

# ***LEXIDACTYLOPHOBIA: THE (IRRATIONAL) FEAR OF FINGERSPELLING***

**F**ingerspelling is a system of manually representing the graphemes of a spoken language used by members of Deaf communities worldwide. Yet, at least within the North American educational system, fingerspelling appears to be largely discounted in favor of sign usage, despite its high potential for linkage to the orthographical system of English and literacy development. The author describes fingerspelling in connection with how it is used within the American Deaf community, and also describes the development of fingerspelling skills in deaf (and hearing) children. He also describes how deaf adults use fingerspelling to promote literacy development in young deaf children. Strategies for increasing the use of fingerspelling by teachers and parents of the Deaf are outlined.

DONALD A. GRUSHKIN

Grushkin is an instructor of American Sign Language, Division of Special Students, De Anza College, Cupertino, CA.

A phobia is defined in the field of psychology as an irrational fear or dread of a particular phenomenon or situation. For the purposes of the present article, I have coined the term *lexidactylophobia* from the Greek root words *lexi-* (word), *dactyl-* (finger), and *phobia* (an irrational fear of a particular phenomenon). My interest is not so much in promoting application of this term to members of the general population as it is in highlighting a phenomenon relevant to the education of the Deaf: avoidance of the use of fingerspelling by many teachers (as well as parents) of the Deaf in the context of various educational settings and communication philosophies, among them total communication, signed English, mainstreaming, and American Sign Language (ASL)/English bilingual/bicultural programming. Although the reasons for

this avoidance are many and long standing, it occurs at the expense of a widely used resource for ASL/English bilingualism within the American Deaf community that serves as an excellent bridge between manual signs and written language. More important, this avoidance could have negative repercussions for the development of literacy in young deaf (and hard of hearing) children.

The issue of whether fingerspelling is used insufficiently is not new: As early as 1871, Edward Miner Gallaudet (1871/1997) himself (perhaps in response to growing criticism of the manual method by proponents of oral instruction) lamented that "the *abuse* [italics in original] of signs, and by this [is] meant their excessive use, may be...one of the gravest defects under

which our national system of teaching the deaf is laboring" (p. 22). He argued that fingerspelling (which he termed *dactylology*) would provide deaf students with a broader range of communicative options and knowledge, enabling them to function on a more equal level with hearing persons with whom they might come into contact. Gallaudet advocated that

from the moment when the pupil gains command of a few simple expressions, should he be required to use [italics in original] them. The teacher should also use them through the medium of dactylology or writing, and, as a general rule, never employ signs in the classroom, when spelling on the fingers, or written language, will convey with clearness to the mind of the pupils the ideas desired to be communicated. (p. 23)

Although I certainly do not advocate the virtual elimination of signs in the classroom, I advocate throughout the present article that fingerspelling should play an increased role in the instruction of deaf and hard of hearing students, as it provides a highly visual and linguistic link to the acquisition of English vocabulary and syntax, which is, after all, one of the goals of the educational system.

### What Is Fingerspelling?

Fingerspelling is a system of manually representing the graphemes of the written language of a particular society, or in the case under discussion, the letters of the alphabet used in written English. It is important to note that languages based on Roman alphabets are not the only ones to support a system of manually representing the orthography of the written form of the spoken majority language. They can also represent words ideographically (e.g., Chinese Sign Language for written Chinese characters) and syllabically (e.g., Danish Sign Language's

"mouth-hand system") as well as alphabetically (Padden, 1996a).

Bragg (1997) traces the development of "finger alphabets" derived from counting systems in which numbers were used to represent letters of the alphabet (the term *Gematria* has been used to describe this kind of system of number-for-letter representation), as well as the emergence of systems in which each letter is indicated by touching a part of the body that begins with that letter (A: *auris*, ear), to one-handed systems that can be dated as far back as 1579 (although Bragg notes that there is evidence that they existed much earlier than that). Interestingly, Bragg notes that, contrary to popular conception, the one-handed fingerspelling system (from which the French/North American model is derived) was apparently used by religious clerics, not in order to communicate in contravention of their vows of silence, but more likely as mnemonic devices for public speaking or to learn religious tenets printed in what were called "abecedariums."

In contrast to the French/North American one-handed model, sign languages influenced by British Sign Language use a two-handed model which apparently can be traced to the late 1600s, when George Dalgarno independently developed a two-handed system in which specific letters are represented by touching a specific place on the nondominant palm. Dalgarno's system, which was inefficient because of the small size of the palm, was improved upon through the addition of some iconic handshapes, which enabled users to distinguish between letters, by an unknown author in 1698 who was probably hearing but mute, creating the basis for the British fingerspelling system in use today. Despite the differences between the two systems, one is neither more "efficient" or "faster" than the other; there is anecdotal evidence in the Deaf community that when challenged to fingerspell a given word or phrase simultaneously, fluent deaf users of ei-

ther system will finish at the same time. It is also important to note, as Padden and Le Master (1985) do, that

although fingerspelling has a one-to-one correspondence with each letter of the alphabet, it is not an identical representation of print, since the nature of the activity—executing the hand signals in sequence—disallows the scanning capacity of the reader of the printed page. (p. 162)

In the American Deaf community, fingerspelling is highly integrated into the language system, perhaps more so than in other Deaf communities. Padden and Humphries (1988) observe:

Italian Deaf people also use a signed language, but they use mouthing and lipreading more prominently than do American Deaf people. They mouth names of individuals, places, and other borrowed Italian vocabulary, whereas American Deaf people either fingerspell English words or translate them into signs. American Deaf people, according to the Italian counterparts, "barely move their mouths" and "fingerspell rapidly." (p. 120)

Of course, deaf Americans do not fingerspell continuously; Padden (1991, 1996a) found that fingerspelling use is not distributed evenly among all grammatical classes. That is, fingerspelling is used predominantly for nouns, which account for 50% of all use. Other kinds of words likely to be expressed by fingerspelling include adjectives, verbs, functor words (such as the articles *the* and *an*), and pronouns. Outside of these word classes, it is rare to see a native ASL signer using fingerspelling, especially for concepts with a signed equivalent. However, there are exceptions: As I explain later in the present article, fingerspelling is substituted for signs at times, usually to add emphasis to a

statement. Padden and Le Master (1985) provide a fairly clear description of the primary uses to which fingerspelling is put:

Fingerspelling is typically used for verbatim representation of English vocabulary, most commonly individual words, sometimes phrases or sentences meant to be exact presentations of the original written version. The more common fingerspelled items include personal names, place names, names of months and holidays, untranslated English technical terminology and slang phrases (e.g. A-P-R-A-X-I-A, N-O W-A-Y). Acronyms and abbreviations are common (e.g. N-D 'North Dakota,' A-A-D 'American Athletic Association of the Deaf'). Some function words (prepositions, participles, pronouns) are fingerspelled by individuals closely transposing English. (p. 164)

One important aspect of the American system of fingerspelling is the development of lexicalized fingerspelling, which was initially described by Battison (1978) as "loan signs." These are fingerspelled words that become more signlike, often incorporating inflectional aspect. Lucas and Valli (1992) note that the process of lexicalization occurs easily:

