

tasks. That memory strategies were definitely teachable became well established during this era as well, with many different strategies proving teachable (Pressley, Heisel, McCormick, & Nakamura, 1982). However, it also became obvious that long-term use of taught strategies only occurred when memory strategies instruction was metacognitively embellished, as when information about the usefulness of a trained strategy was included in instruction (Borkowski, Levers, & Gruenenfelder, 1976; Cavanaugh & Borkowski, 1979; Kennedy & Miller, 1976; Posnansky, 1978). Metacognitive theory was thriving as a function of the first analyses and tests of it in the realm of children's memory, with metacognitive theory implicating strategies as critical in effective thinking.

At about the same time, Ellen Markman (1977) introduced the idea of comprehension monitoring as an important form of metacognition during text processing, arguing that children were often unaware when they did not understand text. How might awareness of comprehension and miscomprehension improve according to Markman's analyses? One possibility was through processes that could be thought of as strategic, such as explicitly comparing the ideas in the part of text just read with ideas presented earlier in a reading (Elliott-Faust & Pressley, 1986). Not only could metacognition contribute to strategies regulation, but strategies use could result in important metacognitive understandings. Metacognitive theory provided justification for teaching of strategies to promote self-regulation of reading.

The Development of Internalized Cognitive Competence

More than half a century ago, Vygotsky (translated in 1978) recognized that (a) adults often assist children in thinking about problems they are confronting; (b) these interactions are thinking, thinking involving two heads; (c) although the child cannot work through many problems without assistance, with parental support, there may be fine progress; and (d) long-term participation in such interactions leads to internalization by the child of the types of actions once carried out between the child and the adult: Thought processes that were once interpersonal become intrapersonal. Cognitive development proceeds largely because the child is in a world

that provides assistance when the child needs it and can benefit from it. When the child can get along alone, the same adults remain in the background. The same adults also encourage the child away from situations and tasks that are well beyond her or his competence.

Critical developmental interactions between adults and children occur with tasks that the child can not do independently but can do with assistance, tasks that are within the child's zone of proximal development according to Vygotskian theory. A child learns how to perform tasks within her or his zone by interacting with more competent and responsive others who provide hints, prompts, and assistance to the child as needed. The regulative processing that goes on between adult and child during these interactions is eventually internalized by the child—that is, the child ultimately can perform the task without assistance, a development stimulated by the supportive interactions with others before autonomous functioning was possible. Beginning in the late 1970s, Vygotsky's perspective on the zone of proximal development did much to stimulate developmentally-oriented researchers and educators to embrace the teaching of cognitive skills not fully developed in children, but ones that could develop with adult support---such as comprehension strategies.

There were other analyses in this era for explicit adult support of competencies that the child can only do with support initially but can come to control through participation in supportive interactions. Forty years after Vygotsky, Wood, Bruner, and Ross (1976) also observed that adults often assist children, eventually yielding control to the children themselves as they learn how to carry out a task during interactions with adults. Wood et al. (1976) offered the metaphor of a scaffold to describe such teaching. Recall that a scaffold is used when a building is being erected and is gradually removed as the building becomes self-supporting. So it is with the prompts and hints provided by an adult or older child to a younger child.

Meichenbaum (e.g., 1977) also developed an extremely visible position about how adults could interact with children to encourage their acquisition and autonomous use of new cognitive skills, with Meichenbaum's theoretical thinking and research informed by Vygotsky's thinking. Vygotsky (translated in 1962) advanced the idea that inner speech is an important mechanism in

mature thought. Compared to overt speech, inner speech is abbreviated and fragmentary, with complex meanings captured in a few words or syllables. Vygotsky provided a developmental model of how such speech-for-self develops, a model reflecting his belief that speech-for-self begins as interpersonal, overt speech between adults and children, with the adult role highly directive at first, gradually fading as children increasingly internalize directive speech. By the middle 1970s, there were a number of American analyses suggesting that the development of self-directive speech plays an important role in the development of children's self-regulation (e.g., Kohlberg, Yaeger, & Hjertholm, 1968; Patterson & Mischel, 1976; Wozniak, 1972).

Thus, in the late 1960s and early 1970s Meichenbaum hypothesized that children could learn a variety of cognitive skills if they were taught simultaneously to use self-speech to direct their use of these skills (Meichenbaum & Goodman, 1969a, 1969b, 1971). Meichenbaum (1977) offered an entire volume summarizing research consistent with the idea that children could be taught to self-regulate through interactions with adults who initially modeled self-regulative speech and gradually yielded cognitive control to the students themselves.

Meichenbaum's general approach can be illustrated through review of a study by Bommarito and Meichenbaum (reported by Meichenbaum & Asarnow, 1979). They taught comprehension strategies to middle-school students who could decode but were experiencing difficulties understanding what they read. Instruction began with an adult modeling self-verbalized regulation of the comprehension strategies of looking for the main idea, attending to the sequence of important events in a story, and attending to how characters in a story feel and why they feel the way they do as well as some other strategies helpful during reading.

The students saw the adult read as they heard the following verbalizations by the adult:

Well, I've learned three big thinks to keep in mind before I read a story and while I read it. One is to ask myself what the main idea of the story is. What is the story about? A second is to learn important details of the story as I go along. The order of the main events or their sequence is an especially important detail. A third is to know how the characters feel and why. So, get the main

idea. Watch sequences. And learn how the characters feel and why. While I'm reading I should pause now and then. I should think of what I'm doing. And I should listen to what I'm saying to myself. Am I saying the right things? Remember, don't worry about mistakes. Just try again. Keep cool, calm, and relaxed. Be proud of yourself when you succeed. Have a blast. (pp. 17-18, Meichenbaum & Asarnow, 1979)

By the end of six training sessions, the students were self-verbalizing covertly, with control gradually transferred to the students over the course of six sessions. Did the self-verbalization instruction affect reading comprehension? There was greater pretest-to-posttest gain on a standardized comprehension test than for control condition participants.

In summary, there was substantial cognitive developmentally-oriented instructional theory in the late 1970s supporting explicit teaching of cognitive strategies, with theoretical triangulation (Mathison, 1988) for the conclusion that adults could advance the cognitive development of children through scaffolded teaching of important cognitive processes.

Reader Response Theory

In 1938, Rosenblatt made a then radical proposal, that the meaning of a text must vary somewhat from reader to reader. Like Vygotsky, Rosenblatt would be discovered anew in 1978, in her case, with the publication of her theoretical masterpiece, The Reader, The Text, The Poem. Reader response theory, as defined by the 1978 book, had an enormous impact on the language arts education community. It legitimized the teaching of active and interpretive reading (see Clifford, 1991; Holland, Hungerford, & Ernst, 1993), although reading that much more respected the text than other prominent literary analyses of the era (e.g., Eco, 1978; Fish, 1980). According to reader response theory, interpretations vary because the meaning of a text involves a transaction between a reader, who has particular perspectives and prior knowledge, and a text, which can affect different readers in different ways (e. g., Beach & Hynds, 1991; Rosenblatt, 1978). What is critical from the perspective of reader response theory is how the reader experiences and reacts to the text: Sometimes readers form impressions of characters in stories,

and frequently they relate their personal and cultural experiences to events encountered in text. They may respond to difficult-to-understand text by treating meaning-making as an exercise in problem-solving, requiring probing analysis of text and posing of numerous questions as part of attempting to determine what a text might mean. As part of responding to text, readers sometime explain events in a text to themselves. Often they form vivid images. In short, language arts theorists and educators viewed the processes that psychologists considered to be comprehension strategies as reader responses. Reader responding was acceptable to the language arts community in the late 1970s and continues to be so. That is, the cognitive psychologists and the language arts specialists had the same idea of prompting child readers to be more active as they read.

Summary

A number of intellectual directions converged in the late 1970s and early 1980s that inspired prominent research on comprehension strategies instruction in the 1980s. An important factor in this convergence was the federally funded Center for the Study of Reading at the University of Illinois. Durkin's (1978-79) study established the need for comprehension instruction was conducted at the Center. Tierney et al.'s (1980) impressive review of all existing study skills packages pertaining to reading was put together at Illinois, a summary that made obvious the lack of support for most of the study skills approaches. There was substantial interest among Center faculty in the effectiveness of particular comprehension strategies. For example, Brown and Day (1983) were exploring summarization as a strategy. Richard Anderson, the director of the Center, had a long-time interest in mental imagery and its role in learning of connected materials (e.g., Anderson & Hidde, 1971). Schema theory (Rumelhart, 1980) was the driving force at the Center, however, with this stimulating much interest in validation of prior knowledge activation strategies. Ann Brown and her colleagues were exploring the implications of metacognitive theory (e.g., Brown, 1978). The Center faculty were definitely aware of the insights about text processing emerging from protocol analyses, providing input and feedback to

important studies such as Lytle's (1982) dissertation study of elementary-level students thinking aloud as they read. Brown and her colleagues also recognized the importance of and interrelations between Vygotsky's theory, Wood et al.'s (1976) conception of scaffolding, and Meichenbaum's (1977) self-instructional perspective (see Brown, Bransford, Campione, & Ferrara, 1983). The professional organization that would provide much impetus for reader response theory was the National Council for Teachers of English, headquartered at the University of Illinois, with its positions well known to anyone at Illinois concerned with the language arts. Thus, the stage was set at the end of the 1970s at Champaign-Urbana for an important advance in comprehension strategies instruction. Annemarie Palincsar and Ann Brown would make that advance, with their work the first stop on our tour of the advances in comprehension strategies instruction that were made in the 1980s.

