

A Research Synthesis

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# A Review of the Current Research on Comprehension Instruction

NATIONAL READING  
TECHNICAL ASSISTANCE CENTER





# A Review of the Current Research on Comprehension Instruction

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*<http://www.ed.gov/programs/readingfirst/support/index.html>*

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## Introduction

The importance of understanding the nature of good reading instruction in the primary grades cannot be overstated. More than half a century of research has established a strong correlation between those who learn to read early and easily and later academic success. According to the U.S. Department of Education, despite noteworthy progress in recent years, one student in four public school eighth-graders lacks basic grade-level reading skills: they do not understand grade-appropriate material. This result is all the more troubling given that we know more than ever about teaching reading effectively.

In the late 1990's, the National Reading Panel reviewed studies of reading instruction to assess the effectiveness of different approaches. The resulting report identified five areas of instruction essential to an effective reading program: phonemic awareness, phonics, fluency, vocabulary, and comprehension (NICHD, 2000).

Comprehension becomes especially important to students in the later elementary grades (Sweet & Snow, 2003) because it provides the foundation for further learning in secondary school. A student's academic progress is profoundly shaped by the ability to understand what is read. Students who cannot understand what they read are not likely to acquire the skills necessary to participate in the 21st century workforce.

This publication reviews the research on comprehension instruction published since the 2000 NRP report. Using the same criteria used by the NRP as well as two additional criteria (see Methodology), we found 23 studies out of a field of more than 800 articles that met our criteria.

For purposes of analysis and discussion, we grouped the studies by area of research interest: (a) teacher practice, (b) multiple strategy instruction, (c) instruction in text structure, (d) instruction for at-risk readers, (e) technology-assisted instruction, and (f) multi-sensory approaches to comprehension instruction. Our summary of results by area of research interest follows the discussion of methodology.







## Methodology

### Database

In order to review the research since the NRP's review, the authors used procedures defined by Cooper (1998) to identify the body of studies included in this synthesis. These procedures included searching subject indices and citations, and browsing and footnote chasing (White, 1994). Using the search terms "comprehension" or "reading comprehension" and "elementary school," ERIC yielded 402 results and PsycINFO yielded 597 results. Removing duplicates between the two databases generated a total of 889 results. Studies were selected through a two-step process that began as a broad search to locate all potentially relevant research articles and became more restrictive as predetermined selection criteria were applied.

### Analysis

Because this review builds on the work of the NRP, we adopted its criteria for including studies:

- The study must have been relevant to instruction of reading or comprehension. (This criterion excludes studies on comprehension instruction in reasoning, mathematics problem solving, or writing.)
- The study must have been published in a scientific journal.
- The study's experimental design had to involve at least one treatment and an appropriate control group or to have one or more quasi-experimental variables with variations that served as comparisons between treatments (NICHD, 2000).

Beyond the NRP's criteria, this review added:

- The study must have been published between 2001 and 2008.
- The study must have included student participants in grades K, 1, 2, or 3 or any combination thereof.

Applying these criteria reduced the number of applicable studies to 23. Using a code sheet based on two published syntheses (Klingner & Vaughn, 1999), extensive coding was conducted to organize pertinent information from each study. The code sheet allowed reviewers to record information on the coder, participants and setting (e.g., participants' ages), the study's purpose, research design and methodologies, and descriptions of the intervention, the measure, observations, and findings. When a study presented multiple purposes, sets of participants, and results, only those purposes, etc. that pertained to this synthesis were coded and analyzed.

The studies were analyzed and grouped by topic (see Appendix): (a) teacher professional development, (b) multiple strategy instruction, (c) instruction in text structure, and d) instruction for at-risk readers, as well as studies in which comprehension was researched using (e) technology and (f) multi-sensory approaches. The results are summarized by area of research focus.





## Summary of Results

### Teacher practice

- *Taylor, Pearson, Peterson, and Rodriguez (2003)*

The method by which a teacher teaches comprehension (mechanically or strategically) is important in ensuring the effectiveness of comprehension instruction. Observations of teachers several times over the course of a school year by Taylor, Pearson, Peterson, and Rodriguez (2003) suggest that teaching variables such as (a) small-group instruction, (b) skill instruction in comprehension, (c) teacher modeling, and (d) coaching for teachers explained substantial variation in student achievement. The most consistent finding was that teachers who emphasized higher-order thinking promoted greater reading growth.

