

CHAPTER 27

Interventions for Students With Reading Comprehension Problems

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INTRODUCTION

An alarmingly high number of students go through school without learning to comprehend what they read beyond a very rudimentary level (National Reading Panel, 2000; Snow, Burns, & Griffin, 1998). The current version of the Individuals with Disabilities Education Act ensures access to “the general curriculum” for students with disabilities. Because so much of what students are able to access from the general curriculum depends on their ability to read and understand grade level textbooks, development of comprehension strategies is essential in order for them to adequately access the curriculum. Besides students with disabilities, however, there are also large numbers of students without disabilities who have serious reading comprehension problems.

It is possible to reduce the reading demands on some students by modifying or adapting reading materials, that is, making the content more accessible. There is a substantial body of research evaluating the effects of text adaptation or modification for students with learning disabilities (for those interested in this body of literature, see Higgins, Boone, & Louitt, this volume, and Gersten, Fuchs, Williams, & Baker, in press).

There are at least two limitations of reducing or modifying reading expectations as an overall approach to fundamentally address problems associated with reading comprehension difficulties. First, it conflicts with current reform efforts stipulating that *all* students should be held accountable for high learning standards, including the ability to read a variety of texts with comprehension. If the reading portion of the curriculum is “watered down,” or extensively modified for some students, then the idea of universal high standards would seem to be compromised.

Another reason systematically decreasing reading demands for some students is undesirable as a large-scale option is that many effective reading interventions have been developed but are not yet typically implemented on a regular basis in most general education or special education classrooms. If these techniques *were* used correctly and consistently, the comprehension of many students would improve substantially. In fact these approaches would also benefit students who are already proficient readers, increasing their feasibility in both general and remedial education settings.

School psychologists and administrators who regularly work with teachers on classroom instructional approaches are in a strong position to advocate the importance of quality reading comprehension instruction. One key to understanding effective instruction is understanding some of the difficulties that lead to comprehensions breakdowns.

SOURCES OF READING COMPREHENSION DIFFICULTIES

Many students have serious difficulties comprehending what they read even when they have adequate decoding skills (Englert & Thomas, 1987; Gersten, et al., in press; Taylor & Williams, 1983). For example, when text is read aloud to students with comprehension problems to eliminate the possibility that decoding difficulties are causing the comprehension breakdowns, their struggles with comprehension persist. In many cases, students with comprehension problems seem unaware of their comprehension difficulties. We describe some of the most important sources of comprehension difficulties in the next section (Gersten et al., in press).

Vocabulary Development and Background Knowledge

Limitations in vocabulary and background knowledge are a primary cause of comprehension failure, especially after the third grade (Baker, Simmons, & Kame'enui, 1998a, 1998b; Baumann & Kame'enui, 1991; Becker, 1977; Graves & Cooke, 1983; Graves, Cooke, & LaBerge, 1983; Graves & Palmer, 1981; Stanovich, 1986a). Compared with their peers, students with reading comprehension problems know less about most topics they are expected to read about and understand. Knowledge gaps in history, geography, and science interfere with how well these students adequately understand their assigned reading material. Most contemporary approaches to reading comprehension instruction (e.g., Bos & Anders, 1990; Klingner & Vaughn, 1996; Palincsar & Brown, 1984) attempt to assess students' background knowledge about a given topic before they read about it, and encourage students to ask their peers or the teacher when their background knowledge is limited (Klingner & Vaughn, 1996).

The relationship between reading comprehension and vocabulary knowledge also is strong and unequivocal (Baker, et al., 1998a, 1998b; Baumann & Kame'enui, 1991; Paul & O'Rourke, 1988; Stanovich, 1986b). Although the precise causal nature of the relationship is not completely understood, it does seem to be largely reciprocal. In other words, it appears vocabulary knowledge contributes to reading comprehension (Stanovich, 1986b), but also that knowledge of word meanings grows through reading

experiences (Cunningham & Stanovich, 1998). The reciprocal nature of the relationship seems to hold true for readers at all skill and age levels. Even weak readers' vocabulary knowledge is strongly correlated with the amount of reading they do (Cunningham & Stanovich, 1998), and increased reading increases their vocabulary.

Directly teaching students word meanings to increase their vocabulary knowledge can do no more than explicitly deal with a small fraction of the words that students need to learn during their K–12 years (Baker, et al., 1998a, 1998b). Despite the limitations of explicit, teacher-directed vocabulary instruction, there appears to be a beneficial snowballing effect to at least some explicit vocabulary instruction. Directly teaching a small, select number of word meanings can have a significant impact not only on comprehension of passages containing those words but also on comprehension in general, and *on the ability to learn new words in context*. For example, Beck, Perfetti, and McKeown (1982) found that students who were given direct instruction in word meanings were better able to discern meanings of untaught words than other students. Stahl and Fairbanks (1986) suggest that teaching 350 words each year may augment learning from context by 10–30%, a significant amount.

On their own, students do learn word meanings in the course of reading connected text, but the process is not particularly efficient (Beck & McKeown, 1991). Beck and McKeown noted that research spanning several decades “failed to uncover strong evidence that word meanings are routinely acquired from context” (p. 799). Jenkins, Stein, and Wysocki (1984) found that students needed up to 6 or 10 exposures to words in context before they learned their meanings. If students were told their definitions prior to passage reading, however, then only two encounters were necessary to produce positive effects. This difference represents a significant increase in efficiency and a feasible approach for teachers in the classroom. Jenkins et al.'s research has direct classroom applications.

Strategic Processing of Text

Breakdowns in strategic processing of text and how well students monitor their understanding of what they are reading (i.e., metacognition) contribute to comprehension difficulties (Gersten et al., in press). Students may lack appropriate reading strategies or they may not know *when* to use strategies they, in fact, do possess. Students may not realize, or they may ignore, the importance of actively monitoring their comprehension by rereading passages that are confusing, for example.

