Theoretical/Review Article

Emergent Literacy of Deaf Children

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This article reviews the literature on emergent literacy in young deaf children, focusing on the nature and course of both emergent reading and emergent writing. Beginning with definitions and background information concerning emergent literacy as a field of study, it examines instructional approaches that support emergent literacy learning. The review of the literature is organized into four major sections that reflect the body of work to date. The article concludes with an eye toward the future of emergent literacy in pedagogy, theory, and research.

Over the past 25 years, the study of children's emergent literacy has burgeoned into a specific and legitimate field of study. Researchers examined children's earliest experiences with reading and writing, documented the children's initial understandings about print, and generated trajectories for written language development. They examined the contexts of emergent literacy learning and the cognitive and sociocultural factors that influenced its growth. Research on emergent literacy has produced a large body of influential literature that has significant implications for parents and early childhood educators. The vast majority of this research has been with hearing children, and it provided a strong theoretical and methodological framework for the study of emergent literacy in children who are deaf or hard of hearing. While several reviews of the literature on hearing children's emergent literacy are now available (e.g., Mason & Allen, 1986; Sulzby, 1991; Sulzby & Teale, 1991; Sulzby & Teale, 2003; Yaden, Rowe, & MacGillivray, 2000), the research with deaf children has yet to be synthesized. This paper critically reviews the available literature for what it tells us about the nature and course of deaf children's emergent literacy and for its implications for classroom instruction and future research. Organized to consider four areas of relevant literature, the paper concludes with a consideration of implications for future pedagogy, theory, and research.

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Background and Definitions

Emergent literacy is the term most commonly used to represent a new way of conceptualizing very young children's initial encounters with print and their early reading and writing development. The term reflects a significant shift in theory, research, and educational practice. Widespread adoption of this term signals a break with *reading readiness,* the dominant approach to early literacy instruction since the 1920s. Reading readiness is a theoretical orientation and a pedagogical approach that suggests that initial instruction should begin with a series of skills considered prerequisite for learning to read (e.g., visual and auditory discrimination, letter recognition, sound/symbol correspondence) and that writing instruction should be postponed until children are reading conventionally. Inherent in this perspective is the assumption that spoken language activities (face-to-face language in the case of deaf children) should precede reading and writing instruction in the early childhood curriculum. Emergent literacy research has demonstrated, however, that spoken language, reading, and writing develop concomitantly

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in literate environments and ''mutually reinforce one another in development'' (Teale & Sulzby, 1989, p. 4).

Emergent literacy research has its infancy in the late 1960s, when researchers began to discover that children as young as five years learned a good deal about reading through informal literacy activities (Clay, 1967; Durkin, 1966). Over the next 25 years, and particularly in the 1980s and early 1990s, researchers documented the active nature of young children's participation in literacy events and their cognitive and social constructions of written language (see Sulzby & Teale, 2003, for a thorough review). The body of work challenged major tenets of the reading readiness perspective and called into question typical early childhood instruction.

As a technical term, emergent literacy describes ''the reading and writing behaviors of young children that precede and develop into conventional literacy'' (Sulzby, 1990, p. 85). But the term also implies a broad theoretical stance, with multiple guiding perspectives, about early literacy learning.

One perspective on emergent literacy, influenced by the work of Piaget, views young children as active constructors of knowledge who seek to make sense of the written language they encounter in literate environments. Literacy learning is seen as developmental (i.e., evolutional and systemic), and this perspective emphasizes how children's concepts are constructed and how they change over time. A second perspective builds on the work of Vygotsky by emphasizing the sociocultural aspects of early literacy learning. This stance highlights the social interaction of children and adults during literacy events and claims that children acquire literacy as they engage in meaningful activity and social dialogue around written language. Educators often draw upon aspects of each perspective as they plan instructional programs, as do many researchers in framing their investigations.

The period of emergent literacy is from infancy to age 5 or 6, or whenever children are reading and writing conventionally. Sulzby (1990) suggests that a child's writing may be considered conventional when he or she can read from it conventionally and another literate person can also read from it conventionally. By this definition, conventional writing may include invented spelling if the child can read from it conventionally. Children's reading may be considered conventional when they use print cues and move ''flexibly and in a coordinated fashion across a number of aspects or strategies to construct a meaningful interpretation of the text'' (p. 88). Children who rely solely on the illustrations or memory of the text are not reading conventionally. Conventional reading involves some knowledge of phoneme-grapheme correspondences, a basic understanding of a word as a stable unit, and some comprehension of the text.