Comprehension Strategies Instruction

A great deal of progress was made in the 1980s and 1990s in determining whether and how students could be taught to coordinate comprehension strategies. Because the need for such instruction was great and research on comprehension strategies instruction was largely driven by theoretical concerns, such as the ones just reviewed, the research detailed in this section had a wide audience, practitioners as well as researchers and theorists. We cover here the most visible of the contributions, each of which made a great deal of sense given the research that had preceded it.

Reciprocal Teaching

Without a doubt, the most visible report of research on comprehension strategies instruction in the 1980s was Palincsar and Brown (1984).

Study 1. Twenty-four grade-7 readers, who were adequate decoders and poor comprehenders, participated in the study, with six assigned to a condition. In one of the conditions, the participants were taught four comprehension strategies—prediction, questioning, seeking clarification when confused, summarization—using the reciprocal teaching method, a

variant of the reciprocal teaching questioning originally devised by Manzo (1968) as part of ReQuest. In the second condition, participants were taught a different strategy, one for locating information in text in response to post-reading questions about the content of a text. Participants in the third, test only condition, experienced all of the assessments (pretests, posttests, daily assessments) that the participants in the first two groups experienced but received no training in strategy use. The fourth group was a control condition in which the participants received the same pretests and posttests as strategies-instructed students but received no instruction and did not experience daily assessments. Because of space limitations, we take up in detail only the procedures in the reciprocal teaching group and limit discussion to the reciprocal teaching versus control group comparisons.

For the students in the reciprocal teaching group, baseline (pretest) data were collected over a period of 4 to 8 days. One set of pretests involved 400- to 475-word passages, which were read silently by participants, followed by 10 comprehension questions. Also, given a set of summarization rules, like those devised by Brown and Day (1983), students were asked to apply them to two other passages. The students were also asked to generate 10 questions like the ones teachers might generate for each of two 400- to 475-word passages. In addition, students also read some stories line by line. Some of these stories contained semantic anomalies, and the children's task was to indicate when something in the text being read did not make sense. Control condition participants also participated in baseline sessions, experiencing the comprehension, summarization, question-generation, and detecting anomalies measures. Then, there were approximately 20 days of intervention for the students in the reciprocal teaching condition, followed by 5 days of posttesting immediately after the intervention period. Eight weeks later, there were 3 days of long-term followup testing.

Each intervention day began with the adult teacher discussing the topic of the day's text, calling for predictions about the content of the passage based on the title, if the passage was completely new, and calling for a review of main points covered thus far for passages that had been begun the previous day. The adult teacher then assigned one of the two students to be the

“teacher.” Adult teacher and students then read the first paragraph of the day’s reading silently, with the student teacher then posing a question about the paragraph, summarizing it, and then either predicting upcoming content or seeking clarification if there was some confusion about the ideas in the paragraph. If the student teacher faltered, the adult teacher scaffolded these activities with prompts (e.g., “What question do you think a teacher might ask?”), instruction (e.g., “Remember, a summary is a shortened version...”), and modifying the activity (e.g., “If you’re having a hard time thinking of a question, why don’t you summarize first?”). Students were praised for their teaching and given feedback about the quality of it (e.g., “You asked that question well,” “A question I would have asked would have been...”). Students took turns as the student teacher, with a session lasting about 30 minutes.

Throughout the intervention the students were explicitly informed that questioning, summarization, prediction, and seeking clarification were strategies that could help them to understand better and that they should try to use the strategies when they read on their own. The students were also informed that being able to summarize passages and being able to predict the questions on upcoming tests were good ways to assess whether they understood what they had read.

At the end of each day, the reciprocal teaching participants read a 400- to 475-word assessment passage, which was followed by 10 questions about its content. Control participants did not receive these daily assessments.

Both reciprocal teaching and control participants experienced the following assessments during the period corresponding to intervention or as posttests:

- During the study there were two classroom probes, consisting of passages and 10-item tests, like the daily assessment passages, with these placed unobtrusively into ongoing social studies and science instruction.
- Comprehension passages with 10-items tests were administered as posttests as well.
- Summarization, question-generation, and anomaly-detection tasks like the ones administered as pretests were given as posttests.

Reciprocal teaching positively impacted all of these measures. The instruction affected processing as it was intended to do so, increasing summarization skills, question-generation competencies, and monitoring, as reflected by detection of semantic anomalies (Markman, 1977). This translated into much better performance on the comprehension assessments in the reciprocal teaching condition than in the control condition.

In addition, there were two other analyses involving the students in the reciprocal teaching condition. Individual students' performances on the daily assessments were plotted. Because the baseline period varied between 4 and 8 days, the point when intervention began varied. Importantly, for all 6 reciprocal teaching students, daily assessment performance jumped shortly after the onset of the reciprocal teaching intervention. An especially important outcome was obtained on a standardized comprehension measure, important because dramatic effects on standardized comprehension measures would be cited prominently to make a case for reciprocal teaching (e.g., Brown & Campione, 1990a, 1990b). Gates-MacGinitie comprehension measures were available for all reciprocal teaching condition participants, with the test readministered to these students at the conclusion of the study. Four of the 6 students in the condition showed striking gains on this measure: 15, 17, 20, and 36 months growth. One of the remaining two students made 2 months growth, and one had no growth. There were interpretive difficulties with this outcome, however. The comparable data were not available for control participants, so that a variety of alternative interpretations of the outcomes could not be ruled out (e.g., practice effect, maturation). In addition, because the pretest data were collected in a group and the posttest data through individual assessment, it could be that much of the improvement was due to differences in testing conditions on the two occasions.

In short, Study 1 provided plenty of reason for enthusiasm about reciprocal teaching. Nonetheless, with only 2 students per teacher and an experimenter as a teacher, it was difficult to make a case for the classroom validity of the intervention. In their Study 2, Palincsar and Brown (1984) evaluated the usefulness of reciprocal teaching in a realistic classroom situation.

Study 2. Four small groups of middle-school students who could decode adequately but who experienced comprehension problems participated in reciprocal teaching reading groups. With the exception that these groups were taught by the students' own teachers, all four of whom received several days of training and practice with reciprocal teaching, the procedures were similar to the reciprocal teaching condition of Study 1. In general, the pretest-to-posttest improvements obtained in the first study were replicated, although no standardized comprehension data were collected in this study. Similar to Study 1, the daily assessments were plotted for each of the four reading groups. In each case, performance on the daily assessments jumped shortly after the onset of intervention.

Discussion. Reciprocal teaching reflected well the traditions that had stimulated it. It responded directly to the rising concern (e.g., Wiener and Cromer, 1967) with readers who could decode but who had comprehension problems. It was also strongly influenced by study skills, elaborating on Manzo's (1968) reciprocal questioning approach and emphasizing prediction (Stauffer, 1969), and summarization (Brown and Day, 1983) as learning strategies. Summarization effects on awareness were also emphasized in the Palincsar and Brown (1984) report, reflecting the impact of metacognitive theory: If a person cannot summarize after reading, it is a sign of comprehension failure and the need to process the text additionally before reading on. The importance of scaffolding by the teacher was framed in Vygotskian terms, with reference to Bruner. The importance of self-control as Meichenbaum had defined it was apparent in Palincsar and Brown (1984), with the study also framed in terms of Meichenbaum and Asarnow's (1979) analysis (see also Brown et al., 1983; Brown & Palincsar, 1982). Dialoguing about text, which is so important according to reader response theorists (Rosenblatt, 1978), was emphasized as a critical part of learning via reciprocal teaching, with numerous examples of dialogue presented in the Palincsar and Brown (1984) article (see also Palincsar, 1986; Palincsar, Brown, & Martin, 1986).

The reciprocal teaching research had a substantial impact on practice. For example, stimulated publishers of basal readers to include strategies instruction in their teacher guides,

with summarization, questioning, prediction, and seeking clarification the centerpiece strategies for comprehension instruction. Its direct effect on research was to inspire additional study of the method. Rosenshine and Meister (1994) analyzed carefully 16 studies of reciprocal teaching and summarized the effects on reading produced by the intervention. There were consistent, striking effects on cognitive process measures, such as those tapping summarization and self-questioning skills. With respect to standardized comprehension, however, the effects have been less striking, with an average effect size of 0.3 standard deviations. A further finding of Rosenshine and Meister's (1994) meta-analysis was that reciprocal teaching was more successful when there was more direct teaching of the four comprehension strategies. This outcome is important in light of conclusions we offer later in favor of greater direct explanation as part of strategies instruction.

Paris's Informed Strategies for Learning

Paris and his associates devised a comprehension strategies instructional package, Informed Strategies for Learning, that could be covered in the course of a single school year. The program included 20 modules, each aimed at developing understanding of the reading process, teaching specific strategies, and/or increasing students' awareness as they read. There were four sets of five 3-lesson modules, with each lesson intended to take about 30 minutes, for approximately 30 hours of instruction in total. The main strategies emphasized in the program were elaboration, inference, integration, activation of prior knowledge, summarization, rereading, self-questioning, checking consistencies, and paraphrasing.