Williams (1993) proposed that some students with comprehension problems have difficulty “getting the point,” most likely because they are unable to create effective representations of the text being read. She found, for example, that students with learning disabilities had more trouble identifying important information when they summarized or discussed what they read than students without disabilities. Williams (1991) also found that students who tended to idiosyncratically introduce into stories inaccurate or irrelevant information also had more difficulty making accurate predictions based on story content.

Torgesen (1977) described students who had difficulty strategically processing text as “inactive learners.” In one study he conducted, students were taught specific techniques to increase retention of material read, such as how to underline. Even with a seemingly simple technique such as underlining, students with comprehension problems displayed improvements in reading performance, albeit erratic, unlike their peers without comprehension problems whose improvements were much more consistent (Torgesen, 1982).

Text Structures

Descriptive research indicates that students with comprehension problems frequently possess limited knowledge of how various types of texts are *organized* and *structured*. Texts are commonly divided into two types of basic structures. Narrative texts are fictional stories and are typically structured to contain elements associated with a plot, setting, characters, a central problem or problems, and efforts by principle characters to solve problems. Usually there is some type of resolution at the conclusion of the story.

Expository texts are nonfiction, and their structure is more complex because it is more varied. Some purposes of expository texts are to inform, explain how to do something, make a persuasive argument in favor of a controversial issue, or describe a place or person. Each of these expository styles is structured differently, and different expository styles are typically interwoven into the same source. In other words, in the same textbook chapter an author might describe ancient Egyptians, explain how they lived, and argue their position as an advanced early civilization.

Many students are unaware of even very broad distinctions between the standard organization of narrative texts versus the organization of expository texts. Children with good comprehension skills typically have developed an understanding of how stories are structured even before they are taught to read. Once they begin reading on their own, they expect stories to unfold in certain ways. As they make the transition to reading expository text, they develop expectations for how this text might be organized. Knowledge of text structures leads students to ask relevant questions about the material they are reading as they are reading it, and to form internal predictions about the content, which produces considerable benefits in terms of reading comprehension.

Research has shown that the more students know about how narrative texts are structured—that is, that stories have a beginning, middle, and end, and typically include a plot, setting, and characters—the more information they are able to recall related specifically to these major narrative categories compared to other information in the story (Hansen, 1978; Weaver & Dickinson, 1982; Williams, 1993). Students with this “story-grammar” knowledge also are better able to recognize which story events are closely related to the basic causal chain in a story (Wolman, 1991). Students with comprehension problems are less able to distinguish between essential and nonessential material (Taylor & Williams, 1983). They are also less adept at formulating hypotheses about upcoming details in the text.

The way expository texts are structured is more troublesome for students with comprehension problems than narrative texts, in part because there are so many different types of structures. The number of expository structures varies depending on the source of the information. Essentially one type of structure fits the vast majority of narrative texts. As is the case with narrative texts, skill at discerning expository structures—and using them—facilitates reading comprehension (Hiebert, Englert, & Brennan, 1983; Taylor & Beach, 1984).

Students' awareness of text structure is acquired in a predictable pattern over time (Brown & Smiley, 1977; Englert & Hiebert, 1984), and some expository text structures are more obvious and easier to comprehend than others (Englert & Hiebert, 1984). Some commonly identified expository structures include (a) description, (b) temporal sequence of events, (c) explanation (of concepts or terminology), (d) compare/contrast, and (e) problem-solution-effect (Anderson & Armbruster, 1984). In reality, few texts are written solely according to any one of these formats. Most chapters in content-area texts, for example, are a hybrid of several of these structures (Armbruster, Anderson, & Meyer, 1991; Dimino & Kolar, 1990).

Readers who are unaware of how expository texts are structured do not approach text reading with any particular “plan of action,” appearing, instead, to retrieve information in a seemingly random way (Meyer, Brandt, & Bluth 1980). Students with more sophisticated knowledge of text structures, on the other hand, tend to “chunk” and organize the text as they are reading it.

When researchers have examined these chunks of information from proficient readers, the underlying structures used to organize the text are revealed. And when some type of prompt is provided that helps students chunk information, their comprehension increases. For example, Wong (1980) demonstrated that students with comprehension problems could recall as many main ideas as their peers when questions were used to prompt responses, but performed significantly less well when prompting questions were not provided.

Reading Fluency

The importance of fluent reading, reading with a combination of speed and accuracy, in successful comprehension is undeniable. Studies have demonstrated that correlations between measures of reading fluency and comprehension are consistently robust, usually on the order of .70 to .90 (Deno, Mirkin, & Chiang, 1982; Fuchs, Fuchs, & Maxwell, 1988; Jenkins & Jewell, 1993). Cunningham and Stanovich (1998) present a rationale for the link that researchers always find between reading fluency and comprehension this way:

Slow, capacity-draining word recognition processes require cognition resources that should be allocated to comprehension. Thus *reading for meaning is hindered*; unrewarding reading experiences multiply; and practice is avoided or merely tolerated without real cognitive involvement (*italics added*, p. 8).

In other words, when too much attention is allocated to low-level processes such as word recognition, not enough attentional resources are available to accomplish the higher-order processing involved in comprehension (LaBerge & Samuels, 1974). Furthermore, reading becomes an unpleasant task, one that students tend to avoid.

One promising technique for improving reading fluency is called *repeated readings* (Samuels, 1979; Sindelar, Monda, & O'Shea, 1990), and as its name implies, the technique involves having students reread passages and stories as a way to improve fluency. Repeated readings clearly improve students' overall reading fluency and comprehension on the passages they read multiple times, which itself is important because it gives students a tangible sense of what successful fluent reading is like. Whether the strategy generalizes to improvements in reading fluency and comprehension when students read unfamiliar stories has not been established empirically, however. A reasonable intervention approach would be to use repeated readings as a supplement to direct reading comprehension instruction.

