Metacognition and Reading in Children Who Are Deaf:
A Review of the Research

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The purpose of this article is to review and synthesize the literature linking metacognition and reading in children who are deaf. Although this body of research is sparse, three issues emerge. First, the research implies that current instructional practices used to teach reading to deaf children might actually hinder their development of mature metacognitive knowledge and control. Second, the studies suggest that the low-level reading material typically given to deaf children might not provide the opportunity for them to develop, practice, or use metacognitive strategies. And third, the research shows that deaf students can benefit from metacognitive strategy instruction.

P. David Pearson and Dale Johnson (1978) define reading comprehension with a metaphor: “Comprehension is building bridges between the new and the known” (p. 24). Inherent in this metaphor is the notion that readers actively construct their understanding of a text. A sophisticated reader independently uses metacognitive knowledge and control before, during, and after the construction.

As used by cognitive psychologists, metacognition refers to both the knowledge and the control an individual has over his or her own thinking and learning. Metacognitive knowledge about reading includes (1) knowledge about oneself (Am I a good or a poor reader? Do I do better with construct-response questions or multiple-choice questions?), (2) knowledge about the tasks involved in reading (I know a lot about this topic so it should be easy to remember the information here.), (3) knowledge about the text (Gee, this is a fairy tale. I haven't read one of these before.), and (4) knowledge about strategies (If I make a picture in my mind, I'll remember where this story took place. I don't remember the answer to that question so I'll look at the text again.). Metacognitive knowledge allows a reader to be effective as an active and strategic learner. That is, metacognitive knowledge allows the reader to exercise metacognitive control.

Metacognitive control refers to self-regulatory strategies that allow the reader to monitor progress: to anticipate, to alleviate, or to remedy reading problems. Baker and Brown (1984) state that “any attempt to comprehend must involve comprehension monitoring” (p. 344). For example, a reader might realize that a text is difficult because of his or her own lack of an elaborate schema or background knowledge on the topic. Therefore, the reader decides to take notes on the text (strategy use) and then test himself or herself (monitoring the effectiveness of the strategy). Metacognition during reading (both in terms of knowledge and control) requires the active and constructive involvement of the reader.

Over the past 20 years numerous studies have investigated the normally hearing child’s and adolescent’s metacognitive knowledge about reading. These studies indicate that metacognition about reading de-
velops with age and requires active and strategic monitoring. In addition to maturation, practice and instruction can also foster metacognitive knowledge and the use of metacognitive strategies. The hallmark of successful strategy instruction is that it is integrated into content instruction, it includes ample practice of the strategy with increasingly more complex texts, and it includes information on when, where, how, and why to use the strategy. This body of research also indicates that poor readers, like beginning readers, lack or have incomplete metacognitive knowledge and control of reading. (For reviews of this research see Armbuster, Echols, & Brown, 1982; Flavell, 1985; Garner, 1987; Paris, Wasik, & Turner, 1991.)

There is not an extensive body of research focusing on metacognition and reading in individuals who are deaf. The findings of the research that has been conducted, however, are fairly consistent and do indicate directions for future research as well as implications for classroom instruction. The objective of this review is to synthesize this body of research and to expand on the implications for instruction. To facilitate the review, studies are organized into categories: studies focusing on metacognitive knowledge that provide insights on what deaf readers know about reading, studies focusing on metacognitive control that give information on how deaf readers regulate their thinking, and intervention research that documents the efficacy of instruction on metacognition. Demographic information on the deaf subjects, as reported in each study, is related here. In some studies, this information is not as complete as in other studies.

