a cause-effect graphic organizer to organize the content of the paragraph into a graphical representation. The graphic organizer comprised a blue oval for the cause linked by an arrow to a green oval for the effect. Figure 19.2 presents an example of a cause-effect graphic organizer.

7. *Cause-effect questions.* Teachers introduced two cause-effect questions to help students focus on the cause-effect information in the text:

What is the cause?

What is the effect?

8. *Comprehension questions.* Students answered comprehension questions about the paragraph independently on their work-



FIGURE 19.2. Sample cause–effect graphic organizer.

sheets. Teachers showed the students that they could find the answers to the comprehension questions in both the completed graphic organizer and the target paragraph. The students were encouraged to answer in complete cause–effect sentences.

9. *Community chart.* Teachers used a community chart to review the content vocabulary for each unit. During the second and third units, words from previous charts were reviewed.

10. *Review.* At the end of the lesson, teachers reviewed the definition of *cause* and *effect*, the cause–effect clue words, the vocabulary word list, the cause–effect strategies (clue words, cause–effect questions, and graphic organizers), and the social studies content covered.

The Sequence Program

The content goal of the sequence program was to teach students about basic features of living in a Native American community (Sioux). The program consisted of 10 45-minute lessons (Williams et al., 2012). Two introductory lessons introduced the concept of sequence and the program content (the Sioux community). The remaining lessons focused on the sequence structure in relation to the Sioux; specifically, students learned about sequences the Sioux followed in their everyday lives. Lessons comprised the following 10 sections:

1. *Introduction.* Teachers defined *sequence* as the order in which things happen. Students developed their understanding of the concept through sequence activities using familiar content.

2. *Clue words.* Teachers introduced three sequence clue words: *first*, *next*, and *finally*.

3. *Trade book reading and discussion.* Teachers read aloud about the concept of

community and about the Sioux from three trade books. After reading, teachers directed a short discussion about the reading.

5. *Vocabulary.* Teachers introduced vocabulary concepts related to the features of the Sioux community (*community*, *home*, *school*, *job*, *Native Americans*, *Sioux*, *buffalo*, *clothes*, *moccasin*, *tipi*, *hunter*, and *home school*).

5. *Reading and analysis of the target paragraph.* Students read one of the five sequence paragraphs written specifically for the program. Each of the paragraphs included three to five sentences about a sequence followed by the Sioux. Paragraphs used in later lessons also included “distracter statements,” or general information that did not relate to the sequence structure. As the lessons progressed, some clue words were omitted, the position of the main idea sentence was varied, and the order of the steps was scrambled in order to increase the length and complexity of the paragraphs. The following paragraph was used in Lessons 3 and 4:

There were three steps the Sioux followed to build a tipi. First, they needed to find poles and buffalo skins. Next, they lifted the poles and tied them together at the top. The poles were very tall. Finally, they stretched the buffalo skins over the poles to make walls.

Students first read the paragraph silently, then the teacher reread the paragraph aloud as students followed along on their own copies. Students analyzed the text by circling all sequence clue words, numbering each step in the sequence, underlining the main idea sentence, and crossing out the distracter statement.

6. *Graphic organizer.* Students used a sequence graphic organizer to put picture cards or sentence strips depicting the content of the paragraph in order. Students were given cards depicting each step of the sequence, a card with the main idea sentence on it, and, if applicable, a card showing the distracter statement, and they were asked to put them in order. They were also asked to match each card to a sequence clue word and to complete the main idea sentence. Figure 19.3 shows the graphic organizer used in the program.

7. *Sequence questions.* Teachers taught students to ask and answer four questions:

Main Idea:	
1	What came first?
2	What came next?
3	What came last?

FIGURE 19.3. Sample sequence graphic organizer.

What is this paragraph about?

What came first?

What came next?

What came last?