The first two lessons in each module introduced the lesson with a metaphor (e.g., for a lesson introducing comprehension strategies, "A bagful of tricks"), described the processes being emphasized in the lesson, and outlined how to apply the processes during reading. In the third "bridging" lesson, students practiced the new process with content-area materials, such as science or social studies, from their regular studies. The lessons were supported by workbook

materials, passages for practice of the processes being taught, and posters depicting the metaphor for each lesson.

A number of instructional mechanisms were employed in the lessons. Teachers explained and modeled use of the processes being taught. There were teacher-student discussions about the value of the processes taught, revolving around questions such as, "When should you use this strategy?," "When could it be inappropriate?," "Why is it helpful?," and "How did you use it?" The discussions covered how, when, and where to use the processes being taught, as well as the ease, benefits, and difficulties associated with each strategy. Instruction was scaffolded in that teacher modeling gradually gave way to student self-direction in the selection of strategies to be used to accomplish lesson tasks, and student independence was increasingly expected for the workbook assignments as lessons proceeded.

Informed Strategies for Learning was evaluated at the grade-3 and grade-5 levels in two studies, one small in scale (4 classrooms per condition; Paris, Cross, & Lipson, 1984; Paris & Jacobs, 1984) and one much larger (46 Informed Strategies for Learning teachers, 25 control teachers; Paris & Oka, 1986). There were several consistent benefits in the two studies: Informed Strategies for Learning improved students strategic awareness as measured by a 20 multiple-choice instrument devised by the Paris group (see Jacobs & Paris, 1987). Most of the items on the metacognitive awareness scale tapped processes taught directly in the curriculum and thus, this measure permitted the conclusion that Informed Strategies for Learning students did in fact learn about cognitive processing as a function of experiencing the curriculum. However, although the effects on the metacognitive scale were significant, they were not large, with only a 1- or 2-item advantage seen on the scale at posttesting.

Students in the Informed Strategies for Learning condition also outperformed controls on a cloze task and an error detection task. The cloze task required the students to fill in missing words on a test version of a passage just read. The error detection task involved reading passages containing anomalous information and underlining the parts of the text that did not make sense. Given that Informed Strategies for Learning participants experienced many examples of similar

cloze and error detection items as part of the strategies instruction curriculum, the advantages for them on these tasks were not surprising. Again, however, the effects were never very large.

Informed Strategies for Learning was designed to be much like classic skills programs in many ways, with the program even published as a boxed kit, much as many study skills programs are available. It taught strategies that had been validated separately in well-designed studies (e.g., summarization), incorporated important insights from metacognitive theory (e.g., to emphasize conditional knowledge as part of strategies instruction, teaching comprehension monitoring), and reflected the Vygotskian/Brunerian/Meichenbaumian approach to scaffolded instruction as a way to increase self-controlled use of strategies. Paris's studies of Informed Strategies for Learning were logical outgrowths of the converging lines of theory and evidence considered important at the end of the 1970s and beginning of the 1980s by cognitive developmentalists interested in reading instruction. Disappointingly, however, Informed Strategies for Learning failed to have any effect on standardized comprehension test performance in either of the two evaluations of the method, which for many traditional reading educators is a benchmark of a successful comprehension instructional intervention. This contrasted with the perception in the middle 1980s that reciprocal teaching did impact performance on standardized tests. It also contrasted with the outcomes of another strategies instruction study that became prominent in the middle 1980s.

Bereiter and Bird (1985)

Bereiter and Bird's (1985) approach was first to collect verbal protocols of reading from adults they believed to be good readers in order to obtain insights about comprehension strategies that should be taught to students. The initial verbal protocol study of mature readers was followed by a training experiment with middle-school children.

Study 1. Ten adults, two graduate students and 8 middle-class professionals, read 6500-word passages—an exposition, a narration, a personal opinion essay, a discussion of a controversy, and a procedural description—and talked aloud about their cognitive processing as they read. A

variety of comprehension strategies were reported by these readers: restatement or rephrasing of a difficult portion of text, backtracking to seek clarification, demanding relationships (i.e., deciding to watch for causes for effects, reasons, links between topics, particular information that should be in text), formulating a problem and trying to solve it (i.e., by inference, closer examination of text, rejection of information), prediction, imagery, and recall of related information.

Study 2. Eighty average readers in grade-7 and -8 were assigned to one of four experimental conditions: (a) In the modeling plus explanation condition, four of the strategies observed in Study 1—restatement, backtracking, demanding relationships, and formulating a problem to solve—were taught by a teacher. The students practiced using the trained strategies and judging appropriate use of the strategies. (b) In the second condition, there was modeling and practice of the strategies. (c) In the third, exercise condition, the strategies were neither modeled nor explained. The students only did exercises that entailed the processes associated with the strategies rather than learned how to apply the strategies. (d) Controls only experienced the tests administered in the other three conditions. The participants in the first three conditions received 6 hours of teaching and practice. Think-aloud protocols were collected as participants read passages from one standardized comprehension test, both at the beginning and the end of the study. A second standardized comprehension test was administered silently at pretest and posttest.

Increased use of trained strategies from pretest to posttest was clearly evidenced only in the verbal protocols of the children of the modeling plus explanation condition. Although there were pretest-to-posttest improvements in all conditions on the silently read standardized comprehension test, the greatest gains were in the modeling plus explanation condition. Specifically, there was a little less than a grade-level improvement in the other three conditions versus a 2.7 grade-equivalent increase in the modeling plus explanation condition.

Although modeling and explanation occurred in reciprocal teaching and Informed Strategies for Learning, these explicit teaching processes were much more prominent in Bereiter and Bird's

(1985) modeling plus explanation condition, comprising fully 40% of the intervention. The striking gains on a standardized comprehension test produced by the explanation plus modeling condition provided strong evidence in favor of direct explanation and modeling as an approach to comprehension strategies instruction.

Duffy et al. (1987)

Direct explanations in Roehler and Duffy's (1984) model begin with teacher explanations and mental modeling, or showing students how to apply a strategy by thinking aloud (Duffy & Roehler, 1989) and then proceed to student practice. Practice is monitored by the teacher, with additional explanations and modeling provided as needed. Instruction is scaffolded in that explanations and feedback are reduced as students become more and more independent. The information provided to students during practice depends very much on the particular problems the students encounter and the particular ways that their understandings are deficient. Reinstruction and re-explanations as well as follow-up mental modeling are responsive to student needs, and usually are an elaboration of student understandings up until that point.

Duffy et al. (1987) produced an extremely well designed study of the effects of direct explanation strategy instruction on third-graders' reading, with 10 of 20 groups of weak readers assigned randomly to the direct explanation condition and the remaining 10 groups, or controls, receiving their usual instruction. The researchers taught third-grade teachers to explain directly the strategies, skills, and processes that are part of skilled reading at this level, with the study occurring over the course of an entire academic year. The teachers were taught first to explain a strategy, skill, or process and then to mentally model use of it for students. Then came guided student practice with the students initially carrying out the processing overtly so that the teacher could monitor their use of the new strategy. Assistance was reduced as students became more proficient. Teachers encouraged transfer of strategies by going over when and where the strategies being learned might be used. Teachers cued use of the new strategies when students encountered situations where the strategies might be applied profitably, regardless of when these

occasions arose during the school day. Cuing and prompting was continued until students autonomously applied the strategies they were taught.

By the end of the year, students in the direct explanation condition outperformed control students on standardized measures of reading. Disappointingly, there was only a slight trend toward better performance in the direct explanation compared to the control condition on the comprehension section of the Stanford Achievement Test administered at the end of the year. This lack of a difference, however, occurred in the context of many other clear differences favoring direct explanation, including a standardized measure of reading achievement given the year after the direct explanation intervention had been administered. These results had a profound effect on the reading education community, with direct explanation as Duffy et al. (1987) defined it subsequently used by many educators as basis for implementing comprehension strategies instructions in their own schools.

Transactional Strategies Instruction

Beginning in 1989, Pressley and his colleagues set out to study school-based, educator-developed strategies instruction that seemed to work, that is, where educators could offer evidence, such as pretest-posttest performance differences, that their instruction was having an impact on students. Their first studies were conducted at Benchmark School in Media, Pennsylvania, a school dedicated to helping elementary-age children overcome reading problems (Gaskins, Anderson, Pressley, Cunicelli, & Satlow, 1993; Pressley, Gaskins, Cunicelli, et al., 1991; Pressley, Gaskins, Wile, Cunicelli, & Sheridan, 1991). A focus of the Benchmark curriculum is comprehension strategies instruction. The Benchmark investigations were followed by studies in two Maryland public school elementary programs dedicated to increasing the use of strategies for reading comprehension (Brown & Coy-Ogan, 1993; El-Dinary, Pressley, & Schuder, 1993; Pressley, El-Dinary, Gaskins, et al., 1992; Pressley, El-Dinary, Stein, Marks, & Brown, 1992; Pressley, Schuder, SAIL Faculty and Administration, Bergman, & El-Dinary, 1992).

