Metacognition in Literacy Learning

Theory, Assessment, Instruction, and Professional Development

Edited by
Susan E. Israel • Cathy Collins Block
Kathryn L. Bauserman • Kathryn Kinnucan-Welsch

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To my husband, Kevin, daughters, Elizabeth, Michelle, and Stephanie, who encourage me to practice the virtues of humility, kindness, and the pursuit of wisdom through the utilization of one's talents.
—Susan E. Israel

I dedicate this book to all teachers who work daily to advance the reading abilities of all students. May the work we have done in this book assist you in your diligent instruction. Our goal is that the research can be put to use in your classroom so all students can become avid and highly skilled, metacognitive readers. To that end, we dedicate our efforts.
—Cathy Collins Block

I would like to dedicate this book to my mother, Helen M. Snyder, the first and most important teacher in my life. From an early age, she instilled in me a passion for reading, an inquisitive mind, and an infinite desire to be a lifelong learner.
—Kathryn L. Bauserman

I dedicate this book to teachers and other professionals who help us all understand how teachers continue to learn through practice.
—Kathryn Kinnucan-Welsch

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Preface

In 1979, Flavell coined the term *metacognition*. In his landmark paper on metacognition he stated, "Increasing the quantity and quality of children's metacognitive knowledge and monitoring skills through systematic training may be feasible as well as desirable" (p. 906).

The purpose of this book on metacognition and literacy learning is threefold. First, it is meant to help reading educators develop higher level thinking and reading strategies in their classrooms. Second, it is a response to current research that demonstrates how metacognition can improve both students' and teachers' thought and reading processes with the goal of improving reading achievement. Third, it is a response to the call to increase the quality and quantity of children's metacognitive knowledge, and monitoring skills and approaches for instructional change.

This book is important in the field of literacy and education because there are no comprehensive volumes published on the topic of metacognition and literacy learning. *Mosaic of Thought* (Keene & Zimmerman, 1997) focused on strategy application in a Reader's Workshop and begins to develop the notion of metacognition. This book goes beyond isolated metacognitive strategies by taking an integrated approach in reading and literacy. Learning to incorporate metacognition is a challenging task for all teachers, especially those who teach literacy and reading instruction. Therefore, the recommended audience of the book will be reading teachers, reading specialists, reading researchers, and a text to be used in graduate level reading courses.

This book is a comprehensive volume that includes four significant areas. The first part summarizes the theoretical foundation of metacognition. The second

part provides a variety of assessment tools to measure metacognition. The third part builds on how assessment drives instruction, using the new and innovative instructional strategies and models of how metacognition can be integrated with instruction. The final part is devoted to professional development with reading teachers, reading professionals, and preservice teachers.

Each chapter has special features to help the reader develop metacognitive thoughts while engaged in the text. The features of each chapter are as follows:

- **Metacognitive Teacher Reflection:** Reflections at the beginning of each chapter illustrate what teachers are thinking about the topic discussed in the chapter. Teacher reflections activate the reader's prior knowledge about the topic, and they set the stage for reader expectations.
- **Metacognitive Connections:** Closing each chapter is a metacognitive connection that links the prior chapter's discussion with the current chapter, and gives the reader an idea of what they can expect to learn about in the next chapter. Metacognitive connections help the learner connect the new information gained with previous learning. This special feature also provides a model that demonstrates how metacognition is applied to authentic learning situations.

When the authors were contacted to contribute to the volume, they responded with overwhelming support and interest. As the book progressed, the interest and support extended far beyond a professional level. Many contributors took a very personal interest in the completion and success of the publication. One memorable conversation occurred during the 2004 International Reading Association's 49th Conference in Reno, Nevada. I made it a point to introduce myself to Jay S. Samuels, a contributor in chapter 3, after his presentation. After a brief introduction, Jay commented, "The book will be a true contribution to the field of reading and literacy. I am truly impressed with the level of commitment from such notable scholars who have made contributions to your volume on metacognition." As our conversation continued, I provided him with an update on the status of the book and the chapters. Being curious, Jay asked me if all the chapters had in fact been written. I responded, "All but one author who needed a short extension due to many commitments." Jay continued to press me for information about the delayed chapter and the author's identification. After some trepidation, I revealed the contributor(s). Jay said, "That chapter is worth the wait."

The overwhelming response by the contributors to this volume affords us the opportunity to provide a path for metacognition to "be feasible as well as desirable" for literacy teachers who wish to develop metacognition in literacy learning. For that, I am personally grateful. We think our book on metacognition and literacy learning is long overdue, but it has been "worth the wait."

Susan E. Israel
Assistant Professor, University of Dayton

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Keene, E., & Zimmerman, S. (1997). *Mosaic of thought: Teaching comprehension in a reader's workshop*. Portsmouth, NH: Heinemann.

Acknowledgments

The intention of this volume is to open awareness to metacognition and literary learning by bringing together research findings from reading, linguistics, psychology, and education. The editors of this volume wish to thank, first and foremost, all the contributors. Their commitment to the publication of a book on metacognition exceeded our expectations. In addition, we would like to express our gratitude and appreciation to the senior editor, Lane Akers, whose enthusiasm and interest in the project expedited the volume's publication. We are also grateful to Dixie Massey, of North Carolina A & T State University, and Kelly Cartwright, of Christopher Newport University, for assisting us with the collection of metacognitive teacher reflections. Dr. Kathryn Kinnucan-Welsch would like to thank Anna L. Fohmin, Graduate Assistant in the Matas Program in Early Childhood Education at the University of Dayton, for her assistance with the organization of Part IV. We would also like to thank our family members, who provided us with support and love during the genesis of the book. We would like to express our gratitude for your support and positive response to what we think will be a classic book in the field of literacy and education. Lastly, we would like to thank John Flavell, the pioneer in metacognition, for writing the review that highlights the depth of knowledge on metacognition that has emerged since his first landmark publication on the subject.

—Susan E. Israel
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About the Editors

Susan E. Israel is the graduate reading coordinator and assistant professor at the University of Dayton. In addition, she has served the Alliance for Catholic Education at the University of Notre Dame, where she has taught language arts courses and supervised graduates who learn how to teach and serve in under-resourced Catholic Schools around the country. She was awarded the teacher researcher grant from the International Reading Association, where she has served and been a member for over a decade. Her most recent research involves understanding developmental aspects of reading comprehension, metacognition, as well as research in neuroscience as it relates to reading processes.

