CAROL A. PADDEN AND DARLINE CLARK GUNSAULS

How the Alphabet Came to Be Used in a Sign Language

THE ALPHABET is so often linked to writing that we need to remember that its achievement has two parts—the written symbols found on a page and also the symbols that represent a cluster of sound units, or phonemes. Once committed to a page, language becomes visible and permanent and can be regarded on a plane apart from the intimate interaction of speakers. David Olson, among others, argues that the act of writing on a page has transformed thought about language because it suspends and turns language into a representation in space, one whose content we can study, review, and reconsider (1994).

The second feature of the alphabet—that it enables us to break down the fluidity of speech into units that we can transfer to a visible medium—is a monumental achievement. This aspect is particularly useful to certain groups of language users—religious and deaf signers, who appear to have little in common, except that both need a tool for converting speech to silent and visible forms. Additionally, the two communities have discovered that the alphabet can alternatively be represented on the body instead of on a page. In Greek and Roman antiquity there are recorded references to the use of the body and hands to represent the alphabet, presumably as a representational alternative to the use of paper.

Carol A. Padden is Professor in the Department of Communication, University of California, San Diego. Darline Clarke Gunsauls was formerly a research assistant in the Research Program in Language and Literacy at UCSD.

In the seventh century Saint Bede the Venerable, an Anglo-Saxon Benedictine monk, proposed in his *Ecclesiastical History* (cited in Plann 1997) a system for representing the alphabet "using the fingers" for the purpose of silent communication among the religious. From the Middle Ages through the seventeenth century, inhabitants within the cloistered walls of monasteries often used alphabetic gestures (as well as manual signs) to make face-to-face exchanges while preserving monastic vows of silence. Diagrams showing how to use the hands for the manual alphabet appeared in a book by a Spanish friar, Fray Melchor de Yebra (*Refugium Infirmorum* 1593; cited in Plann 1997), for monks to use while comforting sick and dying people whose illnesses had left them unable to speak. Writing the alphabet on paper enabled a permanent record of languages, but the page deeply altered the nature of the interaction between individuals. Manual alphabets, on the other hand, permitted intimacy, even as they presented language in alphabetic form, because they remained on the speaker's body during face-to-face exchanges.

The monks of the seventh century used a system for representing speech without needing to speak. Sign languages, as we well know, are not related to speech or spoken languages, but deaf people needed to be able to access and to represent the spoken language of their larger communities. The manual alphabets found in many sign languages have very different structural properties from sign languages though they share the same modality; such alphabets consist of a hand gesture for each letter. Sometimes these manual gestures are iconic; for example, the letter *C* is represented with a cupped hand, resembling the curved shape of the letter. In ASL fingerspelling, the letter *Z* traces the zigzag shape of the letter. However, although some alphabetic gestures are iconic, most of them are arbitrary in appearance. To construct a word, hand gestures are executed in sequence.

In sign languages, basic signs consist of one or two syllables, and morphemes are layered simultaneously as well as in short sequences within complex signs. Whereas sign languages can exploit the visual characteristics of objects, manual alphabets can exploit only the visual characteristics of written symbols. Moreover, whereas signs involve the simultaneous expression of meaning, manual alphabets are highly sequential, involving the execution of alphabetic units in sequence to

produce a word. As we explain shortly, this fundamental difference in structural properties is not merely distinctive in terms of origin, it is fully exploited for meaning in sign languages.

In her history of deaf education in Spain, Susan Plann (1997) traces the spread of the manual alphabet in European deaf communities back to contact between monks and the deaf children they tutored in the sixteenth and seventeenth centuries. The first book on deaf education, published in 1620 in Madrid, is credited to Juan Pablo Bonet, secretary to the sixth Constable of Castile (1890). While serving in the constable's household, Bonet observed the methods of a tutor hired to teach the constable's second son, who was deaf from birth. In this wealthy and titled family as well as in others related by marriage or birth were a number of deaf sons and daughters whose parents wanted them educated in addition to their hearing siblings. Some of the deaf sons were in line to inherit the family's properties, and literacy was a requirement for legal recognition as an heir.

Bonet included in his methods of deaf education a lengthy exposition on the use of the manual alphabet to teach deaf students to speak and read. Plann speculates that as the tutors interacted with deaf students, they introduced the manual alphabet to them. Although we have no detailed historical records of the sign language used at that time, hearing siblings and parents may have adopted the manual alphabet as well as a means of communicating spoken language to their deaf relatives. Where learning sign language requires the acquisition of a large vocabulary, manual alphabets are comparatively easier to learn; they have a smaller set of units by which, through sequencing and recombination, any word in a spoken language can be represented in manual form.

In any case, as the manual alphabet made its transition from the religious to the educational, it must have undergone significant adaptation as a tool. While the religious used it to convey speech in silent form, educators used it in the service of language education for deaf students. According to Harlan Lane, in the very first schools for deaf students in Spain, France, and Italy, educators encouraged their deaf students to use the manual alphabet (1984). From the start, very different ideologies about the manual alphabet arose. Educators such as Juan Pablo Bonet of Spain and Jacob Rodrigues Pereire of France

promoted the use of the manual alphabet (with alphabetic gestures representing sounds) in speech training for deaf students. Other educators, notably the famed Abbé de l'Epée, founder of the first public school for deaf students in Paris in the mid-1700s, who used sign language as a pedagogical tool as well as a means of communication used the manual alphabet to teach orthography and written language. Indeed, throughout the history of the manual alphabet as an educational tool, a virtual tug-of-war has existed over its true design. The controversy centers around whether it is a friendly partner of sign language or is antagonistic to it. Ironically, the structural properties of the manual alphabet lend themselves to either purpose: Like sign languages, the manual alphabet represents visible language, yet like speech it consists of a finite set of arbitrary symbols used in sequences to build words and sentences.

In 1817 Laurent Clerc, who had been a student at de l'Epée's school in Paris, helped to establish the first school for deaf children in the United States. In doing so he introduced not only French Sign Language but also the manual alphabet. The manual system first diagrammed by Fray Melchor de Yebra in 1593 and reprinted by Juan Pablo Bonet in 1620 thus found its way to the New World at the inception of the educational system here. One of the earliest volumes of the *American Annals of the Deaf and Dumb*, a periodical on deaf education, includes an article advocating the use of fingerspelling in deaf education (Carlin 1852).

