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AN ALPHABET ON HAND: THE ACQUISITION  
OF FINGERSPELLING IN DEAF CHILDREN

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We here report on a preliminary study of the acquisition of fingerspelling, a manual system for representing the alphabet, by young Deaf children whose first language in the home is American Sign Language (ASL). Unlike ASL, a natural language historically and structurally unrelated to spoken or written English, fingerspelling is composed of 26 distinct hand displays, one for each letter of the alphabet. Fingerspelling a word involves the rapid execution of a sequence of hand configurations, one for each letter of the word being represented. In Deaf families young Deaf children are exposed to fingerspelling used by their parents and older siblings at an early age and begin to fingerspell themselves long before they are able to read and write, and even before they are aware of the correspondence between fingerspelling and print.

We raise here a central question about the process of learning systems that correspond to, but are not, natural languages -- such systems as fingerspelling and writing. This paper provides a first step toward addressing this question by examining features of Deaf children's learning to fingerspell.

Like Chomsky (1971) and Read (1975), who studied writing in very young hearing children, we find that Deaf children begin thinking about fingerspelling at an early age, and indeed begin using the system before they attend school and learn about written English. We have found a number of intriguing similarities between very young children fingerspelling and very young children writing that cannot be due to the system's common link to print, for the reason that at this age children in neither group can yet read, and in particular, Deaf children are not yet able to associate fingerspelled letters with their corresponding written characters.

On the surface, fingerspelling might seem to offer interesting possibilities for the study of auxiliary systems. Unlike speech and print, fingerspelling and signed languages are not cross-modal but intra-modal. Speech employs the vocal channel and print involves

manipulation of an instrument (pencil, keyboard, finger, etc.), but fingerspelling and signing both employ the hands and use many of the same hand configurations. One might propose that because of the similarities in form between fingerspelling and signing, learning fingerspelling would create different possibilities. Although we do not have yet sufficient longitudinal data to compare learning to write and learning to fingerspell, we offer here some preliminary observations about their similarities.

Data in this paper are drawn from videotaped observations of six Deaf children at various ages: DD at 2 years, 3 months (2;3), SS at 2;9 and later at 2;11, VV at 4;7 through 4;8 and at 4;9, KK at 4;9 and later at 4;11, LL at 5;0, and the sixth child, HH, beginning at 7;9 to 7;10 and later at 7;11.

The system of fingerspelling.      The manual alphabet as it is used today in the United States did not originate within the Deaf community but was adopted as an educational tool for Deaf children (Bender 1970) [See Conrad 1984]. There are many other possibilities for manual representational systems in addition to the one used in the United States. The manual alphabet used in Great Britain is a two-hand system, in contrast to the one-hand U.S. system. In Denmark there is a "mouth-hand" system based on a syllabic representation of spoken Danish; and there are systems for representing non-alphabetic symbols; e.g. hand represented and hand-on-hand drawn Chinese characters can be found in use by Chinese deaf persons.

Fingerspelling is not a representation of spoken English, except through the latter's representation of written English. It does not encode phonological alternations in the language, e.g. vowel alternations; nor does it encode the various tiers that construct the spoken signal: tone, pitch, stress (word or phrase). 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. There are other system-internal features that do not appear in print; e.g. the execution of certain clusters of fingerspelled hand configurations take on characteristic global movements so that they are identifiable independently of the units composing the cluster [Cf. the conventional ampersand, '&']

representing 'e' and 't' though it no longer looks like them.]