A variety of qualitative methods were used in this research, including ethnographies, ethnographic interviews, long-term case studies, and analyses of classroom discourse. Although the three programs in these studies differed in their particulars, a number of conclusions held across them:

- Comprehension strategies instruction was long-term, with teachers offering it in their classroom throughout a school year. The ideal was for it to continue across school years. Teachers recognized that the younger the children, the more that was required for them to understand the individual strategies. The younger the children as well, the more that was required for them to learn how to coordinate their use of different strategies.
- Teachers explained and modeled effective comprehension strategies. Typically, a few, powerful strategies were emphasized, for example, prediction of upcoming information in a text, relating text content to prior knowledge, constructing internal mental images of relations described in text, use of problem-solving strategies such as rereading and analyzing context clues when meaning is unclear, and summarizing.
- The teachers coached students to use strategies as needed, providing hints to students about potential strategic choices they might make. There were many mini-lessons about when it is appropriate to use particular strategies.
- Both teachers and students modeled use of strategies for one another, thinking aloud as they read.
- Throughout instruction, the usefulness of strategies was emphasized, with students reminded frequently about the comprehension gains that accompany strategy use. Information about when and where various strategies can be applied was discussed often. Teachers consistently modeled flexible use of strategies; students explained to one another how they used strategies in their reading.

- The strategies were used as vehicles for coordinating dialogue about text (see especially Gaskins et al., 1993). In particular, when students related text to their prior knowledge, constructed summaries of text meaning, visualized relations covered in a text, and predicted what might transpire in a story, they engaged in personal interpretation of text, with these personal interpretations varying from child to child and reading group to reading group (Brown & Coy-Ogan, 1993).

Such instruction came to be known as "transactional strategies instruction," for three reasons relating to alternative theoretical definitions of transaction. First, long-term strategies instruction emphasizes that getting meaning from text involves an active thinker using the text as a starting point for construction of meaning, consistent with transaction as defined in reader response theory (Rosenblatt, 1978). Second, the interpretations of stories that emerge as groups of children apply strategies to stories are different than the interpretations of those stories that would occur if children read the stories by themselves, transactional in the sense of the term employed by organizational psychologists interested in communications and problem-solving (e. g., Hutchins, 1991). Third, a teacher's and students' reactions and interpretations are co-determined by each other's interpretations and reactions to stories during group discussions of stories, which are common in this form of instruction. Thus, classroom strategies instruction is transactional in a sense identified by developmental psychologists (e. g., Bell, 1968).

In a nutshell, transactional strategies instruction involves direct explanations and teacher modeling of strategies, which is followed by guided practice of strategies. Thus, it is more similar to Duffy et al.'s, 1987, approach than to any other model). Teacher assistance is provided as needed basis (i. e., strategy instruction is "scaffolded," Wood et al., 1976). There are lively interpretive discussions of texts, with students exposed to diverse reactions to text.

As they devised instruction, the educators in these settings were aware of the research on comprehension strategies instruction and felt it was relevant to the great need they perceived in their students to learn how to comprehend. These educators felt that short-term instruction

would not produce the effects they wanted. Moreover, explanation, modeling, and scaffolded practice had intuitive appeal. Commitments to traditional language arts instruction with its emphasis on dialogue and interpretation also affected the development of comprehension strategies instruction in these settings. The result was instruction that looked much like Duffy et al.'s (1987) envisionment of strategies instruction, even for some schools that had the reciprocal teaching model as their starting point (Marks et al., 1993). The flexibility of direct explanation has a lot of appeal, with educator's elaboration of it, transactional strategies instruction, enjoying increasing support.

In some areas of research, it is possible to produce programs of research consisting of a number of related multi-factorial experiments. That is not occurring in the case of transactional strategies instruction, however. The main reason is that a realistic test must occur at least over the course of months, for the model specifies that learning comprehension strategies and how to coordinate their application is a long-term development. We can offer three recent reports of comparative studies of instruction that is transactional as defined by Pressley, El-Dinary, Gaskins, et al. (1992).

Brown, Pressley, van Meter, and Schuder (1996) Brown et al. (1996) conducted a year-long quasi-experimental investigation of the effects of transactional strategies instruction on second graders' reading. Five grade-2 classrooms receiving transactional strategies instruction were matched with grade-2 classrooms taught by teachers who were well regarded as language arts teachers but who were not using a strategies instruction approach. In each classroom, a group of readers who were low achieving at the beginning of grade 2 was identified.

In the fall of the year, the strategies-instruction condition and control participants in the study did not differ on standardized measures of reading comprehension and word attack skills. By the spring, there were clear differences on these measures favoring the transactional strategies instruction classrooms. In addition, there were differences favoring the strategies-instructed students on strategies use measures as well as interpretive measures. That is, strategies-instructed students made more diverse and richer interpretations of what they read than controls.

Collins (1991). Collins (1991) produced improved comprehension in fifth and sixth graders by providing a semester (3 days a week) of comprehension strategies lessons. Her students were taught to predict, seek clarification when uncertain, look for patterns and principles in arguments presented in text, analyze decision-making that occurs during text processing, solve problems through strategies including backward reasoning and visualization, summarize, adapt ideas in text (including rearranging parts of ideas in text), and negotiate interpretations of texts in groups. Although the strategies-instructed students did not differ from controls before the intervention with respect to standardized comprehension performance, treated and control students differed by 3 standard deviations on the posttest, a very large effect for the treatment.

Anderson (1992). Anderson (see also Anderson & Roit, 1993) conducted a 3-month experimental investigation of the effects of transactional strategies instruction on reading disabled students in grades 6 through 11. Students were taught comprehension strategies in small groups, with 9 groups of transactional strategies students and seven control groups. Although both strategies-instructed and control students made gains on standardized comprehension measures from before to after the study, the gains were greater in the trained group than in the control condition. Anderson (1992) also collected a variety of qualitative data supporting the conclusions that reading for meaning improved in the strategies-instructed condition. For example, strategies instruction increased students' willingness to read difficult material and attempt to understand it, collaborate with classmates to discover meanings in text, and react to and elaborate text.

Summary. Comprehension strategies instruction is being disseminated in schools in the 1990s, often consistent with the transactional strategies instruction model. Transactional strategies instruction begins with teacher modeling and explanation of strategies and proceeds to students practicing strategies applications together, using the strategies as part of constructing interpretations of text. It is the way that Duffy et al.'s (1987) research on direct explanation of comprehension strategies is being translated into practice. The transactional strategies instruction approach yields improved results on standardized reading tests, which are still the most broadly

used measures of accountability within the American educational system. In addition, transactional strategies instruction seems to produce more interpretive readers, readers better able to discuss their interpretations of text in dialogues that are much more student involved and involving than traditional classroom discussions (cf., Mehan, 1979).

Summary

The strategies instruction of the 1990s is very different from reciprocal teaching, although there is little doubt that the reciprocal teaching research did much to stimulate later research on strategies instruction. Because reciprocal teaching is so familiar to many developmentalists, a principal audience of this volume, we reflect on the transactional strategies instructional approach—which is what comprehension strategies instruction at its best has become—by comparing it with reciprocal teaching—which was the launching conceptualization of comprehension strategies instruction with children.

Both transactional strategies instruction and reciprocal teaching involve teaching of cognitive processes for coming to terms with text. Both include modeling and explanation of strategies. Both include much discussion of what is being read as students practice strategies. Both include teacher scaffolding of instruction—the teacher monitors what is going on and offers supportive instruction as needed. Both cultivate cooperative, supportive relations among students during reading. Both approaches assume that participating in the instructional group and receiving the scaffolded instruction will result in long-term internalization of the cognitive processes being fostered by the group, so that the teacher is progressively less involved as instruction proceeds.

Nonetheless, the differences between reciprocal teaching and direct explanations-based transactional strategies instruction are striking. The most important difference is concerns the salience of the teacher. Reciprocal teaching involves quickly reducing the adult teacher's control. The belief is that if students are to internalize decision-making with respect to cognitive processes, students need to be the ones controlling the cognitive processes in reading group. In contrast, the teacher is much more visibly in charge as part of direct explanations, although

always with the goal of reducing teacher input---that is, direct explanation teaching is scaffolded, with the teacher cutting back as soon as it is possible to do so.

There is an important consequence of this difference in salience of the teacher in reciprocal teaching and direct explanation, one which, in our view favors the direct explanation approach. Reciprocal teaching involves a fairly rigid sequence. Each time, after a portion of text is read, the student leader of the moment poses a question for peers. The peers attempt to respond. Then, the student leader proposes a summary. Only then are the other students in the group invited into the conversation, to seek clarifications by posing questions or make predictions about upcoming text. Those who favor reciprocal teaching correctly argue that these processes are ones that are critical to comprehension of text (e.g., Baker & Brown, 1984). Moreover, they correctly point out that a great deal of flexible discussion of text and issues in text can occur within this framework. The flexibility of discussion certainly is greater during transactional strategies instruction, however, with the direct explanation approach in no way restricting the order of strategies execution or limiting who may participate in group discussion of text. The transactional strategies instructional approach succeeds in stimulating interpretive dialogues in which strategic processes are used flexibly, with consistently high engagement by all group members (see Gaskins et al., 1993).