Investigations of Metacognitive Knowledge

The research reviewed here used one of two paradigms: interviews or think-alouds. Interviews have been the most frequently used method in this area of research (Garner, 1987). Interviews, whether employing a standardized protocol or not, simply ask the subjects what they know (e.g., Are you a good reader? Why/Why not? or What do you do when you don't understand a word in a passage?). A general concern in the use of interviews with children, however, is that their responses may not reflect what they know but rather what they are able to express. This is of particular concern in interviewing deaf subjects in regard to the expressive and receptive language skills of both the deaf child and the interviewer. In the think-aloud paradigm, subjects are asked to say aloud “everything they think and everything that occurs to them while performing the task” (Hayes & Flower, 1980, p. 4). With think-alouds, as with interviews, the language competence of the deaf subjects as well as of the researchers is an issue. While Garner (1987) identifies three other paradigms (cross-age tutoring, stimulated-recall, and optimal-nonoptimal product method) that could also yield descriptive information, this review did not find examples of the first two paradigms employed with deaf subjects and only a partial use of the optimal-nonoptimal product method. In this paradigm, subjects produce an optimal product (a summary or retelling) as well as a nonoptimal product. The subjects then state what makes an optimal product good and what makes a nonoptimal product weak. This paradigm explores a subject's metacognitive knowledge about text.

In describing an individualized reading program instituted at the Oregon State School for the Deaf, a residential facility, McCarr (1973) was among the first to contribute to our knowledge about metacognitive awareness in readers who are deaf. She individually interviewed 68 seventh- through twelfth-grade students. During these interviews, she found that most students reported that they were reading well above their assessed reading level. This study was conducted for a purpose other than gaining metacognitive insights; it did not probe the subjects for the reasoning behind their self-assessment. More recent studies have found that readers who are deaf have more difficulty judging their feeling-of-knowing than do hearing readers (Krinsky, 1990; Wood, Griffiths, & Webster, 1981). Self-assessment and feeling-of-knowing are important metacognitive knowledge in that they guide the reader in determining effort and strategies that might be needed to facilitate comprehension.

Three studies that focused on gaining insight into deaf readers' metacognitive knowledge have used interviews. Ewoldt (1986) interviewed 20 hearing impaired students, ages 8 to 14, about their reading experiences. The subjects' overall responses made the investigator question whether the students understood what reading is. For example, when asked whether or not they
were a good reader, most of the subjects said yes. Yet their definitions of a good reader did not include someone who comprehends text or learns from text. Rather, the students mentioned factors such as being smart or hard of hearing (as opposed to deaf). When asked what they would do if they did not understand a word, 75% of the subjects reported that they would ask the teacher for help (a dependent strategy). Of particular note is the fact that Ewoldt’s subjects had previously participated in a research study that encouraged the subjects to employ independent reading strategies such as using background knowledge or context to aid understanding vocabulary. The students did not identify those same strategies as ones they would employ in school. The discrepancy between dependent strategies the subjects spontaneously reported using (those in this study) and the independent strategies the subjects had been observed using in the previous study led Ewoldt to conclude that the “students interviewed here need to be encouraged to take risks and rely on the teacher less. They need to recognize that reading is for meaning . . .” (p. 13).

Strassman (1992) drew a similar conclusion when interviewing deaf adolescents ranging in age from 14 to 19. Strassman’s data indicated that her high-school-aged subjects, all of whom attended a residential school and had severe to profound hearing losses, were skill-oriented and passive participants in school reading activities. Her subjects defined school reading by the activities they did (e.g., vocabulary sheets and dittos). Strassman (1992), like Ewoldt (1986), found that her subjects were largely dependent on their teachers as mediators in comprehension of texts. For example, when asked what they do when they do not understand a sentence, 86% of the responses given by Strassman’s subjects indicated that the students would ask someone for help (a dependent strategy), while only 20% of the responses indicated that the students would reread the passage (an independent strategy). Strassman concluded that her subjects had a school-related schema for reading distinct from a general schema of reading. This was exemplified by one subject who commented that he did not read in school because he did not have a language/reading class that semester!

Sixteen deaf high school students (ranging in age from 13 to 17) who attended a residential program participated in a study by Ewoldt, Israelite, and Dodds (1992). Each subject was prelingually deaf and had a pure tone average hearing loss greater than 85 dB (ANSI) in the better ear. Each participant read and retold three passages. The students were interviewed about the passages and then asked to rank the passages for difficulty and interest. Teachers also read the passages and ranked them. In addition, teachers were asked to identify strategies that they would recommend to help their students understand the texts. Based on their retellings, subjects were assigned to a high-scoring or low-scoring group. Each group was asked to reread the passages. The high-scoring group also read a low-scoring retelling and then suggested strategies that would improve understanding of the text by a low-scoring peer. (This part of the study used an element of the optimal-nonoptimal paradigm.) The low-scoring group reread their own retellings.