Cathy Collins Block is a professor of education at Texas Christian University. She was elected to serve on the board of directors of the International Reading Association from 2002–2005. She has served, or is presently serving, on the board of directors of the National Reading Conference, Nobel Learning Communities, IBM Educational Board of Directors, and the National Center for Learning Disabilities. She presently serves on the editorial boards for the *Journal of Educational Psychology, Reading Research Quarterly, The Reading Teacher, National Reading Conference Yearbook, and America Tomorrow*. She has written more than 30 books relative to reading comprehension and teacher education. She has also served on authorial writing teams for elementary reading curriculum materials, and has published more than 90 research articles.

Kathryn L. Bauserman is an assistant reading professor at Indiana State University, teaching graduate and undergraduate classes in the areas of emergent reading, literacy integration in the curriculum, and reading intervention strategies

based on assessment. She is an active member of several organizations that promote reading: the International Reading Association, serving as a reviewer, and the National Reading Conference, serving on the field council committee. Recent areas of research and writing include metacognition and vocabulary.

Kathryn Kinnucan-Welsch is associate professor of education and chair in the department of teacher education at the University of Dayton. She is currently working with literacy coaches in a statewide literacy professional development initiative, and is a member of the Governor's Literacy Partnership. Her research and publications have focused on the professional development of practicing teachers.

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I

Metacognition and Theory

The foundation of this book rests on the theoretical foundations of metacognition. This section discusses the foundation of metacognition and puts theory in context with literacy learning. Metacognition is defined within the context of cognitive structures within a reading framework. In part I the guiding theoretical principles explain the automatic processes of reading, the role of comprehension in conjunction with metacognition and literacy learning, and the developmental aspects of metacognition. Part I is distinctive in that the theoretical framework of metacognition explains monitoring functions of learning through metacognition and strategy instruction. A range of metacognitive models—some never before published and some that are newly updated and improved—have been included.

Part I provides an excellent classroom resource for the foundational scaffolds that can be used to guide metacognitive assessments, instruction, and professional development that are later described in the corresponding chapters. Griffith and Ruan's chapter 1 contains a definition of metacognition and what is involved in skilled reading, and touches on the relation between reader interests and metacognition. Randi, Grigorenko, and Sternberg (chap. 2) discuss how the process of comprehension can help increase metacognitive awareness and strategic processes. This chapter is guided by the theoretical foundations of compre-

hension and explains the role of metacognition in the application of instruction. Chapter 3, by Samuels, Ediger, Willcutt, and Palumbo, focuses on the theoretical foundations of automaticity and metacognition, as well as instructional strategies that develop automatic processes of metacognition. This chapter is unique in that a new model of automaticity and metacognition have been explained. After the reader has developed a theoretical foundation of metacognition, Baker (chap. 4) places metacognition in perspective with a child's developmental differences.

Once literacy learners have gained a solid understanding of the theoretical foundations of metacognition and how this relates to developmental differences, they are ready to better understand how assessment tools can be used to identify areas of metacognition. Therefore, part II summarizes the area of metacognition and assessment.

1

What Is Metacognition and What Should Be Its Role in Literacy Instruction?

Priscilla L. Griffith
Jiening Ruan
The University of Oklahoma

If only there was a book called "What Students Think" with a how-to-guide, then everyone would want to be a teacher. But of course that's our challenge! Chapter 1 is essential for every educator because the more we understand the thought processes in our students the better we as teachers can instruct our lessons to reflect all the ways our students are decoding what the heck we are trying to teach! If we can read up-to-date research on how our students are thinking and how they are learning about what they're thinking we can adjust our delivery accordingly and frequently.

There is exemplary information on decoding strategies and ways for teachers to elicit think out louds, but we need concise research on metacognition. *We need to know the different ways our children are self-monitoring a lesson on Shakespeare, the Civil War, or ladybugs. So we as teachers can "teach to their brain." A book solely devoted to this concept and a chapter specifically targeted to what has been studied gives a great helping hand to our further understanding of metacognition; research gives us the confidence to use strategies in our classroom.*

I hope to find in this chapter research to give credit to what I am doing in my classroom, but more importantly let me see other successful methods. If I can peer into my student's mind with the help of chapter 1, hopefully I can continue my quest in being an exemplary reading teacher.

—Lindsey M. Hale

In 1979, John Flavell published "Metacognition and Cognitive Monitoring: A New Area of Cognitive-Developmental Inquiry." He defined metacognition as "knowledge and cognition about cognitive phenomena" (p. 906) and tied the term to self-regulated learning through the phrase "cognitive monitoring."

Flavell (1979) described a model of cognitive monitoring that incorporated metacognitive knowledge and metacognitive experiences. In this model, metacognitive knowledge is characterized as combinations of information around three knowledge variables—self, task, and strategies—that will be effective in achieving the goals of the task. Metacognitive experiences are "items of metacognitive knowledge that have entered consciousness" (p. 908), and may include an evaluation of where one is in completing a task, or perhaps just a sense of confusion on which the person may or may not act. According to Flavell, metacognitive experiences alter a person's metacognitive knowledge base. We provide an example from our own reading of Flavell's article to illustrate how metacognition impinges on reading.

As we read, we asked ourselves, just what does Flavell's definition mean? *Webster's New Collegiate Dictionary* (1973) became our source of information about key terms in that definition:

- Knowledge—the fact or experience of knowing something with familiarity gained through experience or association
- Cognition—the act or process of knowing including both awareness and judgment
- Phenomenon—fact or event

Putting the terms together, we constructed our definition: Awareness and judgment about an event gained through experience. We compiled enough information about the term to enable us to continue reading with meaning.

What we have described in this brief example of our own reading is how metacognitive processes actually work during ongoing reading. We realized that some parts of the text were confusing. We were monitoring. Metacognition was being defined using cognition, a word that was part of the term. We needed a clarification before reading much further. We self-regulated, that is, we stopped our reading to get more information. Consulting a dictionary had worked well for us in the past, and that is what we tried this time. We deployed a strategy. We put together an understanding of the term, which we checked by rereading the text. Our constructed definition was adequate and we continued reading. (An aside: How close was our definition to that of Harris and Hodges', 1995, in *The Literacy Dictionary: The Vocabulary of Reading and Writing*? Close enough, we believe, for comprehension to occur. Harris and Hodges defined metacognition as "awareness and knowledge of one's mental processes such that one can monitor, regulate, and direct them as a desired end; self-mediation," p. 153.)