Transactional strategies instruction, like reciprocal teaching, is a product of a variety of theoretical forces. The specific strategies in transactional strategies instructional programs typically are ones validated in basic research, ones that also are salient in verbal protocols of excellent reading. The metacognitive theoretical emphases on heightening student awareness is unambiguous in transactional strategies instruction, with many efforts made to increase the understanding of students about the effects of strategies on their reading achievement, to increase their understanding about when, where, and how to apply strategies they are learning. Transactional strategies instructors are determined to teach within their students' zones of proximal development, scaffolding instruction, and encouraging students to reflect and then instruct themselves about how to proceed with their reading. Because educators who teach

comprehension strategies are committed members of the language arts education communities, interpretation and response are prominent in transactional strategies instruction lessons and dialogues. Although the most directly influential research on transactional strategies instruction was direct explanation as exemplified by Duffy et al. (1987) and others (e.g., Bereiter & Bird, 1985), transactional strategies instruction is the conjunction of many intellectual forces affecting reading instruction at the end of the twentieth century, ones that continue to evolve. This theme will be explored in some detail later, in the concluding comments to this section on comprehension instruction.

Alternatives to Comprehension Strategies Instruction

In addition to teaching of comprehension strategies, two other general directions have been pursued as a means for increasing student understanding of text. Neither of these, however, have been studied as extensively as comprehension strategies instruction.

Improving Word-Level Processing and Knowledge

As reviewed earlier in this chapter, proficiency in basic decoding processes is associated with later competence in comprehension and overall reading achievement. One question posed by researchers has been whether improving word-level competence translates immediately into comprehension gains. The answer seems to be yes, at least sometimes. For example, improvements in comprehension following decoding instruction have been evident in the most systematic program of research to date assessing instructional improvement of decoding in dyslexic students. This is the work carried on by Lovett and her colleagues at Toronto's Hospital for Sick Children.

Lovett, Ransby, Hardwick, Johns, and Donaldson (1989) succeeded in improving the decoding of dyslexic students ages 9 to 13, with two different training methods proved effective, one involving letter-sound analyses and blending and the other intensive practice in reading and writing. Both of these programs also produced improved performance on a measure of standardized reading comprehension. Lovett, Warren-Chaplin, Ransby, and Borden (1990) also

succeeded in improving the decoding of dyslexic students with two different approaches to training, one an exclusive whole word approach and the other varying instruction depending on the nature of the word—a whole word with irregular words and letter-sound analyses and blending with regular words. The exclusive whole word approach produced improved performance on a standardized measure of comprehension relative to gains in a control condition; the mixed whole word and letter-sound mapping approach produced comprehension gains no better than those occurring in the control condition. An analogous pattern of outcomes was produced by Lovett et al. (1994), who trained dyslexic readers to decode using one of two approaches, either phonological analysis and blending or decoding by analogy (e.g., if child knows round, using that knowledge to decode unfamiliar words such as bound, found, mound, and pound). The former approach increased performance on a standardized comprehension measurement relative to a control condition, although the latter approach failed to do so.

There was no obvious accounting for the different outcome patterns in these studies. The comprehension measures were tangential to the main interest in word-level effects and thus, there was insufficient measurement to tease out the various effects of word-level processing improvements on comprehension. That improvements in decoding competence might have immediately documentable effects on comprehension is an important hypothesis, with enough preliminary support for it in the studies by Lovett and her colleagues to urge additional study of this problem.

Because the students in the Lovett studies were dyslexic, it is especially important to generate evidence on this problem with respect to the reading of normal readers. That is, when normally-achieving children learn to read words using various approaches to decoding instruction, are there immediate improvements in their comprehension? Beyond decoding, does it make much difference on comprehension if students know more about the meanings of words? Given consistent correlations between vocabulary knowledge and reading achievement (see Anderson & Freebody, 1981), there certainly is the possibility of a causal relationship between vocabulary knowledge and comprehension. Without a doubt, the best known evaluation of this causal

hypothesis was Beck, Perfetti, and McKeown (1982; McKeown, Beck, Omanson, & Perfetti, 1983; McKeown, Beck, Omanson, & Pople, 1985; Omanson, Beck, McKeown, & Perfetti, 1984). In Beck et al. (1982), fourth-graders were taught 104 new vocabulary words over a period of five months, with the students encountering the words often as part of the intervention and using the words in multiple ways as part of instruction. Follow-up measures included pretest-to-posttest gain scores on a standardized comprehension test. Although the effects were not large, at the end of the study, comprehension tended to be better for students receiving the vocabulary intervention compared to those who had not.

In reviewing the relevant studies, some of which produced vocabulary-comprehension associations and some which did not, Beck and McKeown (1991) concluded that vocabulary interventions affected comprehension positively to the extent that they stimulated students to make deep and extensive connections between vocabulary words and their definitions. They attributed failures to find comprehension effects in some vocabulary intervention studies as reflecting superficial and rote learning of vocabulary-definition linkages. Durso and Coggins (1991) provided an outcome in a true experiment that could be interpreted as consistent with the Beck and McKeown (1991) interpretation of the between-study differences in outcomes.

So, should students be taught vocabulary explicitly as a means of improving comprehension? There is debate, with some believing there are so many vocabulary words that instruction has no hope of making much dent on comprehension (e.g., Nagy & Anderson, 1984). Others argue that the doubters overestimate the number of different words in English that need to be known in order to read well and that vocabulary instruction is a viable option (e.g., D'Anna, Zechmeister, & Hall, 1991).

An important understanding that has emerged in recent years is that there are Matthew effects in reading, analogous to the Biblical Matthew's conclusion that the rich get richer: All else being equal, good readers will improve faster than weaker readers (Stanovich, 1986). If students can decode, it is easier for them to read. Because it is easier for them to read, they will read more. Yet as the consequence of doing more reading, good decoders will become still more automatic

and skilled in decoding even as they are exposed to more text than poor readers. Moreover, the more skilled the decoding, the greater the learning from any given piece of text. The result, in all, is that not merely reading ability per se but also vocabulary, literary experience, and all manner of book knowledge will increase more rapidly for good decoders than for weaker decoders. As knowledge increases, future reading comprehension is more certain, because comprehension largely depends on prior knowledge, including vocabulary. The research we have just reviewed is consistent with Stanovich's argument that poor decoding constrains comprehension growth. Thus, as educational researchers strive to improve reading comprehension directly, they must not overlook the importance of assessing and supporting word-level abilities. They must recognize the critical importance of lower-order competencies as part of the spiral of experience and growth that enables improvement in higher-order competencies.

Improving the Comprehensibility of Text

Toward increasing the productivity of children's reading, an alternative to increasing children's reading comprehension is that of increasing the comprehensibility of their texts. Psychologists have identified four major approaches for modifying the structure of texts so that their content is easier to comprehend and more memorable (see especially Britton, Woodward, & Binkley, 1993). Developmentally-oriented reading educators, however, are not entirely convinced that such modifications should be made to the texts children read.

Signals include the following (Meyer, 1975):

- Use of text conventions that flag the structure of the text (e.g., cause and effect signaled with "...because...", sequences with "first...second...third...fourth...and so on."
- Advance organizers summarizing a main point before it is developed
- Summary statements at the end of a section of text

- A variety of words specifying importance of information, such as "Of less consequence...", and "More to the point..."

Signaling seem to provide at least slight comprehension advantages to readers (e. g., Lorch, 1989; Meyer, Brandt, & Bluth, 1980). It is especially helpful in making difficult conceptual information comprehensible and useful.

Elaborations and connections can be added to textbooks used by elementary-level students to increase the likelihood that students detect and understand connections between ideas. Often, the students lack prior knowledge assumed by the texts. In addition, many textbook passages are very poorly written if not downright incoherent. Textbook passages can be modified so that essential background information is presented and linkages between ideas in text are made explicit, for example, by adding elaborations and connections to text. Such revision has been shown to produce modest increases in schoolchildren's learning (Beck, McKeown, Sinatra, & Loxterman, 1991; McKeown, Beck, Sinatra, & Loxterman, 1992). The benefits of adding connections and elaborations at the high school and college levels have been more striking than the gains at the elementary level (Britton, Van Dusen, & Gülgöz, 1991; Britton, Van Dusen, Gülgöz, & Glynn, 1989; Duffy et al., 1989; Graves & Slater, 1991).

Adjunct questions can be placed before a text, in text, or after text (e. g., Rothkopf, 1966). Both pre- and postquestions enhance memory for material covered by questions (Anderson & Biddle, 1975). Postquestions also improve learning of nonquestioned material, increasing review and reflection of more than just the information that answers the postquestion. Adjunct questioning effects are not large, consistent with the general tendency of most text modifications to produce small effects. In general, adjunct question effects are smaller and less certain with children than with adults (see Pressley & Forrest-Pressley, 1985).

Text accompanied by semantically-redundant illustrations is more memorable than unillustrated text (Levin, 1982, 1983; Levin & Lesgold, 1978; Levin & Mayer, 1993; Pressley, 1977; Woodward, 1993). Pictures also stimulate inferences that would not occur if text alone

were processed (e. g., Guttman, Levin, & Pressley, 1977). The only consistently negative effect of pictures on learning that has been reported is with beginning readers. Pictures can reduce decoding demands for these readers and thus, reduce their attention to the words they are reading. If children read words accompanied by their illustrations, their acquisition of the words as sight vocabulary is less likely than if they read them without accompanying illustrations (Samuels, 1970).

Should text be made easier to comprehend? Chall, Conard, and Harris-Sharples (1991) concluded that attempting to produce an optimally comprehensible textbook for a given content area at a particular grade level misses the mark. Rather, different textbooks are required for different students, depending on their reading ability. This is consistent with the principle that a little challenge motivates students (e.g., White, 1959), that students will be more motivated if they are reading materials that are not too easy but not too difficult either.