Encouraging Task Persistence

Early academic experiences that consistently end in failure can easily decrease students' motivation to engage in the hard work reading requires. The consequence is that many unsuccessful readers learn to avoid settings and activities that require reading skills, both at school and at home (Stanovich, 1986b). Many adults can relate to this pattern in their own lives. In an academic environment, for example, many beginning graduate students have a very negative experience in their first statistics class. They quickly learn to avoid all but the requirement statistics classes and frequently go to great lengths to avoid other types of classes as well, such as those having to do with more conceptual approaches to research design.

Research increasingly stresses that task persistence is a major source of variability in comprehension among students, especially when it comes to expository text (DeWitz, 1997). As reading material becomes more complex and involved, all readers must expend more effort deriving meaning, and layers of meaning, from the text. The persistence they demonstrate in working out text meaning increases as the difficulty of the material increases. Beginning readers may struggle quite a bit to determine the meaning of even seemingly simple narrative or expository passages. Many students with serious reading problems seem to have limited reserves of task persistence when compared with their peers. This finding was highlighted in a large observational study by McKinney, Osborne, and Schulte (1993).

A major movement in the field of comprehension research has been to develop teaching approaches that actively encourage students *to persist* in "figuring out" what the text is saying (e.g., Beck, McKeown, Sandora, Kucan, & Worthy, 1996). In the next two major sections of the chapter we discuss ways to improve the comprehension of narrative and expository text.

IMPROVING COMPREHENSION OF NARRATIVE TEXT

Students are expected to read narrative text in school, and the stories are generally structured similarly. Characters have goals that are either stated directly or can be inferred. The key characters are placed in settings, and they make plans and undertake actions to achieve these goals. Actions unfold in an orderly sequence. Ultimately, there is an outcome, which constitutes success or failure in reaching important goals.

Students who grasp the basic text structure for narratives (often called story grammar) recall more of the key story elements than other information in the story (Hansen, 1978; Weaver & Dickinson, 1982; Williams, 1993). They also recognize which events are closely related to the basic causal chain in a story (Wolman, 1991). In other words, knowledge of story grammar helps students discern what is likely to be most relevant for understanding the story.

Many studies devoted to improving comprehension of stories utilize story grammar as a basis for the strategy (Singer & Donlan, 1982). Students are taught to identify the principal components of a story and then to use this knowledge as an organizational guide when reading. Teaching this structure explicitly is effective for students with comprehension problems as well as students without comprehension problems (Gersten et al., in press).

A useful way to think about interventions for students with and without reading comprehension problems centers on the concept of *procedural facilitators* (Gersten, Baker, Pugach, Scanlon & Chard, 2001). Procedural facilitators are questions, prompts, simple outlines, or other graphic organizers that target important structures critical in reading the text with comprehension (Scardamalia & Bereiter, 1986). Common story grammar procedural facilitators provide a way for students to approach reading difficult text. It is important to realize they are not a summary of the text developed by the teacher but a type of scaffold designed to help students organize their thoughts about a story.

A seminal study on the use of procedural facilitators was conducted by Idol (1987), who used a story mapping technique to enhance the reading comprehension of students with comprehension problems and peers who were average and above average readers. The story map was designed to “draw the readers’ attention to the common elements among stories,” which she thought would foster the “possibility of the reader searching his or her mind for possible information” related to the text (p. 197). In other words, the story map was to serve as a framework for integrating story elements from the text with the reader’s own experiences.

On the story map, students recorded information about 10 story grammar questions, having to do with important elements of the story. Examples of the questions used throughout the intervention include: *Where* did the story take place? *When* did the story take place? *How* did [*main character*] try to solve the problem? Was it hard to solve the problem? (*Explain in your own words*) (Gersten et al., 2001).

As concrete supports, procedural facilitators highlight in an overt fashion what expert readers do more or less intuitively as they read. Many different types of procedural facilitators exist, but their goal is the same—to provide a “plan of action” for

readers, and a system for teachers or peers to use to provide ongoing feedback and support. A plan of action is derived from the learners' need for help with text organization and structure (Kolligian & Sternberg, 1987) and their need for a road map or guide to successfully negotiate the comprehension process.

Procedural facilitators are essentially tools providing a *common language* between teachers and students to help guide dialogue and interactions between teachers and students and between readers and authors. During teacher-student interactions, teachers can verbally model patterns of thinking about and comprehending text. Students can display their attempts to comprehend text—either verbally or in writing—and get feedback from teachers.

In the study by Idol (1987), use of the story map procedural facilitator resulted in improved comprehension of all students in the study. It seemed to be particularly effective for students with learning disabilities and for the other students with serious reading comprehension problems. Idol found that when given the option students almost unanimously preferred to use the story maps *after* reading a story rather than during reading.

One of the most important findings was that when formal use of the story maps was discontinued the comprehension of students on average remained high, indicating that students had begun to internalize the strategies. The comprehension of some students decreased significantly, however, indicating that for them internalization had not occurred and that the removal of the facilitator was premature.

Another finding in Idol's study was entirely unexpected. Idol analyzed students' writing before and after the intervention. Prior to the intervention, students with comprehension problems included fewer story grammar components in their journal entries than other students. After the intervention, these students significantly increased the number of elements they included. In fact, 80% of these students began to write stories that included all of the story grammar elements that were taught.

Idol's study led to a series of related studies confirming that when teachers explicitly taught narrative text structures using story maps there was an increase in students' reading comprehension, especially for students with comprehension problems (Dimino, Gersten, Carnine, & Blake, 1990; Gurney, Gersten, Dimino, & Carnine, 1990; Williams, Brown, Silverstein, & deCani, 1994). Explicitly teaching narrative text structures has had a consistent positive impact on reading comprehension.