Just think about how you would fingerspell someone's name if you were introducing them for the first time and then how the form of that fingerspelling would change if you used the name over and over again in a conversation. The changes that you observe are examples of lexicalization. (p. 189)

For example, the sign for GO-BACK (#BACK<sup>1</sup>) is in actuality derived from the fingerspelled B-A-C-K. However, what is seen is a "reduced" form of the English word: Only the letters B, K, and sometimes C are actually visible;

the A is elided. Also, Lucas and Valli (1992) state that lexicalized fingerspellings often change: The signs may be located differently; different handshapes may be used; the palm may be oriented differently; movement may be added; the movement may be reduplicated; an additional hand may be put into use. In addition, lexicalized signs can be inflected for person or location (e.g., I went #BACK there; The man and woman got #BACK-TOGETHER; My letter came #BACK-TO-ME). Often, lexicalized fingerspellings are used for emphasis, such as when an individual signs #YES or #NO.<sup>2</sup> There are a number of lexicalized fingerspelled words commonly used by the Deaf, including #SALE, #BANK, #YES, #EARLY, and #BUSY.

There are two further observations to be made about lexicalized fingerspelling, according to Lucas and Valli (1992). The first is that often there are fingerspelled signs as well as regular signs for the same concept, such as CAR and #CAR or BED and #BED. It would appear that lexicalized fingerspelling often may be substituted for the signed equivalent in order to add emphasis to a statement, as when a deaf signer will use #YES instead of YES, or #BUSY instead of BUSY (Maxwell, 1988; Padden & Le Master, 1985). In addition, signs are often produced in combination with a fingerspelled word, such as LIFE + #STYLE or F-O-O-T + WORK (Lucas & Valli, 1992; Padden, in press). Although Lucas and Valli are unclear on why these sign and fingerspelling combinations occur, Padden (in press) observes that there are specific patterns to these combinations based on semantic properties of individual lexical items or grammatical contrasts that are resolved through the use of a fingerspelled term.

Fingerspelling has a long history, both within many Deaf communities of the world and in the general hearing society. However, since fingerspelling came to be used in the

education of deaf and hard of hearing people, it has played a large role in the development of bilingualism in the Deaf communities that utilize a fingerspelling system.

### Education and Bilingualism in the Deaf Community

The American Deaf community, being situated within the general population of hearing people, is of necessity a bilingual community (Grosjean, 1992; Padden, 1996b). Within the general U.S. population, it has been estimated that about 8% of Americans possess some degree of hearing loss. Of this number, about 1% have a severe to profound hearing loss (Paul & Quigley, 1990). Further, around 90% of deaf and hard of hearing individuals are born to parents with normal levels of hearing (Schein, 1989). It is small wonder, then, that in order to communicate with hearing people (who frequently have no knowledge of signs or deafness), deaf and hard of hearing individuals need to establish a mastery of the dominant language in their society (in either its spoken or written forms), which, in America, is English.

Yet, because of their hearing loss, most severely to profoundly deaf individuals (who form the "core" of the Deaf community) have difficulty communicating through spoken language at both the receptive and productive levels. For this reason, communication through sign language, whether individually developed "home signs" (Mylander & Goldin-Meadow, 1991) or conventionally established and transmitted linguistic systems such as American (or any other national) Sign Language, is the predominant modality for most severely to profoundly deaf individuals. However, these sign languages, which are presented in an entirely different modality and usually arise independently of the national majority (spoken) language, typically bear little if any syntactical or phonological relationship to the spoken language of the hearing majority. Thus,

the problem of educators of the Deaf has long been how to instill competence in the majority language in their students. The various approaches employed by educators of the Deaf have had a variety of influences on the bilingualism of members of the Deaf community.

The approach that has been historically predominant, and perhaps most "popular" among many hearing people, is oralism, or teaching deaf children to acquire the majority language through visual and auditory means. Certainly, this approach has the advantage of potentially enabling the deaf child to acquire and use the syntax and phonology of the majority language in a naturalistic manner, without the mediating influence of a second language or modality. However, the efficacy of oralism has been low, for many reasons, including the fact that speech is found within a limited decibel and pitch range, which is often out of the reach of many individuals with a hearing loss, even with amplification technology.

An alternative means of providing access to the spoken language is lip-reading, the art of deciphering the spoken message by watching the words formed on the speaker's lips. Although this method is entirely visual and theoretically accessible to the profoundly deaf person, in reality only about 30% of any given message (in English) is entirely visible on the lips (Benderly, 1980). This leads to incomplete acquisition of the lexicon and structure of the spoken language, as well as a potentially distorted perception of the phonology of the language (Johnson, 1994; Leybaert, 1993).

An alternative to oralism and lip-reading has been the development of signed English systems that attempt to represent the lexical items and morphology of English through the hands. Signing Exact English, or SEE2 (Gustason, Pfetzting, & Zawolkow, 1972), is perhaps the most commonly used signed English system in America (Luetke-Stahlman & Milburn, 1996).

To represent English morphology, SEE2 utilizes a number of signed "markers" to indicate inflectional affixes. In addition, words with multiple meanings but only one citation form of a sign (such as *pond*, *lake*, or *puddle*) are "initialized," wherein the sign is given a fingerspelled handshape to differentiate it from other similar signs and word meanings. However, these signed English systems appear not to have produced a full understanding of English in children exposed to them, as the children seem to experience a "blurring" of the boundaries between free and bound signed morphemes (Stokes & Menyuk, 1975), and despite their English-based language model, still produce signing that is grammatically closer to ASL than to English (Supalla, 1991).

In connection with the issue of initialized signs, Nover (1995) notes that although these are attempts to indicate English morphology, the morphology of English words is inadequately represented by these initialized signs, which are perceived as just that: signs, not "English." A major difficulty with initialized signs is that while some have come to be fairly accepted within the Deaf community, a large proportion are not. In addition, within the classroom, many initialized signs are developed ad hoc for the purposes of signing vocabulary for which there is no existing ASL sign. However, these ad hoc signs are not used in the Deaf community; a student who had learned these temporary signs might emerge from the classroom using a sign that would not be understood by her peers in the Deaf community, and possibly also lacking a full realization of the spelling of the word that the sign represented.

Within the realm of sign language, there is only one means through which English morphology and graphology can be truly and fully represented and accessible to deaf children (and adults): the use of fingerspelling. This is not to suggest that fingerspelling be used extensively or ex-

clusively. Such a strategy has been tried in the past in the guise of the Rochester Method or "Visible English" (Reich & Bick, 1977), and found to be ineffective for education or daily use, since the constant motion of the fingerspelling hand is tiring for the signer. Furthermore, a range of less than half to two thirds of all the letters to be fingerspelled were actually present and legible, which did not allow students to experience a complete model of English (Reich & Bick, 1976, 1977). Because fingerspelling is used to represent English graphemes and lexicon, it is a prime example of "language contact" (Lucas & Valli, 1992) between ASL and English. Despite its relationship with English, fingerspelling has been actively resisted or overlooked by members of the Deaf community and educators of the Deaf. One must wonder why this is so.