A secondary finding suggested that routine, practice-oriented approaches to teaching important comprehension processes resulted in a lower growth rate of students' reading comprehension than did strategic approaches; in fact, the more routine-practice approaches observed, the lower students' growth in reading comprehension. Strategic approaches to comprehension processes, rather than mechanical ones, also correlate positively to first-graders' writing growth.

## Multiple strategy instruction

- *Guthrie, Wigfield, Barbosa, Perencevich, Taboada, and Davis, et al. (2004)*
- *Van Keer and Verhaeghe (2005)*
- *Guthrie, Wigfield, Humenick, Perencevich, Taboada, and Barbosa (2006)*

While we know that instruction in comprehension strategies improves students' comprehension, studies by Guthrie et al. (2004, 2006) and Van Keer and Verhaeghe (2005) found that instruction using multiple strategies can create more strategic readers and increases reading comprehension.

Guthrie et al. (2004) investigated concept-oriented reading instruction (CORI) which combines strategy instruction with motivation supports (see Guthrie et al., 2004, for a detailed description of CORI). Motivation supports included giving students choices, hands-on activities, and interesting text. Results indicated that students in the CORI classrooms were more motivated than were students who received only strategy instruction or traditional instruction. Furthermore, students in the CORI classrooms were more strategic readers than were students in the strategy instruction-only classrooms.

In a related study, Guthrie and colleagues (2006) confirmed that a high number of stimulating tasks increased student motivation and that motivation has a positive effect on reading comprehension. (Tasks must be integrally connected to the content of texts and students' interests to increase motivation.) Reading comprehension instruction that explicitly combines motivation practices with strategy instruction increases reading comprehension compared with strategy instruction alone or traditional instruction.

Van Keer & Verhaeghe (2005) combined explicit strategy instruction and whole-class activities with cross-age tutoring and same-age peer-tutors. Second-grade students who received explicit strategy instruction and then practiced reading with cross-age (fifth-grade) tutors made similar gains to students who practiced under direct teacher supervision. This was not true of second graders who practiced with same-age peer-tutors.

## Instruction in text structure

- *Garner and Bochna (2004)*
- *Williams, Hall, and Lauer (2004)*
- *Hall, Sabey, and McClellan (2005)*
- *Williams, Hall, Lauer, Stafford, DeSisto, and deCani (2005)*
- *Paris and Paris (2007)*

Five studies related to text structure published since the NRP met our criteria. Overall, the results support teaching text structure to young readers to improve their reading comprehension. Such comprehension is necessary for organizing expository information and ultimately making sense of expository texts.

Garner and Bochna (2004) demonstrated that novice readers were able to transfer knowledge from one literacy activity to another after exposure to instructional strategies that used repeated presentation, explicit explanation, teacher modeling, and questioning. At post-test, the intervention group demonstrated significantly higher listening comprehension than did the comparison group; these students also demonstrated superior comprehension in relation to each of four story elements and displayed metalinguistic awareness of text structure by labeling and giving examples of story structure concepts more frequently. Not only did students transfer story grammar knowledge and use it successfully in a different context from the one in which they gained and practiced it, they transferred the knowledge in the context of a more difficult task than the one in which they initially acquired the knowledge.

However, in this instance, the success of story grammar instruction in supporting listening and reading comprehension was complicated by the lack of students' improvement in story retelling. It may be that text structure knowledge serves a specific purpose and may support the formation of an enduring situational model rather than a text base. Knowledge of text structure may promote long-term organization, retention, and retrieval rather than facilitating the immediate and temporary formation of a mental representation depicting a text's progression.

Williams, Hall, and Lauer (2004) found that text structure, content familiarity, and reading comprehension ability affect student performance. To determine whether instruction in text structure helps second-grade students improve their comprehension of compare and contrast expository text, the authors randomly assigned students to one of two text conditions: narrative sequence or text structure sequence. A third group of students served as a control. Students who received text structure instruction achieved significantly higher scores in recalling and identifying clue words and generating oral and written sentences than did students in the two other groups. There was no difference among the groups in recalling three compare and contrast questions. Nor was there a difference among groups in students' proficiency in the use of a graphic organizer (all achieved relatively high scores), suggesting second graders' familiarity with the strategy.