Explicit teaching. In teaching students comprehension strategies related to story grammar dimensions, initial instruction might focus on (a) who the story is about, (b) the main problem, (c) attempts to solve the problem, and (d) how the story ends. As students read stories during this instructional phase the teacher should pause to ask questions related to these dimensions, and make sure that all students comprehend the story. This is particularly important, of course, for students with comprehension problems. At the end of the story, students should try to summarize the story using the four questions to guide them.

Guided practice. In the guided practice phase, story grammar questions and maps are central to reading. The maps should have enough room on them for students to take notes as they read or after. At the end of the story, students should try to summarize the

story by using the story grammar questions. Teachers should have frequent class discussions centered on answering the story grammar questions. Students should learn to support their answers by indicating specific parts of the story. This can be particularly effective if students answer a question incorrectly. Rather than telling the student the answer is incorrect, it can be more beneficial when teachers have students find the sentence or paragraph that supports their answer. It is critical, however, that teachers make sure students understand what the correct answer is and why. If there are frequent errors at this level, then it may be necessary to return to an earlier, more explicit level where teachers more carefully monitor and model the use of the story grammar questions.

Independent use. As students become adept at reading stories by using story maps and questions as a guide, teachers should continue to monitor students' use and begin to prompt students to provide analyses of stories that probe deeper levels of meaning. In some cases pursuing deeper levels of comprehension can stem directly from the original story grammar categories. In other cases additional categories can be integrated with existing ones. This is important because continued improvement in comprehension requires that readers pay attention to key details that change from story to story and are not easily categorized in maps and questioning facilitators. Frequently, it is possible to link these important details to the ideas represented in the story grammar framework, and teachers should do this explicitly to make sure students see the connection.

Teacher Questioning During Reading

Teacher questioning during reading can support students becoming active readers. Ongoing questioning is more effective when it is structured and follows a specific pattern because students are more likely to internalize self-questioning strategies and use them independently after instruction.

Essentially, interspersed questions model for children how good readers actively question the text as they read. Questions posed before reading can improve comprehension if they are general and focus on the most salient information in the text (Rickards, 1976). They help orient beginning readers to the idea that it is important to have thought about what the content of the text might be before reading it.

It is important to stress that during the reading of the text these same questions should be addressed (White, 1981) so that readers get to see how their expectations and predictions about the story held up. Discrepancies should be noted and discussed. For example, in H. G. Wells' story, *The Star*, questions might include: What made the new star? Where was the star heading? Why did the star become brighter and brighter? After reading, the same three questions could be asked, plus some additional ones, such as What was the school girl worried about?

Asking the same questions before and after reading is especially effective if the reading material is difficult to comprehend (Hartley & Davies, 1976; Levin & Pressley, 1981), and the more precise the questions are, the more students can focus their attention on specific information (Anderson & Biddle, 1975). Asking additional questions after reading helps students not become preoccupied with reading the text just to answer the orienting questions.

Recent research has shown that *teacher questioning* is also an effective way to help students understand how stories are structured. Answering predictable, repeated patterns of questions helps students focus their attention on the crucial structure of the story and results in better comprehension than asking unpredictable, uniquely relevant questions (Carnine & Kinder, 1985; Dimino et al., 1990; Gurney et al., 1990; Idol, 1987; Short & Ryan, 1984; Singer & Donlan, 1982; Williams et al., 1994). In other words, interspersed questions should be aligned with the story maps students use to depict the structure of the stories (Idol, 1987).

As stories become more complex the mapping and questioning procedures teachers use to facilitate comprehension can also increase in complexity to include more elements, require greater elaboration, and so forth. The important point about story maps and related teacher questioning strategies is that a consistent pattern be used and that the stories used during instruction should lend themselves to this pattern. In the next section we outline a general sequence of instruction for expository text.

IMPROVING COMPREHENSION OF EXPOSITORY TEXT

By the time children enter the fourth grade the demand for them to read and understand expository material (i.e., history, science, geography, social studies, and other disciplines) is substantial (Wilson & Rupley, 1997). In fact, most reading beyond the primary grades involves expository text, as does most reading that adults find necessary for work and in everyday life (Stanovich, 1994).

Comprehending expository text is typically more difficult than comprehending narrative text for four reasons (Hidi & Hildyard, 1983; McCutchen & Perfetti, 1982). Expository text is more likely to be “information dense,” with unfamiliar technical vocabulary and content (Lapp, Flood, & Ranck-Buhr, 1995). A second reason, which has generated a great deal of attention, is that expository texts use more complicated and varied structures than do narrative texts (Kucan & Beck, 1997).

The third challenge of expository texts is that they involve reading long passages without prompts from a “conversational partner” (Bereiter & Scardamalia, 1987). In narrative texts, dialogues are typically interspersed throughout the text, and conversations per se are an everyday part of children’s oral language experiences. Fourth, as Stein and Trabasso (1981) have suggested, the logical-causal arguments typical of expository text structure are more abstract, and therefore less familiar, than the goal-directed events that characterize narrative texts.

Single-Strategy Instruction

The major method for enhancing student comprehension of expository text is “strategy instruction,” which is intended to improve how readers “attack” expository material, in order to become more deliberate and active in processing it. Examples of strategies to improve the comprehension of expository text include passage organization training, self-questioning procedures, mapping organizers, and summary skills training (Gersten et

al., in press). Research on strategy instruction in reading comprehension has tended to investigate one strategy in isolation or the effect of multiple strategies together.

One study with a high degree of classroom utility examined the *Question Answer Relationships* strategy (QARs) (Simmonds, 1992). Students were taught to categorize comprehension questions as *Right There* (text explicit), *Think and Search* (text implicit), and *On My Own* (script implicit). Twenty-four special education teachers teaching more than 400 students with significant reading comprehension problems used the QARs strategy to teach students to categorize the three types of questions.