In terms of structure, fingerspelling differs from signing in a number of ways: First, a sign of a sign language uses one, or at most two, distinct hand configurations, but a fingerspelled word has as many separate configurations as there are letters in the word. Second, while there are some hand configurations common to fingerspelling and signing (e.g. for A, F, S, V, X, Y), there are others that appear rarely or not at all in the sign hand configuration system (e.g. the alphabetic hand configurations for D, J, M, N, T, Z). [Strictly speaking, fingerspelled 'J' is not a distinct configuration but the hand configuration of 'I' moved to outline the letter, just as 'Z' is formed with the index finger (I) tracing that letter's shape.] Other hand configurations appear only in a restricted subset of ASL signs: name signs and signs borrowed from English pedagogical systems like Signed English. Third, the space of articulation for a sign extends from the top of the head to the waist and well out from the sides of the body, but fingerspelling is strictly confined to a small region in front of the fingerspeller's body. In addition, while the orientation of the palm relative to the body in a sign can vary from facing upward, downward, to the sides, fingerspelling orientation is limited: the palm must face outward from the speller's body. [A more precise description than that using palm orientation is based on the posture of the forearm: for the first six letters, the forearm is pronated to bring its radial edge closest to the body and allow the hand to face obliquely forward; for 'g' and 'h' the forearm is supinated; for the next four letters the forearm is prone again with the wrist retroflexed; 'm' and 'n' may be as for the first five or with wrist flexed, as it is for 'p' and 'q'; the remaining hand configurations are made with the original, slightly pronated, forearm posture.] And finally, compared to the range of possible movements in signing, fingerspelling uses a subset of smaller and more finely executed movements in rapid succession.

Battison (1978) has described a small set of ASL signs that originated as fingerspelled words. In these "loan signs," the number of distinct hand configurations in the original word is reduced to two at most; and other features (orientation and movement) are added so that the loan sign becomes a phonologically well-formed sign, no longer a fingerspelling action. In cases of

loan signs like BREAD, the fingerspelled origins are undetectable, and members of the signing community who do not know the etymology of such signs will not recognize them as loan forms.

We find this to be the case in our studies; we asked an older child (7;10) whether the loan signs NO and DOG were fingerspelling; the child replied that they were not fingerspelled words [even though the initial and final hand configurations are easily identifiable]. Accordingly, in our work, we are careful to distinguish between fingerspelled items and fingerspelled loan signs, since for all purposes, the loan signs are signs, not fingerspelling.

Use of fingerspelling in the American Deaf community. Fingerspelling as it is used in the United States is somewhat exceptional in its extent of use. Many sign language communities elsewhere in the world lack any kind of manual system for representing the local language, and of those that do have such systems, the extent to which fingerspelling is used is slight. American deaf persons are noted for their more frequent use of fingerspelling in their daily interactions and for their unusually rapid execution of fingerspelling, a partial indication of the prevalent use of the system.

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-A-D 'American Athletic association of the Deaf'). Some function words (prepositions, participles, pronouns) are fingerspelled by individuals closely transposing English.

In the normal conversational stream fingerspelling is interspersed with signing, but the frequency of appearance of fingerspelling and the choice of fingerspelled items is influenced by a number of sociolinguistic considerations. Frequency of fingerspelling increases in situations perceived as requiring use of English; e.g. reciting from a book, a formal presentation before an audience believed to prefer English, the presence of an English speaker.

Casual in-group contexts are less likely to elicit fingerspelled items. In other contexts fingerspelling is avoided because of the nature of the signal (e.g. in the theater the convention is not to use fingerspelling at all, presumably because distance from actor to audience is likely to be too great for comfortable viewing of complex handshapes in rapid sequence.

As a rough measure of frequency, we counted the number of fingerspelled items<sup>1</sup> appearing in three different videotaped sign conversations. In one segment from an informal conversation between two friends, of a counted 100 lexical items, 3 were fingerspelled. In a second segment of similar context, of 115 items, 7 were fingerspelled. But in a conversation between two Deaf signers and a hearing signer, a high of 23 fingerspelled items appeared in a set of 139 signs. The higher number of fingerspelled items reflects an accommodation to more English representation.

From our data, it appears that parents do not fingerspell to their children as frequently as they do to other adults. We have seen parents avoid fingerspelling and substitute signs for items they frequently fingerspelled. In the case of personal names, when an individual is introduced to another, the convention is to fingerspell the full name as an introduction. Some parents will introduce a person to a young child by name sign only, or will assign a "name sign" ad hoc to that person -- a naming known only within the family or social group. For slightly older children, parents will fingerspell the name slowly to the child in addition to making a name sign, and require only that the child remember the name sign. Other cases of sign substitutions for fingerspelled items include invented signs known only inside the family. In one case the parents invented a sign for 'distilled' to talk about distilled water. While parents may change their fingerspelling behavior for the child, this does not mean that the child receives no exposure to fingerspelling. We must assume the child is constantly exposed to older siblings, adults, and parents fingerspelling to each other as part of the larger language activity in the home.