In a related study, second graders of both low and high comprehension ability were found to be sensitive to expository text structure and could benefit from instruction in text structure (Williams, et al. 2004, 2005). Similar findings by Hall, Sabey, and McClellan (2005) suggest that teaching text structure is an effective strategy for promoting expository text comprehension by second-grade students. Hall and colleagues found that students who received text structure training were able to use two expository text comprehension strategies effectively: that is, they gained a conceptual understanding of compare and contrast and produced better-structured summaries than did students who received content-only instruction or no instruction.

An intervention based on instruction in text structure studied by Williams, Hall, Lauer, Stafford, DeSisto, and deCani (2005) improved students' abilities to comprehend compare and contrast texts. Students who received the

intervention also demonstrated transfer to uninstructed compare and contrast texts: they not only learned what they were taught but were also able to transfer that knowledge for use with new content.

The study by Paris and Paris (2007) demonstrates that comprehension by first graders, even by students who cannot decode well, can be promoted through explicit instruction in reading strategies and text structure. They found that instruction in narrative thinking benefited students' comprehension of narratives in the picture-viewing modality as well as narrative meaning-making in listening comprehension and oral production modalities. That is, students participating in the experimental group showed better understanding of explicit pictorial information and were more able to make conclusions about implicit pictorial information. They also improved in listening comprehension and recall of main narrative elements, in recall of main story elements, and were more able to ascribe dialogue to characters. From pre- to post-test, students in the experimental group showed improvements in recall, in the ability to organize main story elements, in understanding explicit pictorial information, and in making more accurate inferences about implicit pictorial information. For most of these variables, the students in the experimental groups had lower scores at pre-test and caught up and even surpassed the comparison students at post-test.

Thus, comprehension instruction that minimizes decoding demands can provide direct benefits to students before and as they learn to read. The Paris and Paris study showed the benefits of direct comprehension instruction for young students with both high and low decoding skills. Teachers should design beginning reading practices that foster narrative thinking skills for all students, regardless of ability.

Taken together, these findings suggest that awareness of text structure appears to improve students' comprehension of expository texts. They also suggest that young students experience greater difficulty with unstructured text and need appropriate and extensive exposure to expository texts with frequent opportunities to employ comprehension strategies. Introducing expository text in the elementary grades would thus be useful.

If texts are to be used in content areas, it might be beneficial to present them first in a narrative structure, which the young readers found easier to understand. Although students comprehended texts about familiar events better than texts about unfamiliar events, structured text effectively benefits comprehension of both familiar and unfamiliar content. Findings also indicate that training in a single text structure does not improve students' ability to handle another text structure (Williams, et al. 2005); therefore it may be necessary to provide explicit instruction on each individual structure.

Although there is some concern that stressing reading comprehension may minimize focus on educational content, this study shows that, controlling for the amount of instructional time, students can acquire as much content when instruction includes text structure as when it does not. This finding encourages instruction that is designed to combine content and comprehension goals.

## At-risk learners

- *Laing and Kamhi (2002)*
- *Linan-Thompson and Hickman-Davis (2002)*
- *Berninger, Vermeulen, Abbott, McCutchen, Cotton, Cude, Dorn, and Sharon (2003)*
- *Vaughn, Linan-Thompson, Kouzekanani, Bryant, Dickson, and Blozis (2003)*
- *Burns, Dean and Foley (2004)*
- *Otaiba, Schatschneider, and Silverman (2005)*
- *Schacter and Jo (2005)*
- *Cain and Oakhill (2006)*
- *Berninger, Abbott, Vermeulen, and Fulton (2006)*

The largest number (nine) of the studies identified for inclusion in this synthesis were related to working with at-risk readers or students already identified as having reading difficulties.

Berninger, et al. (2003) studied the effectiveness of three instructional approaches in supplementing the core reading program: (a) word recognition training, (b) reading comprehension training, and (c) combined word recognition and reading comprehension training. They found that (c), combined word recognition and reading training, and (b), reading comprehension training, increased struggling second-grade readers' phonological decoding skills significantly more than did (a), word recognition training or the control condition.

Results for the comprehension-only treatment were not significantly different from those for the treated control. In an extension study, students who received supplemental instruction including word recognition training, reading comprehension training or both improved significantly more in phonological decoding and reading real words than did those in the core program alone. Furthermore, the combined word recognition and reading comprehension treatments, for which instruction was explicit, had the highest effect sizes for both pseudo-word and real-word reading.

