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What Really Matters in the Early Literacy Development of Deaf Children

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With much earlier identification of hearing loss come expectations that increasing numbers of deaf children will develop literacy abilities comparable to their hearing age peers. To date, despite claims in the literature for parallel development between hearing and deaf learners with respect to early literacy learning, it remains the case that many deaf children do not go on to develop age-appropriate reading and writing abilities. Using written language examples from both deaf and hearing children and drawing on the developmental models of E. Ferreiro (1990) and D. Olson (1994), the discussion focuses on the ways in which deaf children draw apart from hearing children in the third stage of early literacy development, in the critical move from emergent to conventional literacy. Reasons for, and the significance of, this deviation are explored, with an eye to proposing implications for pedagogy and research, as we reconsider what really matters in the early literacy development of deaf children.

Earlier identification of hearing loss allows for earlier intervention and raises expectations that increasing numbers of deaf children will develop language and literacy abilities that are comparable to their hearing age peers.[1] By implication, such expectations focus attention on what happens in the early years of literacy learning as these experiences have been shown to be critical to future success for hearing children. It is during these years that the groundwork is laid for understanding the functions of text and the strategies that can be employed to make sense of print, including the principles of how an alphabetic writing system works. "Emergent literacy at school entry may be viewed as particularly important because of its association with later reading [and writing] skills and the importance of these abilities for school success generally" (Barnett, 2001, p. 421). There would be no reason to imagine that these abilities are any less important in the case of children who are deaf.

"A robust body of knowledge exists about the first five years of life and the extent to which children's early experiences correlate with their competencies in language and literacy" (Ramey & Ramey, 2006, p. 445). With respect to hearing children, much has been written as to the nature of the experiences and interventions that support optimal early literacy development, especially for those learners who are at particular risk of having difficulty developing literacy skills. By virtue of their hearing loss, deaf children fall into this at-risk group, and given the renewed emphasis on the importance of early intervention, it is timely that we revisit our understandings of the nature of early literacy development for these learners.

Suggestions have been made that, with respect to early literacy development,[2] deaf children follow similar trajectories to those of their hearing counterparts. In a review of the literature, Williams (2004) writes that "deaf children's emergent reading reflected the developmental sequence of hearing children described in the research literature" (p. 356) and that "young deaf children's emergent writing development may be similar to that of hearing children" (p. 361).

Given these indications of a parallel start, it would seem reasonable to expect that most deaf children

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would go on to develop text-based literacy abilities commensurate with their hearing age peers. Yet it remains the case that 50% of deaf students graduate from secondary school with a fourth grade reading level or less (Traxler, 2000), and 30% leave school functionally illiterate (Marschark, Lang, & Albertini, 2002). This begs the question as to when the language-learning trajectories of deaf children begin to draw apart from hearing learners to the extent that outcomes are so divergent, suggesting that perhaps the early literacy development of these two groups is less similar than it appears on the surface. Are there aspects of development that are playing out differently between the two groups that we have failed to take into account? Are these the aspects that are critical to future success in learning to read and write? Are we missing what really matters in the early literacy development of deaf and hard-of-hearing (D/HH) children?

Language and Early Literacy Development

To provide a background for a discussion of these questions, it is necessary to consider the linguistic prerequisites for developing the ability to read and write and how these are acquired by both hearing and deaf children.[3] A fundamental premise, at least in the case of hearing learners, is that there is an intimate connection between language acquisition and subsequent literacy development, such that children who begin schooling with stronger language abilities have a relatively easier time making the move to text-based literacy. This relationship between language and literacy is well documented (see Beck & Olah, 2001), and there is an extensive body of evidence to indicate that a broadly conceived notion of language skills, which includes vocabulary, syntax, discourse, and phonemic awareness, is fundamental for early and long-term literacy success (for an in-depth discussion, see Dickinson, McCabe, & Essex, 2006). This connection is now taken for granted in the case of hearing children, and the commonsense notion that follows is that "literacy develops when children have encounters with print, presumably written in a language which the child speaks" (Perez, 2004, p. 57). Similar arguments have been made with respect to deaf children with the suggestion that, given the importance of the relationship between the face-to-face and written forms of English, more attention must be paid to how the development of spoken and/or signed English relates to literacy development in this population (Paul, 1998, 2003).

For deaf children, the import of this language–early literacy connection can have implications in two ways. First, many deaf children have delays in their face-to-face language development which can negatively affect literacy learning. "The frequently reported low literacy levels among students with severe to profound hearing impairment are, in part, due to the discrepancy between their incomplete spoken language system and the demands of reading a speech-based system" (Geers, 2006, p. 244). Second, deaf children whose first language is not English (e.g., ASL or some other spoken or signed language) are faced with developing literacy in a language they may not have yet acquired.

Mayer and Wells (1996) provide a framework (see Table 1) for considering the relationship of language and literacy in the development of both hearing and deaf learners that can be used as a model for considering how early literacy is positioned with respect to the development of face-to-face language (spoken, signed, or some combination) and the subsequent development of reading and writing.

Mayer and Wells (1996) outline four overlapping phases in the process of becoming literate, with

Table 1 Phases in the process of becoming literate

Goal	Hearing D/HH using spoken language as L1	D/HH using natural signed language as L1
Learning the first language	Spoken L1	Signed L1
Social to inner speech	Egocentric spoken L1	Egocentric signed L1
Inner to written speech	Spoken L1	????
Learning the synoptic genre	Spoken L1	????

Note. Since natural signed languages do not have widely accepted written forms, development at phases 3 and 4 is not possible.

progress through the phases depending on having a linguistic bridge or means to mediate development in and between phases and on having access to a language-learning situation that meets a particular set of conditions. These conditions are (a) adequate exposure in quality and quantity, (b) to accessible linguistic input, (c) in meaningful interactions, (d) with others who are already capable users of the language. Although there is certainly variability with respect to the relative quality of these linguistic interactions for all learners (Wells, 1986), it can be generally assumed that for most hearing children the minimal conditions for language acquisition are being met.

The first phase in the process is concerned with the development of language for face-to-face communication. Given the above conditions are in place, language acquisition at this stage happens relatively effortlessly as children use language as a tool to mediate interactions in their environment. In this way, the means to acquiring the language is the use of the language itself (Halliday, 1975), and this can happen just as effectively in a spoken or a natural signed language—or perhaps, in the signed form of a spoken language (Luetke-Stahlman, 1998).

However it is worth noting that, unlike the situation for most hearing children, for deaf children there are usually challenges to be addressed with respect to meeting at least one of the necessary language-learning conditions (e.g., making the input accessible via amplification or signed language). The result is that many deaf children may not have acquired a face-to-face form of their first language in the unfettered way that their hearing counterparts have. Given improvements in amplification technology (including cochlear implants) and possibilities for more timely educational interventions, one of the anticipated benefits of earlier identification of hearing loss is that deaf children will have increased probabilities of developing age-appropriate language skills. Yet despite advances in many areas, there continue to be concerns in this regard (see the discussion in Paatsch, Blaney, Sarant, & Bow, 2006).

Without a full face-to-face language in place, deaf children often do not have the requisite basis in place for age-appropriate cognitive and literacy development. There is a need to emphasize this point as suggestions have been made that face-to-face language (spoken or signed) is not a key element in the early literacy development of deaf children and that even in the absence of much fluency in this area, deaf children are able to make "gains in literacy knowledge comparable to those made by hearing children" (Rottenberg & Searfoss, 1992, p. 477). Although it is certainly true that print can and should be meaningfully introduced to children at a very young age, it is not the case that, for hearing children, this exposure to print occurs in absence or lieu of concomitant spoken language development.