As the child grows older, parental expectations

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1 Signs, fingerspelled words, complex morphological constructions, classifiers, holophrastic gestures, all were counted as lexical items.

about fingerspelling ability change. In a taped play session between mother and child (2;3), fingerspelling appeared only in an explicit instructional context; the mother asked the child to name himself and other members of the family. During this exercise the child persisted in giving his age when asked to fingerspell his name. After a few unsuccessful attempts to correct the child, his mother then asked him to imitate her production of each hand configuration for his name, which the child was able to do correctly. Aside from this instructional episode, we saw no other fingerspelling to the child during that interaction.

We have seen changes in expectations over a few months. When we first began videotaping a family with a young child (4;7), we saw very few cases of parents correcting the child's fingerspelling, but a few months later (4;9), the mother chastised the child for failing to fingerspell 'cat' correctly. When the child was younger, misspellings were tolerated with amusement or ignored, but now that the child was attending preschool, correct spelling became a parental concern.

Families vary in how they approach instruction about fingerspelling. Some parents use fingerspelling as a mode of teaching about English and will explicitly begin instruction in fingerspelling at a very early age (2 to 3 years), teaching names of objects and common English phrases, in the belief that fingerspelling aids development of written English skills. Other families do not engage in any fingerspelling instruction and allow children to develop fingerspelling skills on their own or after they start school.

Acquisition of fingerspelling. We find that Deaf children construct a theory about how fingerspelling works in ways independent of English orthography and morphology. By the time the child is nearly ready for school, she knows basically what to fingerspell: names of people and places, sometimes representations of English print; e.g. on candy bars. By the time of beginning school, these theories about what parts of communicative activity should be in fingerspelling begin to converge with the externally based system of representing written English. This is when the child develops yet another set of hypotheses about the second tier of activity, how to "spell."

We found different reactions when we asked children of different ages to "name" some object. A young child (2;9) is happy to produce fingerspelled items on

request; a two-year, eleven-month old will comply to a point, then become distracted; but a 4;7 year old child becomes agitated at being asked to fingerspell names of objects. When we showed pictures of animals and objects to the older child and asked what the names were, this well-mannered child was agreeable, but all outward signs showed extreme impatience; she fidgeted and rolled on the floor as she fingerspelled sequences of letters. The agitation indicates to us that the child begins to understand that the task of fingerspelling is complicated by something else that is not yet clear to her. At this point we see other types of behavior that suggest the child is developing ways of thinking about the convergence of fingerspelling and print.

Here we focus on early hypotheses children develop about fingerspelling and its relation to sign language. In a later study we hope to report in more detail our early studies on the convergence of fingerspelling and print in older children, 4 to 7 years old.

Learning to fingerspell. The parents in the present study report that their children displayed their first fingerspelling attempts at approximately 2 years of age. This is early but still late in comparison to the appearance of the first sign the child makes. The first sign appears as early as 8 months, and by the time the child is two, sequences of three or four signs are not unusual (Petitto 1983). It appears that there are structural properties about fingerspelling that make it more complex as a system than the more basic sign vocabulary. Part of the complexity can be found in the finer movements required for fingerspelling and the set of complex hand configurations, some of which do not appear in ASL signs. But the overall structure of fingerspelling, its linearity and arrangement of units with respect to one another are also different from sign language.

We observed that early fingerspelling (2;9) attempts all involved a sequence of at least three hand configurations. This child when asked for her name fingerspelled the following sequence: E-U-B; and when asked for her dog's name: U-B-A. Ferreiro (1978) has observed that an early hypothesis that hearing children develop about the written word is that it must have a certain minimum of letters, usually three. Two-letter words are ignored or labeled as "mistakes." More detailed studies should reveal whether the observation about a minimum number of hand configurations is indeed



general in our population of children, and should propose accounts for why learning about writing and about fingerspelling should produce similar child hypotheses. We cannot assume that fingerspelling at this age has any correspondence to writing.