Schacter and Jo (2005) evaluated the impact of a research-based summer reading day-camp intervention on the reading performance of students from economically disadvantaged backgrounds. Students participated in two hours of daily reading instruction and spent the remainder of the day on summer camp activities. The intervention was conducted for seven weeks, five days per week. This study demonstrated increases in summer camp participants' reading comprehension, a noteworthy finding given that research has consistently shown that students from economically disadvantaged homes lose reading skills. However, the benefit diminished over time.

Berninger, Abbott, Vermeulen, and Fulton (2006) investigated issues related to improving reading comprehension in second graders who experienced problems in learning to read words. Students in the intervention group participated in a "reading club" held before or after school. This supplemental instruction was in addition to the reading program provided during the school day to students in both the intervention group and the control group. Students in both the intervention and control groups improved significantly in reading comprehension. However, when statistical controls for pretreatment differences in oral vocabulary knowledge were introduced, statistical effects for improved reading comprehension disappeared. This finding suggests that individual differences in oral vocabulary could interfere directly with students' development of either word reading or reading comprehension and may influence whether and how students respond to reading comprehension instruction. Results for individual differences and for instruction both support a model in which sequential steps in learning written language could contribute to developing reading comprehension.

Burns, Dean, and Foley (2004) studied the effects of teaching unknown key words as a preteaching strategy with 20 students identified as learning disabled in basic reading skills and reading comprehension. The mean

number of comprehension questions answered correctly increased by 2.4, which was statistically significant. An effect size (ES) estimate was also computed using Cohen's *d*, which resulted in an ES of 1.76 standard deviation units. This suggests a strong effect, according to Cohen's classification of .20 as small, .50 as medium, and .80 or larger as large. All of the students exhibited positive gains, again a significantly reliable finding, as determined by the Wilcoxon Signed Ranks test.

Cain and Oakhill (2006) studied the consistency of students' skill impairment to identify fundamental skill weaknesses that might be associated with poor text comprehension. Results found no evidence for any fundamental skill weaknesses among poor comprehenders. However, poor vocabulary skills were associated with impaired growth in word reading ability, and poor general cognitive ability was associated with impaired growth in comprehension. Although the authors caution against over-generalizing the results of their study because sample sizes were small, it is unlikely that there is a single underlying source of poor comprehension: while students with comprehension difficulties are at risk for generally poor educational attainment, weak verbal or cognitive skills appear to affect poor comprehenders' reading development in different ways, and students with poor verbal reasoning skills may be impaired across the wider curriculum. It appears that a student's reading comprehension ability is more complex than the result of cognitive level, verbal ability, or reasoning skills, although these factors clearly play a role. When comprehension problems are identified, careful analysis of other language and cognitive skills should inform the intervention.

Laing and Kamhi (2002) examined whether think-aloud procedures would uncover differences in the kinds of inferences generated by average and below-average readers. Students were presented with stories in one of two conditions: think aloud or listen through. In the think aloud condition, students would listen to a story and after each sentence the students were asked to tell what they understood about the story. In the listen through condition, students would listen to the entire story without stopping to answer questions or tell what was happening in the story. Comparing the number and types of inferences produced by average and below-average readers, the authors found that (a) average readers generated significantly more explanatory inferences than below-average readers, and (b) comprehension performance as measured by story recall was significantly better for both groups in the think-aloud condition than in the listen-through condition. More students in the think-aloud condition answered questions correctly than did students in the listen-through condition. The average readers answered significantly more questions correctly than did the below-average readers; their comprehension performance showed a relatively greater improvement in the think-aloud condition than did the improvement shown by the below-average readers.

Otaiba, Schatschneider, and Silverman (2005) investigated the effectiveness of an intervention provided by community tutors to kindergarten students at risk for reading difficulties. No differences were uncovered among the groups at pre-test on any of the dependent variables. Results demonstrated significant differences from pre- to post-test on four of the seven dependent measures. Students who received tutoring four days a week showed larger gains than did the control group on WRMT-R Word Identification, Passage Comprehension, and the WRMT-R Basic Reading Schools Cluster measures. Even students who received tutoring twice a week were found to have improved more than the control group on the CTOPP Blending Sounds subtest.