Roller (1990) provided a similar analysis, contending it especially important to have well structured text when students are processing moderately unfamiliar content: If content is familiar and easy, students will comprehend it regardless of whether the text is well organized. If content is too difficult, students will not understand it even if the text is well organized. When content is moderately familiar (or unfamiliar, depending on how you look at it), organization and clues to text organization make a huge difference (see also Spyridakis & Standal, 1987). Such analyses challenge those who are studying text modification to take developmental and ability differences into account, more than they have done in the past.

Summary. Researchers have succeeded in identifying a number of ways to improve comprehension, each of which produces a small amount of improvement in understanding. The case in favor of decoding instruction is overwhelming, as detailed earlier in this chapter. That facility in decoding increases comprehension strengthens the case for decoding instruction. Our reading of the evidence is that there is more support for teaching vocabulary than not. Finally, although we do not endorse one-size-fits-all books for children, making books as easy to

understand and remember as possible is reasonable. If the small advantages created by improved presentations in text are complemented by the advantages that can be produced through strategies instruction, as detailed earlier in this section, students might get much more from their texts than they have in the past.

Concluding Comments

There are contemporary parallels to all of the theoretical and pragmatic factors of the late 1970s and early 1980s that motivated the research reviewed in this section. Thus, we expect more research on comprehension, especially expanded teaching of comprehension processes:

Despite the substantial research reviewed here and the dissemination of it, including by a number of elementary curriculum publishers, the need for more comprehension instruction in schools hardly seems abated in the 1990s. Accountability for comprehension instruction increased in prominence during the Reagan and Bush years, with the ascent of the National Assessment of Educational Progress (NAEP), the nation's report card, leading the way. With respect to reading, the NAEP test outcomes have changed little since the late 1970s, with American students consistently reported as having comprehension problems. The concern for comprehension instruction has been emphasized with the development of new tests as well, particularly reading performance assessments. Students who manifest the processes stimulated by comprehension strategies instruction receive high scores on these modern assessments (Mitchell, 1992).

There has been increasing recognition in recent years that many high school and college students lack sophisticated comprehension skills (Pressley, Brown, & El-Dinary, 1992), with a concomitant increase in developmental studies and remedial programs. Modern studies skills programs have assimilated contemporary strategies instruction (see Flippo & Caverly, 1991) and thus, the symbiotic relationship between the studies skills movement and comprehension process instruction continues.

The evidence in favor of individual cognitive strategies continues to accumulate (see Dole, Duffy, Roehler, & Pearson, 1991). Direct explanation approaches to the development of articulated strategies use by students, such as transactional strategies instruction, are now being researched.

The 40+ extant verbal protocol studies of reading were analyzed by Pressley and Afflerbach (1995). The portrait of sophisticated reading that emerges from this analysis is strongly supportive of comprehension strategies instruction, for excellent readers do much that is strategic as they read: Good readers (1) overview before reading; (2) look for important information in text and pay greater attention to it than other information; (3) attempt to relate important points in text to one another to understand the text as a whole; (4) activate and use prior knowledge to interpret text, such as generating hypotheses about text and predicting text content; (5) reconsider and/or revise hypotheses about the meaning of text based on text content; (6) reconsider and/or revise prior knowledge based on text content; (7) relate text content to prior knowledge as part of constructing interpretations of text; (8) attempt to infer information not explicitly stated in text when the information is critical to comprehension of the text; (9) attempt to determine the meaning of words not understood or recognized, especially when a word seems critical to meaning construction; (10) use strategies, such as underlining, repetition, making notes, visualizing, summarizing, paraphrasing, and self-questioning, to remember text; (11) change reading strategies when comprehension is perceived not to be proceeding smoothly; (12) evaluate the qualities of text, with these evaluations in part affecting whether text has impact on reader's knowledge, attitudes, behavior, and so on; (13) reflect on and process text additionally after reading it (reviewing, questioning, summarizing, attempting to interpret, evaluating, considering alternative interpretations, considering how to process the text additionally, accepting one's understanding of the text, rejecting one's understanding of a text); (14) carry on a responsive conversation with the author; and (15) anticipate or plan for the use of knowledge gained from the reading. In short, there is much better verbal protocol evidence in the 1990s than in the late

1970s for many, many conscious processes as part of excellent, self-regulated reading (e.g., Wyatt et al., 1993).

More complete metacognitive theories of self-regulation have appeared in the past decade than were available in the late 1970s. All of these theories specify that strategies are important in self-regulated thinking, which is portrayed as a product of cognitive processes, metacognitive knowledge and monitoring, conceptual knowledge, and motivational processes and beliefs (e.g., Borkowski, Carr, Rellinger, & Pressley, 1990; see Schunk & Zimmerman, 1994).

Transactional strategies instruction is particularly well matched to these contemporary models of self-regulation and the development of self-regulation (Brown et al., 1996), with development through modeling and direct explanation of processes consistent with much modern thinking about the educative development of intellectual autonomy (Deshler & Schumaker, 1988; Moshman, 1982; Pressley, Harris, & Marks, 1992). Transactional strategies instruction also meshes well with literary critical theories embraced by contemporary language arts professionals and, in particular, with the reader response approach embraced by those now extending Rosenblatt's (1978) thinking in the elementary and secondary curricula (Beach & Hynds, 1991; Clifford, 1991; Holland et al., 1993; Karolides, 1992).

In summary, there are very strong pragmatic and theoretical reasons for continuing research on comprehension strategies and their development through teaching: Such instruction meshes with accountability demands, but also is acceptable to the language arts educator community. The case is strong that transactional strategies instruction stimulates comprehension processing consistent with the processing of excellent readers. Finally, such research and translation into practice will continue largely because there is no obvious competitor approach to meeting what continues to be a very great need: Improving word level processes has had only slight effect on comprehension in studies to date. Text modifications also have relatively small effects on comprehension.

Contemporary Views on Writing and Writing Instruction

Much has changed in the past two decades with respect to writing instruction in American schools. This is largely due to the efforts of language arts educators to increase the amount of writing occurring in schools, especially expressive writing. For example, Gray (see 1988) began the Bay Area Writing Project in the early 1970s. Bay Area teachers who wrote themselves and taught writing to their students collaborated with other teachers who wanted to increase writing in their students. At the center of this model, which eventually expanded into the National Writing Project, were the beliefs that teachers of writing needed to be writers themselves and that the only way to learn how to teach writing was by becoming a writer. Toward this end, writing project teachers organized summer workshops and peer support. With the appearance of a number of visible books urging teachers to teach writing and develop writers in their classrooms (e.g., Atwell, 1987; Calkins, 1986; Graves 1978, 1983), this movement found much support in the professional language arts literature.

The result has been that composing of stories and narratives has become an everyday occurrence in many American elementary classrooms, much more common than such activities were 20 years ago. In contrast, instruction on the formal conventions of writing, such as spelling and grammar, was more common 20 years ago than it is today. As in the case of comprehension, contemporary writing instruction can be understood by considering its historical foundations, for a number of scientific and educational directions in the early 1980s did much to stimulate the development of modern writing strategies instruction.

The Development of Writing Skills

Earlier in this chapter, we discussed how children learn the basics of alphabetic spelling. As important as these skills are, children must go beyond the basics to become skillful writers. Looking back at the stories in Figures 2 through 5, we see obvious development in such areas as sentence structure, vocabulary, and attention to the reader. What does research have to say about these higher-level aspects of writing?

Learning to spell accurately and automatically is an important part of being a skilled writer. Children who must puzzle over the spelling of each word have little attention left to devote to higher-level aspects of writing. Such children may avoid words that they are unable to spell, limiting their vocabulary and their ability to express themselves. Thus, even though spelling is often considered a low-level skill, it has an important influence on higher-level aspects of writing. The results of Juel (1994) support these claims. As part of her longitudinal study of children in grades one through four, Juel asked judges to rate children's stories (which were elicited in response to a picture) for story development, syntactic maturity, and richness of vocabulary. The raters were specifically instructed to disregard spelling. Two factors were found to account for about 40% of the variation among children in the rated quality of writing. The first of these factors was the children's spelling ability. Even though judges were told to ignore spelling when they rated the stories, the good spellers were observed to produce better stories than the poor spellers. The second factor that helped to account for variation in writing ability was the quality of children's story ideas. This was assessed by asking children to tell a story about the same picture they had earlier written about. The oral stories were scored using the same criteria that were used to score the written stories. Children who told better oral stories tended to be better writers. The relative contributions of spelling and story ideas changed across grades. For first graders, spelling was the dominant influence on the quality of the written stories. By grade two, the measure of story ideas had become more important, its influence steadily increasing through grade four. Still, spelling made a significant contribution to writing quality throughout the four years of the study. These results show that, at least in the elementary grades, good spellers tend to be good writers.

Juel (1994) further found that children's ability to tell a good oral story -- one determinant of their writing ability -- was related to their reading experience. Good readers gained each year on the oral story-telling measure. Poor readers did not improve from grade one to grade four. In fourth grade, as in first grade, the poor readers' oral stories, like their written stories, were often no more than lists of what they had seen in the picture. Children who do not read very much,

like the poor readers in Juel's study, have less opportunity to learn about story structure and vocabulary than avid readers do. Their writing is predictably poor.