When learning to fingerspell, the young child needs to master several sets of skills. First, each of the 26 hand configurations, some peculiar to fingerspelling, must be mastered. The characteristic positioning of the hand in a fixed central location for executing the sequence of handshapes must also be learned. And finally, the child needs to learn the set of possible transition movements from one hand configuration to the next.

We found that children did one of two things when they "fingerspelled;" and Maxwell (1983) observed the same thing. One child when asked the name of a person she had recently referred to with a name sign moved her fingers in a manner mimicking fingerspelling, but only the first letter was distinct; the other letters were not articulated, but the overall form of the imitation was very close in appearance to fingerspelling. The position was correct, the palm orientation facing outward was correct, and the gross movement was characteristic of fingerspelling; yet none of the hand configurations corresponding to the letters of the name were present. These forms only resembled the general appearance of adult fingerspelled items enough to be recognized by parents for what was intended.

In some cases, fingerspelling took the form of articulating each individual hand configuration in a sequence. In such cases only older children (5 Years) were able to use an English spelling consistently. For younger children, spelling varies and order of letters is freely interchangeable. One child, 4;11, was told by her father that "E.T." (fingerspelled E-T, after the alien character in the popular movie) took her candy. She shook her head and replied that it could not have been "E.T." but fingerspelled the name T-E. Another child, 4;9, spells cat variously as C-A-T, C-R-I, and C-N-I. But in many cases the child simply does not know the English word and will invent a spelling. A picture of a computer keyboard elicited C-N-I-T, and a picture of an airplane elicited Y-O-B.

Learning to fingerspell is no more difficult than learning other complex sign forms; the child begins to display fingerspelling-like activity as early as 2 years of age, arranges hand configurations in sequence by age

3, and soon after begins to notice correspondences between fingerspelling and other systems.

Interaction of fingerspelling & signed language. As early as 2;9, the child has clearly distinguished between those contexts in which fingerspelling is appropriate and those in which signing is appropriate. A sign is "what something is," but fingerspelling is the "name" of something. We found this to be consistently true of different children in different families. If we asked in signs, WHAT THAT? 'What's that?' the child would promptly reply with a sign. But if we asked WHAT NAME THAT? 'What's the name of it?' the child would attempt to provide a fingerspelled response.

Ferreiro (1978) also notes the same distinction in children's references to spoken words and written words: only written words are "names." We think similarities in children's distinction between language and auxiliary systems is not accidental but is indicative of an early understanding about their different structural properties; namely, that these latter systems are representations of something else. Language items are "the things themselves," but auxiliary systems are used "for something else." The question we ask at this point, which we cannot yet answer but hope to with more testing, is what a 2;9 child believes fingerspelling is "for."

Generally, fingerspelling and signing are differentiated by function in the language repertoire of the young Deaf child, but we noted that two of our children over age 4 had figured out a major point of convergence between fingerspelling and sign, in the set of initialized signs of ASL.

Unlike the majority of signs of ASL, for which there is no direct correspondence between the form of the sign and its closest written English translation -- in fact many signs use hand configurations that do not appear in the fingerspelling alphabet; initialized signs do correspond. The hand configuration in an initialized sign is that of the first letter of the English word accepted as its gloss or translation. The usual sign TRY, e.g., has no connection with T-R-Y; its hand configuration coincides with the fingerspelled letter 'S'; but a derivative form, EFFORT does correspond; its hand configuration is the fingerspelled letter 'E'. As in the case of EFFORT, many of these derivative forms are pedagogical forms, used in educational settings for

teaching English to deaf children.

The hand configurations of initialized signs differ from those of regular signs in another way; the hand is held as it would be in fingerspelling an isolated letter. To illustrate: the fingerspelled 'B' is held with the palm facing outward; the initialized sign BIOLOGY is made with the hand held the same way; but the same handshape 'B' in a regular sign like WINDOW has the palm toward the signer.

One large subset of initialized signs used regularly in the Deaf community contains the name signs. Such name signs use the first letter of the person's first, middle, or last name; e.g. 'C' is frequently used in a name sign for a person named Carol.