In another study of supplemental reading instruction, Vaughn, et al. (2003) compared the effects of group size (1:1, 1:3, and 1:10) on struggling second-grade readers who received the same supplemental reading intervention. Results showed that groups with teacher-student ratios of 1:1 and 1:3 outperformed the 1:10 groups on passage comprehension. It is noteworthy that no differences in achievement appeared between students taught in groups of three and those taught one-on-one.



Similarly, Linan-Thompson and Hickman-Davis (2002) found that most of the English language learners in their study benefited from supplemental reading instruction, although not all students benefited equally. Of students who made less than six months' growth during the three-month intervention on word attack and passage comprehension, seven percent of students in 1:1 supplemental instruction, 20 percent of students in 1:3 supplemental instruction, and 32 percent of students in 1:10 supplemental instruction failed to make minimal gains.

Supplemental instruction clearly benefits struggling students. These studies demonstrate the importance of early, intense intervention. Allocations of resources for at-risk students should be examined in all schools. As Otaiba, et al. (2005) demonstrated, community tutors may be a viable option. Grouping size should be also considered; it is clear that teaching students in small groups gives students more opportunities to practice skills and more intense support, leading to increased reading achievement (Otaiba, et al., 2005; Linan-Thompson & Hickman-Davis, 2002). The broader implications are that teaching specific reading strategies in small groups will likely improve comprehension for struggling readers.

## Technology-assisted instruction

- *Chambers, Slavin, Madden, Abrami, Tucker, Cheung, et al. (2008)*

Chambers, et al. (2008) evaluated the effects of two types of technology application for teaching beginning reading: computer-assisted tutoring and the use of brief phonics and vocabulary videos shown during classroom instruction by the teacher. Both applications added more than half a standard deviation to students' reading performance. Comprehension received the largest increase in effect size: students who experienced the technology scored more than a full standard deviation higher than those who received the identical classroom instruction and tutoring without technology.

Although not all of the outcomes were statistically significant, the results justify optimism about technology's potential for enhancing teachers' lessons. Incorporating multimedia content into class lessons and tutoring sessions seems to help make concepts clear and memorable to students, employing the well-known finding that students retain visual and auditory content provided together better than they retain either type of content alone. This study also supports findings on engagement: students who are actively engaged in their learning have better reading outcomes than do passive learners.

## Multi-sensory learning

- *Joshi, Dahlgren, and Boulware-Gooden (2002)*
- *Glenberg, Gutierrez, Levin, Japuntich, and Kaschak (2004)*
- *Glenberg, Brown, and Levin (2007)*

Joshi, Dahlgren, and Boulware-Gooden (2002) provide an empirical demonstration that systematic, research-based reading instruction is crucial at the early elementary grade levels and that systematic synthetic phonics instruction (in particular, instruction following the principles of the Orton-Gillingham method) for the very early grades is effective in combating reading failure. In their one-year study of first graders, the authors found that multisensory teaching techniques that combined all three learning modalities—auditory, visual, and kinesthetic, first-grade students made significant gains in phonological awareness, decoding, and reading comprehension. However, first-grade students in the control group also made significant gains in reading comprehension.

A study conducted by Glenberg, et al. (2004) on object manipulation versus read-reread demonstrated that object manipulation can greatly enhance first and second graders' reading performance. Students using the manipulation technique scored higher on critical action-sequence questions and temporal order questions than those who did not. Glenberg, et al. (2006) also found that object manipulation had a positive effect on students' reading comprehension when used in smaller groups. This was true for students in both individual and peer settings.

Object manipulation appears to help students draw inferences necessary to construct integrated mental models. A mental model is often conceptualized as a representation that goes beyond information explicit in the text by incorporating a student's inferences and world knowledge: thus the mental model becomes a representation of what the text is about rather than a representation of the text itself.

This research has demonstrated an approach to language comprehension—the use of physical manipulation and even imagined manipulation—that suggests a powerful teaching technique. However, before recommending this technique for classroom use, researchers must demonstrate that it works with longer and more realistic texts and that the results of using the technique do not fade as students become more familiar with the process. Furthermore, research needs to demonstrate that students can be taught to move from physical representations of story-relevant objects to mental images.



## Conclusions

We know that teaching students specific reading strategies, such as finding the main idea, summarizing, and analyzing text structure—and when to use them—helps students become successful readers. Metacognitive strategies concern the reader’s planning, monitoring, and evaluation of the tasks at hand. Several intervention studies predating the NRP report (Duffy, et al., 1987; Palincsar & Brown, 1984; Pressley, 1998) suggest that instruction in metacognitive and reading strategies improves reading comprehension.