In the first part of the nineteenth century, deaf people used fingerspelling and interspersed it with signs. Later on, Zenas Westervelt, an educator, announced his intention to perform an experiment using the manual alphabet as a complete system of communication—to the exclusion of signs. Westervelt, a teacher from the New York School for the Deaf in Fanwood, had been invited by his philanthropic in-laws to open a new school in the western part of upstate New York. The school would serve children who lived too far away from Fanwood to attend (Gannon 1981). In 1878, just two years after opening the school, Westervelt announced at a conference of educators that he had devised a new method of education that involved the "Disuse of Signs" (Scouten 1942). The method involved the exclusive use of the manual alphabet for all communication—

between teachers and pupils in the classroom and among the students themselves outside the classroom. Named after the school's physical location, the "Rochester Method" sought to restrict communication in sign language in order to teach English in a visible manner to deaf students. Westervelt proudly invited Alexander Graham Bell to visit the school and observe firsthand the fruits of his new method. Bell came and proclaimed it a success: "Prof. Westervelt [has] made absolute demonstration of the fact that children who are born deaf can be taught the English language without the use of signs or gestures. This is particularly gratifying to me as well as to all others who are interested in this subject. I think the use of the sign language will go entirely out of existence very soon" (ibid., 15).

Nearly a hundred years later, American Sign Language (ASL) survives, but the Rochester Method has virtually disappeared. Though other schools, including the Louisiana School for the Deaf and the Florida School for the Deaf, tried to adopt the method, by the 1960s these schools had largely abandoned it. Students and teachers rebelled at being required to use the manual alphabet exclusively, and sign language regained its role as the principal language of education. But the experiment, which lasted for more than seventy years, may have played a role in promoting the use of the manual alphabet to the American deaf community. Today ASL actively uses the manual alphabet—not exclusively as the Rochester Method required but as a selective tool for cross-modal borrowing, a way to import spoken language vocabulary into the signed language. It is ideal for this purpose because it imposes a segmentation of English words into units, which are then reconstituted as borrowed vocabulary.

Many other sign languages also use a manual alphabet. Sutton-Spence and Woll (1993) and Brennan (2001) describe the development of a two-handed manual alphabet in British Sign Language, unrelated to the alphabet that ASL uses. This two-handed system has been transported along with British Sign Language to deaf communities in New Zealand and Australia. Japanese Sign Language has two coexisting manual systems, one for kanji and the other for kana (Soya Mori, email, July 31, 1995). Employing small handshape differences for certain letters, a number of European sign languages use Bonet's

system. A Danish educator invented a mouth-hand system for phonetically representing sounds in Danish, but over time Danish signers adapted the system for alphabetic, not phonetic, representation (Birch-Rasmussen 1982). Even more types of manual systems in sign languages can be found throughout the world, but what is perhaps most interesting about ASL signers is how pervasively they use fingerspelling in everyday language. Fingerspelling constitutes anywhere from 12 to 35 percent of signed discourse in ASL and is widely used by signers across gender, age, class, and ethnicity. Signers of other languages remark that ASL has a good deal of fingerspelling and that ASL signers fingerspell at great speed compared to the more deliberate fingerspelling of French or Italian signers. In Italian Sign Language (LIS), fingerspelling is used more for foreign words than for spoken Italian words, so it occurs much less frequently in signed discourse in LIS than in ASL.

If this were the only interesting feature about the use of fingerspelling in ASL, the story would be fairly simple. However, signers use fingerspelling not only to borrow but also to maintain a contrast of two types of vocabulary—the everyday, familiar, and intimate vocabulary of signs, and the distant, foreign, and scientific vocabulary of words of English origin. The long history of fingerspelling in ASL reveals that the manual alphabet has become more than a representational tool: It has itself become a *signifier* of contrastive meaning through the exploitation of the structural properties that set it apart from signs—it is not of iconic origin, nor does it layer morphemes vertically as do complex sign structures. Instead it is made up of a set of arbitrary units strung together linearly in long sequences, having an appearance and form quite distinct from signs. Thus its "foreignness" is representable in both content and form.

Fingerspelling for Representation

The history of the adaptation of fingerspelling by deaf signing communities in the United States is a sketchy one. Much of what we know is limited to educational materials and publications, from de l'Epée's books on the instruction of deaf students to manuscripts on the Rochester Method published in the late nineteenth and early

twentieth centuries. In a circular defending the use of the Rochester Method in deaf education, Edward L. Scouten reports that deaf students used fingerspelling not only in the classroom but also among themselves after classes (1942). Anecdotal reports from former teachers and graduates of the Rochester School during that period describe a generation of students who used a great deal of fingerspelling and less signing in their conversational language (Shirley Panara, interview, 1972). A generation after Scouten's report, however, the Rochester Method had faded from use at the schools that had adopted the method, and sign language had taken its place. Strong disagreement from other educators and suspicion about the proponents' oralist motives prevented the method from becoming more widespread.

Archival films dating from the start of the twentieth century give a few clues about early fingerspelling. "The Preservation of the Sign Language," a 1913 film featuring George M. Veditz, president of the National Association of the Deaf, shows Veditz signing text with a large number of fingerspelled words—he fingerspelled names of people and places as well as phrases and complete sentences, all of which constituted nearly 15 percent of the vocabulary he used. Films from the same collection featuring "masters of the sign language" show fingerspelling in nearly every lecture, though the frequency of fingerspelling varies across signers. Veditz fingerspells more frequently during his speech than does his contemporary, Edward Miner Gallaudet, who recites on film the often-told story of Lorna Doone (Gallaudet 1913).