8. *Summary.* Students used the sequence questions to write a summary of the lesson paragraph. Teachers encouraged students to include the title and the main idea sentence in their summaries, and to include a clue word in each of the statements of steps in the sequence. Students generated free summaries without the help of a frame.

9. *Community chart.* Teachers used a community chart to review the content vocabulary used in the program.

10. *Lesson review.* At the end of each lesson, the teacher and students reviewed the definition of *sequence*, the sequence clue words, the sequence questions, and the vocabulary words.

Evaluation Studies

In this section we describe three evaluation studies, one for each of the three programs. Across the three studies, we worked with a total of 618 students and 41 teachers in 11 New York City public schools. The schools were similar in terms of demographics. Enrollment across the schools was 64% Hispanic, 29% African American, 5% European American, and 2% Asian/Other. Eighty-six percent of students received state aid in the form of free- or reduced-price lunch, and 9% of students were enrolled in either part- or full-time special education services. Mean age across the three evaluation studies was 7.74 years old ($SD = 0.20$ years). Across the three studies, mean pretest score (grade-level equivalent) on the Word Identification subtest of the Woodcock Reading Mastery Test was 2.6 ($SD = 0.46$), and mean pretest score

on the passage comprehension subtest was 2.3 ($SD = 0.63$).

The studies were true experiments, that is, classrooms were randomly assigned to treatment condition. All statistical analyses were performed with the classroom as the unit of analysis. There were three conditions. The first condition was our text structure program, which we have described for each module. The second condition was a comparison program in which students received the same instruction with the omission of the embedded text structure training. Both groups received the same books and paragraphs, and the same number of lessons. This content-only program was designed to correspond to more traditional instruction and was intended as a viable science or social studies program. The third condition was a no-instruction control.

Students were taught by their own teachers, who had volunteered to be part of a randomized study. The teachers varied greatly in age and years of experience. They were provided with pretraining, the lessons, and all ancillary materials (books, posters, wall charts, copies of student handouts, etc.). Each teacher was observed twice during the instruction and participated in a debriefing interview after the study was completed.

The goal of our evaluations was to answer two questions. First, can explicit instruction on text structure improve second graders' comprehension of expository text? Second, can this improvement be achieved without a loss of content acquisition (science or social studies knowledge)?

Measures

First, we assessed the students on strategies we taught: use of clue words, generic questions, and graphic organizers. We also assessed content knowledge by means of a vocabulary test and questions focused on the science or social studies they had learned in the program. Then, we addressed our main goal, reading comprehension. During individual student sessions, a tester read several short paragraphs and the student provided an oral summary; students read other paragraphs independently and wrote their summaries. In addition, after reading or listening to other paragraphs, students answered

comprehension questions that targeted the main idea and other information included in the paragraph. In the sequence study, assessment of independent reading and writing was also done in group testing sessions.

For the compare–contrast program, the contents of the test paragraphs varied with respect to how similar they were to the paragraphs used in instruction. Test paragraphs assessed the effects of explicit teaching (paragraphs involving two animals previously paired in instructional materials), immediate transfer (paragraphs involving a novel combination of animals on which students had previously been instructed), near transfer (paragraphs involving animals not encountered in the instruction), far transfer (paragraphs with content unrelated to animal classification), and structure transfer (paragraphs involving animal content structured as pro–con, a variant of compare–contrast).

For the cause–effect program, test paragraphs included both of the structures taught (one cause–one effect and one cause–multiple effects) in both oral and written presentation modes. As with the compare–contrast measures, the content of the paragraphs varied in similarity to those used in the instruction. The test paragraphs assessed the effects of explicit teaching (a one cause–one effect paragraph that had appeared during instruction), near transfer (a novel one cause–multiple effects paragraph containing information about an untaught feature of an instructed community), far transfer (a novel one cause–multiple effects paragraph containing information unrelated to the program content), and transfer to authentic text (paragraphs taken from less structured trade books).