Although children's ability to tell oral stories is related to their ability to produce written stories, children's written texts are at first less complex and more primitive than their oral productions. O'Donnell, Griffin, and Norris (1967) documented this difference by showing children a silent film. Immediately after seeing the film, children were asked to tell its story to an experimenter and also to write it. The children's written and spoken productions were segmented into T-units, which are the shortest units that can be grammatically punctuated as sentences. Third graders produced shorter T-units in their writing than in their speech. Moreover, the T-units in writing were less complex, less likely to contain constructions such as embedded clauses. A later study by Loban (1976) reported that, up to about seventh grade, T-units continued to be longer in speech than in writing. These results are consistent with the view that young children's written language is constrained by their oral expression. Because writing makes so many demands on them, young children cannot display their linguistic abilities to the same extent in writing as they do in talking.

At some point during the middle years of schooling, an important shift occurs. Written language now becomes more complex and elaborate than spoken language. O'Donnell, Griffin, and Norris (1967) found signs of this shift as early as fifth grade when examining the length of T-units in speech and writing. The shift in T-unit length occurred somewhat later in the study by Loban (1976). In this study, though, differences in elaboration favoring writing were apparent in fifth grade for a random sample of students. These differences appeared in fourth grade for children with high language ability but not until eighth grade for students with low language ability. By late elementary school, then, most children realize that writing is not just talk written down. Children deliberately shape their written productions in a way that they do not normally do in speaking. They learn that certain linguistic forms, vocabulary items, and conventions are used to a greater extent in writing than in talking (Rubin, 1980). It is likely that Missy (Figure 5) has already gone through this shift, whereas Shayna (Figure 5) has not.

Development is also observed in children's ability to consider the point of view of the reader and the purpose of the writing, for example whether the goal is to entertain, inform, or persuade. Thus, in a study by Scardamalia, Bereiter, and McDonald (1977), cited in Bereiter (1980), fourth graders who were asked to write instructions for playing a novel game did not do a good job of adapting the instructions to the readers. It is not that children of this age are totally egocentric; research on social cognition reveals that they can take another person's point of view into account under some circumstances. Rather, children seem to have difficulty considering the needs of the reader while simultaneously coping with all of the other demands of writing. Missy (Figure 5) did apparently consider the reader when she wrote "very" a large number of times so that the reader would realize how long the trail felt to the hikers. Although goal-setting and audience consideration improve with age, they remain problems for many student writers at least into the high school years (e.g., Langer, 1986, Chapter 3).

Revision is uncommon in young children's writing, with the first draft often being the final draft (e.g., Bereiter & Scardamalia, 1987, Chapter 11; Fitzgerald, 1987). When young children and poor writers do revise, their revisions tend to be superficial. Better writers put more stress on revision (see Fitzgerald, 1992). They attend closely to what they want the reader to get out of the piece and they keep in mind the style that they want to use. In the course of writing, they give more concern to the overall meaning of the text than to the structure of individual sentences or to mechanics. Nevertheless, good revisers do attend to spelling, punctuation, and grammar before they are done.

As children develop, their writing also becomes better organized. For example, Stahl (1977) found that second graders' compositions on the topic of "my house" showed no evidence of attention to selection, arrangement, or balance. The compositions generally just broke off at the end, with no concluding statement. By eighth grade, students presented the content in a coherent arrangement, allocated space in proportion to the importance of the elements, and ended at an appropriate point. Some fifth graders' stories showed the qualities of the typical second-grade story whereas other fifth graders' stories were more like eighth graders'. Shayna (Figure 5)

seems to write whatever comes to mind in the way that Stahl observed among second graders; Missy's writing (Figure 5) is more organized.

The writing of young children and of poor writers has been characterized as "knowledge-telling". Children add ideas to essays as they come to mind rather than systematically searching their relevant knowledge. Children may fail to notice that what comes to mind may not actually be relevant to the topic at hand (Bereiter & Scardamalia, 1987, Chapters 1 and 7; Scardamalia & Bereiter, 1986; see also Emig, 1971; Pianko, 1979). As a result, the writing is often less complete than it could or should be. To be sure, Langer (1986) reported improvement in student writing from the elementary- to secondary-school years. Thus, elementary students tend to write simple stories and expositions that reflect a knowledge-telling strategy, often using packaged expressions such as "Once upon a time ..." and "They lived happily ever after". These give way to more complex writing, although the book reports and laboratory reports observed in high school are often very uncreative in structure. High school students' longer papers typically begin with a thesis statement, followed by several paragraphs, each of which contains one point related to the thesis, followed by a concluding paragraph. Even still, knowledge-telling is not an uncommon strategy among secondary students (Applebee, 1984; Durst, 1984; Marshall, 1984).

Langer and Applebee (1984, 1987; Applebee, 1984) pointed to conventional schooling as a major culprit in shaping students' unreflective knowledge-telling. The most frequent writing assignment students experience in school, they argued, is that of writing a short answer as part of an examination where such answers are not evaluated for style but rather for correctness and completeness of content (Marshall, 1984). What is graded is more often the mechanics than the construction of meaning. Not only do school tests primarily tap content, they often probe items in their order of coverage in the class (Bereiter & Scardamalia, 1987, Chapter 7). Even the wording of some test questions (e.g., ... "what we studied last week...") can promote information-dumping rather than reflection. Knowledge-telling may be further encouraged by asking students to write about topics about which they know already, since there is no need to seek out further information and integrate it with what is already known. When reports are assigned in

school, a simple listing of pieces of information found in different sources will often earn a high mark. It has also been argued that educator pressure to attend to mechanics such as spelling, capitalization, and punctuation induces students to attend to word-level and sentence-level elements of writing and to ignore whether paragraphs and the essay as a whole make sense (Langer, 1986, Chapter 3).

To better understand the thought processes involved in good writing, Flower and Hayes (1980, 1981) collected verbal protocols from college freshmen and college-level composition teachers. The writers were asked to say everything that came to mind as they composed essays on given topics. Analyses of their tape-recorded protocols made clear that expert writers approach writing as a problem-solving challenge, to be solved through three interrelated processes. The first process, planning, includes generating and organizing the content, and setting writing goals that place the sought reactions of probable readers in the forefront. The second process, translating the plan into words, results in a rough draft. The third process is that of revising the draft.

This three-phase conception of writing as planning, translation, and revising was not new (see Rohman, 1965). What was new was how highly interrelated and recursive the three phases were. During drafting, the skilled writer is sensitive to gaps, recognizing when reorganization or more information is needed. Thus, revision begins even during the process of translation, invoking more planning alongside. Layer within layer of planning, translating, and revising cycles were reported by the skilled writers as they wrote.

In contrast, the freshman writers in Flower and Hayes' (1980, 1981) studies were less likely than experts to set goals for their writing. Knowledge-telling was observed more frequently, planning was less salient, and revision was much less extensive. Moreover, whereas the novices paid close attention to mechanics throughout their writing, experts did so only at the end, in polishing their piece. Flower and Hayes' (1980, 1981) work thus documented that even students at an elite university (Carnegie-Mellon) were relatively unskilled in composition, and that the weaknesses lay in the process as much as the product. Why might this be?

Contemporary Writing Instruction

Among educators, whole language has been the dominant philosophy on literacy education for the last several decades. The whole language philosophy emphasizes the reading and writing of whole texts while de-emphasizing instruction in basic skills and mechanics per se. Toward bringing the elementary writing curriculum under the whole language umbrella, Graves's (1983) work was particularly influential. At the core of Graves's recommendations was the subordination of basic skills and mechanics to the writing process itself. Students were to be frequently engaged in sustained writing about topics and ideas of their own choosing. During Writer's Workshop, as writing sessions are known in classrooms following the Graves's model (see also Atwell, 1987; Calkins, 1986), the optimal teacher-student relationship is collaborative with the teacher providing assistance and input to students as needed, often as part of conferences concerned with revising a student-produced text.

On the face of it, there is much positive about Graves's approach to writing instruction. In contrast to the short-answer syndrome discussed earlier, students in Writing Workshop classrooms are regularly encouraged to write longer pieces and for various purposes. Teacher-student revision conferences create opportunity for the teacher to assess students' spelling, grammar, capitalization, and so on, and to conduct mini-lessons targeted at their particular needs. In Dewey's (1913) spirit, Graves's approach with its focus on students writing about what they want to, anchors instruction on the students' own interests. To reinforce the authenticity of process-writing, publication of students' final drafts is encouraged and this can be motivating, too.

As attractive as Graves's model is—as well as related models, such as the Bay Area and National Writing Projects—it was not particularly well-informed about how skilled writers write. In particular, there is more to learning to write than simply writing lots, as revealed by the Flower and Hayes (1980, 1981) analyses. Some educators picked up on the insights produced in the verbal protocol studies, developing instruction that focuses on higher-order dimensions of meaning and message construction. In these approaches, young writers are taught to plan,

translate, and revise recursively. Close attention to sentence- and word-level concerns is deferred until the revision stage.

With elementary-level students, the most ambitious exploration of the value of a plan-translate-revise model of writing instruction was carried out by Englert, Raphael, Anderson, Anthony, and Stevens (1991). The instructional program, referred to as Cognitive Strategy Instruction in Writing (CSIW), targeted writing of explanatory and compare-and-contrast essays, and the study involved regular and special education students in the fourth and fifth grades.