There is no reason to believe that deaf children are unique in this respect. Dyson (2001), in making reference to Ramsey (1997), contends that "it is difficult to see how children could learn to compose with written graphics unless they could already use comfortably a natural language (spoken or signed) as a tool to plan, narrate, make queries and even reflect on, and analytically examine speech itself" (p. 128). Thus, it can be argued that the first aspect of what matters in early literacy development is that children have near to age-appropriate spoken and/or signed language fluency in place. All subsequent claims made in this paper with respect to early literacy learning are predicated on this premise.

In Phase 2, the move is from the use of language for communication with others (intermental) to communication with oneself (intramental), and the child begins to employ language as a tool for thinking (Vygotsky, 1978). The outward manifestation of this development is the use of egocentric speech or egocentric sign as children use knowledge of their face-to-face language to "think out loud." In this way, cognition is shaped by the nature of the language that has already been acquired, and children can be said to think in the language in which they speak and/or sign. Because there is such an intimate connection between face-to-face language and cognition, the quality of the discourse children have experienced shapes and provides the substance for what is thought about. The ability to think in a language and to later read and write it has much to do with how well one can communicate in the language in the first place (Vygotsky, 1978; Watson, 1996, 2001; Wells, 1981).

Phase 3 is pivotal to this discussion of early literacy development as it is at this point that children are

asked to express themselves, not only in their face-to-face to language but also in print. Things that have heretofore been spoken, signed, or thought about must now be committed to paper. This can be a daunting task as children try to make sense of the relationships between the language they already know and the language of print, encountering "rich conflicts" along the way (Grossi, 1990). Learning of reading and writing, although not children's first attempts at making representations, does constitute "their first encounter with what will appear to them as arbitrarily constructed, unmotivated signs" (Kress, 1994, p. 219).

To accomplish this task, hearing children exploit knowledge of their face-to-face language as they talk their way into text. "Children are highly proficient in all aspects of the syntax of speech at this stage. That proficiency provides the linguistic foundation on which they build when they first learn to [read and] write" (Kress, 1994, p. 53). This is the point in the literacy-learning process when the commonalities between speech (sign) and print are more important than the asymmetries, as children rely on these commonalities to decode and encode print (Perfetti, 1987).

The questions that arise when thinking about the early literacy development of deaf children rest on how these learners make sense of print and how it is that they talk or sign their way into text. How do they resolve the rich conflicts that arise when they sort out the relationships between their face-to-face language and text? What are the necessary understandings about print that must be established at this stage if age-appropriate literacy is to be achieved? The focus for the remainder of this paper will be on a detailed examination of this third phase of development as it is central to the question of what matters for deaf children in their early literacy development.

However, before moving on to this examination, it would be important to make note of what occurs in Phase 4 as this is the level that is concerned with the development of literacy for educational purposes. At this stage, it is assumed that basic literacy has been established and that the connection between face-to-face language and print has been made. This stage is typified by more complex uses of text and the use of the synoptic genre. It is in the synoptic written genres (e.g., expository texts such as essays, arguments, etc.) that discipline-based knowledge is typically constructed and communicated, typified by the use of low-frequency vocabulary, compound–complex grammatical constructions, and grammatical metaphor (Halliday, 1993). Fluency at this stage goes far beyond a functional level of literacy (i.e., Grade 6 level), is necessary for advanced academic study, and is the standard by which success as a literacy learner is often measured—a standard that many deaf learners often fail to meet.

Stages of Early Literacy Development

In most discussions of emergent literacy, stages are proposed to describe early written language development. Most of these frameworks focus on the development of spelling, following from the seminal work of Read (1971). Given that it is not spelling but reading and writing that are most problematic for deaf children (Kyle & Harris, 2006; Mayer, 1998), the three levels suggested by Ferreiro (1990) have been adopted as the basis for describing the early literacy development of deaf children. Ferreiro's levels are particularly useful as they focus on the ways in which the relationships between face-to-face language and text develop in the young literacy learner. Although spelling is an inescapable aspect of this development, Ferreiro focuses on the ways in which children come to understand three different representation systems for making meaning—spoken language, drawing, and writing. She argues that the emergence of writing follows a process from a general understanding that writing is distinct from drawing, to a specific awareness of letter/sound correspondence (Perez, 2004).

As is characteristic of many discussions of early literacy development in hearing children, writing, rather than reading, will be used as the basis for the analysis. More specifically, written samples will be used as the means for comparing young deaf and hearing writers in order to consider the texts of deaf children in relation to what is typically seen in the development of hearing children and to illustrate the features of development at each stage. It needs to be clarified here that the purpose in using these examples is to provide a fulcrum for a theoretical discussion of what is necessary for the development of

age-appropriate literacy. The specific details of the two studies from which the samples are taken have been reported elsewhere (Mayer, 1998; New Zealand Ministry of Education, 2005) and will not be repeated here. That said, it is still necessary to provide sufficient background information about the children in these two studies to provide a basis for the interpretation of the samples and a sense as to the extent to which the claims made might be generalizable to the broader population of deaf children.

A total of 115 deaf children were involved in the two studies. However, given the focus on early literacy, only samples from the 30 writers between the ages of 4 and 7 years were considered for this paper as this represents the group who would be typically identified as early literacy learners. All these children attended public schools (in a school for the deaf or in a mainstreamed setting) and used sign or some combination of speech and sign as their primary means of communication. As is too often the case, a number of these children did not have a firmly established first language (signed or spoken) upon school entry. With few exceptions, the children had profound hearing losses and regularly used some form of personal and/or group amplification. The extent to which this amplification provided access to spoken English varied among the children, and given the fact that they all used sign to communicate, it could be argued that as a group they did not have full access to language via audition alone. It would also be fair to say that the level of signed language proficiency varied from child to child with some relying more on a natural signed language (ASL or New Zealand Sign Language) and others on some form of English-based sign.

With respect to generalizability, it is also reasonable to suggest that this group of young literacy learners is representative of deaf children in similar contexts as the nature of their written products is similar to those reported in other studies of early literacy development (e.g., Andrews & Gonzales, 1991; Ewoldt, 1985; Ruiz, 1995; Schleper, 1992). And even though all these young writers use sign as an aspect of their communication, what we learn from them has relevance for thinking about early literacy development in oral deaf children as well, as the key issue is language not modality. What is also telling is that even though there is considerable group variation with respect to the nature of their early experiences and cognitive and linguistic aptitudes, there is very little difference among the writers in their early efforts to create English text. This seems to indicate that there are other common underlying issues that may help to explain why such a diverse group of deaf children produce texts that are so much alike.

In the following sections, three levels of early written language development are presented, in which the products of hearing and deaf writers of like ages are juxtaposed in order to draw attention to the similarities and differences among them at each stage. These examples are intended to be illustrative of what is (or should be) happening at each stage and to indicate differences between young hearing and deaf writers that could help inform our understanding of early literacy development in deaf children. This premise is driven by the fact that, in the case of hearing children, the sequence of early written language development is well documented (Tolchinsky, 2006), with any divergence from this pattern indicating potential difficulties with future literacy learning (Clay, 2002; Cramer, 2006). Looking at the development of deaf writers against this backdrop could help illuminate how departures from expected patterns may matter in terms of later literacy development.

Level 1: Distinguishing Writing From Drawing

In Level 1, children search for criteria to make the distinctions between the visual representations of drawing and writing. The key understanding developed during this level is the notion that, although the same kinds of lines are used in both drawing and writing, the lines function differently in terms of what they are meant to represent. "When we draw, the lines are organized following the object's contours; when we write, the same lines do not follow the object's contours. When writing, we are outside the iconic domain" (Ferreiro, 1990, p. 15). Drawings look like the objects they are meant to represent, whereas writing does not (i.e., the picture of the house vs. the word "house").