The researchers found that, while reading the passage identified as most difficult and most interesting, the students engaged in each of the 10 metacognitive strategies they mentioned in the interview, including rereading the text, continuing to read more text, and reading other material. Moreover, the researchers found that students primarily reported using dependent strategies (e.g., using the dictionary) while teachers primarily recommended dependent strategies (e.g., ask the teacher). The researchers interpret their overall findings to indicate that “deaf students are far more proficient readers than teachers give them credit for . . . and they are aware that teachers underestimate their ability to understand text independently” (p. 360). It is interesting to note that when high scorers were asked to recommend strategies for the low scorers, 75% of them recommended the dependent strategy of having someone explain the text. While the investigators did not elaborate on this finding, it is consistent with the findings cited above. Namely, deaf students have a school-related schema for reading; when deaf students are put in the role of “teacher” they suggest strategies that have been taught to them, even though they themselves use more independent strategies.

Andrews and Mason (1991) employed a think-aloud paradigm in their study. Fifteen white young men from low- to low-middle socioeconomic status
families participated in the study. Five of the subjects were prelingually deaf high school students (ranging in age from 17 to 20 years) from a state residential school. Each of these subjects was fluent in American Sign Language (ASL), had a profound hearing loss, and had hearing parents. Two groups of five hearing students were used for comparison. The first group ranged in age from 8 to 11 years and was selected as being average students in their grade. The other group was drawn from learning disabled students with at least a 4-year delay in acquiring reading skills. They ranged in age from 14 to 18 years. One student in each group read at each of the following reading grade levels: second, third, fourth, fifth, and sixth.

Each student was asked to read three cloze passages: a passage one grade level below his reading level, a passage at his reading level, and a passage one grade level above his reading level. Passages were presented on a series of sheets. Each sheet ended at the point where text had been omitted for the cloze task. While completing the cloze item, students discussed with the examiner their rationale for their answer. The examiner asked probing questions to help the students verbalize their thinking. Following this discussion, the examiner showed the subject the next sheet, which contained the complete text, including the omitted word. The subject then continued reading until the next cloze blank. The sessions were taped so that transcripts of the think-aloud could be made.

The analysis of the transcripts revealed that the number of strategies used by each subject type increased with reading grade level. Overall, the deaf students used fewer strategies than either hearing group and were less likely to give the actually deleted word or phrase as a response. The deaf students never used the title of the passage and only infrequently employed context clues, whereas the hearing students used both of these strategies. The most commonly used strategy by each of the groups was background knowledge of the text topic. That is, readers relied on the information they knew prior to reading to help them complete the cloze task. Rereading the current sentence and look-backs (selective reinspection of the entire text) were also employed by each group of subjects. The researchers concluded from their study “that deaf youths need more experience reading through texts with a skilled teacher who can help them identify and use appropriate strategies and then use them on their own” (p. 544). This is consistent with Garner’s (1987) finding that young children and poor readers have a deficient strategy repertoire.

In her review on differences in metacognitive experiences among hearing learners, Garner (1987) notes that “young children and poor readers have important knowledge gaps and misconceptions about critical cognitive activities” (p. 39). She cites Garner and Kraus (1981–1982) who suggest that “some in-school experiences may actually produce the knowledge problem. . . . They point out that instruction strongly affects the students’ perception of the reading process, and that primary-grade teachers and basal readers emphasize . . . some skills occasionally at the expense of comprehension” (p. 38). Canney and Winograd (1979) “wonder if reading in school, as it often occurs in a teacher-centered, group-oriented, and skills-focused context, may be thought of by poor readers as distinct from reading to understand and enjoy new content” (p. 6). They theorized that many poor readers are passive readers who learned by rote the routines or techniques that they have been taught.