The National Reading Panel’s synthesis (NICHD, 2000) of comprehension research studies indicates explicit or formal instruction in the application of a multiple-strategy method has been shown to be highly effective in enhancing understanding. The following seven categories appear to provide a scientifically based foundation for the improvement of comprehension:

- *Comprehension monitoring: Students learn how to be aware of their understanding of the material*
- *Cooperative learning: Students learn reading strategies reciprocally*
- *Use of graphic and semantic organizers: Students generate representations of the material to assist comprehension*
- *Question answering: Students respond to questions posed by the teacher and receive immediate feedback*
- *Question generation: Students ask themselves questions about various aspects of the text*
- *Story structure: Students are taught to use the structure of the story as a means of helping them recall story content in order to answer questions about what they have read*
- *Summarization: Students are taught to integrate ideas and generalize from the text information*

The findings also suggest that these techniques, when used in combination, can be effective in improving comprehension of other content areas and standardized comprehension tests.

Results from this current review of the research demonstrate that how teachers teach reading is very important. Teachers who engage their students in learning to read, provide small group instruction and explicit skill instruction in comprehension, and provide modeling and coaching yield students with better outcomes in learning to read. Building on earlier research studies, Guthrie and colleagues (2006) demonstrated that combining motivation practices with strategy instruction in comprehension increases reading comprehension. Several studies also demonstrated that beginning readers were able to successfully transfer knowledge of comprehension strategies from one literacy activity to another after repeated exposure, explicit explanation, teacher modeling, and questioning.

Results from this review should inform both pre- and in-service teacher professional development. Teacher training should prepare teachers to engage students strategically rather than mechanically in approaching comprehension tasks.

While our understanding of word recognition skills has grown dramatically, our knowledge of how to develop oral language and background knowledge to foster reading comprehension remains limited. More attention must be paid to elementary students' comprehension skills.

The field needs more research on comprehension interventions that are scientifically valid and practical as well as more information on the precursors of comprehension and how reading comprehension develops.



## Appendix

### **Studies grouped by area of research interest**

**Studies grouped by area of research interest**

Category	Citation	Purpose
<b>At-risk learners</b>	Berninger, Vermeulen, Abbott, McCutchen, Cotton, Cude, Dorn, & Sharon (2003)	To evaluate the relative effectiveness of three instructional approaches to supplementing the regular reading program for second graders with low word reading or pseudoword reading skills.
	Schacter & Jo (2005)	To evaluate the impact of a research-based summer reading day-camp intervention on the reading performance of students from economically disadvantaged backgrounds.
	Berninger, Abbott, Vermeulen, & Fulton (2006)	To investigate issues related to improving reading comprehension in second graders at risk because of problems in learning to read words.
	Burns, Dean, & Foley (2004)	To investigate the effect of pre-teaching unknown key words as a strategy with students identified as learning disabled in basic reading skills and reading comprehension.
	Cain & Oakhill (2006)	To investigate the consistency of skill impairment in a sample of poor comprehenders to identify any fundamental skill weakness that might be associated with poor text comprehension and depressed reading development.
	Vaughn, Linan-Thompson, Kouzekanani, Bryant, Dickson, & Blozis (2003)	To investigate how struggling second-grade readers who are provided the same supplemental reading intervention compare when assigned to one of three grouping conditions: 1:1, 1:3, or 1:10.
	Linan-Thompson & Hickman-Davis (2002)	To determine the effects of three grouping formats, 1:1, 1:3, or 1:10 on the reading outcomes of monolingual English speakers and English language learners in second grade who were struggling with reading.
	Laing & Kamhi (2002)	To examine whether think-aloud procedures would uncover differences in the kinds of inferences generated by average and below-average readers, and to compare the number and types of inferences produced by average and below average readers.
	Otaiba, Schatschneider & Silverman (2005)	To investigate the effectiveness of an intervention provided by community tutors to kindergarten students at risk for reading difficulties.