In their first attempts at writing (vs. drawing), children essentially draw a picture of the text, making

it look like the examples of texts they have seen. Although the two products may appear indistinguishable to the viewer, children can differentiate between them so that even though both representations may look scribbles, the child will identify one as the picture and the other as the text (Harste, Woodward, & Burke, 1984). With active opportunities to explore text, writing begins to assume an even more text-like form (e.g., scribbles that move from left to right, parallel rows of scribbles, spaces between scribbles), and children begin to incorporate standard letters into their writing in a random fashion. This is a consequence of exposure to print in the environment and a growing awareness that letters are a regular feature of text.

Children assign meaning to texts at this level, and they understand that written language is a form of communication. But because representations are not standard, the meaning cannot be reconstructed from the text without the assistance of the author. As the text itself does not drive the retelling, the reading of the text may change from one incarnation to the next. Overall this first level in children's thinking produces two major accomplishments: "(1) to consider strings of letters as substitute objects, and (2) to make a clear distinction between two modes of representation—the iconic mode (to draw) and the noniconic mode (to write)" (Ferreiro, 1990, p. 16).

An analysis of texts at this level reveals very little difference between the writing of hearing and deaf children, and both appear to have achieved the understandings fundamental to this stage. The samples in Figure 1a and 1b were created by a 4-year-old hearing student and a 5-year-old deaf student, respectively. Both examples feature a clear distinction between picture and text, with writing that consists of scribbles in spaced, linear rows, and it was not difficult to find numerous similar samples from both groups in the data set. Both hearing and deaf children are able to attach a meaning to the text and are able to relate this meaning via their face-to-face language. They both have a clear sense of what they want to write about, and they recognize that the text can carry this meaning. They are using a text-like form to create this written message, but there is no apparent relationship between the written and spoken/signed mode. Any rereading of the story is not bound by the constraints

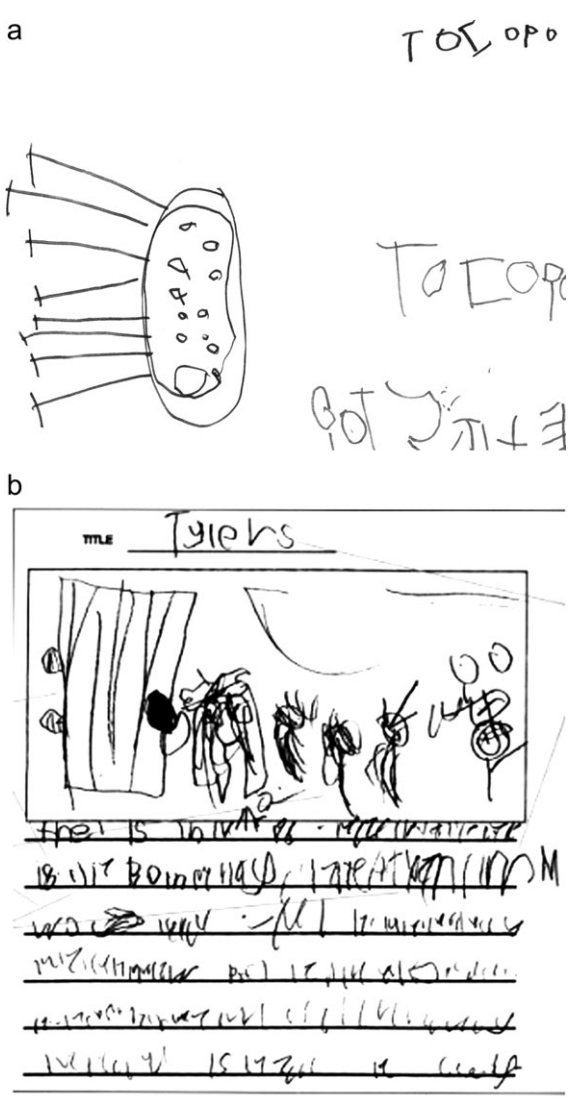


Figure 1 (a) Level 1, drawing versus writing, 4-year-old hearing child. (b) Level 1, drawing versus writing, 6-year-old deaf child.

of the text, and the reading may change from one instance to the next.

Level 2: Identifying Properties of Writing

Development in the second level is typified by an increasing understanding of the properties of text, with the recognition that there are differentiations between words. Children become aware of quantitative and qualitative principles for creating words (Ferriero, 1990; Perez, 2004), developing the sense that there are minimum or maximum numbers of letters in a word

and that certain variations within a word are improbable (e.g., four consonants in a row, a word with no vowels). They also come to see that identical letter strings represent the same object. Coming to these understandings is a consequence of continued exposure and interaction with text, and children's writing will evidence the features of the writing system to which they are exposed. In the case of English, this means the use of the standard alphabet and the incorporation of some memorized patterns (e.g., child's name, high-frequency vocabulary).

It is also at this stage that children may begin to encode characteristics of objects into the written word, coming to the conclusion that "train" must be a long word because a train is a long vehicle (Papandropoulou & Sinclair, 1974). Olson (1994) gives the example of preschool children who, when asked to write "cat," will write a short string of letters and then, if asked to write "three cats," will repeat the same string three times. In this way, the text produced is a representation that is emblematic of the cats themselves, rather than of the words "three cats."

What marks this stage is that, just as in the previous level, it precedes any knowledge of the relationship between the sound patterns of the word and the written representation. The young writer is making a direct relationship between the object and the text. The construction of the text hinges on visual rather than auditory principles, and even though the child understands that the text conveys the meaning of the spoken (or signed) utterance, there is no explicit understanding as to how one representation is captured in the other. The child is using the text as a sort of iconic representation of the object itself, rather than as a representation of the word (or sign) for that object. A similar manifestation of this understanding is when prereaders "read" logos such as "McDonald's" and "Coke," interpreting these items as standing directly for the things themselves, not for the words they represent (Olson, 1994).

Just as in Level 1, there is little to differentiate the texts of the deaf and hearing writers. In fact, it is often the case that deaf children will be more effective at using standard letters and overlearned words in their writing as, by virtue of structured early language

Figure 2 (a) Level 2, properties of writing, 5-year-old hearing child. (b) Level 2, properties of writing, 6-year-old deaf child.

teaching, they have often had more systematic instruction in these areas than the typical hearing child. The samples in Figure 2a (created by a 5-year-old hearing student) and Figure 2b (created by a 6-year-old deaf child) exhibit the features that are typical of development at this stage.

Both writers use combinations of vowels and consonants in creating words and include a few words whose spellings have been memorized (e.g., the, is, see). They apply principles of quantity and quality, with words of reasonable length (i.e., at least three letters and no more than nine), with a different set of letter combinations to represent different meanings (i.e., the same set of letters cannot mean the same thing). They organize the writing in a text-like fashion and are readily able to provide a gloss for what they have written.

Level 3: Connecting Writing to Spoken/Signed Language

This third level, central to the move from emergent to conventional literacy and crucial to any discussion of early literacy development, is the stage at which the writing of many deaf children begins to look markedly different from that of their hearing peers. In referring to all language learners at this level, Teale (2003) suggests that "understanding this transition is especially critical because a significant number of children get hung up in their learning during this time, and because what happens during this period seems to have significant influence on children's progress in literacy achievement across later grade levels" (p. 26).