Emergent literacy researchers typically conduct their investigations in the home, preschool (day care), or kindergarten setting. A variety of methods have been used to investigate emergent literacy in these contexts. Early on, Piagetian-like interview techniques and simple tasks were used to reveal young children's understandings about reading and writing (e.g., Ferreiro & Teberosky, 1982; Harste, Woodward, & Burke, 1984). Over the years, many researchers employed ethnographic or qualitative, descriptive methods and naturalistic observation to ensure ecological validity as they documented young children's knowledge and behavior during storybook reading and informal writing activities (e.g., Cochran-Smith, 1984; Dyson, 1989; Heath, 1983). More recent work has used experimental and quasi-experimental methods to document the outcomes of emergent literacy activities, particularly storybook reading (e.g., Neuman & Soundy, 1991; Otto, 1993).

In short, the emergent literacy framework brings to research and pedagogy a new way of conceptualizing young children's literacy development. This fresh perspective has become a rigorous area of research and has produced a large body of influential work on hearing children's emergent literacy development. The emergent literacy of deaf children has also been examined by a number of researchers. Some researchers have explored deaf children's early experiences with reading and writing in the home and preschool contexts; others have examined individual children's earliest understandings about print. Researchers have investigated both emergent reading and emergent writing. Several studies have examined the impact of specific instructional approaches to supporting deaf children's emergent literacy learning. I review these studies in the sections that follow.

Emergent Literacy in Deaf Children

Two studies in the early 1990s examined whether emergent literacy was a valid theoretical construct for conceptualizing the early reading and writing development of young deaf children. The researchers reasoned that if face-to-face language is not a prerequisite to early literacy learning—as was previously assumed—then deaf children would demonstrate emergent literacy behaviors in literate environments, despite language delay. In the first study, Rottenberg and Searfoss (1992) were primarily interested in discovering how and what deaf children learned about reading and writing in a preschool setting. Williams (1994) wanted to explore how deaf children experienced emergent literacy activities in their homes and in the preschool and kindergarten classroom and document what the children learned about written language as a result of these experiences. Both investigations examined whether deaf children's emergent literacy is similar to hearing children's, as documented in the research literature.

The seven children in the Rottenberg and Searfoss (1992) study were 3 and 4 years of age and had moderate to profound hearing losses and severe language delay. They attended a self-contained public preschool program for hearing-impaired children. The researchers observed the children five hours a week over a 9-month period and wrote detailed field notes on their participation in all literacy activities, which included 15–30 min of "book time" 4 days a week, structured storytelling activities, and opportunities for informal writing. The researchers documented the children's literate behaviors and collected drawing and writing samples. The data were analyzed inductively (Erickson, 1986). This strategy involved searching the data for categories of recurring literate behaviors, identifying relationships among those categories, developing working hypotheses, and then accepting, modifying, or discarding them on the basis of further evidence (see also Goetz & LeCompte, 1981; Strauss & Corbin, 1990).

Results of the study indicated that the children chose to participate in reading, drawing, and writing above all other preschool activities. The children viewed literacy events as "significant" and made "great efforts" (p. 476) to engage in them. Literacy activities were seen as social events: When a child chose to write, others would join the activity. When someone picked up a book to read, the children would pull up chairs to share in the reading. The researchers suggested that the children's participation and their early understandings about print were similar to those of hearing children. The children's severe language delay did not prevent them from participating in literacy activities or learning emergent literacy concepts. In fact, results of the study indicated that the deaf children learned to use written language as a primary form of communication. When they did not have the spoken or sign language needed to express themselves, they used drawing and writing to communicate with both peers and adults.

Results of the Williams (1994) study were similar. The three profoundly deaf children (ages 3.11 to 5.10) she followed for 6 months attended a public preschool for deaf children. Williams observed both in the children's homes and in their preschool and kindergarten classrooms and documented the emergent literacy activities in each context. She detailed the children's emergent literacy knowledge through observation, analysis of drawing and writing samples, and informal assessments (Clay, 1979; Harste, Burke, & Woodward, 1981). The data were analyzed inductively using procedures related to grounded theory analysis (Strauss & Corbin, 1990). Williams indicated that the children were immersed in literacy activities both in their homes and at school. Parents read to their children (or with them) almost daily, and the children engaged in drawing and writing activities on a regular basis. The preschool and kindergarten teachers also read to the children every day, and they modeled and explicitly taught a host of concepts about print and sense-making strategies, as well as letter names and phoneme-grapheme correspondences. Williams indicated that all three deaf children demonstrated considerable emergent literacy knowledge and understanding, which looked similar to hearing children represented in the research literature. Like the children in the Rottenberg & Searfoss study, these children also used written language to communicate with peers and adults when spoken or sign language was insufficient. Interestingly, the children's parents and their teachers used picture books to teach the

children to say or sign specific words and to support the children's language acquisition.