Students in the experimental group performed better than students in comparison groups on question-answering and maze tasks constructed by the teachers using actual classroom social studies material. The effects were consistent across measures, which were not closely aligned with the treatment, making the findings more convincing.

Overall, research on single-strategy instruction suggests that careful teacher mediation is important. Unfortunately, students do not easily internalize the use of single-strategy methods or use them in reading *different* types of texts. Consequently, teachers should be very systematic about teaching the process of applying a strategy and provide students with carefully structured practice opportunities. Support should be faded slowly, and close monitoring of students' application and understanding should continue for an extended period of time.

Multiple Strategy Instruction

Studies evaluating the simultaneous use of more than one strategy have been conducted in laboratory-like and real classroom settings. They also vary in terms of the explicitness of the instruction provided. Some studies have investigated the use of two strategies, frequently combining (a) summarization of main ideas with (b) self-monitoring. Other studies have investigated the use of more than two strategies at a time.

In one study, Graves (1986) compared direct instruction on identifying main ideas with direct instruction combined with self-questioning and self-monitoring. In self-questioning and self-monitoring, students recorded their progress as they read, repeatedly asking themselves, "Do I understand what the whole passage is about?" Results were assessed under three different conditions:

1. Students read outcome passages under a reading aloud condition (as they had been trained to do, with materials cueing students to self-monitor).
2. Students read outcome passages silently, again with materials designed to prompt students to self-monitor.
3. Students read passages silently or aloud (student's choice) 1 week later, with no cues. Each reading required the students to identify main ideas in the passages.

In all three conditions students in the direct instruction with self-questioning and monitoring group performed better than students in the direct instruction alone group,

who themselves did better than students in the comparison group. This finding suggests that careful teacher mediation of summarization (i.e., direct instruction on identifying main ideas) combined with a self-monitoring strategy can significantly improve the reading comprehension of expository text.

One of the most thorough approaches to teaching comprehension of expository text was conducted by Englert and Mariage (1991). A generic graphic organizer was developed to support the use of *multiple* strategies by fourth-, fifth-, and sixth-grade students with significant reading comprehension problems. The “POSSE” intervention used the graphic organizer in combination with the following set of strategies: *Predicting ideas*, *Organizing predicted ideas and background knowledge based on text structure*, *Searching for the text structure*, *Summarizing the main ideas*, and *Evaluating comprehension*.

Teachers modeled the use of these strategies with the graphic organizer and gradually transferred responsibility of the dialogue supporting use of these strategies to the students. An important part of the intervention was students learning to work together on explaining what they read using the graphic organizer as a guide. Although some students had not fully internalized the strategies during the 2-month training, they did increase their strategy knowledge more than comparison students. This was particularly true in the classrooms where teachers did a good job of transferring control of the dialogue to the students. Overall, however, the intervention produced substantial effects, and demonstrated that students with reading comprehension problems could learn to use a relatively sophisticated combination of strategies to improve their reading comprehension.

Graphic Displays

Visual organizers of expository text can also be used to help students comprehend what they are reading (Raphael, Englert, & Kirschner, 1986; Sinatra, 1984; Sinatra, Stahl-Gemake, & Berg, 1984; Sinatra, Stahl-Gemake, & Morgan, 1986). Visual depictions of text structure should be integrated with instruction in other reading comprehension strategies (e.g., identifying main ideas, summarizing) to help students hone in on the central features of comprehension.

Graphic displays of expository text can be helpful in providing a visual picture of the content and showing key linkages. We have synthesized the work of Meyer and Rice (1984) and of Sinatra et al. (1986) into a model of four text structure maps that may be used in conjunction with strategy instruction to improve comprehension in a variety of content areas. The maps illustrated here include important *signal words* that help indicate specific types of text structure.

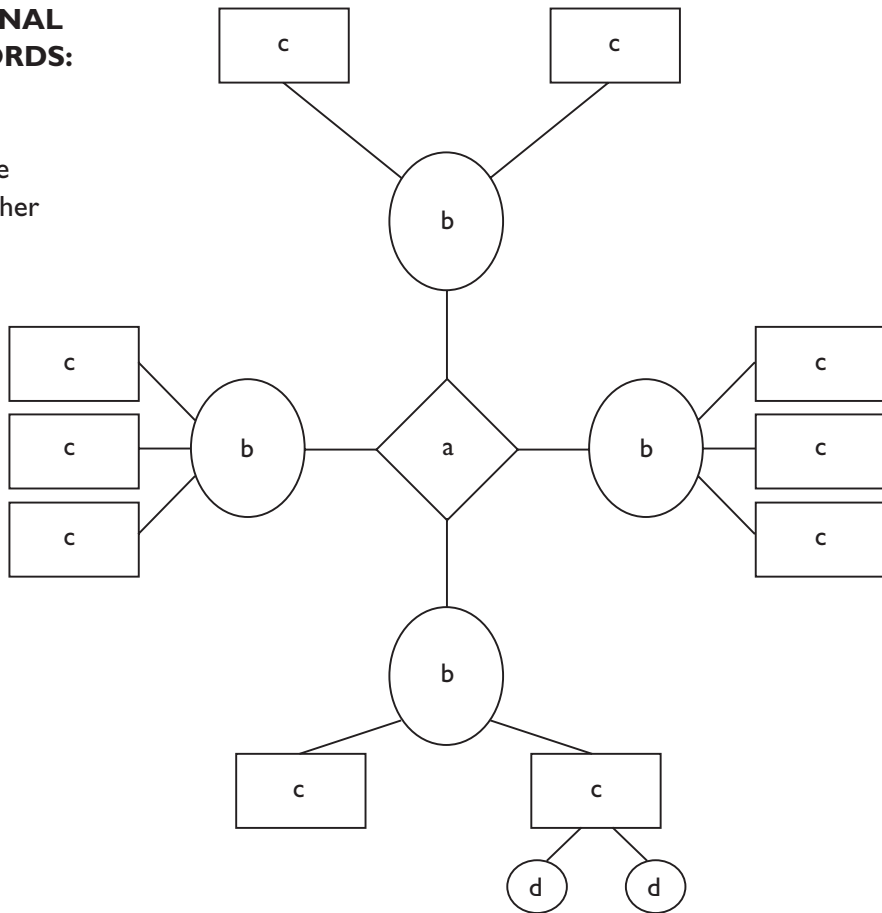
In the model that follows, pupils learn to identify the text structure of passages by identifying a possible “map” of the structure. In doing this, students are taught to read the text, searching for ways it might be mapped using familiar terminology such as “wheels” for a descriptive/thematic map and “steps” for a sequential episodic map.