It at this juncture that hearing children begin to make use of alphabetic principles or what Ferriero (1990) calls the "phonetization of the written representation" (p. 20). She describes this all important shift as one in which children "learn that letters serve the function of representing that fundamental property of objects that drawing is not able to achieve, that is, their names" (Ferreiro, 1986, p. 28). In other words, this is the stage at which children come to see that, rather than a direct relationship, there is an intermediary step between writing and object that is realized in the words (signs) of the face-to-face language. Thus, the challenge of learning to read and write is to find or detect aspects of one's own implicit linguistic structure that can map onto or be represented by the script (Olson, 1994). In this process, children bring together two sets of understandings—the knowledge of their face-to-face language and what they have come to know about how print works. To do this they must have access to the structures of their own speech (or sign), to provide the data for reflecting on language, and they must also have access to a set of conventional print categories (e.g., letters, written words) into which the data can be organized (Homer & Olson, 1999). In the normal course of events, the two sets of data converge as there is a culturally predetermined way in which any language is represented in its script. The task for young writers is to uncover this relationship.

Invented spellings are typical of hearing children's work at this stage and provide evidence of how young writers are beginning to make the connection between spoken and written language. In the process of inventing spellings, hearing children exploit sound–symbol correspondences in order to make sense of the connections between speech and text as they work to commit language to paper (Kress, 1997). Readers, familiar with the language, are able to decode these texts using their knowledge of the language's sound–symbol correspondences. Note the spellings of "ons abon a tim" for "once upon a time" (Figure 3a) and "aotobyografe" for "autobiographies" (Figure 3b) in the texts of two young hearing writers.

It has also been found that, for hearing children, the use of invented spelling, which is phonologically rather than orthographically driven, is a strong predictor of later progress in decoding and understanding the alphabetic principle (for a discussion, see Whitehurst & Lonigan, 2001). In inventing these spellings, children use the point of articulation as a reference for making sound–symbol decisions, and they can often be seen to exaggerate articulations in an attempt to get a feel for the sounds they are attempting to write (Juel, 2006). It is in this process that hearing children draw on their knowledge of letter names as they write, to aid in making sense of grapheme–phoneme associations. With the exception of "W," letter names contain some of the relevant phonemes that are symbolized by that letter (e.g., tee contains /t/, and eff contains /f/; Ehri & Roberts, 2006), and therefore, it is reasonable that young writers would make use of this relationship.

Studies have shown that deaf students can and do invent spellings and are analytical and logical in the process (Ewoldt, 1985; Mayer, 1998; Schleper, 1992). As do hearing children, they understand that there is a relationship to be made between speech (or sign) and text. They employ strategies such as mapping handshapes onto English words, using lip patterns as cues to the beginning sounds of words, and linking finger spelling to text. These strategies are evident in the text in Figure 3c that was written by Jane, a 6-year-old deaf child of hearing parents who communicated, depending on the interlocutor, through either ASL or a combination of speech and sign. Her writing is representative of the performance of the majority of deaf students in this data set and not unlike the texts

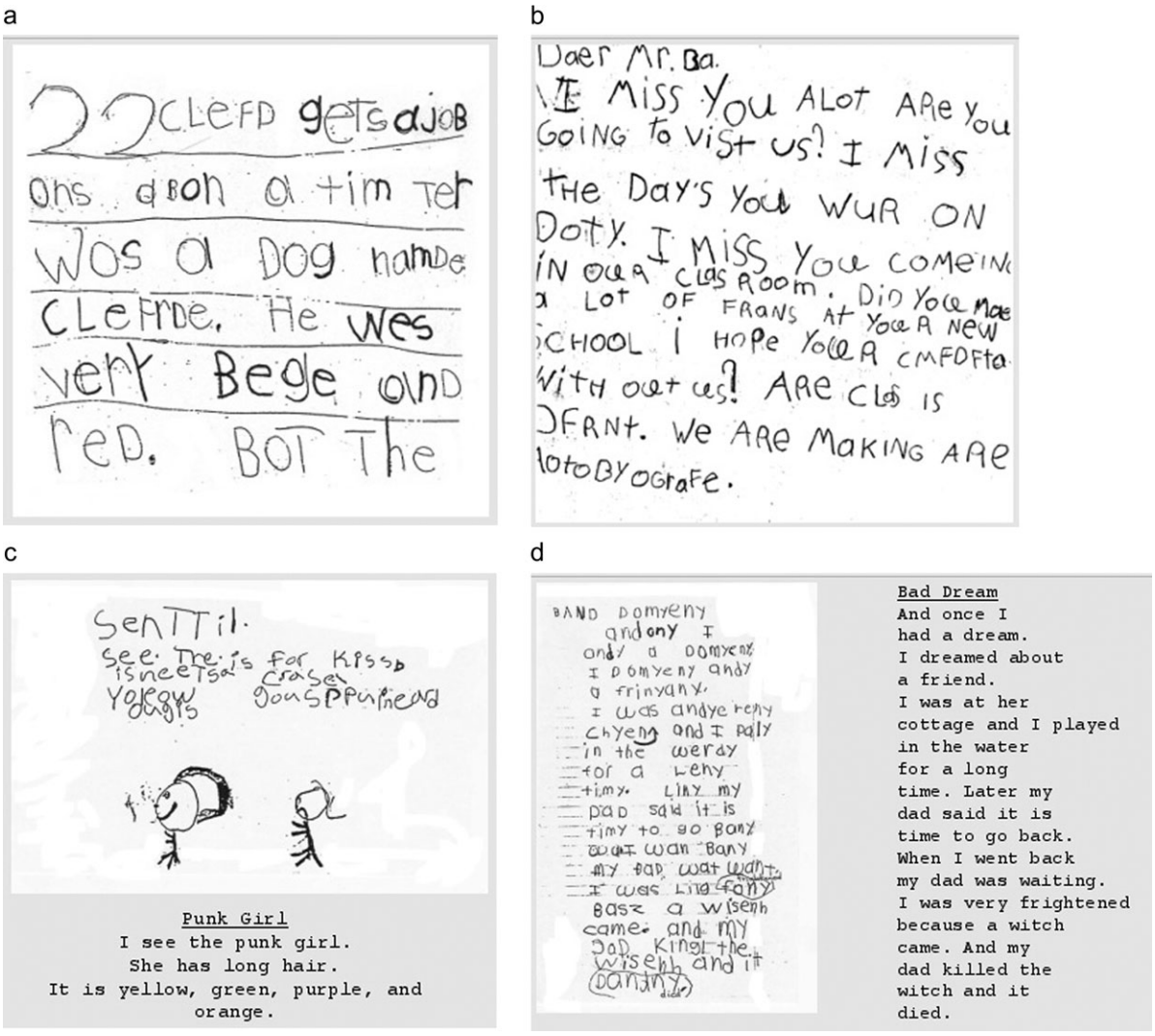


Figure 3 (a) Level 3, linking spoken and written language, 6-year-old hearing child. (b) Level 3, linking spoken and written language, 7-year-old hearing child. (c) Level 3, linking signed and written language, Jane (6-year-old deaf child). (d) Level 3, linking signed and written language, Kate (6-year-old deaf child).

described in other studies of deaf children's early writing.

While Jane is still evidencing features of the previous level in this example (i.e., use of memorized, high-frequency words), she is also demonstrating an awareness of the need to make a sign–print connection that was not evident in her earlier work. Jane exploits the fact that some signs are produced with handshapes that can also be seen as letters from the manual alphabet, and she comes to the conclusion that this handshape represents the first letter of the word for that sign (e.g., in ASL, the sign for "onion" is made with an "x" handshape, therefore, onion starts with "x").[4] This notion is reinforced for her by the fact that many name signs are produced by using the letter from the manual alphabet that is the first letter for that name (e.g., "Nancy" is signed with an "n" handshape).

