



SYNOPSIS OF IMPROVING COMPREHENSION OF EXPOSITORY TEXT IN STUDENTS WITH LEARNING DISABILITIES: A RESEARCH SYNTHESIS

INTRODUCTION

As young readers move from the primary grades to upper elementary and middle school, they also move from learning to read to reading to learn. Gaining meaning from text, the goal of reading, becomes increasingly critical to their academic success. Greater demands are placed on their reading comprehension skills. Many students with learning disabilities find this transition especially difficult. To help them succeed, instructional leaders need to be able to offer interventions that will remedy deficits in students' knowledge and their application of strategies for comprehending expository text across the curriculum.

*To identify the components of effective interventions for these students, Gajria, Jitendra, Sood, and Sacks synthesized 29 studies that addressed instructional approaches for enhancing reading comprehension in upper elementary, middle, and high school students with learning disabilities. The authors describe two main types of interventions: **content enhancement** and **cognitive strategy instruction**. Both were found to be somewhat to highly effective in this population. This synopsis describes the results and their implications for helping students with LD improve their reading comprehension in content-area instruction.*

Gajria, M., Jitendra, A., Sood, S., & Sacks, G. (2007). Improving comprehension of expository text in students with LD: A research synthesis. *Journal of Learning Disabilities*, 40, 210-225.

METHOD & RESULTS

Gajria et al. limited their review to interventions that focused on improving comprehension of expository text in students who were identified as having learning disabilities (LD). All studies in the synthesis involved a control or comparison group of students with LD, and all measured student outcomes with at least one test of reading comprehension using expository text. In all, the 29 studies included in the synthesis involved 1,450 students with LD. Most students received the interventions in small groups in a resource or special education classroom. Researchers were most often the providers of the intervention. The 29 studies contained 34 distinct interventions. The average effect size¹ across interventions was 1.64 (SD=1.19).

The authors further categorized interventions into those that provided content enhancement and those that provided cognitive strategy instruction². Content enhancement interventions involved the introduction of tools such as advance organizers to preview lesson content, visual displays that depict the organization of the content, mnemonic

devices to make the content easier to remember, and computerized instruction for independent practice. Eleven studies included in the synthesis involved content enhancement interventions. Their average effect size was 1.06 (SD=0.63), generally considered a large effect. In the three studies that looked at longer-term maintenance³ effects, the average effect size at follow-up was 1.08 (SD=0.65). Seven of the 11 studies evaluated the use of advance organizers, semantic feature analysis, and other kinds of visual displays that help students make connections between key concepts and vocabulary in expository passages; the average effect size for these studies was 1.12 (SD=0.66). Mnemonic devices were used in three interventions, with an average effect of 1.19 (SD=0.53). Only one study involved computer-aided instruction. See Table 1 for a list of content enhancement studies by type and their effect sizes.

Interventions that focused on cognitive strategy instruction, the second broad category of studies in the synthesis, taught students to learn from their reading by engaging with expository text in new ways.

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¹ An effect size quantifies the strength of an intervention's effectiveness by calculating the magnitude of the difference between the intervention group and the comparison group. Generally, an effect of 0.20 is considered small, 0.50 moderate, and 0.80 large.

² For examples of both types of interventions and information on how to implement them, see *Effective Instruction for Adolescent Struggling Readers: Professional Development Module*, slides 86–132, available at www.centeroninstruction.org

³ A maintenance effect measures the continued impact of an intervention on student performance at a time point after the conclusion of the intervention and the initial measurement of the effect of the intervention. It assesses the extent to which students continue to benefit from the intervention after it concludes.

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These interventions instructed students in higher-order thinking skills such as identifying main ideas, summarizing, creating questions to answer as they read, drawing cognitive maps, or recognizing different types of text structures and knowing how to engage appropriately with each. One goal of these types of interventions is to make students more aware of ways to learn so that they can self-regulate their learning effectively. Ten studies in the synthesis (involving 15 different interventions) taught students a single cognitive strategy for comprehending expository text; eight taught multiple strategies.

Results for interventions involving instruction in a single cognitive strategy indicated a large effect on average, 1.83 (SD=1.05). The strategy most often taught in these interventions (n=6) involved identifying, summarizing, or paraphrasing the main idea of an expository passage. The average effect of this type of strategy instruction was 2.56 (SD=1.09), the largest of any intervention type included in the synthesis. Other types of strategies were taught in only two or three studies, with generally large effects. In the eight studies where multiple cognitive strategies were taught in an integrated manner, the average effect size was 2.11 (SD=1.74). For the nine cognitive strategy interventions where maintenance effects were evaluated, the average effect size at follow-up was 2.69 (SD=1.09); six of these interventions taught a single strategy and three taught multiple strategies. Transfer effects⁴ were measured in three studies (five interventions), with an average effect size of 1.75 (SD=0.54). See Table 2 for a list of the studies that involved cognitive strategy instruction.