To assess the sequence program, only paragraphs that had not been shown during instruction were presented, either in oral or written form. Three paragraphs were created for each form, one well structured and two less structured, for a total of six test paragraphs. In these paragraphs, amount or degree of structure was varied by making one or more of the following modifications: eliminating clue words, introducing distracter statements, changing the position of the main idea sentence, and scrambling the order of the steps in the sequence.

Evaluating the Compare–Contrast Program

This evaluation, which included 128 students in 10 classrooms (four in the text structure condition, four in the content-only condition, and two in the no-treatment control condition) from three New York City public schools, provided positive evidence for the effectiveness of our instructional program (Williams et al., 2005). Students who received the text structure program performed better than the other two groups on the following measures: recalling of clue words; locating clue words; using the graphic organizer; and the comprehension measures that represented immediate transfer, near transfer, and far transfer. Thus, they not only learned what they had been taught in the program but also were able to demonstrate transfer of what they had learned to content beyond that used in instruction. We concluded that it is possible to teach second-grade students about text structure, and that this knowledge improves their comprehension. We also found that there was no difference in the amount of content learned by text structure students and content-only students. Thus, given the same amount of instructional time, students can achieve as much in terms of content acquisition when the instruction includes text structure instruction as when it does not. Additionally, analyses performed separately on students having high, medium, and low standardized reading scores indicated that the program was effective at all levels of achievement in the classroom.

Nonresponsive Students

This study asked an additional question: Were there any particular characteristics, including special education status, associated with nonresponsiveness to the program? We designated students as nonresponders if they received a score of zero on one or more of the three posttest paragraph measures. Using this criterion, we identified 16 of the 51 students who received the text structure program as nonresponders. We found that nonresponders scored significantly lower than responders on the Total Reading measure of the Woodcock Reading Mastery Test and on the Listening Comprehension sub-

test of the Wechsler Individual Achievement Test. There was no relationship between responder status and age, and there was no relationship between responder status and special education status. Of the seven students in the text structure condition who had an individualized education plan (IEP) or who had been referred for one, only one was classified as a nonresponder to the text structure program. This indicates that the text structure program did not disadvantage students with special education status.

Having found evidence of the program's effectiveness, we reviewed the findings from our teacher interviews and classroom observations, and prepared another iteration of the curriculum. Changes included increasing the number of lessons in the program, removing two of the original clue words (*and* and *than*), simplifying the graphic organizer, adding more opportunities for students to use writing, and making the writing tasks more demanding by gradually phasing out use of the summary frame. This revised program was used in an additional experimental study (Williams, Stafford, Lauer, Hall, & Pollini, 2009). The results of this second evaluation confirmed the conclusions of the original study. While we cannot directly compare the results of the two studies, we note that the replication of our work with an additional 215 students strengthens our database considerably.

Evaluating the Cause–Effect Program

The purpose of this study, which included 243 second graders in 15 classrooms (five in each of the three conditions) from three schools, was to replicate our previous findings on the compare–contrast structure and science content using a different text structure, cause–effect, and different content, social studies. At posttest, students who had received the instruction in text structure were better able to answer both cause questions and effect questions than were students in the other two groups. However, the differences were significant only for the effect questions. As in the evaluation of our compare–contrast program, these positive effects appeared not just when the test paragraph had been seen in instruction (we assessed this in written mode); there also was transfer to novel content (assessed

in oral mode). In this study, unlike in the compare–contrast study, we also assessed comprehension by asking questions about details of the paragraph, information outside the cause–effect structure. Because the instruction focused specifically on the cause–effect nature of the paragraph, there was no reason to expect differences in the number of details recalled. The text structure students did not show superiority on questions that asked for paragraph details; this finding speaks to the precision of the instructional effects.