In both of these studies, written language became an avenue for the children's face-to-face communication and language development. Both studies also demonstrated that language delay does not prevent deaf children from participating in literacy activities or from learning emergent literacy concepts. Based on their findings, the researchers called for a purposeful integration of language acquisition and emergent literacy activities in the early childhood curriculum. The findings also suggested that emergent literacy is a viable construct for conceptualizing deaf children's initial encounters with reading and writing and their early understandings about print.

Storybook Reading and Emergent Reading Development

Interactive storybook reading has received more research attention than any other aspect of young children's literacy development, and its impact on emergent reading is well documented in the research literature (see Sulzby & Teale, 1991). Numerous studies in both the home and preschool contexts demonstrate that the social interaction surrounding storybook reading is a key factor in supporting young children's literacy development (e.g., Cochran-Smith, 1984; Yaden, Smolkin, & Conlon, 1989). The familiar and predictable routines of storybook reading help children learn to participate in the activity and provide a framework for independent story re-enactments (also called emergent readings) and, eventually, the child's early attempts at conventional reading. Children also learn fundamental reading behaviors and knowledge, including book handling skills, awareness of written language, lexical and syntactic knowledge about written narrative, concepts about the conventions of print, letter identification, and word recognition skills (Purcell-Gates, 1988; Snow & Goldfield, 1982; Snow & Ninio, 1986). Shared readings can also support children's language development (Valdez-Menchaca & Whitehurst, 1992), and rereading familiar books can increase children's verbal participation and the complexity of their verbal interaction (Morrow, 1988). In fact, interactive storybook reading may give children an important advantage in the early years of school reading instruction (Heath, 1983; Snow, 1983; Teale, 1984; Wells, 1986).

Two studies investigated the impact of interactive storybook reading on deaf children's emergent reading development. Maxwell (1984) detailed the development of a deaf child of deaf parents; Rottenberg (2001) examined the progress of a deaf child of hearing parents. Both studies demonstrated that preschool-age deaf children can learn much about written language through interactive storybook reading and that their emergent reading development is similar to that of hearing children as described in the research literature.

Maxwell's (1984) report was based on 22 interactive storybook readings between Alice and her parents videotaped from the time Alice was 2 until she was 6 years of age. Through these shared readings, Alice learned several concepts about print, including proper book orientation (front-to-back), page turning, and directionality (left-to-right and top-to-bottom). She also learned that stories have plots, books have both narration and dialogue, and characters in stories have styles of speaking. These are important metalinguistic understandings that support learning to read.

The focus of Maxwell's report was the sequence of Alice's emergent reading development. Alice began by labeling pictures with manual signs. Then she used the illustrations to generate the storyline, often signing directly on the pictures, as her parents had done. Little by little, she turned her attention to the sign print in Signed English books, matching her manual signs to the sign drawings, until she was reading the entire story from the sign print. Maxwell suggested that this process was similar to hearing children matching speech to orthography. Then Alice began to understand that the sign print could be segmented and matched with the printed words. The sign drawings provided a bridge for Alice between signed discourse and English orthography. Alice was then able to focus on the printed text, which she also translated to fingerspelling. She went back and forth between the illustrations, the sign drawings, and the orthography to make sense of the books she was reading. Maxwell suggested that the steps she traced in Alice's emergent reading development were ''extremely similar'' (p. 84)

to hearing children's re-enactments of favorite storybooks. Children's re-enactments or emergent readings of familiar storybooks demonstrate what they are learning about the nature of written language and the reading process and tend to have developmental properties (see Sulzby, 1985, 1988). Importantly, Alice's achievement scores for first through third grades indicated that her reading was at grade level, despite her profound deafness.

Rottenberg (2001) collected data on Jeffrey's emergent reading as part of a larger study of emergent literacy learning in preschool-age deaf children (Rottenberg & Searfoss, 1992). Jeffrey was 4.6 years old when the study began. He had not developed extensive spoken or sign language, and he and his parents did not share "a first language" (p. 274). Home interviews indicated, however, that Jeffrey's mother read to him almost daily using Signed English, and his father took him to the public library on a regular basis. Rottenberg suggested that Jeffrey had an "intense interest in and curiosity about print and books" (p. 272). In a short case study, she described the developmental sequence of Jeffrey's emergent reading, which was strikingly similar to Alice's. First, Jeffrey focused on the illustrations in books, labeling the pictures with signs. Then he read familiar words in context (e.g., names of classmates and family members; basic words like *is*). At the third level of development, Jeffrey focused on the sign print in Signed English texts. He studied the drawings, attempting to form the signs. At this level, Jeffrey signed the story using several of the sign print drawings on each page as a guide. Once he had learned to read the sign print, he began to relate it to written English. In this fourth phase of development Jeffrey made "one-to-one matches between the sign print and its corresponding written English form. Often he would point to the written word, look at the sign print, and then sign the word" (p. 274). Later, Jeffrey relied on the sign print only when he could not gain meaning from the printed words. In the last few months of the school year, he moved away from his reliance on sign print and used his developing knowledge of English to read the printed text.