Gajria et al. further investigated effects by student characteristics. Effect sizes were large across grade levels, with average effects for upper elementary school of 1.04 (SD=0.64, n=6), middle school of 1.70 (SD=1.37,

n=15), and high school of 1.48 (SD=0.61, n=7). In the 22 interventions that reported the average IQ score of students, effect sizes were similar for the nine interventions where average IQ was below 92 and the 13 interventions where average IQ was greater than 92. When interventions used expository texts that were modified or constructed for the study, effect sizes on average were higher than when standard classroom materials were used. An analysis of effect sizes by length of intervention indicated higher effects for briefer interventions (less than 4 hours) than for interventions of 4-8 hours or more than 8 hours. However, confounding variables such as instructional method and type of outcome measure used make this finding difficult to interpret meaningfully.

Additional analyses were conducted to determine the impact of instructional features and the type of research methodology on the effectiveness of interventions. Similar average effect sizes were found for small group instruction compared with instruction in pairs or one-on-one, although about two-thirds of the interventions were provided in small groups. Average effects were somewhat larger for interventions conducted in special education classrooms rather than general education classrooms and other settings. Similar effects were found whether or not students were randomly assigned to treatment and comparison conditions and whether or not treatment fidelity was assessed, although most studies used random assignment and assessed fidelity. See Table 3 for average effects by student characteristics, instructional features, and research design.

⁴ A transfer effect measures the impact of an intervention on student performance in a new learning situation that differs from the context in which the intervention was provided. It indicates the extent to which students are able to use what they learned during the intervention in other learning situations.



IMPLICATIONS FOR PRACTICE

The data summarized in Gajria et al.'s synthesis offer research-based guidelines for providing reading comprehension interventions to students with LD who are struggling to understand the meaning of expository text in their content-area classes. The high level of effectiveness (as seen in large effect sizes) demonstrated across types of interventions and other variables, such as student and instructional characteristics, provides a level of confidence that interventions similar to those described in the research will have a positive effect on the reading comprehension skills of students with LD. Both interventions that focused on enhancing the content of the expository reading material and those that focused on teaching cognitive strategies for understanding expository text showed positive effects.

Gajria et al. point out, however, that students who receive content enhancement might come to rely on those tools and need them in every situation where they must grasp the meaning of text while receiving content-area instruction. Cognitive strategy instruction, which focuses to a greater extent on teaching students with LD how to learn, may lead to greater autonomy by giving students tools they can learn to apply in new reading-to-learn situations. Given that few studies measured transfer-of-learning effects, the effectiveness of cognitive strategy instruction in helping students apply strategies to new situations has not largely been documented. In theory, however, it is reasonable to expect that strategy instruction would be more likely to transfer to new learning situations than content enhancement, unless the content enhancement were provided again in the new situation.

In implementing the findings of this synthesis, education administrators are encouraged to consider two

important issues: the learning objectives of content-area classroom teachers and the time constraints they may face in managing the demands of teaching content while helping students with LD grasp the meaning of text. In terms of learning objectives, when content-area teachers are primarily concerned with disseminating specific information to students, a content enhancement intervention, such as a graphic organizer, may be the most appropriate intervention strategy. However, when the learning objective involves supporting longer-term knowledge of how to grasp content-area material, strategy instruction may be more appropriate. Teachers

also might marry the two types of interventions by providing strategy instruction in how to use content enhancement materials effectively and/or teaching students how to create such materials for themselves. In terms of time constraints, strategy instruction may be more time-consuming for content-area teachers than providing a content-enhancement intervention that can be re-used with new groups of students.

However, studies synthesized by Gajria and colleagues illustrate that effective use of content enhancements includes interactive instructional routines that actively involve students in thinking about text; simply providing generic graphic organizers is likely to be inadequate. Based on the results of the synthesis, both types of interventions are likely to have a positive effect on the learning of LD students. Districts and schools will need to give careful consideration to issues such as these in determining the types of interventions to recommend or require of content-area teachers and what additional interventions are needed outside the content-area classroom.

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IMPLICATIONS FOR PRACTICE

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The research in this synthesis should be encouraging to districts and schools that are pressed to find time for interventions in the tightly packed schedules of adolescent students. Two-thirds of the interventions were brief, involving fewer than eight hours of instruction. Dedicating this amount of time to helping adolescents with LD who are struggling with reading comprehension seems reasonable, especially given the evidence of effectiveness. Districts and schools can use the research summarized here to develop and provide brief interventions that minimally disrupt content-area instructional time. Teachers may also find that as students become more able to comprehend content-area text they can devote more class time to high-level concepts and skills rather than explaining simpler content found in the text. In implementing this and all suggestions described

here, it will be important to continue to monitor students' performance in comprehending expository text. Consistently prompting students to use strategies they have learned, and monitoring that use over time will help ensure the transfer of learning from the text used in the intervention to other content-area texts, and ensure that the intervention's effectiveness is maintained over time.