One possibility lies in the relative lack of comfort and fluency some hearing educators experience with fingerspelling. Akamatsu and Stewart (1989) observed a number of errors in the fingerspelling of five teachers of the Deaf who had learned sign in adulthood. While one type of error consisted of "elision" of letters (F-V-E for *five*, T-P-E for *tape*), which is similar to the process found in the development of lexicalized fingerspelling, or "loan signs" (Battison, 1978), others included substitution (e.g., C-S-D-E for *code*), mistiming of letter handshapes (e.g., T-R-A-D-I-Y for *tardy*, J-A-E for *jean*), and failure to double a letter or incorrect doubling of adjacent letters (e.g., C-O-L-I-E for *collie*, V-A-L-E-E-Y for *valley*). Akamatsu and Stewart suggest that teachers might be aware of their own personal difficulties with fingerspelling, and therefore would be more reluctant to use it, although they also point out that the communicative intent (to use an English word during discourse or to teach a new word) of the teacher played a role in whether he or she chose to use fingerspelling.

Another possibility for the underuse of fingerspelling lies in the creation of

signed English systems such as SEE2 (Gustason, Pftzing, & Zawolkow, 1972), which employs a high level of "initialized" signs. It is possible that the creation and use of initialized signs has caused the fingerspelled versions of common words to fall into disuse. To illustrate, one deaf adult from a deaf family has informed me that in the past, *vegetable* and *fruit*, which now have commonly used initialized signs, were formerly represented as #V-E-G and F-R-U-I-T. In addition, some teachers have expressed the sentiment to me that signs are "easier" to understand or grasp than fingerspelling, especially for students who have additional learning difficulties.

In connection with signed English systems, it is fairly well known that these systems are often paired with spoken English, in order to maintain what is commonly known as "Simultaneous Communication" (SC) and referred to as "Sign-Supported Speech" (SSS) by Johnson, Liddell, and Erting (1989). SC/SSS has come under fire from a number of fronts since there is an apparent cognitive inability to produce language in two modalities at the same time, with the result being a "cognitive overload" in which the signal from one modality or the other (but usually the signed modality) is eliminated for periods at a time (Bernstein, Maxwell, & Matthews, 1985; Kluwin, 1981; Marmor & Pettito, 1979; Strong & Charlson, 1987; Swisher, 1984; Swisher & Thompson, 1985). To fingerspell and speak at the same time is equally hard, if not harder, and appears to create a similar "cognitive overload," according to evidence presented by Akamatsu and Stewart (1989) as well as Reich and Bick (1976). Teachers who engage in SC/SSS might, consciously or not, avoid fingerspelling in order to reduce the "cognitive overload" engendered by speaking and signing or fingerspelling.

Still another reason for reluctance to use fingerspelling is a perception by

educators that fingerspelling is somehow more difficult to grasp than signs, especially for young or linguistically delayed students. That is, educators may argue that young children have not learned the alphabetic system, and are therefore incapable of comprehending a lexical item that was fingerspelled to them. Likewise, educators of students who have not attained competence in either ASL or English may feel that it is better to sign to these students than to use fingerspelling, on the grounds that these students do not know the fingerspelled word or have difficulty with spelling themselves. I observed an instance of this viewpoint when I saw a deaf teacher of students of high school age with limited language proficiency develop an invented sign for *amphibian* rather than fingerspell the word, as is usually done for deaf students with higher levels of linguistic competence. When it was suggested that the teacher try fingerspelling the word to them, her response was that some of these students could not even spell their names; to use fingerspelling with them would be to place an unfair burden on their abilities.

Although it might be easy to place the "blame" for failure to use fingerspelling on hearing educators or past educational methodologies, E. M. Gallaudet's article (1871/1997) clearly illustrates that this problem is long standing and may have roots elsewhere. Further, it is not hearing people alone who have resisted the use of fingerspelling; some deaf people have done so as well. Within the American Deaf community, fingerspelling is viewed as "English," despite its regular and systematic use by members of the Deaf community (Padden, 1996a). It is felt by some in the community that fingerspelling increases in frequency when the signer is intending to incorporate more English in his or her signing, and that those who do so are part of the "intellectual elite," attempting to demonstrate a marked attachment to the

dominant (hearing) society, which also serves to disassociate them in some way from the Deaf community (Padden, 1996a). Thus, the use of fingerspelling is politically charged, as Padden (1996a) states. However, Padden (1996a, in press) maintains that fingerspelling should not be viewed as "English," but rather as "foreign vocabulary" borrowed from other languages, like *l'halloween* and *mon learner's permit* in Canadian French. That is, in these cases, the vocabulary derives directly from another language, yet the morphology and phonology are modified to conform to the morphological and phonological systems of the base language (French in this case).

Although English is the language being "borrowed from" in the case of sign language, several decades of research beginning with Stokoe (1960) has capably demonstrated ASL to be a language with a syntactical, phonological, semantic, and pragmatic structure distinct from the structures of English. Therefore, although both ASL and deaf signers display a high degree of English-language influence, it can be confidently maintained that this influence does not consign ASL to status as a substrate of English, but is, rather, indicative of an active bilingualism within the Deaf community. Consequently, fingerspelling should be viewed as "largely foreign vocabulary used as a *resource* [italics added] within the larger resource of ASL," as Padden (1996a) asserts (p. 106), since fingerspelling, and lexicalized fingerspelling in particular, represents a phonological and morphological change from the print modality to the kinetic/signed modality.

### The Acquisition and Development of Fingerspelling

Several studies indicate that fingerspelling in young deaf (and hearing) children exposed to sign language from infancy has a fairly distinct devel-

opmental progression. In children as young as 6 months old, there is a clear preference for hand dominance or preference even in the child's first attempts at signing (Bonvillian & Richards, 1993). Further, Pettito and Marentette (1991) have identified the presence of "babbling" in the manual modality, which consists of a reduced subset of the phonetic units found in ASL, as well as syllabic manual babbling, similar to the processes found in hearing infants. In addition, Pettito and Marentette have found that the time lines for development of these stages are highly concurrent, indicating that despite the modality, children undergo similar stages in the acquisition of language in its phonological and, later, morphological forms.

Boyes-Braem (1990) has identified four distinct stages in which young deaf children acquire the handshapes of ASL. She has found that the handshapes acquired earliest are those that involve the manipulation of the hand as a whole, and are considered the most linguistically unmarked (or "basic") of the ASL handshapes. The handshapes attained during stage 1 are the A, S, L, bO ("pincer grip"), G, 5, and C handshapes. The stage 2 handshapes (which are not as frequently used in the young child's exploration of the environment) are the B, F, and O handshapes. Boyes-Braem suggests that the handshapes of stages 1 and 2 are usually fully mastered by the time the child is cognitively ready to begin communicating symbolically with others. Whereas in stages 1 and 2 only the thumb and index finger (which are more "independent" of other fingers) are manipulated, in stage 3 other fingers are also beginning to be manipulated, and the I, Y, D, P, 3, V, H, and W handshapes are produced. The final stage, stage 4, consists of handshapes in which the middle fingers (considered the "weakest" of the ulnar group) are activated and inhibited independently. In this stage, the handshapes "open 8" (simi-

lar to the handshape used for SICK or "25"), 7, X, R, and T are produced. These latter handshapes are considered the most linguistically marked (or "complex") of the handshapes found in ASL. These stages all appear around the age of 2.5 years; however, they are not all fully mastered until later. It is also important to note that the subset of handshapes represented by these four stages do not comprise the handshapes of the entire fingerspelled alphabet, indicating that children who have not fully mastered all four stages may also not be cognitively and physically ready for fingerspelling as used by adults.