Since Flavell's article, the notion of metacognition has been applied to learning across the content areas. The goal of this chapter is to clarify and expand understanding of the role of metacognition in literacy. The chapter has four main sections. It begins with a survey of the research on metacognition and reading. Next it examines the current state of metacognitive and literacy instruction. The

third section is a discussion of metacognitive literacy instruction and practice, that is, the role of metacognition in literacy instruction. Finally, directions for future research on metacognitive literacy instruction are considered.

RESEARCH REVIEW

The focus of this chapter is the grounding of metacognitive research within literacy instruction. As we surveyed the research literature, our own metacognitive abilities led us to construct pertinent questions around which we organized the information on metacognition. Our questions are as follows:

- What is involved in skilled reading and what is the role of metacognition in skilled reading?
- How has metacognition been described as it applies to reading?
- What is a reading strategy? What is a reading skill?
- What is the relation between reader interest and metacognition?

What Is Involved in Skilled Reading and What Is the Role of Metacognition in Skilled Reading?

Skilled reading consists of the interaction of macro- and microprocesses with prior knowledge that results in the reader constructing a mental picture of the text (Irwin, 1991; Kintsch & van Dijk, 1978; van den Broek & Kremer, 2000). At the macrolevel, the reader relies on summarization and the author's organizational structure to construct a coherent representation of the text. Working at the sentence, or microlevel, the reader attempts to make sense of individual idea units, first by grouping words into meaningful phrases and then by tying together the idea units. At both the macro- and microlevels, the reader must connect the information in the text to concepts in background knowledge. Along the way, the reader makes inferences and elaborations that make sense based on prior knowledge and information in the text (Pearson & Johnson, 1978; Raphael, 1986; Reder, 1980). Fluent reading and a well-developed meaning vocabulary facilitate this process (Pressley, 2002). Figure 1.1 represents this ongoing process.

The execution of any complex skill requires the coordination of many component processes. Attention plays a crucial role in this coordination. Yet, human attentional capacity is limited (LaBerge & Samuels, 1985; van den Broek & Kremer, 2000). Readers must constantly make decisions that impinge on their comprehension of text: when to reread a portion of text, when and what type of inference to make, what information of importance to retain in memory and what information of lesser importance to discard, when to move on in the reading of text and at what rate. Each of these decisions requires selective allocation

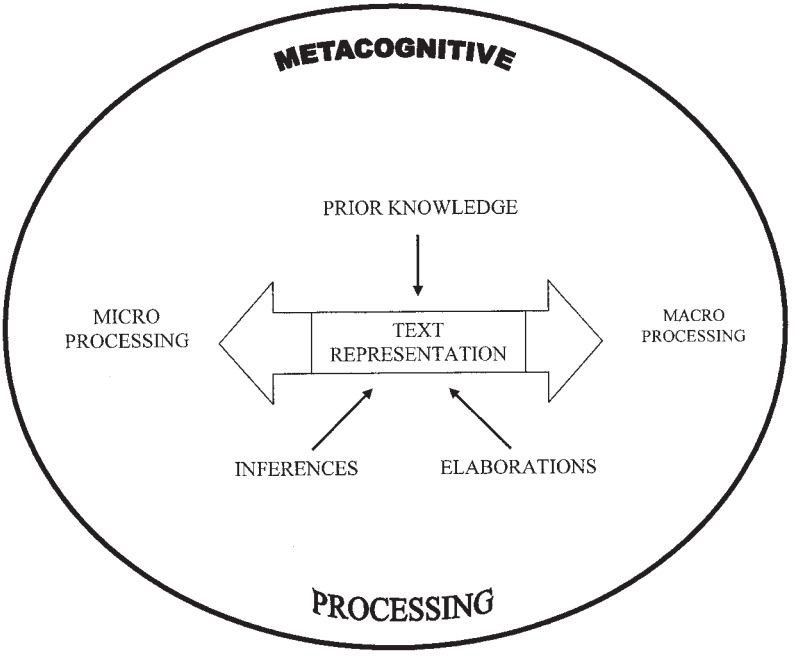

FIG. 1.1. The ongoing process of skilled reading.

of cognitive resources, for example, making a determination to focus attention on text that is important or hard to understand (Wade, Schraw, Buxton, & Hayes, 1993). Readers use metacognitive information to monitor their comprehension for success or failure, and to distribute attentional resources. Note in Fig. 1.1 that we have embedded the cognitive processes of skilled reading within the frame of metacognition because skilled reading breaks down without ongoing monitoring.

Frequently, a reading event is depicted in three phrases: preparing to read, constructing meaning while reading, and reviewing and reflecting on reading (Paris, Wasik, & Turner, 1991). Pressley (2002) described the actions of a skilled reader during each phase. Figure 1.2 summarizes the characteristics of a skilled reader.

How Has Metacognition Been Described as It Applies to Reading?

A. L. Brown (1985) and Baker and A. L. Brown (1984) built on Flavell's model to discuss the relation between metacognitive skills and reading. According to Baker and Brown, metacognition consists of two interrelated clusters of information, which they referred to as *knowledge of cognition* and *regulation of cognition*.

Preparing to Read

- Is clear about the goals for reading
- Skims the text to get information about the length and structure of the text
- Activates prior knowledge

Constructing Meaning While Reading

- Reads selectively, reading quickly irrelevant information or rereading important, difficult, or interesting text
- Identifies main ideas
- Predicts
- Makes inferences
- Interprets and evaluates
- Integrates ideas into a coherent representation of the text
- Monitors understanding

Reviewing and Reflecting on Reading

- Self-questions for understanding
- Invokes strategies to review the text and comprehension
- Summarizes
- Continues to process the text based on reading goals

FIG. 1.2. The characteristics of a skilled reader. Compiled from "The Development of Strategic Readers" in *Handbook of Reading Research* (pp. 609–640), by S. G. Paris, B. A. Wasik, and J. C. Turner, 1991, New York: Longman; and "Metacognition and Self-Regulated Comprehension" in *What Research Has to Say About Reading Instruction* (pp. 291–309), by M. Pressley, 2002, Newark, DE: International Reading Association.

Knowledge of cognition is stable and statable. It is the knowledge readers have about their own cognitive resources, about the reading task, and about the compatibility between the two. Paris, Lipson, and Wixson (1994) described this as the "that," the "how," the "when," and the "why" of metacognition. To illustrate, the readers could know *that* prior knowledge is important for reading comprehension, *how* to use previewing strategies to tap into prior knowledge, and *when* and *why* to adjust their reading rate to achieve the goals set for the reading event. Once this type of information has been established, it will continue to be known, and can be discussed.