FIGURE 1

Descriptive or Thematic Map

SIGNAL WORDS:

one
two
three
another



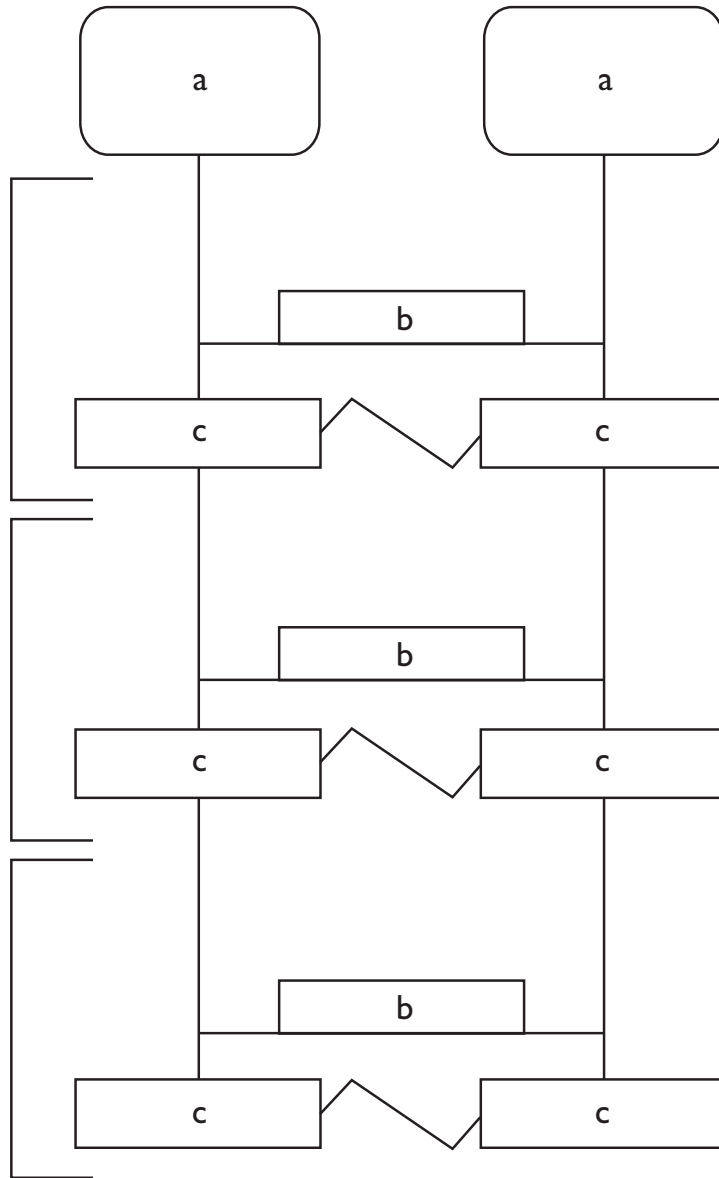
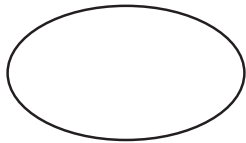
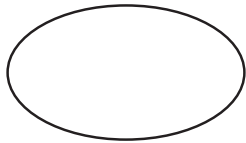
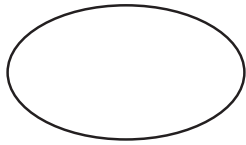
Descriptive/Thematic maps. This type of map, represented in Figure 1, has broad application in many subject areas in which ideas are subsumed by other superordinate ideas. For example, it can be used for describing systems (e.g., body systems) or for illustrating the relationship between ideas in persuasive essays, in which evidence is used to support each point. This map is most comparable to a traditional “outline” pattern. Cell *a* corresponds to the main idea or system (e.g., body systems). At the next level, the four *b* cells list the components of the main system (e.g., nervous, circulatory, skeletal, and digestive systems). The *c* cells each contain a subordinate point to each of the components (e.g., heart, veins, and arteries under circulatory system). Additional breakdown of points can be accommodated by adding additional subordinate levels of cells, as the *d* cells illustrate.

FIGURE 2

Comparative/Contrastive Map

SIGNAL WORDS:

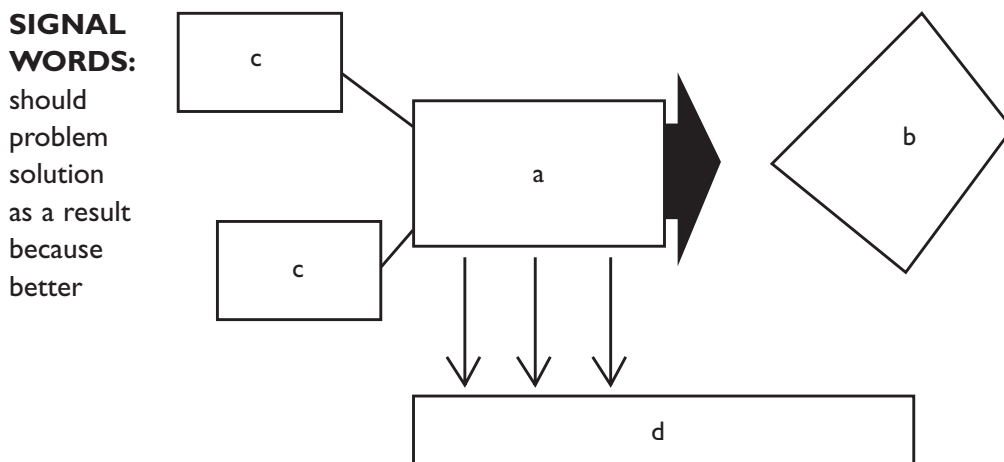
on the other hand
however
in contrast
but