Although children acquire many of the individual handshapes of fingerspelling around the age of 2.5 years, there is evidence that they are unaware that fingerspelling represents a set of separate alphabetic characters derived from the printed word. Instead, they appear to perceive fingerspelled words as a holistic unit within a "movement envelope" (Akamatsu, 1985) that is not analyzed for its components. That is, fingerspelling is perceived as a series of general (or "gross") movements rather than as a sequence of specific hand configurations (Padden, 1991). Padden notes that even though at 3 years of age children begin to make a connection between the fingerspelled handshapes and the alphabetic (printed) characters, this connection between fingerspelling and print remains "tenuous and uncertain" (p. 194). Even by age 4 years, children demonstrate greater ability to recognize spelled sequences rather than produce the spelled words themselves (Padden, 1991). Blumenthal-Kelly (1995) noted that when the child in her study (at 3 to 4 years of age) was shown cards with names of objects and family members printed on them, the child might recognize and produce each letter printed on the card yet fail to recognize the word until shown the lexicalized spelling by her mother.

For example, the child failed to understand R-I-C-E and S-E-E-D, but when her mother used the lexicalized signs #RICE and #SEED, the child demonstrated her understanding by responding with the same lexicalized signs.

At first, children may imitate fingerspelling through random wiggles of the fingers, much in the way children will scribble to imitate writing (Maxwell, 1988). Several researchers (Maxwell, 1988; Padden, 1991; Padden & Le Master, 1985) have noted that often young children's first fingerspelling attempts involve producing their own name. Other uses of fingerspelled handshapes occur with initialized signs; Maxwell states that the child in her study produced initialized signs for TOILET and "name signs" at age 2 years. At age 2.5 years, the child in Padden's (1991) study began to use several lexicalized fingerspellings, but the forms of these were "reduced" in that handshapes were substituted (S-V for #TV) or not articulated fully (F-F for #OFF). However, at around the same age, the child in Maxwell's study produced more or less phonetically intact lexicalized fingerspellings (#TV, #OK). In addition, there appears to be a progression (Padden & Le Master, 1985; Padden, 1991) from a minimal sequence of hand configurations produced (usually no longer than three letters; U-B-A, E-U-B) at 2.9 years of age to more specific choices of configuration without regard to sequence (cat: C-R-I, C-N-I) at 4.9 years of age. What is significant about the production at the older age is that the child recognizes and uses the first letter of the fingerspelled word, and substitutes phonologically similar handshapes for the medial and final letters (I for T and N for A in the example above). Alternatively, spellings will be invented, perhaps based on the handshape used in the sign, such as Y-O-B for airplane, which uses a Y or "I-LOVE-YOU" handshape (Padden & Le Master, 1985; Schleper, 1994).

Around age 4 years, children are also seen to imitate—spontaneously or with prompting—some fingerspelled words, as demonstrated by the child in Maxwell's (1988) study. Perhaps in recognition of the child's emerging readiness for literacy, some parents also produce more fingerspelled forms of signed words, asking the child to imitate the spelling. Although the child may not imitate the fingerspelled production perfectly, parents are often satisfied with an approximation. To illustrate, Maxwell tells of a father talking to his child:

Her parents began to use some fingerspelled words in addition to loan signs and names and other rehearsed spellings.... She might not understand it, as when her father said I WANT A KISS<sup>3</sup> and she complained, I DON'T UNDERSTAND. More often the word was explained to her and she was asked to produce an approximation of the spelling on the spot; e.g. her father told her the name of a kitten: NICKI... then he slowly spelled the name as Alice imitated each letter; finally he told her (YOUR)SELF. Alice's effort was N, I, UMM K, C, K, I, Y. Her father expressed satisfaction with this effort. Interestingly enough, shortly afterwards her father asked her the name of the cat and she spelled it promptly and correctly. (p. 391)

It should be noted, however, that many deaf parents will use fingerspelling with their children, even from birth. Blumenthal-Kelly (1995) observed the parents of a newborn infant between the ages of 1 and 6 months fingerspelling to their child. In addition, the use of fingerspelling increased with age, even though the child herself had not yet produced any fingerspelled items. The acquisition of fingerspelling is also promoted in conjunction with learning of the printed form, such as when letters of the alphabet printed on toy blocks were

identified jointly by mother and child when the child was nearly 2 years old, in Blumenthal-Kelly's study.

Fingerspelling also begins to appear spontaneously and without prompting at age 4 years, although it is evident that the child has not yet fully grasped the distinctions between the different manual systems (alphabetic and numeric) of signs, such as when the child in Maxwell's (1988) study produced S-A-K-E-S-V-3 CANDY V-S-3 when telling her parents about a kind of candy. By age 6 years, the initializing principle appears to be fairly solidified, which is also the age when children enter school and begin learning the written English alphabet (Maxwell, 1988).

It is also significant that children learn the pragmatic functions of fingerspelling at a young age. Padden and Le Master (1985) note that as early as 2.9 years of age, the child in their study evidenced a clear understanding of the appropriate contexts for which fingerspelling or a sign should be used. When asked what an object was, the child would provide a sign, but when asked the "name" of the object, the child would attempt to provide a fingerspelled response. By age 5 years, fingerspelling is used for emphasis: "YOU WATCH don't [spoken] TAKE MY CANDY, DONT TAKE MY CANDY" (Maxwell, 1988). At age 6 years, fingerspelling also comes to be used for clarification, according to Maxwell. Padden and Le Master (1985) state that by the time the child is nearly ready for school, he or she knows most of the items that should be fingerspelled (names of people and places, and representations of English print such as the labels of candy bars). However, Maxwell notes that even at age 7 years, fingerspelling remains a relatively minor aspect of the child's conversational behavior, yet provides a solid basis for extended growth of use. This finding is corroborated by Mayberry and Waters (1991), who found that memory for fingerspelled words in-

creased with age from 7 to 17 years, especially with early sign language and fingerspelling input such as children from deaf households possess.

### Fingerspelling to Foster Literacy

Padden (1990) asserts that "fingerspelling is like practicing, helping the child form links between the language he uses in his everyday life and the characters he must write on a page" (p. 12). Quigley and Frisina (1961) found highly significant correlations between use or knowledge of fingerspelling and vocabulary knowledge. Further, Gates and Chase (1976) discovered that deaf children (when reading ability was held equal) displayed greater spelling ability than children with normal hearing, a result that may be attributable to a visual orientation toward word recognition, as well as the use of fingerspelling (although Gates and Chase do not mention if the children in their study used or had been exposed to manual communication).