The second cluster, the regulatory mechanisms used to solve a problem with comprehension during reading, includes the deployment of a remedy that involves "checking the outcome of [strategy use,] planning one's next move, monitoring the effectiveness of any attempted action, and testing, revising and evaluating one's strategies for learning" (Baker & A. L. Brown, 1984, p. 354). Regulatory mechanisms are not necessarily stable skills. Older children and adults typically use them, but younger children may also use regulatory mechanisms if the task is simple enough. In contrast, an older child or adult, faced with

a task that is too hard, might not be able to put any regulatory mechanisms into operation (A. L. Brown, 1985).

Metacognition is considered to be a late-developing skill. Not many high school graduates and beginning college students are metacognitively mature with respect to reading. Flavell (1979) reported that preschool and elementary schoolchildren, when asked to study a set of items until they were sure they could recall them, said they could remember the items when they usually could not do so. Paris and Myers (cited in Paris & Winograd, 1990) reported that 10-year-olds failed to identify many scrambled phrases and nonsense words while reading. According to A. L. Brown (1985), college students and older high school students are better at planning ahead than younger children. They are more sensitive to fine gradations of importance in text, and in their ability to summarize.

What Is a Reading Strategy? What Is a Reading Skill?

The notion of strategy plays an important role in any discussion of reading and metacognition. Strategic readers are distinguished by their ability to match appropriate strategies to the reading situation (Paris et al., 1991). The terms *strategy* and *skill* both emerge in reviews of the reading process and reading instruction (i.e., a strategic reader, skilled reading). These terms have been used indiscriminately without regard to differential meaning, interchangeably, or quite distinctively to describe different types of processes during reading. This chapter adopts the notion of strategy employed by Paris and colleagues (Paris et al., 1994; Paris et al., 1991). According to Paris et al. (1994), an action becomes strategic when it is selected from among alternatives to attain an intended goal. Thus, the use of a strategy is intentional and purposeful. In contrast, Paris et al. (1991) described a skill as an automatic process applied unconsciously. However, they suggested the interchangeability of skills and strategies by saying that "an emerging skill can become a strategy when used intentionally" (p. 611), and that a strategy can become a skill. "Indeed, strategies are more efficient and developmentally advanced when they become generated and applied as skills" (Paris et al., 1991, p. 611).

Wade, Trathen, and Schraw (1990) took an interesting view of a strategy as being a configuration of different tactics used to meet a particular goal and monitored for effectiveness. They tested this theory by devising a list of study tactics that fell under three categories: text noting, mental learning, and reading. Undergraduate students reported retrospectively on their study methods after reading a large segment of text. Using the self-report information from the students, these researchers identified six categories of study tactics.

Wade et al.'s (1990) Good Strategy User was the closest to other characterizations of skilled, metacognitive readers (Presley, Borkowski, & Schneider, cited in

Wade et al., 1990). A Good Strategy User employed a diverse set of tactics flexibly, showed the greatest use of text-noting tactics (e.g., highlighting, paraphrasing in notes, and diagramming), but also used reading tactics (e.g., reading slowly, skimming, rereading selected portions of the text). Good Strategy Users also used mental integration (mental-learning tactic) to draw connections between ideas in the text and to mentally summarize.

However, the Good Strategy User was not the only category identified. Other skillful users of strategies included Information Organizer, Flexible Reader, Text-Noter, Mental Integrator, and Memorizer. This finding is consistent with Dole, K. J. Brown, and Trathen's (1996) assertion that higher achieving readers comprehend more when they use their preferred strategies. Although lower achievers may benefit from learning specific strategies, better readers benefit more from becoming metacognitively skillful at deploying strategies they do use.

What Is the Relation Between Reader Interest and Metacognition?

Interest is related to attention, deeper processing, and learning (Wade, Buxton, & Kelly, 1999). Deci (cited in Wade, Buxton, & Kelly, 1999) equated interest with intrinsic motivation, or behavior that is characterized by concentration and motivation. Using think-aloud protocols to examine reader interest, Wade et al. (1999) identified text characteristics associated with undergraduate readers' interest. These characteristics were labeled importance/value, unexpected, and reader's connections. Texts that contained information the reader valued, but had not known before, were rated as interesting. Likewise, texts containing information that was different from their prior knowledge, assumptions, or beliefs, or that could be related to their own personal experiences, were also rated interesting.

Wade et al. (1999) also found some text characteristics that were negatively associated with interest. Typically, these characteristics made the text difficult to process, for example: text that did not contain adequate explanations for important concepts (essentially a text that did not have sufficient background information); text that was not well organized or did not flow, preventing the reader from constructing a coherent macrostructure; or text with difficult vocabulary. According to Flavell (1979), metacognitive experiences can affect a reader's metacognitive knowledge base. In some cases, the result is an elaboration of metacognitive strategies. However, experiences with difficult or poorly constructed text may have a negative effect as well. Paris and Winograd (1990) emphasized that self-appraisal and self-management are personal assessments that have an affective component. According to Paris and Winograd, "Expectations, perceptions of the task, and attributions for success and failure can all be regarded as emotionally charged metacognitions" (p. 25).

CURRENT STATE OF METACOGNITIVE AND LITERACY INSTRUCTION

Metacognitive studies have provided literacy educators with greater understanding of reading comprehension processes and compensatory strategies that successful readers employ to support text understanding. These studies have also generated a plethora of ideas for effective comprehension instruction.

Although a careful review of current literature on metacognition reveals an overwhelming amount of information on metacognition and reading comprehension, less information can be found on how metacognition is related to writing, early literacy, and critical literacy.

Metacognition and Writing

There is a corollary between the phases of reading and stages in the writing process. That is, reading and writing may be thought of as complimentary processes involving the use of similar cognitive strategies, including planning and goal setting, tapping prior knowledge, organizing ideas, constructing a gist, monitoring, applying fix-up strategies, revising meaning, and evaluating (Booth, 2003; Tompkins, 2003). Although connected, the two processes require deployment of strategies in somewhat different ways. Langer (cited in Booth, 2003) indicated that formulating meaning occurs more recursively during writing because the writer must constantly generate new text. In addition, whereas readers are involved in adapting their representation of the text to fit the author's message, the writer is engaged in a process of fitting the text to "the needs of another person, a reader, and to the constraints of formal prose" (Flower & Hayes, cited in Booth, 2003, p. 15). We suggest that an important role in metacognitive literacy instruction is helping students determine how cognitive strategies are used during reading and writing.