For us to understand the adaptation of fingerspelling, what is perhaps as relevant as frequency of use is what signers choose to represent in fingerspelled form. Veditz's extensive use of fingerspelling in 1913 equals that found among many ASL signers today, suggesting that the current system of using the manual alphabet was established early in the history of ASL, at least by the end of the nineteenth century, and has endured to this day. Few other sign languages (among them Swedish and British Sign Language) are similar to ASL in how frequently fingerspelling is used. Italian Sign Language uses a manual alphabet different in form from the system that ASL uses primarily to represent spoken foreign words, such as English names

f.s. linguistics history

or English terms. For Italian spoken vocabulary, signers typically mouth the word with a sign. For example, a single sign, FOGLIA ("leaf"), is used for different herbs, with mouthed variants for each one (e.g., "rosmarino" [rosemary], "basilico" [basil], and "salvia" [sage]) (E. Radutzky, email, March 11, 2003).

A number of sign languages exhibit this same pattern—they use mouthing as a means of representing spoken vocabulary. Boyes-Braem describes the extensive use of mouthing in Swiss German Sign Language, where signs are accompanied by mouthed elements 80 to 90 percent of the time (2001). She reports that mouthing is used to modify adjectives, adverbs, and modals; to negate modals; and to name the possessed referent. Among sign languages that use manual systems more, signers sometimes do not fingerspell entire words and instead use abbreviations more commonly. Danish Sign Language has two systems, one phonetic and one alphabetic. When using the alphabetic system, Danish signers may fingerspell the first and the last letter of a word instead of the entire word (e.g., F-D, "Ford" [cars]) (Birch-Rasmussen 1982). Brennan also describes reductions in fingerspelled words in British Sign Language (2001).

ASL has many abbreviations as well (Kelly 1990), among them the names of states (P-A, "Pennsylvania"), cities (S-D, "San Diego" [or "South Dakota"]), individuals (C-P, "Carol Padden"), companies (H-P, "Hewlett-Packard"), or phrases (H-N-Y, "Happy New Year"), but as we describe later, the majority of fingerspelled items in a conversation are fully spelled words. Fully spelled phrases or sentences are not common but are possible and are done for effect. This feature of fully fingerspelling words contributes to the impression that ASL signers fingerspell more frequently than signers of other sign languages.

An Analysis of Fingerspelled Words in ASL

To gain a more detailed view of the contemporary use of fingerspelling in ASL, we obtained access to a sociolinguistics database that Ceil Lucas, Robert Bayley, Clayton Valli, and their associates compiled in 2001, in which groups of signers were recruited to participate in videotaped conversations with each other. The researchers selected seven U.S. sites from which they drew their population of signers.

The signers were further selected to vary in age, ethnicity (Caucasian and African American), and gender. In each group, from two to five signers conversed with each other for about one hour on video. The database includes a total of 207 different signers (see Lucas et al. [2001] for a detailed description of their methods of data collection).

To determine (1) what constitutes the inventory of fingerspelled words signers use and (2) how frequently fingerspelling appears in signed discourse, we carried out two types of analyses. Either of these measures could be expected to vary across signers. One hypothesis about the use of the manual alphabet as a tool is that signers with a larger investment in borrowing from English will have a larger fingerspelled vocabulary and one that varies more across grammatical class. This presumably includes professional or more educated signers. Conversely, signers with less education and who hold less technical jobs will fingerspell less and show variation across fewer grammatical categories.

Inventory Analysis of Grammatical Category

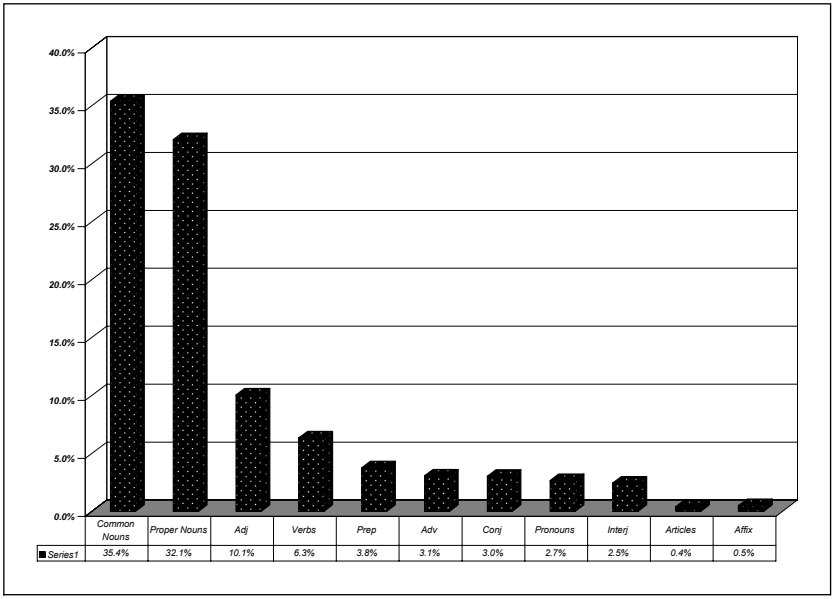
For the first analysis we selected 14 native signers from a pool of 207 signers in the database. The participants came from different regions of the United States and varied in age, educational level, occupation, and gender. From their conversations with others, we compiled an inventory of the fingerspelled words they used. We wanted to determine what kind of fingerspelled vocabulary the most competent signers (i.e., the native signers in the database) used. For each signer we selected a sustained segment of conversation lasting more than ten minutes (we permitted turns among signers but focused on only those signers our sample included). We recorded all of the fingerspelled words used during the segment. We then sorted by grammatical category a combined inventory of 2,164 fingerspelled words from the 14 chosen signers.

As table 1 shows, we found that the inventory of fingerspelled words is not evenly distributed by category. Furthermore, we found that the background of a signer does not play a significant role in the grammatical distribution of fingerspelled words. Instead, the overwhelming majority (nearly 70 percent) of the items consisted of nouns, about evenly divided between proper and common nouns.

The next largest category was adjectives, then verbs. The remaining categories, including prepositions, articles, affixes, and adverbs, trailed off in number, constituting very low percentages of the total. Importantly, this pattern of disproportionate representation of nouns compared to other grammatical categories held consistently for all fourteen of our signers, regardless of their background.