Districts and schools can use the research summarized here to develop and provide brief interventions that minimally disrupt content-area instructional time.





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TABLES

TABLE 1. EFFECT SIZES FOR CONTENT ENHANCEMENT INTERVENTIONS

Study	Intervention Type	Effect size at posttest	Effect size at follow-up	Effect size for transfer
Bos & Anders (1990)	Semantic mapping, semantic feature analysis	0.44	1.27	
Bos, Anders, Filip, & Jaffe (1989)	Semantic feature analysis	1.64		
Darch & Carnine (1986)	Advance organizer	1.80		
Darch & Eaves (1986)	Visual display	1.34	0.36	-0.67
Darch & Gersten (1986)	Visual-spatial display, advance organizer	1.78	0.67	
DiCecco & Gleason (2002)	Graphic organizer	0.33		
Griffin, Simmons, & Kame'enui (1991)	Graphic organizer	0.54		
Brigham, Scruggs, & Mastropieri (1995)	Mnemonic illustration	1.08		
Mastropieri, Scruggs, & Levin (1987)	Mnemonic illustration	0.72		
Scruggs, Mastropieri, McLoone, Levin, & Morrison (1987)	Mnemonic illustration	1.77	1.62	
Okolo & Ferretti (1996)	Computer-assisted instruction/multimedia	0.21		

Adapted from Gajria et al. (2007)

TABLE 2. EFFECT SIZES FOR COGNITIVE STRATEGY INSTRUCTION INTERVENTIONS

Study	Intervention Type	Effect size at posttest	Effect size at follow-up	Effect size for transfer
Single strategies				
Smith & Friend (1986)	Text structure	2.38	2.04	
Bakken, Mastropieri, & Scruggs (1997)	Text structure	2.27	3.29	2.62
Boyle (1996)	Cognitive mapping	1.01		
Boyle (2000)	Cognitive mapping	0.91		
Bakken, Mastropieri, & Scruggs (1997)	Paragraph restatement	1.36	1.23	1.76
Graves (1986)	Identifying main idea	1.64	1.49	
Graves & Levin (1989)	Main idea, self-monitoring	2.55	2.56	
Graves & Levin (1989)	Mnemonic technique	1.42		
Ellis & Graves (1990)	Paraphrasing	2.39	3.41	
Gajria & Salvia (1992)	Summarization	4.45		
Malone & Mastropieri (1992)	Summarization	2.95	1.35	
Mastropieri, Scruggs, Hamilton, et al. (1996)	Elaborative interrogation	0.42		
Darch & Kame'enui (1987)	Critical thinking skills	1.64		
Wong & Jones (1982)	Self-questioning	0.49		
Simmonds (1992)	Question-answer relationship	1.53		
Multiple strategies				
Graves (1986)	Identifying main idea, self-monitoring	4.59	3.60	
Malone & Mastropieri (1992)	Summarization, self-monitoring	1.90	1.27	
Jitendra, Hoppes, & Xin (2000)	Summarization, self-monitoring	3.51	2.07	1.75
Ellis & Graves (1990)	Paraphrasing, repeated readings	4.17	4.52	
Labercane & Battle (1987)	Reciprocal teaching, question-answer relationship	0.39		
Englert & Mariage (1991)	Reciprocal teaching; predict, organize, search/summarize, evaluate	1.21		
Klingner, Vaughn, Arguelles, Hughes, & Leftwich (2004)	Collaborative strategic reading	0.51		
Lederer (2000)	Reciprocal teaching	0.57		

Adapted from Gajria et al. (2007)



TABLES

TABLE 3. AVERAGE EFFECT SIZES BY STUDENT, INSTRUCTIONAL, AND RESEARCH DESIGN CHARACTERISTICS

		Effect size at posttest	SD	N
<i>Student characteristics</i>				
Grade level	Upper Elementary	1.04	0.64	6
	Middle School	1.70	1.37	15
	High School	1.48	0.61	7
IQ	<92	1.62	1.11	9
	>92	1.73	1.14	13
<i>Instructional characteristics</i>				
Instructional materials	Derived from curriculum	0.97	0.61	12
	< 4 hours	1.61	0.91	9
	4-8 hours	1.34	0.58	5
Length of intervention	> 8 hours	1.41	1.64	8
	Small groups	1.52	1.18	21
Instructional group size	Individual or paired	1.67	0.90	8
	Special education classroom	1.89	1.20	13
Instructional setting	General education classroom	0.78	0.30	6
	Other	1.47	1.11	8
<i>Research design characteristics</i>				
Assignment to conditions	Random	1.59	1.16	22
	Non-random	1.17	0.73	7
	Assessed	1.62	1.26	12
Treatment fidelity	Not assessed	1.41	0.96	17

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