Metacognition and Early Literacy

Early literacy is an extremely important area in literacy research and instruction. Although metacognition concerns higher level cognitive operations and processes and is generally found in more mature and older students (Baker & A. L. Brown, 1984; Paris & Winograd, 1990), there is evidence that young children are also able to monitor and regulate their cognitive processes during reading and writing activities (Brenna, 1995; Cox, 1994; Rowe, 1994; Ruan, 2004).

Metacognitive research should expand its current focus to cover early literacy. Modeling and teaching developmentally appropriate metacognitive skills to young children can greatly enhance their abilities to acquire early literacy skills and empower them to become problem solvers and independent readers. A lesson

learned from the highly successful Reading Recovery program is that young children and immature readers can benefit greatly from metacognitive training. The children receiving Reading Recovery tutoring are taught to monitor their reading by constantly asking themselves whether or not what they have read makes sense, sounds right, or looks right. They are also taught to use a list of highly successful fix-up strategies when they encounter difficulties during reading. These strategies include using semantic cues (pictures, background knowledge, context, etc.), syntactic cues (knowledge of sentence structure), and graphophonemic cues (knowledge of sound–letter relation) to decode an unfamiliar word, cross-checking their decoding attempts with all three cuing systems (i.e., rereading, skipping the word, and reading on), and asking for help from others, to name a few. Most students are able to develop a self-monitoring and self-regulating mechanism at the completion of the tutoring.

Young children who are developing phonemic awareness can also benefit from metacognitive training. They can be taught to self-report how they identify rhyming words, syllables, and individual sounds. They can also be taught to verbalize their concepts about print.

Metacognition and Critical Literacy

Critical literacy goes beyond traditional literacy, which emphasizes literal text comprehension. According to McDaniel (2004), "Critical literacy transcends conventional notions of reading and writing to incorporate critical thinking, questioning, and transformation of self or one's world" (p. 474). Critical literacy researchers and scholars take into account the sociocultural aspect of literacy practices and call for readers to carefully examine texts for hidden agenda and assumptions held by the authors or the society in general. From the critical literacy stance, it is not enough that readers comprehend what they have read. They have to critically analyze the social structure and power relationship reflected in texts and ultimately to take actions to achieve social equity and justice (Luke & Freebody, 1997).

Because of the unique emphasis that critical literacy places on questioning and evaluating texts for potential biases and inequality, readers who exercise critical literacy have to closely monitor their reading. In addition to gaining literal understanding of the text, they have to use their own sociocultural knowledge and resources to inform their decision-making about the text, that is, to negotiate the discrepancies in different ideologies, to identify with, or to challenge the author's messages.

Although no existing literature specifically points out the connection between metacognition and critical literacy, the two are closely related to each other. Readers with critical literacy knowledge and skills are most likely to employ metacognitive strategies for text understanding and critiquing. Metacog-

nitive research can generate important implications concerning how we support readers in developing critical literacy.

METACOGNITIVE LITERACY INSTRUCTION AND PRACTICE

In light of the critical role of metacognition in skilled reading, we propose that metacognitive instruction should be a much-valued component in literacy instruction. The goal of metacognitive literacy instruction is for students to develop metacognitive awareness and self-regulatory mechanisms to support problem solving when they are engaged in literacy related activities. This instruction aims at supporting students in forming a learning system that aligns assessment of one's cognitive resources with its allocation and the execution of the task-specific strategies in different learning situations.

Because metacognitive studies have their roots in comprehension studies, most instructional strategies in this area focus on supporting reading comprehension. In particular, research in the past three decades suggests that teaching students to monitor their reading is crucial to success in reading comprehension (Baker & A. L. Brown, 1984). The self-monitoring process can range from goal setting (Baker & A. L. Brown, 1984) to self-questioning (Andre & Anderson, 1978–1979), using mental imagery (Gambrell & Bales, 1986; Pressley, 1976), and deploying fix-up strategies.

These strategies are applicable to both reading and writing activities. For example, goal setting in reading entails the readers setting a purpose for reading, reading for information or for pleasure, and indicating the type of information most valued by the reader. In writing, goal setting can also lead to success of the writing effort. It is related to audience awareness and purpose for the writing (e.g., to inform or to entertain).

Several instructional methods have been demonstrated effective in promoting students' metacognitive development. They are more closely related to supporting the development of reader self-regulation. The strategies include Reciprocal Teaching (Palincsar & Brown, 1984), think-alouds (Baumann, Jones, & Seifert-Kessell, 1993), and Question–Answer Relationships (Raphael, 1986), among others. These instructional strategies generally focus on processes such as questioning, predicting, clarifying, and summarizing and promote student interactions with text and self-monitoring for greater understanding. They also involve powerful teacher modeling and student guided practices, which are keys to successful learning.

Beyond the identification of specific learner strategies and instructional strategies, metacognitive literacy research also points to the close interrelation between reader's interest and reading comprehension. Because reader interest decides the allocation of cognitive resources (Wade et al., 1993), in order for successful reading to occur, the reader has to show and maintain interest during

the reading. Metacognitive instruction should teach students to assess their interest and be able to sustain their interest throughout the reading.

For successful reading to happen, both reader strategies and background knowledge have to be in place (Baker & A. L. Brown, 1984). It is ineffective to focus on strategy use without helping students build sufficient background knowledge.

Teaching for strategies should be emphasized over teaching isolated skills and bits and pieces of knowledge. Strategy use implies a process involving careful and deliberate selection of strategies to accomplish a set purpose (Wade et al., 1990). Teaching students to use strategies for problem solving during reading and writing activities also implies that teachers should teach students to develop metacognitive awareness, knowledge that allows them to understand the task nature/demand, steps to take to complete the task, and under what conditions (contexts). These are generally referred to as metacognitive declarative, procedural, and conditional knowledge (Jacobs & Paris, 1987).

Research has also suggested that instruction on using specific strategies benefits low performing readers, more than high performing readers, with their reading comprehension. Therefore, helping learners become metacognitive about the use of strategies in their current repertoire is more effective than asking them to learn to use different and new strategies (Dole et al., 1996). An implication from this research highlights the significance of support to learners in assessing and taking an inventory of strategies that are currently in use effectively in various learning situations.

One aspect that influences learners' ability to deploy self-regulatory mechanisms for problem solving is the level of task difficulty. Active control of one's cognitive resources occurs when the learner encounters "tasks of intermediate difficulty" (Baker & A. L. Brown, 1984, p. 354). Learners could fail to mobilize their self-regulatory mechanism when the task difficulty level is too high or when the learning situation does not pose much challenge and there is therefore no need to activate the cognitive resources. When supporting students in their development of metacognitive knowledge and control, carefully selected reading materials should be considered.