The almost even division between proper and common nouns was somewhat surprising since it is often said that the purpose of fingerspelling is to represent names of people or places. (Note: Data from the 15th subject, included in table 1, were excluded from the detailed analyses that follow.) We then sorted the native signers by age, geographical location, educational level, occupation, and gender to see whether there were group differences in the distribution of items. One might hypothesize that, among more educated signers, common nouns might appear more frequently than proper nouns since these signers would be more likely to borrow technical or specialized vocabulary. Also, professional-class signers (e.g., teachers, attorneys, and those who use more technical

TABLE 1. Use of Fingerspelled Words by Grammatical Category

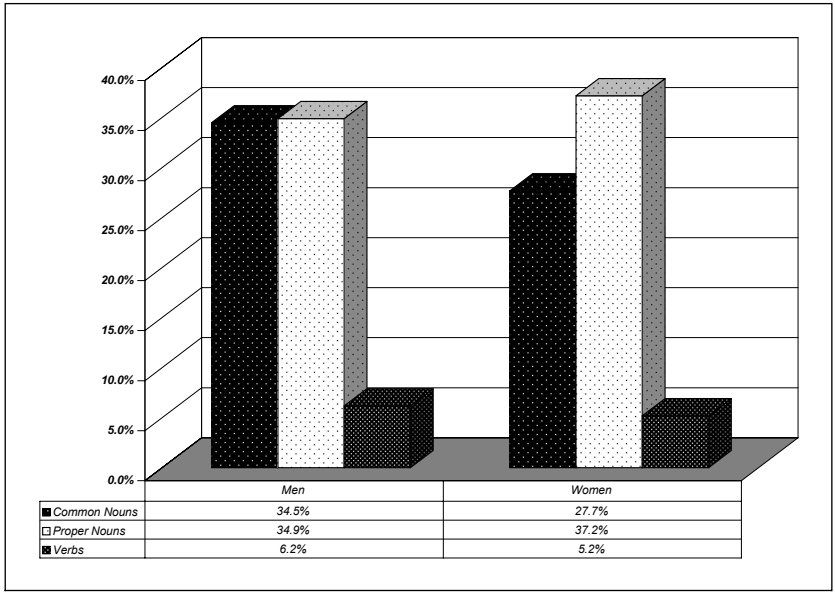


vocabulary) would appear to be more likely to use a varied vocabulary, so we might expect to see a different proportion of words within categories.

The tables that follow compare groups of signers by background with respect to their use of fingerspelled words by grammatical class. Although some differences are evident, overall the distribution is similar: Nouns by far exceed all of the other categories; verbs occur comparatively less frequently.

We observed some small differences with respect to the use of proper or common nouns. As signers increase in age, the difference between the frequency of proper or common nouns narrows, from an almost 9-percent difference among the youngest signers to 4 percent for those between 30 and 50 years of age and less than 3 percent for those older than 50. Younger signers fingerspell more proper nouns than common nouns, but older signers show little difference between the two noun subcategories. Both signers who were still in school and younger signers use more proper nouns. Working-class

Table 2. Men's and Women's Use of Fingerspelled Words by Grammatical Category

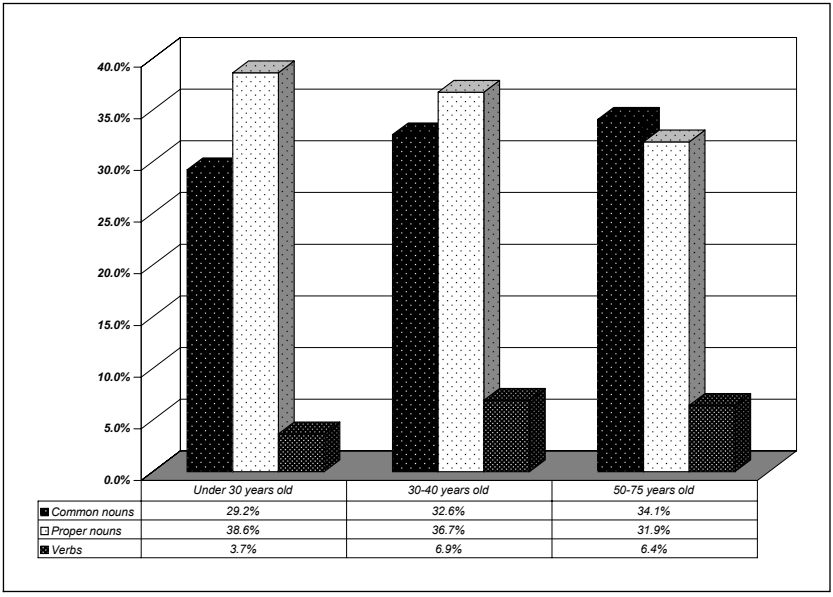


	Men	Women
Common Nouns	34.5%	27.7%
Proper Nouns	34.9%	37.2%
Verbs	6.2%	5.2%

signers (those with occupations in the service, factory, or construction areas) also use more proper nouns, whereas professionals show little difference between the two. It is not clear what these patterns suggest. One might argue that younger signers and those with less education and less-professional occupations use naming functions for fingerspelling, represented by proper nouns. Professional, educated signers have more of a need for technical or specialized vocabulary, so they borrow more of that noun category. When we compare signers by background, it is interesting that, overall, as common nouns increase, proper nouns decrease, so the overall proportion of nouns in the signing stream is maintained at about 70 percent. In other words, professional, educated signers do not have a disproportionate total number of nouns compared to other groups of signers.