However, it is apparent that children must be taught to recognize the link between fingerspelling and written language. Although deaf children may routinely recognize fingerspelled words, they may not recognize these same words in print; Hirsh-Pasek and Freyd (1983b) reported that many of their subjects (6 to 11 years old) were "stunned" to discover that words they had recognized all their lives through fingerspelling were the same as words they had failed to decipher in print.

When taught or encouraged to decode printed words into fingerspelling, deaf individuals experience an increase in their vocabulary recognition to the level of their fingerspelled vocabulary (Hirsh-Pasek, 1986, 1987). A teacher of the Deaf informed me of an experience she had had working with a Native American girl at a school for the Deaf in the U.S. Southwest. At this school, the student dormitories were all

named for regional Native American tribes. This girl, around 8 years old at the time, in the process of writing a letter, asked the teacher, "HOW SPELL #NAVAJO?" The teacher looked at the girl and, with a smile, informed the girl that she had just spelled the target word. The girl looked surprised, spelled it again to herself once, and proceeded to write it correctly on her paper. At the same time, it is important to understand that fingerspelling does not automatically ensure word recognition: Ewoldt (1981) observes that fingerspelling is occasionally used as a "holding" strategy in which words that are not immediately understood are fingerspelled in lieu of a sign (although with repetition of use within the context of a story, the appropriate sign often comes to replace the fingerspelled word).

Although at early ages children perceive fingerspelled words holistically, it is clear that by age 6 years, deaf children are able to disaggregate fingerspelling into its component handshapes, and to map these onto English orthography (Hirsh-Pasek & Freyd, 1984). It is also significant that the developmental pattern of fingerspelling recognition identified by Padden (1991) and Maxwell (1988) correlates highly with the progression of written language (Ehri, 1991; Mason, 1980) from a holistic (or logographic) to an analytic (or orthographic) level of processing. Indeed, Hirsh-Pasek and Freyd (1983a, 1983b) and others (Friedman & Gillooly, 1975; Hanson, 1985; Hirsh-Pasek & Freyd, 1984; Maxwell, 1986; Quinn, 1981; Schleper, 1994) have found that deaf readers are highly aware of the orthographical and morphological patterns of printed English words. Deaf readers will frequently retain the spellings of new words by identifying smaller, more familiar words within the component parts of the larger word, although these smaller words may be unrelated to the root morphemes of the original word. For ex-

ample, Schleper (1994) tells of a student who remembered how to spell reduce by thinking "RED #ICE, I SUBSTITUTE-BY U."

Just as deaf adults use fingerspelling to represent English vocabulary and morphology, deaf children also use fingerspelling for this purpose, and can be explicitly taught to do so. Maxwell (1988) observed the child in her study to use fingerspelling to represent English function words (the, is, be) and bound morphemes (-ed, -ing, -ness) at age 4.5 years. Further, Looney and Rose (1979) discovered fingerspelling to be an effective means (in conjunction with writing) of clearly representing regular inflectional suffixes of English words.

Deaf parents and teachers may use a number of strategies for emphasizing the connections between fingerspelling and English print. One such strategy is the "word sandwich" (Blumenthal-Kelly, 1995), in which the initial and final items of one variety (either signed or fingerspelled items) occur immediately before and after a medial item of another variety. For example, a signer might sign "NUN #NUN NUN" or "LOST M-I-S-C-A-R-R-I-A-G-E" (Blumenthal-Kelly, 1995). Blumenthal-Kelly also further categorizes sandwiched phrases as "full" or "half" sandwiches, depending on whether the first word is fingerspelled or signed, followed by a sign or fingerspelling and then another repetition of the initial fingerspelling or sign (full: i.e., #DO TODAY #DO; BEFORE #SUN RISE BEFORE), or each variety stands alone (half: i.e., BATH #TUB). Sandwiched phrases are frequently used in the process of education, as well as during daily discourse.

One purpose of sandwiching is to show distance, or contrasts between concepts in ASL and their English counterparts. Padden (1996b) tells of a science teacher attempting to explain the concept of *problem* and how the sign PROBLEM is used to refer to a personal difficulty, while the scientific concept

possesses a special, specific meaning of a question raised for consideration or solution, usually by an outside source:

SAME MATH, KNOW STORY, WRITE, SAY: [role shift]:  
 "SUPPOSE [you] HAVE 8 APPLE, THEN [you] TOSS-OUT 4 APPLE TOSS-OUT 1. HOW-MANY APPLE [you] HAVE REMAIN? 4, RIGHT. SAME 1 PROBLEM [false start] P-R-O-B-L-E-M. THAT P-R-O-B-L-E-M [points to class] FIGURE-OUT, ANSWER. QUESTION. PROBLEM NEGATIVE? NO. ONLY QUESTION

*Just like in Math, you know the story that goes (in written English), "Suppose you have 8 apples, then you throw away 4, how many apples do you have left?" Four, that's right. Just like the idea of problem. I mean "problem." A problem is what you need to figure out, to answer. A question. Is a problem a negative thing? No, it's just a question.* (Padden, 1996b, pp. 91-92)

The teacher initially began to sign PROBLEM, but when she realized that it was the concept of *problem* as a scientific—not personal—question to be resolved that was being emphasized in this lesson, the teacher switched to fingerspelling to distance the lexical item *problem* from its more commonly known meaning. Distancing is also effected by looking at or pointing at a fingerspelled word, in order to set it up as alien or unknown, according to Padden (1996b), or merely to emphasize its separateness from the sign lexicon. For example, the same teacher in the preceding example signed:

WHAT F-U-N-N-E-L-S? F-U-N-N-E-L-S... [picks up funnel from table] F-U-N-N-E-L [displays funnel] WHY USE IT?

*What are funnels? Here's a funnel... For what purpose is this used?* (Padden, 1996b, p. 92).



Following this excerpt, Padden (1996b) notes that the teacher displayed an expression of puzzlement, wrinkling her nose as she fingerspelled *funnel*, and moved her hand to one side so as to look at it. Padden states that at the same time this discourse device served to distance the word, it also reflected the children's view that things English are often "foreign and difficult to understand." Whereas this teacher moved her hand to one side while looking at it, the same effect could be accomplished by spelling the word and then immediately afterward pointing with the nondominant hand to the word that had just been spelled.

Another device Padden (1996b) identifies is "linking," in which concepts are explained through a combination of fingerspelling and relation to personal experience:

B-A-K-I-N-G S-O-D-A...[while pointing to words on overhead projection], THAT SAME [picks up box of baking soda and points to "baking soda" on box while mouthing "baking soda"]. SEE THAT BEFORE, CL: arm & hammer logo? THINK #ALL, MAYBE #ALL HAVE [points to box] HOME IN COLD, R-E-F, CL:[puts box in fridge], box-ABSORB, SMELL TERRIBLE [points to box] box-ABSORB-over-time, CAN.