Based on the review of literature, successful metacognitive literacy instruction should address the following components: student background knowledge and schema development, knowledge and practice of a set of developmentally appropriate metacognitive strategies, knowledge of the conditions for the deployment of compensatory strategies. Teacher modeling and scaffolding are extremely important for students to develop self-regulatory mechanisms.

The two scenarios that follow demonstrate how teachers can support the development of regulatory mechanisms with beginning and developing literacy learners. The first scenario is about self-regulation focusing on metalinguistic knowledge; the second is about self-regulation focusing on writing. In each case, the teacher scaffolds instruction by analyzing the task to be carried out by the students, determining what part of the task might be difficult for the students, and

providing practice with strategies that enable the students to successfully complete the task (Booth, 2003).

In the first scenario, we see a first-grade teacher sharing a big book, *Old McDonald Had a Farm*, with a group of first graders at the beginning of the school year. The teacher is focusing on helping students develop metalinguistic awareness, the ability to talk about language as an object of learning (Goodman, 1986). Metalinguistic awareness is a critical indicator of young children's metacognitive knowledge. During the read-aloud and the before and after reading phases, the teacher constantly uses metalinguistic terms such as *letter*, *sound*, *word*, and *sentence*. Several times during the reading, the teacher asks some children to identify those elements of language while she provides praise and informative feedback. The teacher gives each student a card with icons that represent letter, word, sound, and sentence and an example for each. After the teacher read-aloud, the children are given their own little books to read. The teacher checks on individual students. They are asked to identify each element of language as she frequently models and to share an example of each with her. When the students get stuck, she reminds them to look at the card and visualize each object. After several sessions of practice, the students are able to master the metalinguistic terms. This instructional practice helps to develop in young children various levels of awareness and understanding about language.

In the second scenario, a group of fourth graders are asked to write an essay helping their first grader book buddies use the library computer to search for books they want. In the class, the teacher has just finished his mini-lesson on how to write instructions. He shares with the class an essay on planting tulip bulbs in his garden. He discusses with the class the text structure and language features of instructions. As a class, they construct a chart with major elements of the text structure identified. They also highlight the language features/wording choices that most frequently appear in this type of text. He tells the students that when they write their essay, if they encounter a problem, they can refer to the chart for help. The teacher then asks the students to make a checklist of things they should pay attention to when they write their instructions. Next he sends his students to the library to investigate the steps it takes to find a book they want in the school's library system and to record the steps they identify. He reminds them that if they have difficulty, they can refer to the checklist and look up the chart on text structure and wording choices displayed on one of the classroom walls. Many students do exactly what he said. They plan what their essays should include, monitor their own progress during the writing, and evaluate and revise the draft against the chart to produce satisfactory essays.

DIRECTIONS FOR FUTURE RESEARCH

Research efforts in the past three decades have produced a plethora of findings important to the understanding of literacy and teaching. However, several issues demand further research:

1. To what extent should metacognitive instruction be promoted within a literacy curriculum? In most literacy curricula in use across the country, metacognitive literacy instruction is not promoted or emphasized. Although many literacy educators advocate that teachers should emphasize teaching for strategies instead of teaching isolated skills and facts (Fountas & Pinnel, 1996), limited research has been conducted to assess the effect of a literacy curriculum focusing on strategies versus traditional literacy instruction focusing on skills and knowledge.

2. How can teachers support students in developing self-regulation mechanisms? Currently, there is no coherent body of literature on what self-regulatory mechanisms are like, how they operate, or on the efficient orchestration of various metacognitive strategies. According to Baker and A. L. Brown (1984), there are five indexes of self-regulatory mechanism, namely, checking, monitoring, testing, revising, and evaluating. How a reader or writer decides what processes to mobilize and under what circumstances remains an unanswered question. Information on how different mechanisms manifest themselves in learners with different learner characteristics is needed. Part of the difficulty results from the wide variety of literacy learning situations that demand different mechanisms. More substantive information on how self-regulatory mechanisms operate in various learning situations is necessary.

3. Teacher knowledge of metacognition and metacognitive literacy instruction should be investigated. Limited substantive research could be found in this regard. In order for teachers to be successful in implementing metacognitive literacy instruction, an adequate knowledge base on metacognitive literacy instructional practices should be identified for teachers. This knowledge base could also facilitate teacher self-analysis and support teacher learning in developing the expertise necessary for effective metacognitive literacy instruction.

4. Reader threshold for incoherence and ambiguity is another area for investigation. Readers have to notice comprehension failure in order to regulate and deploy fix-up strategies. The way mature and immature readers establish their threshold for activating mechanisms for using compensatory strategies should be more carefully researched.

5. The transfer of metacognitive strategies among different areas of literacy, for example, from reading to writing, or from decoding to comprehension should be studied. Raphael, Englert, and Kirschner (1989) found evidence that upper elementary school students were able to apply their metacognitive knowledge about writing to a reading situation. However, limited research can be found in relation to metacognitive knowledge transfer among different areas of literacy.

6. Past research has identified a number of strategies that support good reading comprehension, and has established that a good reader is able to deploy a variety of strategies (Wade et al., 1990) depending on the interest level, background knowledge, and difficulty level of the text. However, there is no clear understanding of if and how some strategies are chosen over others. The question

remains as to whether or not there is a set of strategies that is more readily activated by the reader and how.

7. Much research has been conducted to explore metacognition and reading. Because of the important role of writing in making a literate person, it is important to investigate the relation between metacognitive knowledge and control and writing development. In addition, how metacognitive instruction can benefit students' writing development also demands more attention from metacognitive researchers.

CONCLUSIONS

Metacognition is a key to successful learning. Learners with high levels of metacognitive abilities are able to monitor and regulate their learning processes to accomplish the learning goals they set. More importantly, supporting learners in developing self-regulation mechanisms should be an important aspect of metacognitive literacy instruction.

Although Baker (2002) argued that metacognition should not be the focus of reading instruction, it should be the goal of literacy instruction if we want to support learners' movement toward independence and success. Teachers should place metacognitive instruction at the center of instruction for all learners, albeit at different levels and with different strategy components.

Consider three cautionary points. We do not intend to make the term into a buzzword or a bandwagon. The term is used to help conceptualize the type of instruction that has its distinctive strengths and focus. Second, because metacognitive abilities involve higher level cognitive processes, teachers should be more aware of their students' cognitive abilities and basic knowledge/skills development. Different students might have different self-regulation mechanisms with different sets of metacognitive strategies closely related to their own cognitive facilities and knowledge/skill base. Metacognitive literacy instruction expecting all students to develop the same type of mechanisms could be an act of hit and miss. Third, the ultimate goal of literacy instruction is to develop lifelong readers and writers who enjoy literacy activities and use literacy to better themselves and their society. Therefore, metacognitive literacy instruction should be a means instead of an end to literacy instruction.