We also looked at how much social studies content the students had acquired. We asked questions about the features of the communities that were the focus of the content instruction (homes, schools, and jobs), about other information that was presented and discussed in the lessons, and about vocabulary definitions. On all three content measures, students who had received the text structure training did as well as students given the comparison content–only training and significantly better than the no-instruction control, indicating, as did the first (compare–contrast) study, that the embedded text structure instruction had not lessened the amount of social studies content learned.

Based on the findings of this evaluation (including, as always, test scores, teacher interviews, and classroom observations), we revised the cause–effect program to target more precisely the needs of at-risk second graders. Changes included increasing the amount of instruction on the nature of cause–effect text, providing more examples of cause–effect text containing familiar content, and focusing the analysis of text at the sentence (rather than paragraph) level. We have carried out an additional experimental study with 197 students in 14 classrooms to evaluate the revised program (Williams et al., 2013).

The results of this second study were more robust than those of the first. All of the comprehension measures showed significant differences in favor of the text structure group. In this second cause–effect study, we were able to retest a substantial proportion of the students after their summer break. We found that some effects of the text structure training remained. While these effects were limited to sentence-combining our findings

were encouraging given the difficulty of finding sustained instructional effects after an extended vacation (Borman, Benson, & Overman, 2005).

Evaluating the Sequence Program

Our evaluation included 247 second-grade students from 15 classrooms (five in each condition) in four schools (Williams et al., 2012). Again, the evaluation provided positive evidence for the effectiveness of our instructional program. The text structure group scored significantly higher on all the strategy and content measures, and higher on the comprehension measures (significantly higher on most of them). Thus, we found that the sequence text structure intervention improved second graders' comprehension of sequence texts not previously seen in the instruction. Also, as before, the combined structure and content instruction did not detract from the amount of content learned by students. Interestingly, we found that the superiority of the text structure program over the other programs was greater for reading comprehension than for listening comprehension. This was not the case in the other two evaluation studies.

Discussion

Incorporating Writing Activities

As we have worked on our instructional programs, we have found ourselves incorporating more and more writing activities into the lessons. We agree with researchers who have shown that writing can be a valuable part of reading comprehension instruction (Bangert-Drowns, Hurley, & Wilkinson, 2004; Graham & Hebert, 2010). Studies for the most part have shown that writing enhances comprehension and learning in terms of content, like the social studies material that is the content focus of our interventions. In our studies, it appears that writing has also been effective in promoting the acquisition of knowledge of text structure.

The main writing activities in our programs are based on the paragraphs used in the text analysis. Each activity is first conducted orally, as a class, and then independently in writing. Students get practice in

combining sentences by selecting appropriate clue words. They then complete sentences and generate their own sentences based on pictures and texts. These activities are in line with recommendations by Harris and Graham (1996) and Berninger, Nagy, and Beers (2011) to use systematic writing instruction with struggling learners and to focus at the sentence level. Finally, students move from these activities to answering questions and summarizing short paragraphs.

Teachers

The reactions of teachers, while not the main focus of evaluation studies, are very important to the success of an intervention. We want to design our intervention to be easy for teachers to use. The materials we provided in these instructional programs were complete and fully explained. The teachers we worked with were pleased that it did not take an inordinate amount of time to prepare for each lesson. Our classroom observations indicated that the teachers delivered the instruction with a high degree of fidelity. In the debriefing interviews we conducted at the end of the instruction, the teachers reported that they liked the explicitness of the intervention and the substantial amount of practice that it provided, and they felt that the students had benefited from it.

Conclusions

We believe that regardless of the controversies over the extent and nature of learning and reading disabilities, good instructional practices can be designed that work for all (or most) children who struggle with reading, including those with specific learning disabilities (Williams, 2003). The evaluation studies described in this chapter have indicated clearly that our instructional programs are effective with respect to student achievement. The structured and explicit approach of our program works well for our target population. Our hope is that by providing these students with quality instruction, we can help them keep up with their peers in the general education classroom and avoid the necessity for Tier 2 or Tier 3 instruction. We want to prevent these children from being labeled as students with disabilities.

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