*Now baking soda...right here on the screen is the same thing as this box is in my hand. You've seen it before, the picture of the arm and biceps? I think all of you, maybe all of you have this at home in your refrigerator. It absorbs bad odors in the refrigerator, over time it absorbs (odors). (pp. 92-93)*

### Putting Theory into Practice

Two keys to the development of literacy are the expansion of vocabulary knowledge (Backman, Bruck, Hebert, & Seidenberg, 1984; Kelly, 1996;

LaSasso & Davey, 1987; Paul, 1996) and time engaged in reading, or more accurately, exposure to print (Howarth, Wood, Griffiths, & Howarth, 1981; Limbrick, McNaughton, & Clay, 1992).

Fingerspelling provides a means for achieving both goals, to some degree. Certainly, it allows deaf individuals to acquire English vocabulary during daily conversation, by associating the new word and its meaning through the context of the discussion (as hearing readers do while reading printed materials, according to Adams, 1990). Alternatively, the meaning of the word may be provided by its user upon asking. This is a form of direct vocabulary instruction that has been shown to be beneficial to vocabulary development in hearing readers (Adams, 1990). In addition, if fingerspelling is, as Padden (1990) states, equivalent to "practicing," then the use of fingerspelling by deaf children can only serve to reinforce the retention (by kinesthetic and visual means) of the English word being spelled. That is, rather than merely seeing the word written down on the page, or even writing it himself or herself, the child also gains an opportunity to literally "get a feel" for the word and how to use it in daily discourse. As noted earlier in the present article, there are a number of research studies indicating that deaf individuals are highly sensitive to orthographic patterns inherent in English. This sensitivity can be reinforced, especially in conjunction with direct instruction, through fingerspelling. That is, the individual can become aware that certain patterns cannot exist in English, such as *p-k*, but that others can, such as *p-r* or *s-t-r*.

It is immediately obvious that fingerspelling can and should be used to introduce new vocabulary. This can be accomplished through any of the techniques identified by Padden (1996b): distancing, linking, and framing equivalences. For example, the teacher could explain a concept such as *aquarium* by fingerspelling it, ex-

plaining its meaning (linking), and writing the word on the board and pointing to it while fingerspelling "A-Q-U-A-R-I-U-M" (framing equivalences). In order to help students learn the spelling of large words, use of the rebuslike technique identified by Schleper (1994) is an effective strategy for children to develop for the purpose of retaining the spelling of difficult words. While working with a class of fourth graders who are classified as "average readers," I found that they remembered instead by signing "I-N + STEAK (holding the K) DELETE-K SUBSTITUTE-WITH D."

It may also be important to present fingerspelled words as units, rather than as individual letters, in order to promote the student's recognition of orthographic patterns. That is, when spelling unfamiliar words to students, teachers often will spell the word letter by letter as the student looks back and forth between the teacher and his or her paper. It may be a more useful strategy to spell the word as a whole, or at least in several chunks divided by meaning or morphemic principles, informing the child to wait before looking down at the paper to write. Padden (1996a) illustrates how this can be done:

We saw a child, age nine years seven months, ask a teacher how to spell "rubber." The teacher fingerspelled the word quickly, R-U-B-B-E-R. The child copied the word as r-u-b-b-e and began to write the word. The teacher waved at the child, and gave one letter, R. The child nodded and wrote down "rubber".... The child understood that the letter R was intended to be the last letter of the word, but the teacher made no explicit reference to this. (p. 113)

The same fourth-grade class that is described above learned *probably* by dividing it into P-R-O/B-A-B/L-Y. This division was easy for them to learn,

although it may not be based on sound, due to the separation into more semantically meaningful (for these students) units: *pro* (as in *professional*), *bab* (similar to *baby*) and the suffix *-ly*. Although this appears to be a highly useful strategy, it also appears that teachers need to promote the development of this skill in students; Padden (1996a) notes that this skill is one "some deaf children struggle to obtain, to be able to appropriate fingerspelled words in whole form and represent them in writing" (p. 113).

One goal of the ASL/English bilingual/bicultural philosophy is the teaching of English grammar and vocabulary through comparisons with ASL, and the use of ASL as the medium of discourse (Johnson, Liddell, & Erting, 1989). Fingerspelling is an effective mechanism for representing distinct English morphemes, lexical items, and phrases. That is, instead of utilizing signed English "markers" (Gustason, Pftzing, & Zawolkow, 1972), teachers can present a "half sandwich" (Blumenthal-Kelly, 1995) of root word and bound morpheme (WORK + I-N-G). Alternatively, the entire word or concept under discussion can be fingerspelled (W-O-R-K-I-N-G), especially when coupled with the device of "distancing" (Padden, 1996b). Other English-based concepts, such as onomatopoeic sounds, can be conveyed through fingerspelling. I once observed a teacher aide asking a preschool child about 3 years old, "WHAT COW SAY? WHAT SHEEP SAY?" to which the child correctly responded "M-O-O" and "B-A-A."

I have suggested throughout the present article that fingerspelling be used in a "naturalistic" manner, according to the norms of the Deaf community. Some teachers might object that deaf children cannot be given spelling tests with fingerspelled vocabulary, because the act of fingerspelling would in itself "give away the answer." However, this is not necessarily so. Teachers, after in-

roducing new words such as *aquarium* and *amphibian* through linking techniques such as those described by Padden (1996b), could fingerspell the word progressively faster each time it was used, until it achieved a lexicalized state. Thus, "A-Q-U-A-R-I-U-M" would eventually be reduced through lexicalization to "A-Q-U-M" or "A-M-P-H-I-B-I-A-N" to "A-M-P-H-I-N." Although the students would still perceive some of the letters of the full English word, they would only be perceiving several salient elements that would provide a clue to the word's spelling, but not the word in its entirety. The students would nevertheless be required to draw upon their memory of the correct spelling of the word in order to write it down for the test. This process is similar to what happens in hearing individuals. Adams (1990) cites a study that revealed that hearing adults utilize the perceived phonemes of a spoken word (even when the perceived phoneme is inconsistent with the phonemic structure implied by their imagined spellings) to derive a correctly spelled pattern or word. The advantage of this process is that the deaf student is taught a word in a way that would be used and understood by the larger Deaf community, rather than by means of an invented sign (possibly initialized) that would only be understood in the classroom, and possibly also without the benefit of having learned the spelling of the English word itself.

### Conclusion

Fingerspelling is a resource within the linguistic system of ASL that provides a strong link to the printed word and literacy for deaf and hard of hearing children, and to avoid it is truly "irrational." The absurdity of this avoidance is especially salient when one considers that fingerspelling is a system that is mastered at the receptive and expressive levels by children as young as age 2 years. The avoidance of

fingerspelling has potentially negative repercussions for literacy, especially when one considers that correlations have been found between the use and knowledge of fingerspelling and vocabulary development. In addition, the fact that deaf individuals have been found to be superior spellers (Quigley & Frisina, 1961; Gates & Chase, 1976) may be attributable to their sensitivity to English orthographical patterns, as well as the practice in spelling inherent in the use of fingerspelling. Although there do not seem to have been any recent studies, there is a general and anecdotal consensus among deaf adults that the current generation of deaf children does not spell as proficiently as past generations, or even as well as the deaf students of 20 to 30 years ago.