Thus, to invent spellings, Jane relies on the initial handshape principle as the rationale for determining the first letter of a word (Mayer, 1998). Once this has been established, she simply adds a set of random letters to stand in for the rest of the word as there is no other apparent connection to be made between the sign and the text. For example, in the second line of her text, Jane writes the invented word "kissb" to mean "punk." Because she signed the word "punk"

using a "k" handshape moving from the forehead across the top of the head, it made sense to her to begin the word with a "k." She completes the word with "issb." It could be the case that she chose "kiss" because it is a learned pattern, but the key point is that, with the exception of the first letter, her invented spelling does not map onto "punk" in any systematic way.

In the next line, she writes "crases" to mean "long hair." The "C" handshape of the classifier she used to sign "long hair in a ponytail" becomes the first letter of her invented spelling for the word. In the fourth line of the text, she is able to write the correct first letter for the color words (e.g., "gous" for "green") as these initial letters are evident in the production of the sign (i.e., the "g" handshape is used to sign "green").

In relying on her knowledge of the relationship between handshapes and the manual alphabet, Jane is able to make an orthographic link to English print as she sorts out the conflicts between sign and text. But this sort of letter knowledge is qualitatively different from the letter naming that hearing children rely on as they invent spellings, and as a consequence, she produces a markedly different written product.

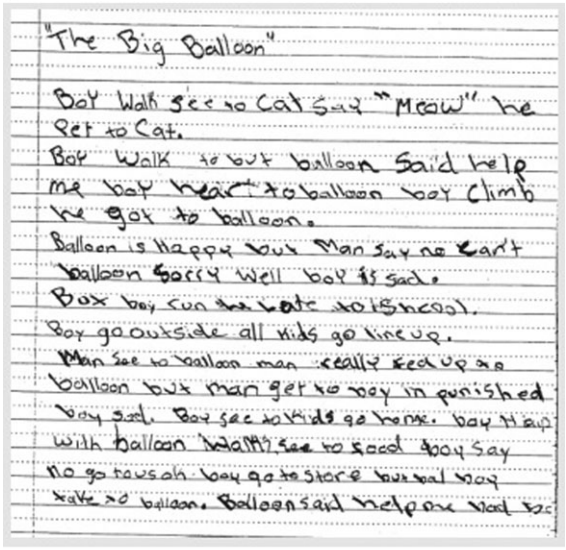
The distinction between Jane's efforts and those of her hearing peers is that it is not possible for a reader with knowledge of the language to decode her writing. There is no way to sound out the meaning of individual words because the representations are not constructed on this basis. Although Jane attempts to exploit commonalities between her language and the text, her efforts do not yield representations that are close enough to standard that they can be read. As well, beyond the lexical level, she is unable to capture the syntax of her face-to-face language in the text in any systematic way or in a way that conveys the meaning of the signed (or signed and spoken) utterance. This is not surprising as the face-to-face language that she is encoding is not English—yet that is the language she is attempting to write. Although she knows what the text means, when reading back what she has written, she is unable to make a consistent link between "talk" and text, and she "tells" rather than reads backs what she has written.

In the data set, there was one significant exception to this pattern. This was the text written by 6-year-old Kate (see Figure 3d)—a text that exhibits features of the writing of both her hearing and deaf peers. As was the case for all the children, Kate used her face-to-face language to drive creation of the text, in her case, a combination of mouthing and English-based sign. She was not a candidate for amplification, her speech was unintelligible, and it would be accurate to say that her first language was a form of manually coded English as this was the form of communication that she was exposed to by her hearing parents. Her face-to-face English was age appropriate, and when she communicated, the English was represented almost completely via mouthing and signs, although she did not always represent every word in both modes. Like Jane, her invented spellings are not phonetically based but are derived from the relationship between handshape and manual alphabet. For example, because she uses an initialized sign for "cottage," she begins her invented spelling with a "c," and as Jane did, she uses a random set of letters to complete the word, spelling it as "chyeng." And just as in Jane's case, it is not possible for a reader of English to independently decode the text.

But unlike Jane, Kate was able to read back her writing in correct English word order with a one-to-one match between sign/mouthing and text, including all the function words typically omitted by deaf students. Notice the direct correspondence at the word level between the gloss and the text in Figure 3d. Therefore, although idiosyncratic with respect to spelling, Kate achieves the critical milestone of the third stage of literacy development. She represents English at the morphosyntactic level, making a one-to-one link between face-to-face language and print, mouthing, and signing her way into text.

What is ultimately most significant about Kate's development is that she is the only student among this group who went on to develop age-appropriate text-based literacy abilities. Although both Jane and Kate (along with all the other children in both studies) achieve conventional spelling, it is only Kate who ultimately produces a standard English text (see Figure 4a and 4b). This suggests two things—that Kate has a command of face-to-face English (even in

a



b

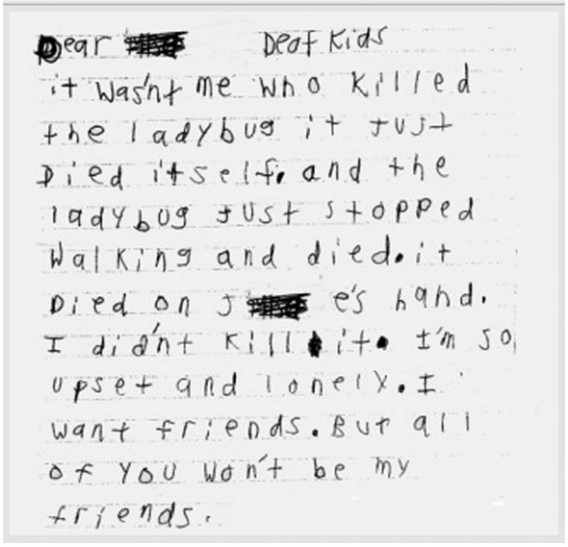


Figure 4 (a) Conventional spelling, Jane (7-year-old deaf child). (b) Standard English text, Kate (7-year-old deaf child).

the absence of intelligible speech) and that she employs effective strategies in committing that language to paper. Yet, given the nature of her invented spellings, it is clear that in some ways these strategies are unique to her as a deaf literacy learner. Developing a better understanding of the singular ways in which Kate and other successful deaf literacy learners master this third level of development seems key to developing a fuller understanding of early reading and writing processes in these children.

The Challenge of Representing Face-to-Face Language in Text

What is striking across all levels of early literacy development described here is that deaf children, like their hearing peers, are active theory builders and constructors of knowledge (Clay, 1983; Kress, 1997). In early writing activities, they are motivated to make sense of text in terms of their present theories of how language works, operating on problems and finding their own solutions. For all young learners at this early stage, the point of engagement with text is not that they always come to conventional solutions for all the conflicts they face in committing language to paper, but that they are able to identify problems and attempt to solve them in systematic and logical ways. It is heartening to see, and a testament to the cognitive capacity and flexibility of deaf children, that they do so if provided with the appropriate opportunities (e.g., see Andrews & Gonzales, 1991; Ewoldt, 1985; Mayer, 1998; Ruiz, 1995; Williams, 1999). In all these studies, instructional programs were designed to allow children to exploit possibilities for constructing meaning that are generally afforded to hearing children (e.g., interactive storybook reading, writing workshop). In many respects, the deaf children in each case were able to take advantage of these learning opportunities in the same way as their hearing counterparts (e.g., responding appropriately to text, developing concepts of print) or, if not in the same ways, in ways that demonstrated that they understood the meaning-making problem (e.g., attempting invented spellings). Given this evidence, therefore, it appears that the problems of early literacy learning do not rest on the fact that young deaf children are unable to act as constructors of knowledge, and on this aspect at least, there is a striking similarity to young hearing learners.