Furthermore, the data show that although signers share roughly the same *distribution* of fingerspelled words across different backgrounds, they differ in their *inventories* of words. The effect of age, education, or occupation may be to vary more widely the inventory

TABLE 3. Use of Fingerspelled Word by Signers of Different Ages

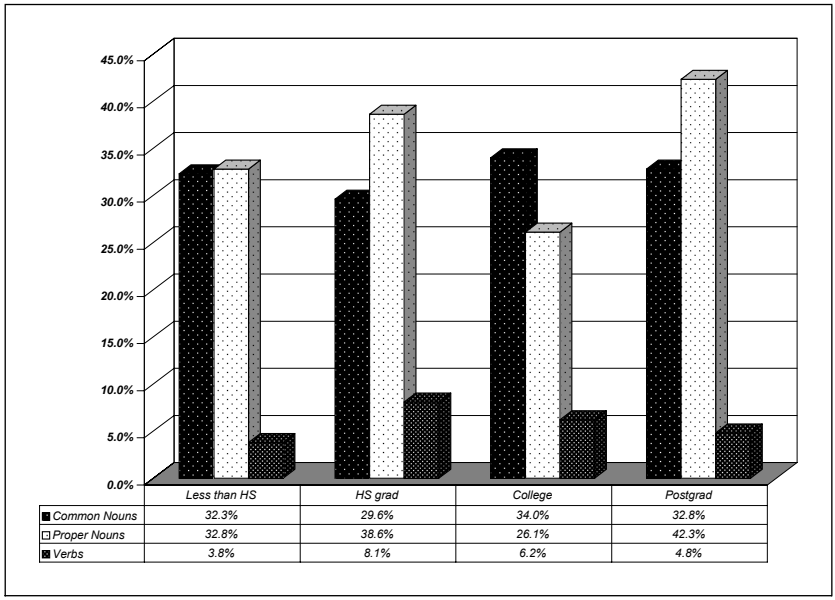


	Under 30 years old	30-40 years old	50-75 years old
Common nouns	29.2%	32.6%	34.1%
Proper nouns	38.6%	36.7%	31.9%
Verbs	3.7%	6.9%	6.4%

of borrowed English vocabulary to include names of objects in addition to names of places or people. One signer, a 74-year-old native signer who did not complete high school, has an inventory of 194 fingerspelled items including common nouns such as "blood," "restroom," "van," "highway," "clot," "age," "pocketbook," "supervisor," "wheel," and "weeks." A 44-year-old signer with a postgraduate education who works in the education field has an inventory of 263 fingerspelled words including "follies," "freaks," "transmitter," "scholarship," "reunions," "community," "houseboat," "contract," and "electrodes." The second signer used more technical vocabulary, but despite very different educational experiences and a 30-year difference in ages, the two signers used roughly the same percentage of common nouns: 39 percent for the 44-year-old and 33 percent for the 74-year-old.

As for fingerspelled verbs, the number varies within a comparatively lower percentage, from a low of none in a conversation by an eleven-year-old to a high of 11–12 percent (of the total number of fingerspelled words) among a couple of older signers. But the higher

Table 4. Use of Fingerspelled Words by Signers of Different Educational Levels



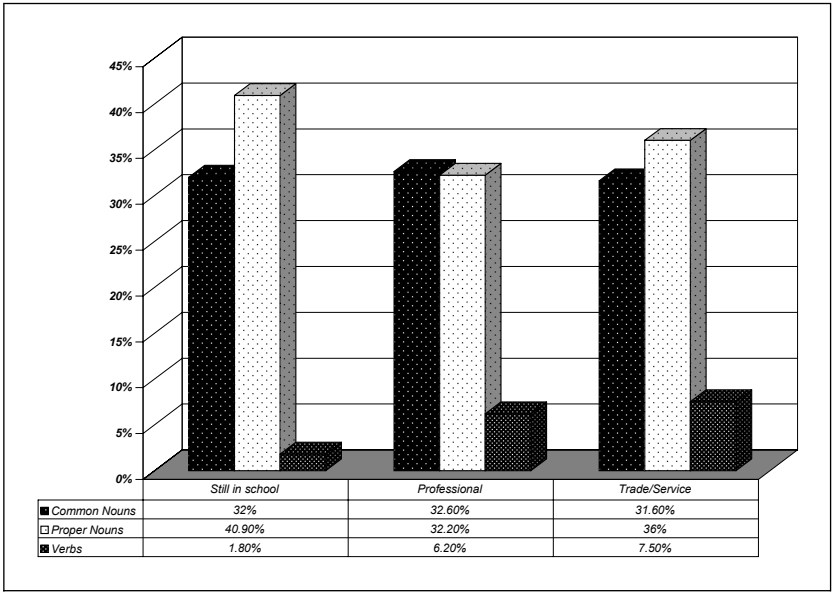
	Less than HS	HS grad	College	Postgrad
Common Nouns	32.3%	29.6%	34.0%	32.8%
Proper Nouns	32.8%	38.6%	26.1%	42.3%
Verbs	3.8%	8.1%	6.2%	4.8%

frequency is misleading because the number of different fingerspelled verbs is quite small. The verb D-O appeared five times in one segment of a conversation, constituting fully a third of the entire verb repertoire in the sample. Fingerspelled nouns, on the other hand, are made up of more different tokens, not just repetitions of a small set. Padden shows that compared to fingerspelled words, which are largely nouns and rarely verbs, there are numerous loan signs that are verbs (1998). In ASL, verbs and adjectives are highly spatialized; nouns are not. The same is true of lexicalized fingerspelled words. For example, the verb loan sign #FAX is reduced to two handshapes, F-X, and displays directionality and marking of subject and object. The fingerspelled noun F-A-X, in contrast, lacks directionality and retains all three handshapes of its alphabetic sequence.

do you mean lexicalized signs? "loan signs" older term I think

To recap, this inventory of fingerspelled words across signers of different backgrounds shows that even though native signers vary in their inventories of borrowed vocabulary as a reflection of their different life circumstances and experiences, they vary very little with respect to *how* they use fingerspelled words within the grammar of ASL. We argue that

TABLE 5. Use of Fingerspelled Words by Signers of Different Occupations



	Still in school	Professional	Trade/Service
Common Nouns	32%	32.60%	31.60%
Proper Nouns	40.90%	32.20%	36%
Verbs	1.80%	6.20%	7.50%

this demonstrates a mature representational system within a sign language: In ASL the use of the manual alphabet is not simply to represent English words but also to borrow and represent *selectively*, that is, mostly nouns, with some representation of other vocabulary under highly constrained contexts. Indeed, this is why the Rochester Method failed: It insisted on fingerspelling across all grammatical categories and essentially rendered communication not only difficult but ultimately unsustainable. In her analysis of fingerspelling in British Sign Language, Mary Brennan likewise demonstrates a constrained system, one that is highly selective and adaptable to that sign language (2001). This is most likely the feature of any alphabetic or representational system that is fully adapted for use in a natural sign language.