The descriptive research reviewed suggests that the deaf learners’ perception of reading or their schema for reading might in fact reflect instructional activities at the expense of building the bridge described by Pearson and Johnson (1978). It would seem that teachers have concentrated on teaching children who are deaf the basic skills of how to read, without fostering active participation and independent strategies for reading to learn, think, and comprehend. Subjects in the Ewaldt et al. (1992) study, as well as those in McCarr’s (1973) research, may be telling us that they can and/or want to read more difficult and challenging material, but are not given the opportunities. Given this opportunity and challenge, deaf students might demonstrate the use of more metacognitive knowledge and control since easy tasks do not require it (Baker and Brown, 1984). The studies by Ewaldt (1986), Ewaldt et al. (1992), Strassman (1992), and Andrews and Mason (1991) would further suggest that teachers have created a limited schema of reading for deaf students, one that does not include the range of activities and thought processes used by mature readers. This
may explain why deaf children can, on demand, use skills and techniques taught. Their ability to use these skills spontaneously or strategically, however, is hindered by their limited schema of reading (Bebko, Lacsse, Turk, & Oyen, 1992; Strassman, Kretschmer, & Blisky, 1987).

Although the studies reviewed here may be flawed by some of the methodological problems inherent in metacognitive interviews (see Garner, 1987, for a detailed discussion of these methodological concerns), this body of research is consistent in finding that deaf students have incomplete metacognitive knowledge about reading as it is generally done in society.

Investigations of Metacognitive Control

Three studies investigating deaf readers’ use of look-back and two studies focusing on feeling-of-knowing will be reviewed. Look-back, or text reinspection, involves noting that information previously read is not currently remembered and intentional rereading of specific parts of a text. Feeling-of-knowing is useful when monitoring memory for improving reading in general and for studying in particular (Flavell, 1985). Accurate memory monitoring allows a person to distinguish what has never been learned from something forgotten. Cognitive effort should enable the individual to remember the forgotten information (Krinsky, 1990).

In addition to these five studies, one study looking at the ability of good deaf readers to detect errors in text is reviewed. The ability to detect errors in a text is thought to reflect cognitive monitoring (Garner, 1987). Factors other than reading ability are also thought to affect success in comprehension monitoring (Baker & Brown, 1984). These include a variety of personality characteristics and differences in cognitive style. These issues were not addressed in the literature reviewed.

Davey (1987) designed a study to investigate the benefits of look-backs under different question-type conditions. Sixty-one proficient hearing readers (mean age 11 years), 62 poor hearing readers (mean age 15 years), and 50 prelingually deaf readers (mean age 15 years), all of whom scored between 5.0 and 7.9 grade equivalent on the Reading Comprehension Subtest of the Intermediate Level Stanford Achievement Test (SAT), participated in the study. The deaf students all attended a residential school for the deaf. Subjects read 12 passages and then answered WH-questions about the passages. The question types were select-response or construct-response. Each question type was tested under two conditions: with look-back and without look-back.

Proficient and poor hearing readers self-reported that look-back increased their comprehension of a passage. Deaf readers did not, even though their demonstrated comprehension (as measured by correct answers to the questions) was increased in the look-back condition of the study. The researcher speculated that the deaf subjects were unaware that the look-back strategy could improve their reading comprehension because they used the strategy to complete the task and not to improve comprehension. This is similar to Strassman’s (1992) findings that high school students see school-related reading as assignments given by the teacher and not as a means for learning.

In analyzing different data from the same group of subjects as Davey (1987), LaSasso (1985, 1986) found that look-back was used as a visual-matching technique, not a metacognitive strategy. Armbruster et al. (1982) state that the distinction between employing a technique and a metacognitive strategy distinguishes good from poor hearing readers. LaSasso defined visual-matching as a technique that consists of “(a) locating a word in text that matches a word in the question and (b) responding by selecting the alternative that contains words in closest vertical or horizontal proximity to that word in text.” Additionally, LaSasso found that subjects who were deaf were less successful in using the visual-matching technique than were hearing subjects.