It could also reasonably be argued that with respect to the first two levels of early literacy development, young hearing and deaf writers are on parallel, comparable trajectories in terms of learning to write. The similarities evident at this stage may go some way to explaining why researchers in the field have made a case for symmetry between the two groups (Williams, 2004). However, what needs to be remembered is that at these early stages writers are not yet

making explicit connections between face-to-face language and text. Young children are definitely aware that print conveys meaning and that as writers and readers they can construct and reconstruct this meaning, but they still see text as a direct representation of the object to which it refers. Making this direct relationship depends to a great extent on the visual mode (i.e., what text looks like), a channel in which deaf learners are unimpeded and in which they may even have a slight advantage. Thus, it is not really surprising to find that, at the earliest stages of literacy learning, deaf children's written products look much like those of their hearing peers. It could even be argued that the underlying strategies for constructing written representations are similar between the two groups.

Yet irrespective of writing system, children must come to see the systematic relationships between their face-to-face language and the text and then reconsider their language in terms of this relationship. Such an interpretation is in line with the view of Ferreiro and Teberosky (1982) that, for hearing children, written language learning is a relearning of spoken language and with Watson's (2001) contention that "any orthography necessarily creates conceptual categories for thinking about language in that it requires the user to segment the stream of speech into units that can be described by that orthography. Orthographies can be thought of as the theories of language they are created or adapted to represent" (p. 44).

This is the major accomplishment of the third level of early literacy development, and it is at this stage that the trajectories of hearing and deaf children begin to diverge. It is problems in the evolution of this relationship that lie at the heart of the challenges that face deaf children in the development of reading and writing. As has been argued via the examples presented, deaf children have a sense of the task and attempt to make relationships between language and text, but it appears that they often lack the necessary knowledge and strategies to do so effectively. The challenge for educators and researchers is to acknowledge and identify what is lacking and then to think about ways in which these gaps can be addressed.

With respect to these gaps, two main points should be emphasized. The first is the lack of knowledge of the face-to-face language to be written. This does not mean the absence of any face-to-face language, but rather an inadequate or incomplete foundation in the language to be written. Learning to read and write, even in a perfect alphabetic writing system, "would still depend on having the oral language with which to understand the morphemes and it would still depend on being able to connect letter sequences to their pronunciation …. Sounding out is based on the assumption that children know the meanings of the words they are decoding. Phonics works only if the string of produced letter sounds approximates a recognizable word" (Juel, 2006, p. 423). Even for hearing children who are learning English as a second language, the basic argument is that it is very difficult to learn to read and write a language that is unfamiliar in its meaning and sounds and that [for literacy development] there needs to be at least minimal familiarity with the target language, although how familiar is unclear (Foorman, Goldenberg, Carlson, Saunders, & Pollard-Durodola, 2004). This raises questions as to what level of English fluency (in speech and/or sign) is necessary as a precursor or concomitant condition to help ensure that deaf children will be successful at learning to read and write.

For all beginning literacy learners, written text and face-to-face language must come to make sense in terms of each other, constituting a symbiotic relationship that young children need to unravel (Homer & Olson, 1999; Olson, 1994). Hearing children do this by using the structures of their speech as the fodder for making sense of text, and in turn, the text provides a model for rethinking the nature of the spoken language (e.g., the concepts of word and letter).

Consider the oft-used English example of "elemeno." As a consequence of numerous recitations of the alphabet (and more especially the alphabet song), hearing children come to believe that "elemeno" is a word. It is only after exposure to the alphabet in its printed form that they come to realize that "l," "m," "n," and "o" represent individual letters, not a word. This provides a simple but instructive example of the ways in which print brings spoken language into consciousness, thus helping the young reader and writer make the connections between the two.

The second point, which is intimately tied to the first, is the inability of many deaf children to effectively employ the range of strategies used by hearing children in making the relationships between face-to-face language and text. Whitehurst and Lonigan (1998, 2001) propose that these are two interdependent sets of processes and skills—"outside in" and "inside out". In contrasting the two, Pressley (2006) describes "outside in" components as developing through informal social processes in the preschool years and coming from outside the printed word. These include general language competencies such as knowledge of concepts, words, syntax, story structure, and the conventions of print. "Inside out" components are more specific to text and derive from sources of information within the printed word. They allow for the rendering of sounds into letters and include knowing the names of letters and letter–sound associations and phonological awareness. "Outside in" skills support general comprehension and are more important somewhat later in the literacy-learning process, whereas "inside out" skills are seen to be vital in the early sequence of learning to read and write when the emphasis is on making sense of the linguistic code itself (Lonigan, 2006).

The most debated of these "inside out" skills is phonological awareness. Phonological awareness "refers to the ability to detect or manipulate the sound structure of oral language" (Lonigan, 2006, p. 78).[5] With respect to hearing students, it is the primary means by which they make the systematic connection between talk and text, and the only variable which has shown a causal, rather than a correlational, relationship in the development of literacy (Phillips & Torgensen, 2006; Pressley, 2006; Scarborough, 2001). The case for its importance for young hearing literacy learners is overwhelming, making it a better predictor of early literacy success than any other variable including IQ (Stanovich, 2000). "Although phonological recoding may play a minor role in skilled adult reading, it plays a critical role in helping the child become a skilled reader, as it is the principal mechanism by which beginning readers (and writers) learn to use the more efficient visual route and achieve competent performance (Form & Share, 1983, p. 114). Arguments have also been made that the development of reading depends on phonological awareness in all languages studied to date, even though developmental differences may be identified given that languages vary in the ways in which phonology is represented in orthography (Ziegler & Goswami, 2006).

Although the focus of this paper is not to summarize the debate as to the relative importance of phonological awareness in early literacy development, it is important to acknowledge contentions that its role in learning to read and write has been overstated. For example, in a letter to the editor, Krashen (2002) questions "the necessity of phonemic awareness training for English speaking children" (p. 128), basing his position on reviews of the research in the area (Krashen, 1999, 2001). In response, Ehri, Shanahan, and Nunes (2002) suggest that "Krashen has relied on the statistical significance of individual studies in making his case but has ignored the issue of power and the contribution of meta-analysis" (p. 128). Further to this point, Shanahan (2004) suggests that although Krashen and others (see Coles, 2001; Garan, 2001) may (or may not) be correct in what they say about particular studies of phonemic awareness, their overall research synthesis is flawed as they do not take an even-handed approach in accounting for studies that both challenge and support their position.

With respect to deaf children, numerous arguments have been made that phonological awareness does play a role in the reading process (Burden & Campbell, 1994; Hanson, 1986, 1991; Hanson & Fowler, 1987; Kelly, 1993; Leybaert, 1993; Waters & Doehring, 1990) and in skilled reading (Hanson, 1989; Kelly, 1995). Other studies (e.g., Miller 2002, 2006) have indicated that deaf individuals, despite poor phonological awareness, have word-processing skills comparable to those of hearing learners. But given that the reading levels of the deaf learners in these studies are substantially below those of their age-matched hearing peers, there is a question as to how much this ability impacts on actual reading levels. Miller (2002) speculates that although "this apparent equality at the word level is encouraging, it may simply imply that phonological processing contributes to later and higher stages of text processing and not, as examined in this experiment, to the initial encoding of words" (p. 325).