Comparison/Contrast map. Being able to compare and contrast events, people, ideas, places, etc., is important in learning to read with understanding. Figure 2 can be used when students read expository material and should compare two concepts. The parallel structure in the map is critical in how it is used. Simply listing features of one concept and then listing the features of the other concept is a common error made in

FIGURE 3

Problem Solution Map



comparison/contrast tasks and is likely to result in shallow levels of comprehension. The top boxes, labeled *a*, display the concepts being compared and contrasted. The map has boxes for features that the concepts share, labeled *b*, and room for features that are unique to each concept, labeled *c*. The circles to the left are very important and require higher level processing skills. Having teachers spend time teaching students to work on accurate labels for those circles can result in rich opportunities for comprehension processing. The circles require the naming of the dimensions on which the two concepts are being compared. For example, a comparison between the North and the South before the Civil War might list the dimensions of economics, politics, and social order.

Problem/Solution map. In expository text that has a clear identifiable problem, it can facilitate comprehension to try and understand fundamental *causes*, and consider *solutions*, in the context of specific causal factors. For example, understanding how to solve cancer problems requires understanding factors that cause cancer. To illustrate cause-and-effect relationships (Figure 3), the large arrow, labeled *a*, is used to show a cause, resulting in a problem, labeled *b*. The boxes labeled *c* are used to define the cause, or to list critical features of the cause. Describing attributes of the cause is an important level of analysis. The vertical arrows indicate that the cause of a problem, and how it is defined, implies or leads to possible solutions.

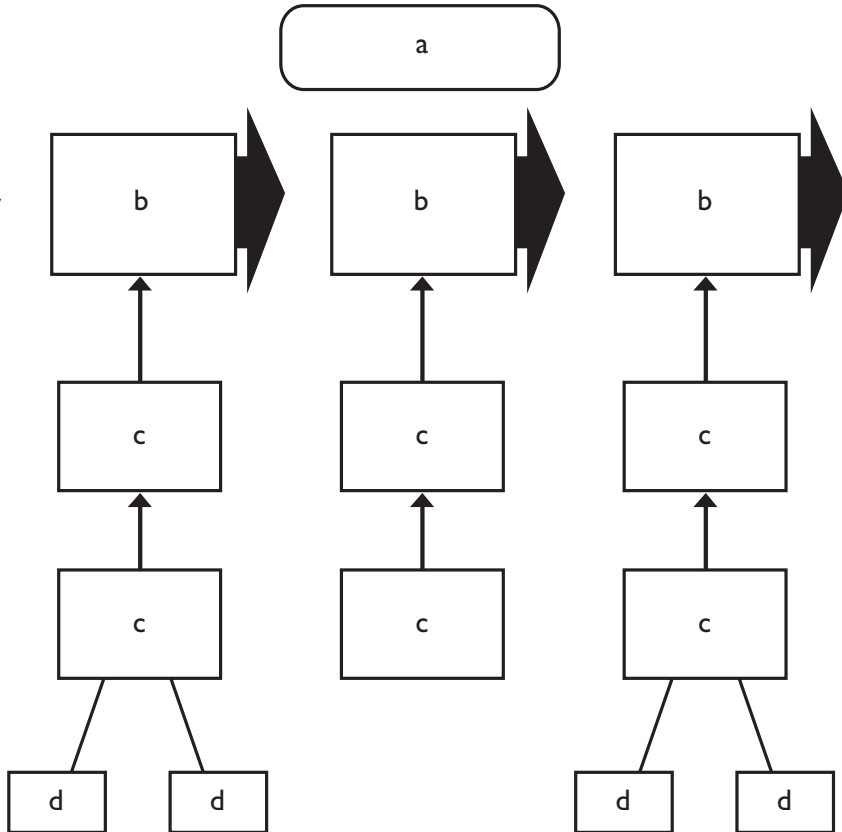
In some content, a better understanding of solutions may result from the careful *analysis* of the problem rather than from a direct understanding of the cause. For example, in dealing with a personal problem identified as the problem, it may be too late or impossible to change the specific events that caused the problem. A better way to target possible solutions may be to deal directly with specific dimensions of the problem.

FIGURE 4

Sequential Episodic Map

SIGNAL WORDS:

then
next
finally
consequently
therefore
because
steps



Sequential episodic map. Sequential episodic maps can be particularly useful for students reading history texts. Figure 4 is an example of a map that could be used to depict the causes of a major historical event. The major event is labeled *a* in the figure. The second level *b* boxes illustrate the relevant causes and consequences of the major event. The first *b* level event results in a consequence, which would be recorded in the second *b* level box. The series of *c* level boxes indicates that each event recorded in the *b* boxes is also associated with one or more causes. The series of *d* boxes shows that *c* level events are also associated with specific causes.