Teachers of the Deaf need to develop their expressive and receptive skills in fingerspelling, and to be comfortable as well as fluent in the use of fingerspelling. They also need to understand how and when to use fingerspelling appropriately, an area that teacher training programs may want to consider in the preparation of these teachers. Teachers must also be taught how to use instructional strategies involving fingerspelling, such as the concepts of linking, distancing, and framing equivalences. I strongly recommend exercises and activities aimed at promoting the awareness of orthographic patterns inherent in English, as well as the demonstration of "rebuslike" strategies for spelling and the encouragement of student-generated breakdowns of spelling words assigned to them for the week. Students must also be encouraged to develop orthographical awareness through the "chunking" of words spelled to them, or to perceive fingerspelled words as wholes, not individual units. The use of lexicalized fingerspelling provides a highly salient means of perceiving fingerspelled words as wholes and as semantic units, rather than as abstract vocabulary to be learned and then discarded over the

course of a school year. Finally, it is imperative that teachers never underestimate their students' ability to perceive or use fingerspelling; they should bear in mind that, as a teenager might sarcastically comment, "even a two year-old can [literally] 'handle' it."

## Notes

<sup>1</sup>Lexicalized fingerspelling or loan signs are conventionally indicated by a pound (#) sign before the fingerspelled word. Fingerspelled words that have not been lexicalized are shown as individual letters separated by hyphens.

<sup>2</sup>It is interesting to note that the sign NO is itself a lexicalization of N-O, although most signers today are unaware of its fingerspelled origins. It is ironic that for emphasis, signers return to the sign's fingerspelled roots.

<sup>3</sup>While lexicalized fingerspelling is indicated by a pound (#) sign, most fingerspelling is represented by capitalized letters separated by hyphens throughout the present article. However, some researchers have chosen to underline fingerspelled words instead, as Maxwell (1988) does.

## References

- Adams, M. J. (1990). *Beginning to read: Thinking and learning about print*. Cambridge, MA: MIT Press.
- Akamatsu, C. T. (1985). Fingerspelling formulae: A word is more or less the sum of its letters. In W. Stokoe & V. Volterra (Eds.), *Sign language research '83* (pp. 126-132). Silver Spring, MD: Linstok Press.
- Akamatsu, C. T., & Stewart, D. A. (1989). The role of fingerspelling in simultaneous communication. *Sign Language Studies*, 65, 361-373.
- Backman, J., Bruck, M., Hebert, M., & Seidenberg, M. (1984). Acquisition and use of spelling-sound correspondences in reading. *Journal of Experimental Child Psychology*, 38, 114-133.
- Battison, R. (1978). *Lexical borrowing in American Sign Language*. Silver Spring, MD: Linstok Press.
- Benderly, B. L. (1980). *Dancing without music: Deafness in America*. New York: Anchor Press.
- Bernstein, M., Maxwell, M., & Matthews, K. (1985). Bimodal or bilingual communication? *Sign Language Studies*, 47, 127-139.
- Blumenthal-Kelly, A. (1995). Fingerspelling interaction: A set of deaf parents and their deaf daughter. In C. Lucas (Ed.), *Sociolinguistics in Deaf communities* (pp. 62-73). Washington, DC: Gallaudet University Press.
- Bonvillian, J. D., & Richards, H. C. (1993). The development of hand preference in children's early signing. *Sign Language Studies*, 78, 1-14.
- Boyes-Braem, P. (1990). Acquisition of the handshape in American Sign Language: A preliminary analysis. In V. Volterra & C. Erting (Eds.), *From gesture to language in hearing and deaf children* (pp. 107-127). New York: Springer.
- Bragg, L. (1997). Visual-kinetic communication in Europe before 1600: A survey of sign lexicons and finger alphabets prior to the rise of deaf education. *Journal of Deaf Studies and Deaf Education*, 2(1), 1-25.
- Ehri, L. C. (1991). Development of the ability to read words. In P. Barr, M. Kamil, P. Mosenthal, & P. D. Pearson (Eds.), *Handbook of reading research* (Vol. 2, pp. 383-417). New York: Longman.
- Ewoldt, C. (1981). A psycholinguistic description of selected deaf children reading in sign language. *Reading Research Quarterly*, 17(1), 58-89.
- Friedman, J. B., & Gilooly, W. B. (1975, March). *The effect of orthographic structure on the perception of letter sequences by deaf and hearing children*. Paper presented at the meeting of the American Educational Research Association, Washington, DC. (ERIC Document Reproduction Service No. ED 112 572)
- Gallaudet, E. M. (1997). Is the sign-language used to excess in teaching deaf-mutes? *American Annals of the Deaf*, 142(3), 21-23. (Original work published 1871)
- Gates, A. I., & Chase, E. H. (1976). Methods and theories of learning to spell tested by studies of deaf children. *Visible Language*, 10(4), 339-350.
- Grosjean, F. (1992). The bilingual and the bicultural person in the hearing and in the deaf world. *Sign Language Studies*, 77, 307-320.
- Gustason, G., Pletzing, D., & Zawolkow, E. (1972). *Signing Exact English*. Los Angeles: Modern Signs Press.
- Hanson, V. L. (1985). Cognitive processes in reading: Where deaf readers succeed and where they have difficulty. In D. S. Martin (Ed.), *Cognition, education and deafness: directions for research and instruction* (pp. 108-110). Washington, DC: Gallaudet University Press.
- Hirsh-Pasek, K. (1982). *What second-generation deaf students bring to the reading task: Another case for metalinguistics and reading*. (ERIC Document Reproduction Service No. ED 246 562)
- Hirsh-Pasek, K. (1986). Beyond the great debate: Fingerspelling as an alternative route to word identification for deaf or dyslexic readers. *The Reading Teacher*, 40(3), 340-343.
- Hirsh-Pasek, K. (1987). The metalinguistics of fingerspelling: An alternate way to increase reading vocabulary in congenitally deaf readers. *Reading Research Quarterly*, 22(4), 455-474.
- Hirsh-Pasek, K., & Freyd, P. (1983a, August). *Deaf readers' ability to analyze morphological regularities*. Paper presented at the meeting of the American Psychological Association, Anaheim, CA. (ERIC Document Reproduction Service No. ED 239 425)
- Hirsh-Pasek, K., & Freyd, P. (1983b). *What deaf individuals bring to the reading task: A focus on word identification strategies*. (ERIC Document Reproduction Service No. ED 239 424)
- Hirsh-Pasek, K., & Freyd, P. (1984). *Vocabulary development: How deaf individuals can learn to use the information given*. (ERIC Document Reproduction Service No. ED 246 404)
- Howarth, S. P., Wood, D. J., Griffiths, A. J., & Howarth, C. I. (1981). A comparative study of the reading lessons of deaf and hearing primary school children. *British Journal of Educational Psychology*, 51(2), 156-162.
- Johnson, R. E. (1994). Possible influences on bilingualism in early ASL acquisition. *Teaching English to Deaf and Second-Language Students*, 10(2), 9-17.
- Johnson, R. E., Liddell, S. K., & Erting, C. J. (1989). *Unlocking the curriculum: Principles for achieving access in deaf education* (Gallaudet Research Institute Working Paper No. 89-3). Washington, DC: Gallaudet University.
- Kelly, L. P. (1996). The interaction of syntactic competence and vocabulary during reading by deaf students. *Journal of Deaf Studies and Deaf Education*, 1(1), 75-90.
- Kluwin, T. (1981). The grammaticality of manual representations of English in classroom settings. *American Annals of the Deaf*, 126, 417-421.
- LaSasso, C., & Davey, B. (1987). The relationship between lexical knowledge and reading comprehension for prelingually, profoundly hearing-impaired students. *Volta Review*, 89, 211-220.
- Leybaert, J. (1993). Reading in the deaf: The roles of phonological codes. In M. Marschark & M. D. Clark (Eds.), *Psychological perspectives on deafness* (pp. 269-309). Hillsdale, NJ: Erlbaum.
- Limbrick, A. A., McNaughton, S., & Clay, M. M. (1992). Time engaged in reading: A critical factor in reading achievement. *American Annals of the Deaf*, 137(4), 309-314.
- Looney, P. A., & Rose, S. (1979). The acquisition of inflectional suffixes by deaf youngsters using written and fingerspelled modes. *American Annals of the Deaf*, 124(6), 765-769.
- Lucas, C., & Valli, C. (1992). *Language contact in the American Deaf community*. San Diego, CA: Academic Press.
- Luetke-Stahlman, B., & Milburn, W. O. (1996). A history of Seeing Essential English (SEE1). *American Annals of the Deaf*, 141(1), 29-33.
- Marmor, G., & Pettito, L. (1979). Simultaneous Communication in the classroom: How well is English grammar represented? *Sign Language Studies*, 23, 99-136.
- Mason, J. (1980). When do children begin to read? An exploration of four-year-old children's letter and word reading competencies. *Reading Research Quarterly*, 15(2), 204-224.
- Maxwell, M. M. (1986). Beginning reading and deaf children. *American Annals of the Deaf*, 131(1), 14-19.
- Maxwell, M. M. (1988). The alphabetic principle and fingerspelling. *Sign Language Studies*, 61, 377-404.
- Mayberry, R. I., & Waters, G. S. (1991). Children's memory for sign and fingerspelling in relation to production rate and sign language input. In P. Siple & S. Fischer (Eds.), *Theoretical issues in sign language research: Vol. 2. Psychology* (pp. 211-229). Chicago: University of Chicago Press.
- Mylander, C., & Goldin-Meadow, S. (1991). Home sign systems in deaf children: The development of morphology without a conventional language model. In P. Siple & S. Fischer (Eds.), *Theoretical issues in sign language research: Vol. 2. Psychology* (pp. 41-63). Chicago: University of Chicago Press.
- Nover, S. M. (1995). Full inclusion for deaf students: An ethnographic perspective. In B. Snider (Ed.), *Inclusion?: Defining quality education for deaf and hard of hearing students*.