Gibbs (1989) studied 19 high school students who were judged by their teachers to be the top readers in the junior and senior classes. The subjects ranged in age from 16 to 19 and their reading proficiency ranged from fourth to twelfth grade as measured by the Gates-MacGinitie. Using an error-detection measure designed to assess an individual’s metacognitive awareness of nonsense words, phrases that violate common knowledge, and phrases that make a passage internally inconsistent, she found a correlation between reading ability and metacognitive sophistication. Gibbs concluded that “both deaf and hearing readers with high
reading scores also carry a strong awareness of what is going on in the text that they are reading. They recognize errors and contradictions; they look for high truth value. In short, they are metacognitively sophisticated” (p. 217).

In exploring metacognitive control in good deaf readers, Gibbs (1989) found that they resemble good hearing readers in their metacognitive monitoring of text. Further research with proficient deaf readers is needed to help determine the factors leading to their success. One question that needs to be considered is the extent to which experience with increasingly difficult texts influenced the development of metacognitive control of reading. Baker and Brown (1984) point out that readers are more likely to take cognitive control of their endeavors when given tasks of intermediate difficulty because too easy tasks do not require metacognitive control and too difficult tasks are frustrating.

Krinsky (1990) studied 40 high school students (ranging in age from 14 to 20) who were not as proficient in reading as those who participated in the Gibbs study. Krinsky's deaf subjects were reading at a grade equivalent of 1.4 to 5.9 as measured on the SAT-HI. The deaf sample was compared to two hearing groups of students, one group by age and the other by reading level. After subjects defined words from the Peabody Picture Vocabulary Test, they were asked to rank missed words in terms of expected difficulty. The data revealed that the deaf subjects were less likely to guess at word definitions and more likely to say “I don’t know” than was either group of hearing subjects. When deaf subjects did guess, their responses were based on visual aspects of the target word (e.g., embedded words within the target item—*date* as a definition for *dilapidated*). In contrast, hearing subjects demonstrated some familiarity with the words they guessed about. The researcher hypothesized that hearing subjects had previously heard all of the undefined words and were able to formulate a guess as to their meanings based on previous semantic information even though they were not able to correctly define the words. Subjects were also asked to judge their feeling-of-knowing for both easy and difficult words. Feeling-of-knowing judgments were made in two ways: yes/no judgment and a paired-comparison judgment. For the yes/no phase of the experiment, subjects were shown a word and asked if they could pick a picture of the word from a group of four pictures in the PPVT manual. For the paired-comparison, subjects were asked to make a judgment about which one of two words would be more easily selected from a group of four pictures. The deaf subjects were unable to assess their feeling-of-knowing for vocabulary words, whereas both hearing groups were able to do so.

In investigating test-answering strategies, Wood et al. (1981) made a similar finding; that is, deaf children did not use a feeling-of-knowing judgment before answering test items. Deaf children answered more test items and made more errors than did the hearing children. Furthermore, as a group, hearing children were less likely to answer difficult items. Webster, Wood, and Griffiths (1981) interpret this phenomenon “as a legacy of teaching practice: passive unquestioning styles of learning” (p. 145).

The studies reviewed indicate that typical (i.e., poor) deaf readers do not have metacognitive control as indicated by feeling-of-knowing or use of look-back. If typical deaf readers are unable to identify what they know versus what they don’t know and what they comprehend versus what they don’t comprehend, how will they be able to control selecting and using strategies to remedy comprehension problems? Metacognitive control requires a reader to actively monitor building a bridge between the text and one’s own knowledge rather than what Webster et al. (1981) call a passive unquestioning style of learning. As Garner (1987) points out, “nonmonitoring, minimally strategic children operate at a serious disadvantage in school, particularly in situations demanding self-directed, independent approaches to learning” (p. 120).