Both Maxwell and Rottenberg concluded that sign print was important to the children's learning to read because it provided a bridge between picture cues, sign language, and English orthography. Rottenberg argued for the early introduction of Signed English books both at home and in school activities. Maxwell (1986, p. 19) suggested that teachers treat the sign drawings "as a line of print" and ask deaf children specific questions about it. Related research also indicates that the use of sign print supports deaf children's word identification and comprehension skills (Robbins, 1983; Stoefen-Fisher & Lee, 1989; Wilson & Hyde, 1997).

The deaf children's emergent reading reflected the developmental sequence of hearing children described in the research literature. These findings suggest that preschool deaf children are likely to benefit from repeated, interactive storybook readings as hearing children do (Snow & Ninio, 1986; Morrow, 1988). Given that a number of studies suggest that adults' styles of reading aloud have differential influences on children's understandings of literacy (e.g., Dickinson & Keebler, 1989; Teale & Martinez, 1996), parents and teachers of deaf children must find ways to engage in storybook reading that allow for meaningful interaction. For example, there is the difficulty of holding the book and signing at the same time, as well as the child's need to shift visual focus from the illustrations to the adult's signing to the printed words. Researchers have sought practical solutions to these difficulties by investigating the ways in which deaf parents read to their deaf children (Akamatsu & Andrews, 1993; Andrews & Taylor, 1987; Lartz & Lestina, 1995). The findings of those studies provide direction for both hearing parents and classroom teachers of deaf children. The *Shared Reading Project* (Delk & Weidekamp, 2001) at the Laurent Clerc National Deaf Education Center at Gallaudet University was based on the results of this research and was specifically designed to show parents how to read to their deaf children using strategies that make book sharing most effective.

Given the impact of interactive storybook reading on children's emergent literacy development, many researchers have argued that instructional models for young deaf children should reflect the interactive storybook reading experience. A number of studies have investigated the effectiveness of interactive storybook reading as an instructional approach. I review those studies in the section that follows.

Interactive Story Reading as an Instructional Approach

A early as 1975, Hart cogently argued for storybook reading in preschools for young deaf children:

> Rather than using reading readiness workbooks, teachers should be thoroughly familiar with the specific skills and apply them in natural situations. For example, a young child who can match up colored pairs of socks probably doesn't need visual discrimination exercises in reading readiness workbooks. . . . The most important thing [we] can do to promote reading in the preschool . . . [is to] *read to the child*." (p. 170, emphasis in original)

Two experimental and three descriptive studies have investigated the effectiveness of interactive storybook reading as an instructional model. The studies highlighted various aspects of the instructional approach and the deaf children's learning.

Andrews and Mason (Andrews, 1983, 1988; Andrews & Mason, 1986a, 1986b) emphasized word recognition in their experimental storybook reading intervention. In each session, the teacher signed a specially designed storybook and discussed it with the children, focusing on several target words and making the sign-to-print correspondence explicit. Each child received a copy of the storybook to read, dramatize, and retell. Then the children practiced fingerspelling the target words and printing them on the blackboard. Fifty *drilled* words appeared in the experimental storybooks and were systematically taught during the training sessions using drill cards. On one side of the drill card was the printed word; the other side featured an illustration of the manual sign. Fifty *exposed only* words appeared in the storybooks but were not actively taught. Fifty *untaught* words did not appear in the storybooks nor were they presented during the experimental treatment. The intervention was conducted for 30 min each week for 25 weeks at a residential school for the deaf. There were 23 kindergarten and first-grade children, ages 5–8 years, with severe to profound hearing losses in the experimental group. The comparison group of 22 children had similar characteristics and received "conventional reading instruction" (p. 211).[1] Results of the study indicated that the experimental group outperformed the comparison group on fingerspelling, book reading, story retelling, and word recognition tasks. These children learned more *drilled* words than *exposed only* words and more *exposed only* words than *untaught* words. The researchers concluded that explicitly teaching young deaf children to match manual signs to printed words in the context of storybook reading supported early reading development.