**Studies grouped by area of research interest (continued)**

<b>Category</b>	<b>Citation</b>	<b>Purpose</b>
<b>Multiple strategies</b>	Van Keer & Verhaeghe (2005)	To evaluate the effectiveness of explicit reading comprehension strategies instruction, followed by practices in teacher-led whole-class activities, reciprocal same-age peer-tutoring activities, or cross-age peer-tutoring activities on 2nd and 5th graders' reading comprehension (and perceptions of self-efficacy).
	Guthrie, Wigfield, Barbosa, Perencevich, Taboada, Davis, Scaffiddi, & Tonks (2004)	Study 1: To investigate the extent to which combining motivation support and strategy instruction is influenced by reading outcomes. Emphasis was placed on cognitive strategy use, reading motivation, and reading comprehension. Strategy instruction was intended to support students' development of self-efficacy for reading comprehension. Study 2: To compare the effect of concept-oriented reading instruction to strategy instruction and to traditional instruction on reading comprehension, reading strategies, and reading motivation.
	Guthrie, Wigfield, Humenick, Perencevich, Taboada, & Barbosa (2006)	To compare reading comprehension instruction that combined support for motivation and cognitive strategies in reading with alternative reading comprehension instructional frameworks; effects were measured on multiple reading outcomes.
<b>Multi-sensory</b>	Joshi, Dahlgren, & Boulware-Gooden (2002)	To investigate the effectiveness of multisensory teaching techniques and learn whether, following a year of instruction delivered through multisensory techniques, first-grade students would perform significantly better in the basic reading skills of phonological awareness, decoding, and comprehension compared with a group of students taught in the conventional manner.
	Glenberg, Gutierrez, Japuntich, Levin, & Kaschak (2004)	The theoretical background for this research was the Indexical Hypothesis, which asserts that meaning arises from simulating the content of sentences by indexing words to the objects and actions they represent, deriving affordances, and meshing those affordances as directed by syntax of the sentence. The object manipulation condition guaranteed meaningful comprehension as described by the Indexical Hypothesis. In addition, to extend finding from earlier associative-learning research to suggest that both manipulation and imagined manipulation can greatly enhance young students' reading performance, as reflected in their memory for what they have read and their ability to derive text-based inferences and to determine whether manipulation versus read-reread differences were generally statistically significant.
	Glenberg, Brown, & Levin (2006)	To assess if hands-on manipulation of story-relevant objects can enhance reading comprehension of short story text in small reading groups.

**Studies grouped by area of research interest (continued)**

<b>Category</b>	<b>Citation</b>	<b>Purpose</b>
<b>Teacher practice</b>		
	Taylor, Pearson, Peterson, & Rodriguez (2003)	To investigate the effects of teacher practice on students' reading achievement. To investigate the extent to which reading instruction that maximizes elementary students' cognitive engagement and enhances their growth in reading and writing; to determine which aspects of reading instruction have the largest effect on students' reading growth.
<b>Technology</b>		
	Chambers, Slavin, Madden, Abrami, Tucker, Cheung, & Gifford (2008)	To evaluate the combined effects of the Reading Reels embedded multimedia content and the Alphie's Alley computer-assisted tutoring model.
<b>Text structure</b>		
	Williams, Hall, Lauer, Stafford, DeSisto, & deCani (2005)	To investigate the effectiveness of an instructional program designed to teach second graders how to comprehend compare and contrast expository text and to determine whether one common type of expository structure could be taught to primary-grade students without a loss of content knowledge about the text itself.
	Hall, Sabey, & McClellan (2005)	To investigate the effectiveness of an instructional program designed to teach second grade students expository text comprehension during guided reading (small-group) instruction, compared with a traditional guided-reading instructional program and a no-treatment control group. The focus was on background knowledge and vocabulary.
	Williams, Hall, & Lauer (2004)	To determine whether instruction focused on text structure helps second-grade students improve their comprehension of compare and contrast expository text.
	Paris & Paris (2007)	To provide evidence about emerging comprehension by testing whether classroom instruction on narrative thinking can enhance first-grade students' comprehension skills and to investigate whether explicit instruction in strategies and knowledge for understanding narrative stories leads to direct benefits in students' comprehension skills. The latter question asks whether instruction intended to target narrative comprehension skills generalizes to expository comprehension skills.
	Garner & Bochna (2004)	To examine the effect of instruction in narrative text structure on first graders' listening and reading comprehension, with a view to documenting strategy instruction and transfer of learning in beginning readers, and to determine whether first-grade students would, following instruction in the context of listening to stories, gain in listening comprehension and transfer this comprehension gain to support reading comprehension.

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