**Intervention Research**

Four intervention studies focusing on metacognition and reading have been reported in the literature. Each study found that the subjects’ reading performance was improved during the course of the intervention, and for some subjects, strategies taught were maintained after the intervention. Only one of the four studies however, included a maintenance check. In addition to these four studies, research on Instrumental Enrichment (IE), a cognitive strategy instruction curriculum, will be
briefly reviewed. A by-product of IE training has been improvements in reading comprehension.

Using a single-subject design, Akamatsu (1988) gave metacognitive strategy instruction in summarization skills to five 11- and 12-year-old students. While the strategy instruction was provided to the group, subjects were measured against their own baseline scores. The intervention consisted of having the classroom teacher model the strategy for summarization while thinking aloud. The think-aloud included information on when, where, how, and why to use the strategy. Instructional intervention was given three days per week for three weeks. Two maintenance checks were given: one immediately following the intervention period and the second three weeks later. During the course of the intervention, all subjects showed marked improvement in their abilities to write summaries. During the maintenance period, three subjects continued to write well-formed summaries while a decline in performance was noted in two subjects.

Over the period of one month, Satchwell (1993) used direct instruction to teach six children ranging in age from 9 to 11 several predicting and inferring techniques to use while reading. Instruction was given three times per week for an hour and a half each session. Five of the six children made significant gains in both reading grade level and ability to use the target techniques, which included the Directed Reading Thinking Activity (DRTA), predicting story elements, predicting from context, making prediction webs, predicting through cloze, and prediction through inferential questions.

Both the Akamatsu and Satchwell studies gave the postintervention measurement soon after the withdrawal of the intervention. While Satchwell found improvement with training, her study gave no indication whether this improvement was maintained over time. Akamatsu did find that three out of five subjects maintained the benefits of the intervention, but the second maintenance check was given only three weeks after the conclusion of the intervention.

In investigating whether mental imagery could be used as a metacognitive reading comprehension strategy, Schirmer (1995) videotaped eight lessons with nine children ranging in age from 7 to 11. The lessons were given once a week for 30 to 45 minutes. During the first phase of the study she employed a typical DRTA approach. During the second phase, she added to the DRTA approach by asking the children in the prereading activity to “[m]ake pictures in your mind about what you read to help you understand and remember.” During the postreading activity she asked them, “Do you have any pictures or scenes in your mind that you remember from this part of the story?” The assumption underlying the use of mental imagery is that this strategy requires the reader to actively process the text in order to construct meaningful images that link background knowledge with text information. Mental imagery should therefore assist the reader in organizing, integrating, and retrieving information from text.

A quantitative analysis comparing the typical DRTA phase with the mental imagery phase revealed no relationship between mental imagery and the ability to make predictions, summarize, answer literal and inferential questions, or to retell a passage. A content analysis of the videotapes, however, revealed that during the mental imagery phase the students’ thought processes included recollection, representation, inference, and evaluation.

Schirmer (1995) acknowledges that the research on mental imagery does not support an unequivocal relationship between mental imagery and reading comprehension. While her study did not address a longitudinal effect or the ability to employ the strategy spontaneously, it did demonstrate that mental imagery can be an effective teaching strategy for increasing comprehension.

Fox (1994) conducted a larger study both in terms of time and number of subjects. He required Gallaudet undergraduate students in his World Literature Survey course to do prereading, reading, and postreading metacognitive exercises designed to improve reading comprehension and retention. The exercises included such things as study guides, summaries, and guided mapping (a partially completed diagram of factual material in the story to assist the students in organizing and remembering descriptive information). Each exercise was explained in class. The explanations included how and why to use the exercise. These exercises im-
proved student attendance, class discussion, and grades for almost all students except the two highly skilled readers in the class and the students with "attitude problems" (p. 510).