Gillespie and Twardosz (1997) used children's reading re-enactments as pre- and posttest measures to access the effects of an experimental storybook reading intervention at a residential school for the deaf. The 18 children who participated in the study ranged in age from 4 to 11 years and read at the preprimer or primer level[2] at the pretest measure. All 9 children in the experimental group were profoundly deaf, while only 6 of the 9 children in the control group had profound hearing losses. The group storybook reading intervention took place in the children's cottages (i.e., small-group residences) twice weekly, for 30 min each session, over a 5-month period. Group storybook reading did not occur in the cottages of the children in the control group, but counselors read to individual children upon request, as had been the practice prior to the study. The researchers videotaped each storybook reading session to document the children's participation and the story reader's approach to reading aloud.

Results indicated that children in the experimental cottages were highly engaged during the storybook reading sessions, particularly when the story reader used interactive and/or expressive reading styles. They also displayed more "self-competence or self-efficacy" and exhibited "a commanding sense of self as a reader" (p. 150) during posttest emergent reading re-enactments. Statistically significant differences were found between the experimental and control groups on the posttest measure of reading independence ($p < .05$). No statistically significant differences were found, however, between the two groups on the emergent reading re-enactment task, which the researchers suggest may be due to differences in the children's hearing losses. The researchers contend that the storybook reading intervention was successful because it helped build self-confidence and independence in

the experimental group children, traits that are important to children's progress as emergent readers.

L. Rowe and Allen (1995) highlighted a two-teacher approach in their descriptive study of interactive storybook reading in a public preschool program that integrated deaf, hard of hearing, and hearing children. The children ranged in age from 18 months to 3.6 years, and the group ranged in size from 20 to 30 depending on attendance. Two teachers lead the interactive storybook reading sessions and presented each page of the book in three successive steps. One teacher read the text aloud and then showed the children the illustrations. Then the other teacher signed the storyline ''using the best model of ASL possible'' (p. 177). She used strategies that are often used by native signers to tell stories, such as miniature signing and signing directly on the illustrations (see Mather, 1987, 1989). The first teacher continued to hold the page facing the children as the second teacher signed, so that the children had access to the illustrations, the signs, and the printed text. The researchers did not describe in any detail their data collection or analysis procedures, but they report observing the deaf children using voice inflections and mouth movements after the oral reading, and signing portions of the story during or immediately after the ASL narration. The children often selected these familiar books at other times during the day to explore and retell, and an identical set of the books was sent home with the children to read and share with their parents. Reports from parents indicated that the children read these books with family members at home, despite communication barriers. The researchers suggested that the instructional program ''created an interest in books'' (p. 179) that could provide a foundation for early reading.

Williams and McLean (1997) examined five profoundly deaf preschool-age children's responses to interactive storybook reading and the procedures the classroom teacher used to facilitate the children's response. Studies with hearing children suggest that children's responses to storybook reading reveal their efforts to construct meaning as well as what they understand about story and written language. The research also indicates that a teacher's instructional approach can influence children's responses (Cochran-Smith, 1984; Hickman, 1981; Kiefer, 1983; Roser & Martinez, 1985). Williams and McLean videotaped 16 storybook reading sessions over a 4-month period. Results of the study indicated that the children demonstrated a myriad of responses that reflected their engagement, interest, and comprehension and were similar to hearing children's responses. Results also indicated that the teacher adopted a specific and systematic procedure for interactive storybook reading that supported the children's emergent reading behaviors. After a brief introduction to the book, the teacher opened to the page she was about to read, sometimes pointing to the printed text. She placed the book face down on her lap and signed an animated rendition of the text. Then she displayed the illustrations and allowed time for the children to respond. The teacher asked questions to monitor the children's comprehension, and like the deaf mothers mentioned above, she made clarifying remarks and related the story to the children's lives. She modeled fundamental book-reading behaviors and used literary terminology (e.g., letter, word, sentence, page, story) that gave the children specific vocabulary for talking about the various forms of print. She also explicitly modeled a variety of comprehension strategies that have been shown to support deaf students' reading achievement (see Andrews & Mason, 1991; Satchwell, 1993). The researchers suggested that the influence of the instructional context was demonstrated by both the quality and quantity of the children's responses to the storybook reading sessions.