- Washington, DC: Gallaudet University Press.
- Padden, C. A. (1990). *Deaf children and literacy: Literacy lessons*. (ERIC Document Reproduction Service No. ED 321 069)
- Padden, C. A. (1991). The acquisition of fingerspelling by deaf children. In P. Siple & S. Fischer (Eds.), *Theoretical issues in sign language research: Vol. 2. Psychology* (pp. 191-210). Chicago: University of Chicago Press.
- Padden, C. A. (1996a). Early bilingual lives of deaf children. In I. Parasnis (Ed.), *Cultural and language diversity and the Deaf experience* (pp. 99-116). New York: Cambridge University Press.
- Padden, C. A. (1996b). From the cultural to the bicultural: The modern Deaf community. In I. Parasnis (Ed.), *Cultural and language diversity and the Deaf experience* (pp. 79-98). New York: Cambridge University Press.
- Padden, C. A. (In press). The ASL lexicon. *International Review of Sign Linguistics*.
- Padden, C. A., & Humphries, T. (1988). *Deaf in America: Voices from a culture*. Cambridge, MA: Harvard University Press.
- Padden, C. A., & Le Master, B. (1985). An alphabet on hand: The acquisition of fingerspelling in deaf children. *Sign Language Studies*, 47, 161-172.
- Paul, P. V. (1996). Reading vocabulary knowledge and deafness. *Journal of Deaf Studies and Deaf Education*, 1(1), 3-15.
- Paul, P. V., & Quigley, S. P. (1990). *Education and deafness*. New York: Longman.
- Pettito, L. A., & Marentette, P. F. (1991). Babbling in the manual mode: Evidence for the ontogeny of language. *Science*, 251, 1493-1496.
- Quigley, S. P., & Frisina, D. R. (1961). *Institutionalization and psycho-educational development of deaf children* (CEC Research Monograph, Series A, No. 3). Washington, DC: Council for Exceptional Children.
- Quinn, L. (1981). Reading skills of hearing and congenitally deaf children. *Journal of Experimental Child Psychology*, 32(1), 139-161.
- Reich, P. A., & Bick, M. (1976). An empirical investigation of some claims made in support of Visible English. *American Annals of the Deaf*, 121, 573-577.
- Reich, P. A., & Bick, M. (1977). How visible is Visible English? *Sign Language Studies*, 14, 59-72.
- Schein, J. D. (1989). *At home among strangers: Exploring the Deaf community in the United States*. Washington, DC: Gallaudet University Press.
- Schleper, D. R. (1994). Does your F want to Y?: How deaf children use invented spelling. *Whole Language Umbrella*, 6(2), 16-17.
- Stokes, W., & Menyuk, P. (1975). *A proposal for the investigation of the acquisition of American Sign Language and signed English by deaf and hearing children enrolled in integrated nursery school programs*. Unpublished manuscript, Boston University.
- Stokoe, W. (1960). *Sign language structure* (Studies in Linguistics: Occasional Paper No. 8). Buffalo, NY: University of Buffalo Press.
- Strong, M., & Charlson, E. S. (1987). Simultaneous Communication: Are teachers attempting an impossible task? *American Annals of the Deaf*, 132, 376-382.
- Supalla, S. (1991). Manually coded English: The modality question in signed language development. In P. Siple & S. Fischer (Eds.), *Theoretical issues in sign language research: Vol. 2. Psychology* (pp. 85-109). Chicago: University of Chicago Press.
- Swisher, M. (1984). Signed input of hearing mothers to deaf children. *Language Learning*, 34(2), 69-85.
- Swisher, M., & Thompson, M. (1985). Mothers learning Simultaneous Communication: The dimensions of the task. *American Annals of the Deaf*, 130, 212-217.

Copyright of American Annals of the Deaf is the property of American Annals of the Deaf and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.