CSIW adopted most features of process-writing as defined by Writer's Workshop models, including that students chose their own writing topics and that writing instruction occurred in a socially-rich milieu in which teacher-student and student-student conferences were frequent. Beyond that, however, students received a great deal of explanation about good and poor explanatory and compare-and-contrast essays. One way this was accomplished was by sharing good and poor examples of writing, with teachers thinking aloud about the example while leading a discussion of its strengths and weaknesses. Reflecting aloud, the teacher asked questions such as, "Did the author address what is being explained?" or "Did he or she explain where this should take place?" Through think-alouds, teachers also modeled writing of explanatory and compare-and-contrast essays. Thus, to model the planning process, teachers asked themselves a series of questions about what should be in the text they wanted to write. Students watched and heard the teacher mull, "Who am I writing this for?...Why am I writing this?...What do I know about this?...How can I organize all of this?" Similarly the teacher continued to think aloud while writing and revising the piece together with the class. The similarities with the direct explanation approach to comprehension strategies instruction may be seen to reflect Duffy's impact on his Michigan State colleagues.

Over the school year, as the program proceeded, students took greater and greater control of planning, drafting, and revising. In addition, ongoing supports, such as planning sheets were provided, e.g.:

WHO: Who am I writing for?

- WHY: Why am I writing this?
- WHAT: What do I know? (Brainstorm)
- HOW: How can I group my ideas?
- How will I organize my ideas?
- (compare/contrast, problem/solution, explanation, other)

After a year of instruction, CSIW students wrote better than control students who had been engaged in writing without the intensive emphasis on planning, drafting, and revising. The essays produced in the post-training evaluation were analyzed in a number of ways. Whether scored holistically, with respect to how well the essay as a whole conveyed its intended message, or analytically, with respect to the completeness of the information included in explanation or compare-and-contrast essays, CSIW students did better than controls. This advantage also held when the students were asked to write something other than explanation or compare-and-contrast pieces. The CSIW writers were also more inclined to anticipate potential reader questions and to let readers know when they were offering personal opinions. In general, these positive outcomes were observed both with regular education students and students with mild reading disabilities. (For a review of a number of successes in teaching learning disabled students to plan, draft, and revise, see Graham and Harris, 1992).

In similar spirit, several researchers have endeavored to assist the writing of narratives, by providing sets of questions such as: What happened first? What happened next?...What happened last? (Hume, 1983) or Who is the main character? Who else is in the story? When does the story take place? Where does the story take place? What does the main character do or want to do? What do other characters do? What happens when the main character does or tries to do it? What happens with other characters How does the story end? How does the main character feel? How do other characters feel? (Harris & Graham, 1992). Similarly, in support of expository writing, Graham and Harris (1988) taught learning disabled students to follow a set of commands: (1) Generate a topic sentence. (2) Note reasons. (3) Examine the reasons and ask if readers will buy each reason. (4) Come up with an ending. Alternatively, toward assisting

students' search for topic-relevant information, Bereiter and Scardamalia (1982) explored the value of encouraging use of sentence openers such as, "One reason...", "Even though...", "For example...", and "I think..." In general, such prompting increases at least the amount that students write (Kellogg, 1990) and has often resulted in measurable improvement in writing quality among both regular and learning disabled students in the later elementary- and middle-school years (for a review, see Graham and Harris, 1992).

In keeping with the broader interest in comprehension-monitoring (Markman, 1981), researchers have shown special interest in the revision process. For example, Beal (1987) determined that children have more difficulty in identifying where a text needs to be revised than in doing the revision itself once the problem is pointed out. Although the ability to detect revisable problems improves across the elementary grades (Beal, 1990), it can also be fostered through instruction. Thus, to help third and sixth graders evaluate the need for revisions, Beal, Garrod, and Bonitatibus (1990) taught them to ask a series of questions about their drafts: "Who are the people in the story and what are they like?", "What is happening in the story?", "Why are they doing what they did?", "Where does the story take place?", and "When does the story take place?" The approach has been shown to improve children's revisions, especially when instruction is rich with examples of problematic narratives. A different tactic, developed by Fitzgerald and Markham (1987), consisted in teaching sixth-grade students to think of revision as a problem-solving task that could be solved through additions to text, deletion of text, substitutions, and rearrangements. Graham and MacArthur (1988) taught students with learning disabilities to pursue revisions through six steps: (1) Read the essay. (2) Find a specific sentence that tells something the writer wants in the essay. (3) Add two more reasons to the essay to support the point. (4) Check each sentence of the essay. (5) Make changes. (6) Reread and make final changes. All of these studies demonstrate that elementary-school students can learn to revise better than they otherwise do.

Summary

Every school day, many American elementary students are writing narrative and exposition. They learn to plan, draft, and revise by doing it. During teacher-student revision conferences, the teachers provides mini-lessons targeted at aspects of mechanics that seem problematic for the particular student writer. That is, teachers use student drafts to diagnose student instructional needs.

That educational research sometimes makes a difference is dramatically illustrated in the revolution in writing instruction that has occurred in the last decade, with isolated skills- and mechanics-driven teaching of writing largely an approach of the past. This revolution occurred because of converging theoretical analyses and research outcomes, analyses provided by language arts researchers, cognitive scientists, and developmental psychologists. The progress in writing strategies instruction parallels the progress in teaching of comprehension strategies. Scientists from diverse disciplines conducted analyses directly relevant to the development of literacy competencies via instruction, instruction that is necessary because the literacy of young adults is far short of what it could be. Instruction can make an important difference in the development of academic competence.

Research on skilled writing continues. For example, although there is not doubt that skilled writers plan extensively before they write, new analyses (e.g., Gould, 1980, 1981; Kellogg, 1994, Lansman, Smith, & Weber, 1990) suggest that it may not take up the majority of writing time as suggested by earlier analyses based on think-alouds (Hayes & Flowers, 1986). How high prior knowledge in a domain makes writing easier, although not necessarily better, is becoming better understood. Conversely, how high verbal ability increases the quality of writing but not necessarily its quality is also becoming better understood (Kellogg, 1993).

Just as research on the writing process improves, so do research programs on writing strategies instruction such as that by Graham and Harris (1992). This makes imminent sense given that the great need for more effective writing instruction persists, with recent reports on writing from the National Assessment of Educational Progress no more sanguine about student

writing than earlier ones. We believe, as do others (e.g., Bruer, 1993, Chapter 7) that this is largely because the process writing models that only stimulated more writing are only now being replaced on a large scale by writing instruction consistent with planning-drafting-revising conceptions of writing.

Summary

In recent years, the field has made reifying progress in understanding the difficulties of learning to read and write as well as ways to ease their progress. Indeed, to the extent that these understandings find realization in the classroom, there is sound reason for expecting the incidence of learning disability in these areas to be reduced dramatically. In particular, the lion's share of the variance in early reading and writing success is absorbed by measures of letter knowledge and phonemic awareness and—through them—word recognition, decoding, and spelling. Succinctly stated, successful entry into print depends first on understanding how our writing system works and then on learning to use it.

Given that children just plain can't read or write unless they can conquer the print, the primacy of these word-level factors should probably not be surprising. On the other hand, if the first goal is to move children comfortably and confidently into reading and writing, it is only because the ultimate goal is to lead them into literacy in the broadest sense of that word. Although the passage from illiteracy depends critically on developing facility with the written word, it remains a long stretch from such basic competencies to true literacy.

Beyond the basics, the firmest prescription from research is that children should read as often, as broadly, and as thoughtfully as possible. In theory, this seems so simple, straightforward and equitably valid a recommendation. In practice, however, it too is problematic. Given equal opportunity, poor readers cannot possibly read as much in quantity or quality as good readers, nor are they likely to try. Children who do not read well are those who need most to read more, but children who do not read well are very often loathe to read at all.

Issues of uneven access notwithstanding, there are indications that schoolchildren generally are reading more these days. This can only be good news, but even so: What children are reading more of, it seems, are stories and novels; in contrast, what they need most to become good at reading is informational text. Among both children (Mullis et al., 1995) and adults (Guthrie, Schafer, & Hutchinson, 1991) in the US, the ability to read informational texts remains differentially and disturbingly weak.

We are thus returned to the two issues with which we started. First, why is it so difficult for so many children to learn how to read and write the words? And, second, on what else, besides word facility, does literacy depend—and, in particular, on what else that can be hastened and sharpened through instruction? If we believe we have answered the first of these questions, then it is due time to turn in earnest to the second. We do not know what to do about vocabulary difficulties. We do not know what to ask about syntactic difficulties. Research on strategies instruction has given us better methods for helping students to think actively about reading comprehension difficulties and to write with more clarity and coherence. Clearly, however, our understanding of the underlying nature and optimal development of such higher-order dimensions of literacy is still quite crude.

As one last provocation, then, we leave you with this thought: Strong correlations hold between children's reading and writing abilities (Shanahan & Tierney, 1990; Spivey & King, 1989). As Stotsky (1984) has pointed out, how much and how well students read are firm predictors of the quality of their writing. One wonders: If we had more refined questions and measures, might we find telling reflections of writing on reading as well? Children's early spelling behaviors have served as a powerful database for studying their perceptions, misperceptions, and cognitive command of the phonological and orthographic structures that make beginning reading difficult. Perhaps children's writing will similarly yield an entry into the higher-order linguistic and conceptual difficulties of becoming literate. In any case, and whatever the means, gaining that understanding must be the field's next challenge.

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