Gioia (2001) explored the efficacy of interactive storybook reading as a language intervention model. The researcher observed and videotaped 3 deaf children, ages 3–4 years with moderate to profound hearing losses, as they participated in storybook reading in their preschool classroom from October through June. Gioia requested that the classroom teacher read storybooks to the children verbatim, ''as they were written,'' rather than paraphrasing the text, so that the children would have exposure and access to ''rich language'' (p. 419). Results of the study indicated that the children began to incorporate into their vocabularies new or unusual words that their teacher discussed during daily storybook reading sessions. Research with hearing children also documents the

beneficial effects of vocabulary discussion during interactive storybook reading (e.g., Cochran-Smith, 1984; Elley, 1989). The deaf children also learned important literary terms (e.g., author, title, page, words, print) that supported their emergent literacy development. At the beginning of the study, the children demonstrated receptive vocabularies of fewer than 25 words on the *Peabody Picture Vocabulary Test-Revised* (Dunn & Dunn, 1981); by June they were speaking and signing in five- to seven-word sentences. The researcher contended that storybook reading had a "remarkable impact" (p. 425) on the children's language development as well as their emergent literacy learning.

Taken as a group, these studies suggest that interactive storybook reading may be an effective approach to supporting deaf children's emergent reading development. In particular, the studies suggest that interactive storybook reading supports deaf children's self confidence as emergent readers, their comprehension, interest, and engagement with books, and their storytelling and word recognition skills. The studies also suggest that a teacher's approach influences children's learning. The findings must be considered with caution, however, as not all researchers detailed their data collection or analysis procedures, and the body of work is still rather meager. Given the importance of emergent and early reading development to later conventional reading, further intervention studies with young deaf children are clearly warranted.

Emergent Writing

Five descriptive studies have examined the emergent writing development of young deaf children. All five investigations framed children's writing development as the social construction of literacy hypotheses based on children's home or school experiences. The researchers viewed children as composers and defined writing broadly as any effort at symbolic representation, including scribbling, drawing, letter-like forms, and recognizable or conventional print. Children's compositions (i.e., stories, messages, letters) were examined as the primary research product. Four of the studies examined a particular aspect of the emergent writing process, and the fifth study investigated the impact of the instructional context on the children's emergent writing development. All five studies demonstrated that young deaf children can and do write emergently when given authentic opportunities to do so.

Conway (1985) was among the first to study deaf children's emergent writing, and he focused his investigation on the purposes for which young deaf children choose to write. For 6 months, Conway observed and videotaped 7 children, ages 5–6 years, with moderate to profound hearing losses, as they worked at the writing table in their self-contained auditory/oral kindergarten class. He also collected writing samples. Results of the study indicated that the children wrote for a number of purposes including to convey personal information, preserve or recall experiences, organize information, interact with others, and entertain. The children also used writing to practice letter formation, experiment with how writing implements can be used, and explore how content can be expressed. Conway suggested that writing was a meaningful activity for the deaf children that fulfilled personal and sociocultural purposes that were similar to those of hearing children (Dyson, 1983, 1989; Taylor, 1983). He argued in favor of kindergarten programs that present writing as an activity that is used for communication purposes rather than as a time to perfect the mechanical aspects of the process.

Ewoldt (1985) was also one of the first researchers to study deaf children's emergent literacy. She investigated young deaf children's early concepts about print. Ewoldt observed 10 children, ages 4–5 years, with severe to profound hearing losses, during drawing/writing time across a school year. She also collected writing samples and used informal measures to assess the children's understandings of written language. Unlike the children in Conway's study who used writing to practice letter formation and experiment with writing utensils, Ewoldt stated that these children rarely wrote without a message in mind; they expected their writing to signify meaning. Results also indicated that the deaf children demonstrated several important concepts about print that have been documented in studies of hearing children's emergent writing (Clay, 1975; Harste, Woodward, & Burke, 1984). For example, the deaf children demonstrated an

early understanding of the structure of written language by writing mock letters and some conventional letters. One child rearranged the letters in his name in an effort to write new words, demonstrating his developing understanding of the generativeness principle of English orthography (i.e., that a finite number of letters can be rearranged to generate an infinite number of new and different words). The children also demonstrated the principle of intentionality by using fingerspelling to dictate to themselves the next letter or number they would write. These early concepts about print provide an important foundation for later writing development.