Research on IE, a thinking skills curriculum, and deaf students has also been successful in improving reading comprehension scores as measured on standardized reading tests. In one such study, Martin (1984) worked with a control group of 18 students and compared them with an experimental group of 10 students. The experimental group was given IE training for a two-year period. This program focused on cognitive skills (e.g., classification and analysis) that are distinct from any content area but are applicable to all content areas. Explicit instruction in the cognitive skills included metacognitive discussions of the skill prior to application to cognitive areas. On average, Martin's subjects were 16.5 years old, had a hearing loss of 88 dB, and were reading on a grade equivalent level of 4.5. Based on pre- and postintervention measurements, Martin concluded that "the emphasis on metacognition activities during IE lessons must be considered as at least one factor in the improvement of experimental students" (p. 241). Martin (1993) reviews other studies on IE and concludes that there is "a strong positive relationship between cognitive instruction and achievement in literacy areas such as reading comprehension when other variables are controlled" (p. 84).

While the Akamatsu (1988), Satchwell (1993), and Schirmer (1995) studies involved small numbers of children over short periods of time, thereby limiting the generalizability of the findings, these studies, as well as the Fox (1994) investigation, demonstrate the potential effectiveness of teaching strategies that encourage active and constructive reading processes. Clearly, more intervention research is needed. Future studies should be longitudinal and include maintenance checks.

Implications

Based on this body of research, three issues are apparent. First, several researchers question whether current instructional practices are leading deaf children away from developing metacognitive knowledge by emphasizing skills and school-related activities at the expense of reading for meaning and authentic purposes. This type of instruction might actually be giving deaf children the wrong schema for reading, thus leaving them thinking that what they typically do in school (e.g., worksheets, answering teacher questions, or memorizing vocabulary words) characterizes all reading activities. A time-on-task study conducted by Limbrick, McNaughton, and Clay (1992) substantiates the question raised here. The researchers found that their deaf subjects spent minimal time actually engaged in reading and were "subjected to teacher interactions that may inhibit the development of meaning-based reading skills" (p. 309). The concern that misfocused instructional practice might be a substantial factor in poor literacy achievement has also been discussed by Gormley and Franzén (1978), Erickson (1987), LaSasso (1987), Limbrick, Williams (1994), and Paul (1996).

The Ewoldt et al. (1992) finding that deaf high school students are more interested in the most challenging texts and engage in metacognitive strategies more while reading them raises the second issue. Are the low-level reading materials given to many deaf students (based on their grade level reading scores) actually suffocating their metacognitive control? As Schirmer (1994) states, "It is common knowledge that youngsters who are deaf tend to obtain depressed scores on standardized tests of reading" (p. 223). This would explain why Gibbs (1989), whose subjects were proficient deaf readers, found that they demonstrated metacognitive control similar to hearing readers. Her subjects, as well as the two skilled readers in the Fox investigation, had presumably had experience in reading challenging materials and therefore had an opportunity to develop their metacognitive knowledge and control. Studies on emerging literacy in deaf preschoolers clearly indicate that they learn about literacy in ways similar to hearing preschoolers (Ewoldt, 1985, 1991; Maxwell, 1983, 1984; Rottenberg & Scarfoss, 1992; Williams, 1994). This may reflect the fact that the deaf emergent reader faces the same cognitive challenges as the hearing emergent reader, whereas older deaf children are not being challenged by reading materials given to them.
Third, just as hearing students benefit from metacognitive strategy instruction, so do deaf learners. Martin (1993) maintains that the “sequence of teaching reasoning skills, the media through which they are taught and the methodologies for engaging [deaf] learners remain precisely the same as those for hearing learners” (p. 83). Successful metacognitive skills training programs are longitudinal and include practice in use of the target skill, practice in self-regulation of the skill, and awareness of the significance and outcome of using the skill (Armbruster et al., 1982; Baker & Brown, 1984).

While there is still a limited body of research on metacognition and reading in students who are deaf, this literature would suggest that if a deaf reader is to have metacognitive knowledge about reading, teachers may need to alter their reading instruction to reflect less of school and more of the authentic and purposeful situations in which people read. Additionally, the research suggests that deaf students should be given more challenging texts that would encourage their use of metacognitive control. Grade equivalent scores on standardized reading measures (Schirmer, 1994) and readability estimates (Israelite, 1988) may not be the best way of matching a deaf child to appropriate reading materials. Furthermore, the research suggests that deaf students, like hearing students, benefit from instruction in metacognition about reading.

References