In any case, it is not phonological awareness per se, but what it affords, that makes it so crucial in the development of early literacy. It is the primary means by which hearing readers and writers come to make the systematic connections between spoken language and text and to sort out how print works. Even though there may not always be a one-to-one match between sound and symbol, it is the strategy that is most effective in allowing writers think about their language in terms of the text, holding true in every language studied to date, even Chinese (Ashby & Rayner, 2006).

It is also informative that even when hearing children have the requisite spoken language in place, they can encounter difficulties in reading and writing, and in the majority of cases, these are attributable to deficits in phonological awareness (Scarborough, 2001; Stanovich, 2000). This suggests that it may not be a question of whether, but how, phonological processing skills are taught. Yet with respect to the early literacy learning of deaf students, it has been suggested that "the 43 or 44 phonemes of spoken American English present a barrier to reading, when our print system has only 26 symbols and that there is a closer relation between print and the manual alphabet, thus enabling us [deaf learners] to bypass phonology" (Moores, 2001, p. 3). Yet there is no evidence to indicate that young deaf children can become successful readers and writers by bypassing phonology, entirely circumventing the set of strategies that have been found to be critical for every other group of English language learners. Therefore, rather than imagining that we can bypass phonology, it would be productive to redirect our attention to the ways in which we can help children to solve the phonologic problem of spoken language in ways that make sense for children who are deaf.

Implications for Educational Research and Practice

If we want to improve outcomes, it is key that we focus our attention on those areas that have proven to be most problematic for deaf children (e.g., developing a solid base in the language to be written) and attend less to those areas (e.g., concepts of print) that have proven to be less troublesome. The following recommendations follow from this position.

1. Continued emphasis on creating rich literacy-learning environments

As the central purpose of using language in any form is making meaning, it is now a generally accepted principle that early literacy experiences should be relevant, purposeful, and functional for the learner. Programs should be designed to provide daily opportunities to experiment with reading and writing, linking literacy with experiences and the active use of language (Teale & Sulzby, 1989). A well-designed program should incorporate a balance between a whole language focus and skills instruction, taking advantage of the strengths of both (Pressley, 2006; Stanovich, 2000). And although there are indications that, especially for at-risk learners, the balance of elements in an integrated literacy program may need to be adjusted to provide extra support in areas of weakness (Xue & Meisels, 2004), there would be nothing to gain by engaging in a deaf education version of the "reading wars."

One of the most positive moves in recent decades has been the move to literacy-rich programs for young deaf children. That said, the challenge will be to design environments that continue to emphasize this richness while at the same time promoting children's attainment of the orthographic and phonologic understandings that are necessary to achieve fluency.

2. Less emphasis on literacy-learning strategies that are easily acquired or less efficacious

As was argued earlier, deaf children are generally on par with hearing children in the very earliest stages of literacy development. They quickly learn that text carries meaning and that it differs from drawing. They readily acquire concepts of print such as directionality, letter matching, and word spacing. This set of "outside in" skills is important, but the evidence suggests that we need not focus inordinately on them in our teaching or research as deaf children generally do not struggle to develop them.

There is also a danger in putting too much emphasis on the memorization of sight words as an approach

to early literacy learning—a common feature of many early literacy programs for deaf children. A reliance on this strategy deprives the child of the chance to use those analytic and hypothesis testing skills that involve syntax and meaning, and it promotes a false sense of what reading and writing really is (Donaldson & Reid, 1982). It is not a strategy that, by itself, leads to fluent reading and writing, even though it is relatively easy to teach and allows for some early success.

It is also problematic to talk about deaf children as "readers" when they only focus on key words to gain meaning from a text. Rottenberg (2001) describes Jeffrey, a preschool-aged child she observed for an academic year, as an independent, competent reader when the evidence indicates that he would sign one word "sick" when reading the text "I'm sad when I'm sick" (p. 274). While fluent reading rests on more than decoding every word, children cannot paraphrase something that has not been interpreted correctly to begin with, and it is certainly the case that as texts become more syntactically and semantically complex, there is an even greater need to read each word with care (Donaldson & Reid, 1982). Pressley (2006) cautions against promoting an approach that gives a priority only to meaning cues in word recognition. He suggests that this is a very dated idea that persists despite evidence that sounding out and decoding at the word level promotes word recognition and comprehension better than an emphasis on semantic contexts.

3. More emphasis on aspects of literacy learning that are problematic

There are two areas, fundamental to success in learning to read and write, that need to be given more explicit attention as we design and research early literacy programs for deaf children. These are (a) developing a foundation in the spoken and/or signed mode of the language to be written (i.e., English) and (b) focusing on those strategies that allow children to make the most effective connections between face-to-face language and text. These are categorized as problematic for two reasons. They represent the set of abilities and skills that are most challenging for deaf children to master and there tends to be disagreement in the field as to the extent to which they are necessary (or possible) for early literacy learning in this population. That said, we cannot ignore, in our pedagogy and research, that which has shown to be pivotal in the development of early literacy learning with hearing children. And although gains made may not always bring them to the same level as their typically developing peers, it has been shown that hearing children with disabilities benefit from explicit teaching in these areas (O'Connor, Notari-Syverson, & Vadasky, 1996).

The Need for an English Language Base

The case has been made that the challenge facing young readers and writers is to come to see text in terms of their face-to-face language. This requires that they have enough lexical and syntactic knowledge of this language to effectively bring it to bear on the text. Although debate continues as to what constitutes a requisite threshold level of spoken language, it is widely accepted that children with a stronger spoken language base are better placed to develop early literacy abilities than those with weaker abilities in this area. Beyond necessary knowledge of the core grammar of English (Gee, 2001), this oral preparation for literacy includes discourse experiences that feature decontextualized language use. For example, during sharing time or show and tell, children would be encouraged to present information in ways similar to a well-written paragraph, assuming no prior knowledge on the part of the listener, being explicit by including a topic sentence and only relevant details, and employing the requisite complexity of syntactic structures (Snow, 2001).

The implication for deaf children is that early literacy programs must place a premium on the development of face-to-face English. For oral deaf children or those using some form of English-based or contact sign, this also means putting more emphasis on using their face-to-face language in a wide range of contexts and in ways that will provide access to the English vocabulary and structures commonly found in text. For deaf children who use ASL as their first language, the challenge is that the text does not represent the language they are signing. There is no logical way for them to see their face-to-face language in terms of English print, as English print was never designed to represent ASL in the first place. Conversely, the text,

while providing a model for thinking about signed language (e.g., print brings the nature of finger spelling into conscious awareness), does not yield the same set of understandings as it does for users of English (e.g., a sign is not always equivalent to a word). Therefore, unlike the situation for the child speaking or signing in English, there is a breakdown in the systematic relationship between talk and text.

To be clear, this is not an argument for or against ASL as a first language for deaf children, but rather a questioning of the aptness of the metaphor that there are bridges that link a natural signed language such as ASL and print literacy in English. Signing in one language and writing in another is a translation activity that goes far beyond what we are asking of young hearing writers in early literacy programs. Therefore, it should not be surprising that this is a problem far too complex for most young deaf writers to solve. In fact, many of the bridges that have been proposed to make the connection between the two languages are actually English based. They do not represent a bridge between languages, but within a language, that is, from one representation of English to another (e.g., using cued speech, visual phonics, finger spelling, or signed English to mediate the construction of text). In other words, all these bridges depend on some knowledge of English to begin with, and therefore in ASL–English bilingual programs, attention must be paid to the ways in which face-to-face English is developed. It is not the presence of ASL but the absence of some form of face-to-face English that is at issue, and the challenge for educators in bilingual programs is to sort out the balance between the two languages that allows for sufficient opportunities for the development of both (e.g., see Swanwick [2002] for a discussion of the use of British Sign Language and manually coded English in a bilingual setting).