In an in-depth case study, Ruiz (1995) investigated the working hypotheses underlying her own deaf daughter's emergent writing development. The researcher analyzed Elena's drawing and writing papers created in the home from ages 3 to 7 years to examine both the forms of writing as well as Elena's hypotheses about written language. Emergent literacy researchers agree that the forms of emergent writing must be examined in light of children's conceptualizations (Clay, 1975; Ferreiro, 1986, Sulzby, 1990). Ruiz found that many of Elena's hypotheses about English orthography were similar to those of hearing children. Elena was aware of the symbolic nature of written language; she demonstrated her understanding that ''writing stands for things'' (p. 209). Early on, Elena's writing had to touch her drawing for the print to have meaning; later, she separated the print from the pictures. Elena's name was her first known word or ''stable string'' (Ferreiro & Teberosky, 1982), and, like the deaf children in Ewoldt's study, Elena used the letters in her name to generate spellings for unknown words. She demonstrated her understanding that there should be correspondence between the size or age of the referent and the written word. For example, if the person is young or the object is small, children assume that the word will have few letters. Still later, Elena's letter strings tended to have at least three or four characters per word, and she avoided repetition of the same character in a word.

Ruiz indicated that Elena's writing development did not follow a linear progression; rather, it was ''a fluid, recursive process'' (p. 209). Elena used hypotheses, discarded them, and took them up again as needed. All of these hypotheses have been demonstrated in studies of hearing children's emergent writing (e.g., Branscombe & Taylor, 1996; Harste, Woodward, & Burke, 1984; Schickedanz, 1990). Elena also demonstrated the use of other hypotheses not observed among hearing children, and Ruiz suggested that these conceptualizations may be attributable to Elena's deafness and the use of sign language. For example, when Elena came to understand that words can be fingerspelled, she hypothesized that ''the shape of your hand when you sign a word tells you its first letter'' (p. 213).

Ruiz contended that Elena showed some metalinguistic awareness of sound-based strategies but favored the use of visual strategies for writing. In fact, the researcher argued that although sound played a role in Elena's emergent writing development, Elena did not need a well-developed phonemic awareness to become a successful reader and writer. Ruiz questioned whether other deaf children could also forego this path in learning to read and write. Research with young hearing children strongly suggests that phonemic awareness supports early reading and writing development (e.g., Byrne, Fielding-Barnsley, & Ashley, 2000; Tangel & Blachman, 1992), but researchers have yet to examine the role or importance of phonemic awareness in deaf children during the emergent literacy period.

Ruiz (1996) also examined Elena's punctuation development as a part of the larger study. Elena did not use punctuation in her writing during the preschool years (ages 3–5.6), but Ruiz suggested that in kindergarten (age 5.6–6.6) Elena experimented a great deal with punctuation and ''punctuated more than hearing children do'' (p. 126) during that early period of development. Elena spontaneously used the period, hyphen, tilde (a writing convention used in Spanish), and question mark in increasingly conventional ways. These punctuation marks were not explicitly taught in Elena's kindergarten class; rather, Ruiz suggested that Elena's use of these marks were ''very tied to the things she was excited about writing'' (p. 118). The researcher argued that punctuation may have been more salient to Elena because of her visual, meaning-based approach to reading.

Williams (1999) examined the role of sign language in deaf children's emergent writing. Research convincingly demonstrates that hearing children use spoken

language to support their early writing endeavors and the talk that surrounds the writing is significant to the children's emergent writing development (Dyson, 1983, 1989, 1993; D. Rowe, 1989). In fact, Sulzby (1990, p. 84) suggested that "the language that children use surrounding writing activities gives crucial evidence of their developing concepts." For 6 months, Williams observed and videotaped five profoundly deaf children, ages 4.11 to 5.7 years, as they worked at the writing table of their preschool classroom. She also wrote extensive field notes that described in detail the children's use of sign language. Williams found that the deaf children used sign language in a variety of ways that supported their writing and helped to maintain their social relationships, including seeking assistance, providing information, instructing others or evaluating their work, and directing one's own writing. As they interacted, the children made connections between fingerspelling, printed letters and words, and manual signs. The deaf children's use of sign language was similar to hearing children's use of spoken language during early writing activities. The study corroborated previous findings with hearing children that social interaction is important to emergent writing (Labbo, 1996; Troyer, 1991). The study also highlighted the importance of an instructional context that provides opportunities for young deaf children to interact socially as they are learning to write. When children talk about print as these children did, they transform written language into a visual object they can manipulate, explore, and reflect upon. Metalinguistic conversations such as these are essential to children's emergent writing development (Clay, 1975; Vygotsky, 1962).

Andrews and Gonzales (1991) examined the influence of the instructional context on young deaf children's emergent writing development. The researchers questioned whether traditional teaching methods that emphasize structural writing skills (e.g., tracing and copying letters, filling in worksheets) rather than authentic composition are to blame for deaf children's general lack of sophistication with print. For a full year, they immersed six severely to profoundly deaf children, ages 6–8 years, in a literacy-rich kindergarten environment. The instructional program included a variety of reading and writing activities, including reading predictable books, reading re-enactments, storytelling, signed video stories, free writing, and writing notes and letters to one another. The researchers collected samples of the children's writing and used these to evaluate the children's developing knowledge about written language.