Peer-Mediated Instruction in Reading Comprehension

Procedures to build reading fluency, the use of procedural facilitators, teaching single or multiple reading comprehension strategies, and graphic organizers of text are all ways to get students to process and understand what they are reading more effective-

ly. The most recent research on reading comprehension incorporates more flexibility in how these techniques are used by students because the variations in the types of text students have to learn are extensive, and long-term effectiveness requires that students internalize these approaches if they are going to be used over time. Researchers increasingly believe that ongoing dialogue about the meaning of text is a critical component in boosting comprehension levels, especially for students with comprehension problems. One popular technique for increasing dialogue and active processing is through the use of peer tutors. As with most intervention approaches, there are benefits and drawbacks of using peers to “teach” or foster comprehension (Fuchs, Fuchs, Mathes, & Simmons, 1997; Vadasy, Jenkins, Antil, Phillips, & Pool, 1997).

Peer tutoring has the potential to provide ongoing interactive dialogue in a system in which students have the opportunity to work cooperatively and provide feedback to each other (see Greenwood et al., this volume, and Fuchs et al., 1997; Greenwood et al., 1992; Simmons, Fuchs, Fuchs, Hodge, & Mathes, 1994). Studies have begun to provide empirical support for the impact elaborated dialogue has on the comprehension of students with serious comprehension problems. In contemporary models of peer tutoring and contemporary approaches to explicit teaching of comprehension it is possible to conceptualize a system in which feedback is truly tailored to the unique abilities of each student. Another potential advantage is that having peers working together is a very feasible configuration. If actual benefits in comprehension are derived, then the amount of time devoted to this type of instructional arrangement is much less limited by resource considerations or logistic factors than many other types of reading instruction, such as one-to-one tutoring with an adult.

A potential limitation of peers is that they may not have the verbal skill to adequately assist other students, even if they themselves have strong reading skills. On the other hand, it is also possible that peers might actually use language that is more easily understood by other students than the more formal language of adults.

Studies demonstrate the potential for strategy instruction with students with learning disabilities, but few have focused on teacher delivery within naturally occurring classroom settings. An exception is the work of Fuchs, Fuchs, Mathes, and Simmons (1997), which has addressed how a peer-tutoring system focused on comprehension can be achieved in the context of real classroom conditions. Peer-Assisted Learning Strategies, or PALS, is a class-wide one-to-one peer-tutoring program involving partner reading, paragraph summary, prediction, and other activities that have been demonstrated to strengthen reading comprehension. The truly innovative feature of the system is that students work with each other on sophisticated reading comprehension strategies but do so in a very structured format.

In one important study (Fuchs et al., 1997), 20 teachers implemented PALS for 15 weeks. Students in the PALS classrooms demonstrated greater reading progress on all measures of reading achievement than students in comparison classrooms. Measures included words read correctly during a read-aloud, comprehension questions answered correctly, and missing words identified correctly in a *doze* (maze) test. The intervention was effective for students with learning disabilities and for students without disabilities, including low and average achievers.

SUMMARY

Research has consistently demonstrated the possibility of teaching methods and strategies that significantly improve reading comprehension skills of students with serious reading difficulties. Many studies have been conducted in real classroom settings, and the approaches are eminently feasible for classroom application. There are a number of important aspects about the knowledge base that school psychologists and others who work with teachers on effective implementation of these approaches should bear in mind.

Research studies have made an important distinction between comprehension approaches that target narrative text versus expository text. Change agents, such as school psychologists, and classroom teachers can improve student performance by using this distinction as they target ways to improve comprehension instruction. The commonality that ultimately bridges narrative and expository instruction is that both genres can be read with deeper understanding by accessing the underlying text structures on which they are developed.

In general, narrative texts are easier to understand because a single underlying story grammar structure supports the vast majority of narrative texts. Expository texts tend to be more challenging to read with understanding because, in part, there are many different types of structures that underlie how they are written. Expository texts also are more challenging because the content and vocabulary may be entirely unfamiliar to many students.

Because text structures do serve as an organizer for the material students are expected to read and understand, however, instruction should address providing access to those structures for the purpose of improving comprehension. Deciphering text structures becomes even more important as reading demands increase, and as the shift to reading primarily expository material occurs, usually around grade 4.

Research is clear on the benefits of teachers explicitly teaching students reading comprehension strategies. This instruction includes early explicit instruction on text structures, beginning with narrative texts and moving to different types of expository texts. Building on text structures is instruction that demonstrates that comprehension during actual reading is an entirely active process rather than a passive one. Teachers can model this, for example, by using think aloud techniques and other explicit approaches. Question asking before, during, and after reading should be an integral part of comprehension instruction. Predictions about content could be confirmed, and students should be required to find evidence supporting their answers to questions by finding relevant content in the text.

It is crucial that students begin to internalize the reading comprehension techniques and approaches they have been taught. Extended practice fosters internalization, but this is best accomplished under the careful guidance of the teacher, who can provide support and feedback. The goal is for students to personalize comprehension strategies, to use them independently to the point where they become more and more automatic, as they are for good readers.

Constructive classroom dialogues can help students internalize their use of formal reading strategies. Interactive dialogue—either with the teacher or proficient peers—is certainly one of the key areas of contemporary research on reading comprehension instruction. The growing evidence, in particular, that peers can work together to improve comprehension has tremendous potential for classroom application because there are many peers but only one teacher, and opportunities for extensive work and practice are abundant.

One final consideration is that the development of strong reading comprehension skills should begin early. There is every reason to expect that in first and second grade students should be well on their way toward becoming fluent readers of grade level text (i.e., automaticity with decoding). During that development, reading comprehension strategies should be a consistent part of reading instruction. As decoding improves and becomes less and less a barrier to successful reading, the emphasis on comprehension strategies can continue to increase. Of real assistance in this scenario is that basal reading programs have started to change quite substantially to reflect more research-based approaches. More empirically validated and explicit techniques for teaching phonemic awareness, alphabetic understanding, and reading fluency are being included and integrated. Approaches for teaching comprehension strategies are also infused in these lessons and become a more substantial part of the program over time.

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AUTHORS' NOTES

Sections of this chapter are adapted from Gersten, Fuchs, Williams, and Baker (in press).