METACONNECTION FOR CHAPTER 1

Chapter 1 defines metacognition and literacy learning relative to theory. Skilled reading strategies are discussed in relationship to metacognitive strategy application. The following chapter guides us as we learn more about the relationship between reading comprehension and metacognition.

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2

Revisiting Definitions of Reading Comprehension: Just What Is Reading Comprehension Anyway?

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It is important and vital to measure student's awareness of strategic comprehension processes in order to know the problems which students are having with understanding what they are reading and to identify decoding strategies which they may be misapplying or not using at all.

When children fail to understand what they read, this impacts on how well they will perform in every academic study area. A science teacher related to a class I attended that he was instructed to write his objectives on the board for each lesson he taught. It was illogical for him to do this since these students he was teaching science to did not have the ability to read the objectives and as a result would have no understanding of what he wrote. These students are obviously having problems with processing what they are reading and need help to rectify their comprehension processing.

To be made aware of students' strategic comprehension processes would enable teachers to cater to the instructional level of the child. Identifying and addressing problems students are having with comprehension processes, would enable teachers to increase the understanding of students and their ability to problem solve. This would result in higher order thinking culminating in self directed learning.

—Cecelia Batson

In her observational study, Durkin (1978) examined reading comprehension instruction in the upper elementary grades and found surprisingly little of it going on. Since then, there has been much interest in providing teachers with the knowledge and skills necessary to teach reading comprehension effectively. Research on reading instruction began to focus teachers' attention on the cognitive processes good readers use to comprehend text, providing detailed descriptions of

what effective readers do. Reading comprehension research has identified more than 30 cognitive and metacognitive processes involved in reading comprehension (see, e.g., Collins Block & Pressley, 2002).

Although theories of reading comprehension abound, in practice, there appears to be little teaching of reading comprehension. In 1998, researchers published a study providing evidence that there may be more testing of reading comprehension than there is instruction guiding students in processing text in ways that contribute to understanding (Pressley, Wharton-McDonald, Mistretta-Hampton, & Echevarria, 1998). Teachers typically assess reading comprehension by asking "comprehension questions." But assessment is no substitute for instruction, especially if the questions are intended to assess literal comprehension. Moreover, if students are able to answer such questions, then does it necessarily mean they *understand* what they have read? Exactly what does it mean to "comprehend" what one reads?

This chapter explores different definitions of reading comprehension that have informed reading comprehension research, reading instruction, and assessment practices. How has reading comprehension been defined by researchers, teachers, and those interested in assessing reading comprehension? Has there ever been a single definition of reading comprehension? To answer these questions, the discussion first revisits theoretical conceptions of reading comprehension that have guided the study, teaching, and assessment of reading comprehension. Next, it reviews the research base on reading comprehension instruction, including research on the cognitive processes that make readers' thinking visible. Reading comprehension research has typically focused on the cognitive processes thought to be components of reading comprehension. In this program of research, the goal has often been to identify the skills readers need to "comprehend" or make sense of the text to arrive at commonly agreed on meanings. Assessments consistent with this conception of reading comprehension evaluate the component processes used to comprehend text at the literal level. More contemporary assessments of reading comprehension, however, are informed by a different conception of reading comprehension that takes into account how readers interact with the text to construct meaning and to interpret the text in personally relevant ways (Rosenblatt, 1978). This chapter argues that a unifying definition of reading comprehension is essential both to the teaching and the testing of reading for understanding. It concludes by describing a componential approach to reading comprehension instruction that contributes both to the literal and interpretive understanding of text as well as to personal enjoyment of reading.

DEFINITIONS OF READING COMPREHENSION

One early definition of reading comprehension viewed "reading as a process of communication by which a message is transmitted graphically between individuals" (Kingston, 1967, p. 72). Kingston argued that reading comprehension de-

pends on the reader's interpretation of the written symbols conveyed by the author, much as in the interpretation of an abstract painting. He noted that, given how unlikely it is for all individuals to attach identical associations to any given symbol, reading comprehension is often measured by the degree to which readers conform to some authority figure's interpretation (e.g., teacher or test constructor).

Reading comprehension is a complex process that is difficult to define, much less teach and assess. For more than two decades, researchers have attempted to identify the processes effective readers use. The goal is that teachers articulate those strategies to novice readers. Pioneering research in this area described a set of comprehension-monitoring strategies students could practice in a reciprocal teaching format (Palincsar & Brown, 1984). Readers' intentional use of these cognitive strategies, which include summarizing, generating questions, clarifying unfamiliar vocabulary, and making and revising predictions, has been found to improve reading comprehension (Rosenshine & Meister, 1994).

Although reading comprehension research has identified individual cognitive processes efficient readers use, it is less clear how these strategies work together to contribute to comprehension, and which skills are essential for comprehension to occur. For example, if a reader cannot summarize a passage concisely, does that indicate poor reading comprehension or lack of summarization skills? The answers may depend on the definition of reading comprehension.

If meaning resides in the text, then comprehension involves summarizing and recalling what is stated in the text; generating a unique interpretation consistent with one's own experiences may be inappropriate for arriving at the meaning agreed on by the majority of readers. Winograd and Johnston (1987) called attention to this distinction between personally constructed and socially constructed meaning. They argued that research has tended to view reading comprehension as an end convergent on a single meaning perhaps best achieved through the use of strategies. They called for an expanded definition of reading comprehension that recognizes both the personal and social construction of meaning. Personally constructed meaning arises from the interaction between reader and text and reading is a generative activity that results in unique interpretations of the same text by different readers (Rosenblatt, 1978). In this view, readers' prior knowledge and experiences serve more central roles and readers' interpretations are more likely to be different than convergent on one traditional meaning. Reading comprehension is thought to occur when readers bring to bear their prior knowledge and experiences to make sense of text, often rendering the author's ideas, the reader's (Pearson & Fielding, 1991).

This is a transactional view of reading comprehension that assumes the reader's active meaning-making role in dialogue with the author (Rosenblatt, 1978). Transactional strategy instruction, including teaching students to take active reader roles, helps students make predictions about stories, associate what they read with their prior knowledge, and construct mental images. It has been

found to be effective in increasing reading achievement (Pressley & El-Dinary, 1997). But, as Winograd and Johnston (1987) pointed out, reading for enjoyment is not typically prompted by purpose setting strategies, such as reading to confirm predictions.