[Non-alphabetical name signs are rare, often denoting a characteristic feature of the person; see Meadow 1977.] Ted Supalla has argued that name signs comprise a separate subset with a restricted phonology within the ASL lexicon (personal communication). One restriction on name signs that does not apply to regular signs in ASL is that only fingerspelled hand configurations can appear in them.

At age 2;9, one of our young subjects does not use the hand configurations of name signs as input for fingerspelling. She will identify herself using her name sign, which has the hand configuration 'S', but she spells her name E-U-B. She is able to identify family members and the family dog using their name signs correctly made, but she does not use the letter of the name sign as the first letter of their fingerspelled names. But an older child (4;7) regularly uses name signs as an input for fingerspelling; when asked to name an individual whose name sign uses the letter 'C', she mimicked a fingerspelled word with only the first letter, 'C', distinct.

The older child displayed in a number of ways knowledge of the two systems, regular signs and initialized signs, and of the correspondence of fingerspelling to initialized signs. When shown pictures of fingerspelled letters, she responded only with initialized signs, some of which were possible name signs. When shown the hand configurations for 'W', she gave the initialized sign WE, for 'F' she signed FOX (F-hand at nose). When shown 'V', she moved the hand around the face as if searching for a cue for a possible sign and then gave a fictitious but entirely well-formed name sign. But when she was shown pictures of the same handshapes in orientations unlike that of

fingerspelling, she provided only regular signs; e.g. the handshape 'V', with the orientation facing toward the body instead of outward, elicited the sign JUMP.

We found some interesting indications of the viability of this rule for the older child in another exercise, where she was asked to give names for pictures of objects. She was shown a picture of a racket and asked to identify it. She gave the correct sign RACKET, which has a hand configuration similar to the fingerspelled letter 'S'. When asked to name the object, she paused, fidgeted, and then hesitantly proposed a word beginning with 'S'. Shortly afterward she spelled Y-O-B in response to a picture of an airplane. The fingerspelled hand configuration for 'Y' is not identical but similar to the handshape used in the sign. Judging from the relative productivity of name signs and initialized vocabulary in ASL, it would seem reasonable from the viewpoint of this child to guess that the name of something might correspond to the handshape of its sign. What she will later learn is that this predictability applies only to initialized signs.

Summary. By the time the child is in her fourth year, she has acquired a basic understanding of the different systems of signing and fingerspelling, their distinctive properties, and the points where the two meet, as in the large set of initialized signs. We have noted some similarities between those hypotheses that Deaf children draw about fingerspelling and those that hearing children draw about print, and we suggest that this would be a rich area in which to investigate early hypotheses about representational systems. We suspect that the similarities will reveal a general pattern of learning about such systems and how they differ from acquisition of natural languages.

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- 1978 Lexical Borrowing in ASL. Silver Spring, MD: Linstok Press.
- Bender, R.  
1970 The Conquest of Deafness. Cleveland: Case Western Reserve Univ. Press.
- Conrad, R.  
1980 The Deaf School Child. NY & London: Harper & Row.
- Chomsky, C.  
1971 Write first, read later, *Childhood Education* 47, 6.
- Ferreiro, E.  
1978 What is written in a written sentence? A developmental answer, *Journal of Education*, Fall, 25-37.
- Maxwell, M.  
1983 Language acquisition in a deaf child of deaf parents. In *Children's Language*, v. 4, Nelson ed. Hillsdale, NJ: Erlbaum.
- Meadow, K.  
1977 Name signs as identity symbols in the deaf community, *Sign Language Studies* 16, 237-246.
- Petitto, L.  
1983 From gesture to symbol. Unpub. Ph.D. dissertation, Harvard University. [also From gesture to symbol: The relation of form to meaning in ASL personal pronoun acquisition. In *SLR '83*, Stokoe & Volterra eds. Silver Spring, MD: Linstok Press (1985), 55-63.]
- Read, C.  
1975 Lessons to be learned from the preschool orthographer. In *Foundations of Language Development* v. 2, Lenneberg & Lenneberg eds. NY: Academic.