Inventory Analysis of Fingerspelling Frequency

Our second analysis focused on the frequency of fingerspelled words in the language. One frequent claim is that signers who are more educated or hold professional jobs fingerspell more often. To test this impression, we selected a group of thirty-six signers based on educational background and age, half native and half nonnative signers, to determine whether differences in frequency of fingerspelling are related to a person's signing background. For each signer we transcribed a continuous segment of 150 signs and counted the number of fingerspelled words appearing in that segment. We then determined the number of fingerspelled items as a proportion of the total number of signs in the segment.

The Influence of Topic. When we examined the signers' use of fingerspelling, we found that topic has some influence on frequency. Talking about events or describing a process or procedure often elicits more frequent fingerspelling, especially if the topic is a technical one, such as problems with blood clots. Some signers stylistically fingerspell more than others, with as much as 30–39 percent of their output in fingerspelled form. (One of these signers had a reputation among friends as "fingerspelling everything.") Because we had only one instance of their signing in the database, we do not know whether the group of signers we transcribed will maintain the same high level

of frequency when discussing a different topic or whether a different group of signers would fingerspell with the same frequency.

Native versus Nonnative Signers. When we compared native and nonnative signers, we saw differences. Native signers on the average fingerspelled slightly more frequently, at 18 percent, compared to nonnative signers at 15 percent, but the difference is more prominent when signers are compared individually. Half of the native signers fingerspelled with frequencies of 20 percent or higher compared to less than a third of nonnative signers. As a group, nonnative signers had more low-frequency fingerspellers.

The Influence of Education. Finally, when we compared native and nonnative signers by educational level, there was little difference within the group of nonnative signers related to educational level. But among native signers, the more education they had, the more frequently they used fingerspelling. High-school-aged native signers fingerspelled 15 percent of the time compared to college and postgraduate native signers at 21 percent.

Conclusions from the Analyses

What our analyses tell us is that fingerspelling in ASL is not simply a tool for representing English vocabulary—it is also a tool for representing certain kinds of English vocabulary in certain kinds of ASL structures. Its existence within ASL is constrained and limited. Among native signers, fingerspelled words generally appear more often in the signing stream, most likely because these signers are competent in the system. As we mentioned earlier, the proponents of the Rochester Method believed that the ideal system for educational purposes was one in which fingerspelling was used in place of sign language. However, approximately 125 years after the method was introduced, sign language has repudiated that supposition. Signers have not rejected fingerspelling wholesale; instead they have adapted it as a source of vocabulary creation, particularly for nouns. They continue to draw new vocabulary from within ASL, but a second source is the manual alphabet.

Fingerspelling as a Signifier

If fingerspelling were simply a tool for borrowing from spoken language, the story of the manual alphabet might be fairly straightforward. As it turns out, fingerspelling in ASL is more than just a conduit for English vocabulary; it can also function as a signifier of a certain dimension of meaning. Although signs make up the core of the language, fingerspelling, by virtue of its highly linear and segmentable structural properties, can exploit its status for the purpose of drawing contrastive meaning. An example of this function occurs in George Veditz's speech, when he does not sign but instead fingerspells phrases in order to invoke biblical authority. He decries "false prophets" who pronounce the oral method as the best for deaf education, and later he warns of "a new race of pharaohs who knew not Joseph" and who are threatening to control the way in which deaf children will be educated. Here Veditz draws a contrast between his signed exhortations, which speak to his community, and the use of fingerspelled biblical phrases to assert a different authority. In modern ASL, the contrastive function has shifted to the signification of technical, scientific, and foreign meanings.

Representational systems in sign languages have been described as supplying technical and scientific vocabulary, but we have observed that fingerspelling goes beyond simply representing to actually *signifying*. Fingerspelling exists in contrast to native vocabulary, not only to name or signify what is not yet named in sign language but also to assign contrastive meanings to both native signs and fingerspelled words. The use of this contrast is easily seen in the classroom. In a study of classroom language used by teachers participating in a bilingual ASL-English curriculum, Padden and Ramsey (2000) observed teachers compare signs and purposely use fingerspelling to teach science, mathematics, and language arts.

A striking example of this was executed by a deaf fourth-grade teacher who was performing an experiment involving baking soda, water, and vinegar in order to illustrate the properties of gases and liquids. She began her lesson by announcing that she wanted the students to first state the experiment as a "problem." In introducing the first part of the lesson, she used the ASL sign PROBLEM but then

explained that she would not be talking about problems in the personal sense, such as a problem with friends or difficulty in accomplishing something. Instead she wanted the class to think of this as a P-R-O-B-L-E-M, which she introduced with the fingerspelled word. Pointing to the signing space where she fingerspelled the word, the teacher went on to say she meant a problem as in the scientific or mathematical sense. The experiment would begin with a statement of a P-R-O-B-L-E-M, which was the question of the properties of gases and liquids. To emphasize what she had done, she repeated the contrast, first the sign PROBLEM followed by the fingerspelled word P-R-O-B-L-E-M.

The teacher used this oppositional signifier technique several times during Padden and Ramsey's observation of her classroom. Signs were used for the familiar, the known, and the intimate. Although a sign could be adapted for technical use, fingerspelled words were often used to establish a different kind of meaning: one more foreign or scientific and not intuitive. This technique was used primarily by deaf teachers who sought to bridge their students' home or familiar knowledge and the scientific knowledge they were learning at school. The effort is similar to one that Carol Lee (Lee 2000; Lee and Smagorinsky 2000) mentions in her description of a teacher's explanation of ''testifying,'' a type of African American talk, as both a technique and an analytical tool in a classroom of middle-school African American teenagers. Drawing from Vygotsky's (1978) characterization of concept development as involving the development of ''spontaneous'' and then ''scientific concepts,'' where the latter is reflective and analytical and the former is intuitive and everyday, Lee describes the teenagers' grasp of testifying as a transition of concepts. The deaf fourth-grade teacher used fingerspelling among the young deaf children to explicitly connect different spheres of knowledge and used the contrast to expand the potential of meaning.