To make a productive connection between two representations (spoken/signed and written), the representations must be in the same language. If they are not, we are asking deaf children to make sense of an impossible problem. Although it has been demonstrated that deaf children do the best they can to make relationships where possible (e.g., handshapes mapping onto English letters), it has not been demonstrated that this gets them to standard English beyond the level of conventional spelling. If we accept the premise that an English base is necessary, this raises questions as to how to provide meaningful access to face-to-face English in a manual mode for the purposes of learning to read and write (see also Marschark & Harris, 1996).

Although strengths developed in ASL can and should be used to advantage in the early literacy-learning process, it remains the case that we have a shallow understanding of how ASL works to support text-based literacy development in young deaf children. This needs to be investigated in light of the compelling body of evidence suggesting that it is inherently risky to ask children to read and write a second language in which they cannot yet access meaning (Tabors & Snow, 2001). Therefore, our teaching and research need to be directed to questions of how, not if, deaf children should develop a spoken or signed base in the language they are learning to read and write. For oral deaf children, this provides an additional, compelling rationale for emphasizing spoken language competence in early intervention programs. For children who sign, it means thinking about ways in which the manual mode, and sign languages in particular, can be used to give access to English. On this point, it would be most productive to consider the use of contact language[6] (Johnston, 2002; Lucas & Valli, 1989, 1992) as this is the way in which the deaf community has used sign to advantage in making the links to English print.

Strategies

Beyond a spoken or signed base in the language to be written, deaf children need to be in command of those strategies that are most effective in making the link between language and text. This is an issue that researchers and educators in the field have been attempting to address for some time, and although numerous options have been proposed (see below), there is little consensus as to the strategies that may be most efficacious for deaf learners. For hearing children, the "inside out" strategies related to phonological processing have been shown to be central in linking talk and text, and in a review of the issue with respect to deaf learners, Schirmer and McGough (2005) note that it is not yet known whether explicit training in phonological awareness is effective. They

speculate as to whether finger spelling and sign language can allow deaf readers to make visual connections to text in ways that are comparable to what phonological processing affords hearing children via the auditory channel. In her most recent comment on the subject of finger spelling, Padden (2006) argues that it should be a part of the preschool child's language development, suggesting that it sets the child up for later using finger spelling as a link to English words and the development of literacy. She describes this as pushing toward "a convergence of skills where the skill of finger spelling is aligned to the skill of reading and written spelling" (p. 197).

Although there are benefits in making these links, the benefits are limited if the goal is to make links between language and text that are commensurate with those that hearing children make via phonological processing. Finger spelling is very efficacious at the word level where the relationship between manual representation and orthography is logical and systematic, and this may help account for the success that deaf students have in achieving standard spelling. It could also be useful for highlighting discrete aspects of spoken language, bringing these aspects into conscious awareness and helping to make the link between talk and text more explicit (e.g., using the manual alphabet to mark word endings such as "s" that can be difficult to hear, almost as a form of manual highlighting). However, it is unlikely that finger spelling alone would be an adequate substitute for the range of "inside out" phonological processing strategies that hearing children employ.

This emphasis on the primacy of phonological processing should not be taken as an argument for intensive speech programs for all deaf children or for a move away from manual communication. Rather, it raises questions as to the nature of the phonological processing strategies that young deaf children, who must rely on sources other than audition, could be taught in order to afford them the benefits that hearing children gain via this route. It may well be that some of these strategies are unique to deaf learners and are a consequence of the idiosyncratic ways in which signed and spoken modes can be combined.

Trezek and Wang (2006) make a convincing case for the use of visual phonics within the context of a phonics-based reading curriculum, and Harris and Moreno (2006) and Campbell (Marschark, Siple, Lillo-Martin, Campbell, & Everhart, 1997) suggest that a phonological code can be derived through speechreading. Arguments have also been made for the efficacy of cued speech (LaSasso, Crain, & Leybaert, 2003) or the integration of numerous input sources (articulation, speechreading, finger spelling, and writing) as routes to the acquisition of phonological information (Leybaert, 1993; Mayer, 1998). Investigating the viability of any or all of these routes (or others that are yet to be defined) should become a focus of our teaching and research.

Conclusion

I share Williams' (2004) frustration with the relative paucity of direct evidence available with respect to the early literacy development and experiences of deaf children. It stands in stark contrast to the incredible volume of research on the early literacy development of hearing children—a body of research that includes studies of children with disabilities and those who are second language learners. Admittedly there are fewer studies that focus on the latter two populations, but all available evidence suggests that there is little difference among these groups as to the sets of skills and abilities needed to develop conventional literacy. Differences tend to rest on the nature of educational programming and interventions specific to each group—differences that are driven by the particular strengths (i.e., an established first language literacy base in L2 learners) or weaknesses (i.e., learning disabilities related to auditory processing) that children exhibit. But there is no indication that these children bypass or do not need to acquire the same understandings (e.g., a knowledge of the language to be written, phonological processing skills) as all other young literacy learners. In this paper, an argument has been made that young deaf literacy learners are no different in this regard and that what really matters for them in the early stages of literacy learning is not very different from what matters for their hearing peers.

It would be instructive then to bring the body of research evidence from hearing children to bear in

articulating a theoretical model of deaf children's early literacy development. To this end, in this paper, Olson's (1994) model has been used as a framework for conceptualizing the challenge young deaf children face in learning to read and write. Olson's emphasis on the interdependent relationship between language and text allows for thinking about the ways in which deaf children can (must?) make the link between speech/sign and print, suggesting possibilities for future research.

And while there is absolutely a need for more research on the early literacy development of deaf children, this research must be focused more judiciously. Some of these focus areas have been identified in the final sections of this paper, with a particular emphasis being put on the third stage of early literacy development where children make the transition from emergent to conventional literacy. It is vital that we develop a richer understanding of this stage as, based on the evidence we have to date, it is at this point that the development of deaf children is no longer in line with that of their hearing peers. Although it is encouraging to see the field moving in this direction (e.g., recent studies on the efficacy of systematic phonics instruction), much remains to be done. Although the challenges can be daunting, the research possibilities are exciting and have the potential to meaningfully inform practice.

As a final word, there is also a need to engage in studies of early literacy development that hold researchers accountable for reporting whether deaf children ultimately learn to read and write at an age-appropriate level. At the risk of sounding strident, it is frustrating to read research on early interventions that do not track children over time to find out if they actually learn to read and write at grade level or to encounter claims that a strategy has been successful even when the evidence indicates that less than age-appropriate literacy has been achieved. Attending to literacy outcomes must feature in both our teaching and research because in the end what really matters in the early literacy education of deaf children is that they do learn to read and to write.

Notes

1. Literacy in this instance refers to text-based literacy—specifically the ability to read and write.

2. The terms "emergent" and "early literacy" will be used interchangeably, recognizing that distinctions can be made between the terms (see van Kleeck, 2004, p. 175).

3. For the purposes of this paper, I will assume that English is the language to be written. However, I would suggest that the argument applies to learning the written form of other languages as well.

4. Similar findings have been reported by Haydon (1987) and Schleper (1992).

5. It would perhaps be useful in the case of deaf learners to conceptualize this as phonological sensitivity (Burgess, 2006).

6. Contact signing as defined by Lucas & Valli (1992) is the simultaneous production of two separate codes (spoken and signed) in which a signer produces ASL lexical items on the hands and simultaneously mouths the corresponding English lexical items, using a combination of English and ASL syntactic structures (p. 94).

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