Results of the study indicated that all six children showed growth in their acquisition of print concepts and understanding of the alphabetic system. In general, the children's development moved from scribbling, to printing a single random letter, to printing a series of random letters, to printing whole words. This developmental path reflects some characteristics of hearing children's writing (see Sulzby, 1990), but the report is insufficiently detailed to make solid comparisons. Andrews and Gonzalez concluded that the instructional context effectively supported the children's emergent writing development, and they recommended authentic reading and writing activities—rather than traditional methods of instruction—to enable deaf children to discover how the alphabetic system works. Instructional contexts such as this have also been shown to support young hearing children's emergent writing (e.g., Dyson, 1989). Andrews and Gonzalez's findings must be considered with caution, however, as no data analyses were provided in the research report.

Collectively, these five studies suggest that deaf children learn about written language through authentic acts of composition, and that social interaction during writing time is supportive of their emergent writing development. In each study reviewed here, deaf children were provided regular opportunities to write messages of their own choosing and to interact while they wrote. There was little explicit instruction on the mechanical aspects of print, yet the children demonstrated a variety of fundamental concepts, understandings, and processes that were essential to their movement toward conventional writing.

The research also suggests that young deaf children's emergent writing development may be similar to that of hearing children. The purposes for which the deaf children wrote, their initial concepts and working hypotheses about print, and their uses of sign language to support early writing clearly reflect the purposes, understandings, and early writing processes of young

hearing children. Their developmental trajectories also appear similar. These similarities in development suggest that instructional approaches and programs that support hearing children's emergent writing may also be appropriate for young deaf children. Further intervention studies are clearly warranted to test this assumption.

A Look Toward the Future

Previous sections have clearly indicated a number of needs for further research in the area of deaf children's emergent literacy. While there are literally hundreds of studies on hearing children's emergent literacy, we have less than 20 investigations that describe the experiences and development of young deaf children. The body of work to date has insufficient depth or volume to provide a complete picture of deaf children's emergent literacy learning. Simply put, we need much more research in this area.

We currently have only two case studies of deaf children's emergent reading and one case study of a deaf child's emergent writing. We need additional, in-depth and longitudinal case studies of individual children's emergent reading and writing behaviors so that we can construct a detailed, theoretically-grounded representation of deaf children's emergent literacy development at given points in time and across time. Developmental tracing of young children's reading and writing processes can provide important information on how young children move toward conventional literacy, as well as what educators can do to scaffold their development. Case studies that muddy the waters—that is, those that provide depictions of deaf children who do not demonstrate the developmental patterns reflected in the current literature (if indeed they exist)—would be especially informative. We need to paint a portrait that captures the diversity of deaf children's emergent literacy behaviors.

We also need a number of case studies that cross the boundaries of the home and school contexts and provide ample information about emergent literacy development in each setting. Williams' (1994) study is an example of a qualitative investigation that crossed these boundaries, but with much less observation in the home. Given the complexity of deaf children's language, communication, and cultural experiences, as well as the differences that frequently exist between the home and school contexts, case studies of these kind seem particularly important.

Writing development appears quite complex and is strongly influenced by the instructional context. As mentioned earlier, we need additional studies that explore the impact of daily, open-ended composing periods. We also need studies that examine various factors that may effect deaf children's writing development. For example, studies with hearing children suggest that children's writing is influenced by the books they read (Ballenger, 1996). Investigations that examine the ways in which emergent reading interacts with emergent writing would also be informative. Given the advent of new communication technologies, we need to examine the multi-modal nature of emergent writing. Computers offer possibilities for writing that differ in significant ways from pencil and paper composition, including freedom from some of the more tedious aspects of the process. Research with hearing children suggests that the visual and auditory support of the computer may have important implications for young children's composing (Chang & Osguthorpe, 1990; see also Olson & Sulzby, 1991). Use of the computer may provide opportunities for cognitive growth as children encounter problems in using the computer to express their ideas symbolically (Labbo, 1996).

Finally, future research must reflect a broader array of deaf children and take into account the cognitive, social, and cultural aspects of their literacy learning. Once we have built sufficient depth and volume, we will need to synthesize the research findings and then articulate a theoretical model (or models) of deaf children's emergent literacy learning.

Notes

1. The authors do not explain what they mean by "conventional reading instruction."

2. The authors define primer level as "kindergarten plus" (p. 322).

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