Humphries and MacDougall (2000) situate fingerspelling as an active technique of bilingual education and describe deaf teachers' use of ''chaining'' as an example. In chaining, teachers link together signs, written words, and fingerspelling to demonstrate equivalence. For example, when explaining the properties of volcanoes, a deaf teacher pointed to the board, where she had drawn an illustration of

a volcano next to the written word, and then she signed VOLCANO followed by the fingerspelled word V-O-L-C-A-N-O. Kelly has also noted this technique in bilingual ASL-English homes with deaf children of deaf parents who want to demonstrate vocabulary from both languages to their children (1995). Kelly calls the technique "sandwiches," where signs are quickly followed by a fingerspelled word equivalent. Humphries and MacDougall argue that chaining is one of several examples of home bilingual practices that have migrated to the classroom as part of a reform movement to expand bilingual education in deaf schools (2000). In this sense, fingerspelling is used not only to represent English equivalence but also to maintain a stable coexistence between two languages. It is a signifier of different but equivalent vocabulary.

In her description of British Sign Language fingerspelling, Mary Brennan finds that fingerspelling is used to introduce scientific and technical vocabulary but that over time sign translations eventually replace many fingerspelled words (2001). In ASL, many fingerspelled words remain in the language even when a signed translation is available. For example, Brennan describes how the word "diglossia" was introduced first in BSL in fingerspelled form and was later translated. In ASL, the same term remains fingerspelled, and there is no widely used translation among sign linguists, hearing or deaf, in the United States. There are many examples of fingerspelled words, technical and otherwise, that remain in this form and have no signed counterpart (unlike the contrast between PROBLEM and P-R-O-B-L-E-M). One might argue that fingerspelled words exist because there are no signs for a particular concept or idea. It is hard to understand why ASL signers fingerspell words such as C-L-O-T or C-A-N-C-E-R or even ordinary objects such as F-L-O-U-R or B-R-O-C-C-O-L-I when translations are easily obtained. In other sign languages, those fingerspellings would be signs, but in ASL they remain in fingerspelled form. ASL also insists on fingerspelling many brand names (e.g., Nissan, Toyota, or Ford) that in other sign languages have their own signs. Names of our presidents are almost always fingerspelled, from "Clinton" to "Bush" (with the exception of Richard Nixon, whose name sign is an adaptation of the sign TO-LIE), whereas other sign languages typically assign name signs to well-known figures and leaders. In many

European sign languages the name sign for Mikhail Gorbachev involves a reference to the prominent birthmark on his forehead, but in ASL his name is always fingerspelled.

The Case of ASL Fingerspelling

Why do ASL signers fingerspell so much? Why is fingerspelling so robust in its contrastive and oppositional use to signs? Why don't ASL signers translate more and use fingerspelling less, as do signers of many other sign languages? Several theories exist, but none has been fully investigated. First, it is not entirely true that signers "fingerspell a lot." On the average, they produce fingerspelled words about 10–15 percent of the time in a signing stream. Some signers produce fewer fingerspelled words whereas others produce more. Topic and context can play a large role in influencing the frequency of fingerspelled words in a signed conversation. Signers avoid fingerspelling functor words and verbs and use fingerspelling mostly for content words. Although fingerspelling represents English vocabulary, it does not represent the English language fully, so one must describe its link to spoken language carefully.

Nevertheless it is true that, compared to signers of many other sign languages, ASL signers fingerspell more. One popular theory for this is that the introduction of the Rochester Method in 1878 promoted the use of fingerspelling among deaf children and adults and thus greatly influenced its entry into the language. A drawback to this theory is that the Rochester Method was used in a systematic way only by the Rochester School. Even though other schools contemplated using the method or attempted to use it on a smaller scale (as did the Louisiana School and the Florida School for the Deaf), none of those schools adopted it to any great extent. The method had its supporters, but it also had detractors among educators and deaf people throughout the country. In an issue of the *American Annals of the Deaf and Dumb* from the nineteenth century two teachers at other schools for deaf students debated the exclusive use of fingerspelling, arguing that it "becomes pedantry" and "perverts everything" (White 1890) and that "the excessive use of finger-spelling tends to mar the smoothness and clearness of the speaker's style of delivery" (George 1890).

Furthermore, certain signing communities around the world (e.g., Scotland and some eastern European countries such as Albania) introduced the manual alphabet as an exclusive method in their schools (V. Kalo, interview, September 2001). Nevertheless, deaf people in those countries today do not use fingerspelling to the same extent that ASL signers do. For instance, Brennan (2001) reports that a manual alphabet was enforced in the Edinburgh school for deaf students, yet signers in Scotland use more fingerspelling for full words than they use abbreviations and other reductions that are common among signers in other parts of the United Kingdom. Still, she finds that fingerspelling frequency is low (less than 5 percent) even among those attending the Edinburgh school. The fact that there were attempts to adopt a type of Rochester Method in these countries evidently did not influence their sign languages to adopt fingerspelling to an extent equal to that in the United States.

Another theory about the pervasiveness of fingerspelling in the United States is that it reflects high rates of reading and writing literacy among deaf students and adults. The rapid spread of schools for deaf students throughout the United States, totaling about eighty-seven by the year 1889 (Fay 1890), brought access to literacy to deaf students in a relatively short time. The founding of Gallaudet University in 1864 both enabled and sustained levels of literacy among older deaf students. High rates of literacy among deaf Americans could have led to a greater involvement in literary and scientific endeavors, for which fingerspelling would have served as a necessary vehicle for communicating about these concepts. George Veditz, discussed earlier as an example of fingerspelling in the early part of the twentieth century, graduated from Gallaudet in 1884, and while serving as a teacher of deaf students he also pursued his interest in botany as a hobby. Many deaf people of his time were deeply interested in science and literary activities and presumably would have needed to represent text in the English language.