Rosenblatt (1978) distinguished "aesthetic reading" for the purpose of enjoyment from "efferent reading" for the purpose of information seeking. Other researchers (Guthrie & Mosenthal, 1987) have distinguished descriptive definitions of reading from pragmatic definitions. These researchers explained that theorists typically create descriptive definitions of reading that embody particular ideologies. For example, theorists may define features of reading materials that imply that meaning resides in the text. The pragmatic approach, on the other hand, is concerned with studying how people read in different settings and for different purposes. Building on the pragmatic approach, Guthrie and Mosenthal drew a distinction between reading comprehension and reading to locate information, arguing that reading for information is more strategic and goal directed. Reading comprehension research, however, has tended to take a theoretical approach to defining reading and has tended to view all reading as strategic.

READING COMPREHENSION RESEARCH

Reading comprehension is a complex cognitive process. Metacognition, or thinking about the cognitive processes involved in reading, has been a primary focus of reading comprehension research (see Baker, 2002, for a review of metacognition in comprehension instruction). One important defining feature of metacognition is that it can be made "public" (Jacobs & Paris, 1987). A goal of reading comprehension research has been articulating the cognitive processes used by effective readers. Defining these processes, however, risks reducing reading to an algorithm that may not be appropriate for different situations and different purposes.

Reading Comprehension Processes

Much research on reading comprehension has focused on identifying skills that may account for poor readers' deficits. Cain, Oakhill, and Bryant (2003) characterized poor comprehenders as a heterogeneous group whose difficulties are likely to derive from a variety of cognitive deficits, including weakness in understanding vocabulary and syntax. They summarized the reading comprehension deficits of poor comprehenders at the discourse level: difficulty making inferences, regardless of prior knowledge; lack of ability in identifying referent pronouns; lack of skill in using context clues, especially when abstract thinking is involved; weak comprehension monitoring skills and lack of ability to repair comprehension or

vary strategy to purpose; and incomplete understanding of text structure. This research has focused on skills readers use to comprehend the literal meaning of text.

Kintsch (1988) identified similar processes used in text comprehension. At the sentence level, readers decode words and use knowledge of syntax to construct the meaning of sentences. At another level, relational processes are used to make connections across sentences or paragraphs. Other comprehension skills include making inferences and interpreting author's words and phrases that have been omitted.

Winograd and Johnston (1987) argued that conditional knowledge is necessary for reading comprehension and the teaching of reading comprehension can be advanced by understanding the conditions under which particular strategies are appropriate. They further argued that there are a limited variety of strategies in the reading comprehension research base and these strategies are not sufficient for understanding and interpreting text at more than a superficial level. Some reading comprehension programs have focused on helping students understand when to use particular strategies. Process-based comprehension instruction models strategies during the reading process at times when particular processes are called for (Collins Block, Schaller, Joy, & Gaine, 2002). In this model, students are encouraged to think about why the authors wrote as they did. Students are also encouraged to describe their own comprehension processes as they are used at particular times, rather than memorizing separate strategies to be applied universally.

Knowing when to use different comprehension processes to make sense of text may assist struggling readers in answering comprehension questions on reading achievement tests. One study analyzed reading comprehension errors made by 10 sixth-grade students on the Qualitative Reading Inventory (P. Dewitz & P. K. Dewitz, 2003). Consistent with Kintsch's comprehension processes and Cain et al.'s research on poor comprehenders, this study found that students' errors could be attributed to failure to make relational inferences (linking ideas across passages), failure to make causal inferences, failure to parse syntax correctly, inappropriate use of prior knowledge, or failure to know a key vocabulary word. The researchers hypothesized why strategy instruction may not solve the kinds of reading comprehension problems described in this case study. For example, some strategies may conflict with other strategies, such as drawing on prior knowledge to make a prediction and looking for connections across sentences and paragraphs to make causal inferences. The researchers also pointed out that strategies typically packaged in strategy instruction programs, such as reciprocal teaching, do not specifically match students' comprehension problems and students would benefit from learning when and which strategies to use, depending on the text and the purposes of reading.

Some classroom teachers have also questioned the appropriateness of strategy instruction. Villaume and Brabham (2002) described teachers' listserv discussions on teaching reading comprehension. Some teachers noted students' per-

functory use of strategies rather than the thoughtful interactions that strategy instruction is intended to promote. Other teachers described a different kind of strategy instruction in which teachers modeled their own thinking about text and encouraged students to generate and share their own strategies they use to interpret text. In these classrooms, students demonstrated more engagement and thoughtfulness. Nonetheless, whether reading comprehension strategies are applied universally or as the text demands, such strategies alone may not be sufficient for reading beyond the literal level. In classrooms that emphasize reading in authentic contexts, teachers and students may take a more pragmatic view of reading. Considering the complexity of reading comprehension, the research base may offer little guidance for teachers interested in promoting thoughtful interactions with text (Snow, 2002).

Research on Reading Comprehension Instruction

The research base on reading instruction has been the focus of several recent publications that have aimed to disseminate research findings about effective literacy instruction to educators. The National Reading Panel (2000) investigated studies of 16 categories of reading comprehension instruction. Of these, the panel identified 7 methods that appeared to have a scientific research base for concluding that they are effective in improving reading comprehension (pp. 4–42). The seven methods include comprehension-monitoring strategy instruction, cooperative learning, graphic organizers, discovering and describing story structure, question answering, question generating, and summarization. In addition, the panel concluded that many of these strategies have been used effectively in combination where readers and teachers interact with texts.

Although the National Reading Panel Report reported research on reading comprehension, teachers may not find the research base adequate for making informed decisions about how to teach reading comprehension effectively (Snow, 2002). The report of the Rand Reading Study Group (Snow, 2002) attempted to organize the research base on reading comprehension to identify gaps in the knowledge base. Reviewing the research, the Rand Study Group formulated a three-dimensional definition of reading comprehension that synthesized transactional, social, and functional theories of reading comprehension. Defined as "the process of simultaneously extracting and constructing meaning through interaction and involvement with written language," reading comprehension includes three elements: the reader, the text, and the activity or purpose for reading (p. 33). Whereas the National Reading Panel Report (2000) focused on interactions between text and reader, the Rand Study Group added the functional and social dimensions. From a social perspective, reading comprehension is a process of constructing meaning through interactions in particular settings, such as classrooms (Bloome & Egan-Robertson, 1993). From a functional perspective, com-