A final clue may come from Veditz's speech: He warned that both sign language and fingerspelling were in danger in American schools at the turn of the century. The greatest argument for oralism is that it promotes the development of English language skills. If deaf people could show their opponents their skill in the use of English through

fingerspelling instead of speech, they could refute the argument for oralism and effectively advocate the use of the manual method in schools for deaf students. In the battle against oralism, fingerspelling may have become both a vehicle for representing English text in argument (as Veditz does when he pointedly fingerspells "pharaohs who knew not Joseph") and a demonstration of deaf people's ability to manage both languages. As a weapon in the battle against oralism and with the solid backing of prominent deaf leaders such as John Carlin and George Veditz, fingerspelling may over time have become entrenched in the language. It is a theory worth pursuing, but it requires a detailed understanding of sign language practices among deaf children and adults in nineteenth-century America and of the role fingerspelling played in these practices.

Conclusion

A deeper understanding of the use of the manual alphabet in ASL and of representational systems in other sign languages is enhanced by a richer historical account of their development. Fingerspelling is interesting not simply as a language system but also as a human innovation that grew out of a long history of adaptations of the alphabet. Its transition from the religious to the educational follows the history of deaf education and the pathways of language use in these communities. We need to explore ways of using archival material to shed light on the way in which a community of signers adopts and integrates representational systems into a sign language. In the case of ASL, the special circumstances of fingerspelling—that it both signifies and is itself a signifier—places the system in a privileged position. Not merely a vehicle for cross-modal borrowing, it has also become a means of actively making meaning in the language. Its highly significant properties—its linearity (as opposed to the simultaneity of signs) and its very foreignness—are not only structural but metaphorical as well. Though the system exists as a complement to sign language, it is a powerful one, offering ASL signers multiple ways to construct meaning.

References

Birch-Rasmussen, S. 1982. *Mundhåndsystemet.* Copenhagen: Døves Center for Total Kommunikation.

Bonet, J. P. 1890. *Reducción de las letras y arte para enseñar a ablar los mudos* (Simplification of the letters of the alphabet and method of teaching deaf-mutes to speak). 1620. Reprint, Harrowgate: Farrar.

Boyes-Braem, P. 2001. Functions of the Mouthing Component in the Signing of Deaf Early and Late Learners of Swiss German Sign Language. In *Foreign Vocabulary in Sign Languages: A Cross-Linguistic Investigation of Word Formation,* ed., D. Brentari, 1–47. Mahwah, N.J.: Erlbaum.

Brennan, M. 2001. Making Borrowing Work in British Sign Language. In *Foreign Vocabulary in Sign Languages: A Cross-Linguistic Investigation of Word Formation,* ed. D. Brentari, 49–85. Mahwah, N.J.: Erlbaum.

Carlin, J. 1852. Advantages and Disadvantages of the Use of Signs. *American Annals of the Deaf and Dumb* 4(1):49–57.

Fay, E. A. 1890. Tabular Statement of American Schools for the Deaf, 1889. *American Annals of the Deaf and Dumb* 35:57–65.

Gallaudet, E. M. 1913. *Lorna Doone.* Silver Spring, Md.: National Association of the Deaf.

Gannon, J. 1981. *Deaf Heritage: A Narrative History of Deaf America.* Silver Spring, Md.: National Association of the Deaf.

George, D. W. 1890. Signs and Fingerspelling. *American Annals of the Deaf and Dumb* 35:115–17.

Humphries, T., and F. MacDougall. 2000. "Chaining" and Other Links: Making Connections between American Sign Language and English in Two Types of School Settings. *Visual Anthropology Review* 15(2):84–94.

Kelly, A. 1990. Fingerspelling Use among the Deaf Senior Citizens of Baltimore. Paper read at New Ways of Analyzing Variation in English (NWAVE) XIX, October, Philadelphia, University of Pennsylvania.

———. 1995. Fingerspelling Interaction: A Set of Deaf Parents and Their Deaf Daughter. In *Sociolinguistics in Deaf Communities,* ed. C. Lucas, 62–73. Sociolinguistics in Deaf Communities series, vol. 1. Washington, D.C.: Gallaudet University Press.

Lane, H. 1984. *When the Mind Hears: A History of the Deaf.* New York: Random House.

Lee, C. D. 2000. Signifying in the Zone of Proximal Development. In *Vygotskian Perspectives on Literacy Research: Constructing Meaning through Collaborative Inquiry,* ed. C. D. Lee and P. Smagorinsky, 191–225. New York: Cambridge University Press.

Lee, C. D., and P. Smagorinsky. 2000. *Vygotskian Perspectives on Literacy Research: Constructing Meaning through Collaborative Inquiry.* New York: Cambridge University Press.

Lucas, C., R. Bayley, and C. Valli. 2001. *Sociolinguistic Variation in American Sign Language.* Washington D.C.: Gallaudet University Press.

Olson, D. R. 1994. *The World on Paper: The Conceptual and Cognitive Implications of Writing and Reading.* Cambridge: Cambridge University Press.

Padden, C. 1998. The ASL Lexicon. *Sign Language and Linguistics* 1(1):39–64.

Padden, C., and C. Ramsey. 2000. American Sign Language and Reading Ability in Deaf Children. In *Language Acquisition by Eye,* ed. C. Chamberlain, J. Morford, and R. Mayberry, 165–89. Mahwah, N.J.: Erlbaum.

Plann, S. 1997. *A Silent Minority: Deaf Education in Spain, 1550–1835*. Berkeley: University of California Press.

Scouten, E. L. 1942. *A Revaluation of the Rochester Method*. Rochester, N.Y.: Alumni Association of the Rochester School for the Deaf.

Sutton-Spence, R., and B. Woll. 1993. The Status and Functional Role of Fingerspelling in BSL. In *Psychological Perspectives on Deafness,* vol. 1, ed. M. Marschark and M. D. Clark, 185–208. Hillsdale, N.J.: Erlbaum.

Veditz, G. 1913. *The Preservation of the Sign Language*. Silver Spring, Md.: National Association of the Deaf. Film.

Vygotsky, L. 1978. *Mind in Society: The Development of Higher Psychological Processes*. Cambridge: Harvard University Press.

White, H. 1890. Spelling versus Signs. *American Annals of the Deaf and Dumb* 35:111–14.