

Breaking the Sound Barrier

Researchers of communication techniques for the deaf study different strokes for different folks of the hearing-impaired community

BY LINDA GARMON



The National Theatre

"...my eyes are my ears; my hands are my voice, and my language, my speech, my ability to communicate, is as great as yours." — Signed by Sarah, a deaf character in *Children of a Lesser God*, by Mark Medoff

Watch Sarah defend her ability to communicate, and you might catch a language created by deaf people, American Sign Language (ASL), in action. See this same currently popular play in another city, and it is quite possible that the actress playing the stubbornly proud deaf student will use Signed English, one of several manual codes that attempt to model the vocabulary and structure of English sentences. In yet another production, Sarah might use Pidgin Sign English, a blend of certain ele-

ments of both ASL and English. The mode of communication varies with the performer.

And that typifies the state-of-the-art of deaf communication. It depends on the teacher. It depends on the background of the deaf person. Some go so far as to say it depends on what textbooks a school buys. In short, there is no consensus among educators of the deaf as to which single communication technique is the best—so several different modes or combinations of modes now flourish. Some educators of the deaf say this "trend" is a result of an increased acceptance of the philosophy of Total Communication—the belief that the strengths in one communication mode can reduce the weaknesses in another; others simply call it a confusing mess.

Whichever, the result is a wildly dynamic and diverse field of investigation in which research advances can affect the fluctuating popularity of the various modes of communication for the deaf.

One such advance, still in its embryonic stage, is the development of an automatic cuer—a special computer system that would analyze speech and flash appropriate symbols onto the wearer's eyeglass lenses to aid in lipreading. The computerized glasses—conceived by Robert Beadles of Research Triangle Institute in Research Triangle Park, N.C., and R. Orin Cornett of Gallaudet College in Washington, the world's only liberal arts college for the deaf—could revolutionize education of the deaf. Cornett cautions, however, that at least five or six more years of de-

Sarah (Linda Bove)—pictured with her teacher-turned-husband James (Peter Evans) and school supervisor Mr. Franklin (Ken Letner) in a scene from *Children of a Lesser God* (above, right)—refused to lipread or speak. Other characters orally translated most of what she signed. The sign language now used in classrooms can be ASL, manual English or a blend. The signs pictured to the right are either signed English or ASL, depending on what has preceded and will follow them.



Charles Shoup/Gallaudet College

ELEMENTS OF TOTAL COMMUNICATION*

AMERICAN SIGN LANGUAGE

(Ameslan or ASL)

- standard signs
- non-English language
- some fingerspelling
- unique grammar
- unique syntax

one sign = one concept

AURAL/ORAL

- amplification
- lipreading
- cued speech (eight hand configurations, four facial positions)
- oral gesture (silent mouthing)
- speech

one lipsign = one or more phonemes

FINGERSPELLING

- finger rather than hand signs
- letters run together as in oral or written production
- Rochester method (fingerspelling combined with speech)

one hand configuration = one letter

GESTEMIC

- childrenese
- esoteric (localisms)
- international sign
- natural gestures
- pantomime

one gesture = one concept

MANUAL ENGLISH

- Seeing Essential English
- Signed English
- Signing Exact English
- Linguistics of Visual English
- fingerspelling
- standard sign often used as root
- creation of new signs for inflections, endings, tense, affixes, articles

one sign = one word or affix

SIGLISH (SIGN ENGLISH)**

- Pidgin Sign English
- fingerspelling
- syntax heavily English-oriented
- standard sign modified on continuum toward English
- gear-shifting between English and ASL idiom

one sign = one concept

*Note: In development of this chart reference was made to the work of Dennis Cokeley of the Kendall Demonstration Elementary School and Roslyn Rosen of the Model Secondary School for the Deaf in precollege programs at Gallaudet College.

**Bernard Bragg of the National Theatre of the Deaf uses the term "Ameslish."

Mervin D. Garretson/Gallaudet College

velopment and testing block the availability of this device beyond the laboratory. "It [the computer] makes too many mistakes," he explains. In addition, "Just the problem of making it small enough to wear still keeps us struggling." Cornett and Beadles now are trying to iron out those wrinkles in two prototype automatic cuers. These models will be sent to Tele-sensory Systems, Inc., of Palo Alto, Calif., which in turn will manufacture a first batch of about 24. Deaf persons will be fitted, and trials will begin.

Should those trial runs be successful, the field of deaf communication could see a surge in popularity of cued speech—the foundation of the automatic cuer; deaf persons necessarily would have to learn this communication tool before being fitted with the computerized glasses. Cued speech is *not* a form of sign language, but rather a code designed to take the guesswork out of lipreading. "There are 72 ways to lipread 'met' and more than 9,000 ways to lipread the Spanish word 'siesta,'" explains cued speech developer Cornett.

To clear up such ambiguities, Cornett's code uses four hand locations (side of the face, the throat, the chin and a corner of the mouth) to indicate different groups of vowels and eight hand shapes to indicate groups of consonants. The hand locations and shapes are used in synchrony on one hand to supplement the information on

the lips for each syllable of the spoken language. When saying "philosophy," for example, a cuer's hand moves through four different location-shape combinations, presenting a deaf person with a visual representation of the phonemes, rhythm and consonants of spoken speech.

As such cued speech not only aids the deaf in lipreading, but also aids in teaching them how to speak. Moreover, since cues define phonemes and consonants rather than words in the English language, cued speech can be used by non-English speaking deaf persons and their parents. (According to the results of a national survey published by Gilbert L. Delgado of Gallaudet in the April *AMERICAN ANNALS OF THE DEAF*, there are enrolled in school programs about 3,000 hearing-impaired children from non-English speaking homes—and that number is on the rise.) In addition, the code is a simple one, requiring only days to master.

But cued speech does have its drawbacks. Critics doubt, for example, that small children have the dexterity to unambiguously cue each syllable of the spoken language. In addition, very few people know the system. Finally, opponents of cued speech fear its use separates deaf cuers from other deaf persons and teaches them that success lies only in being more like the hearing.

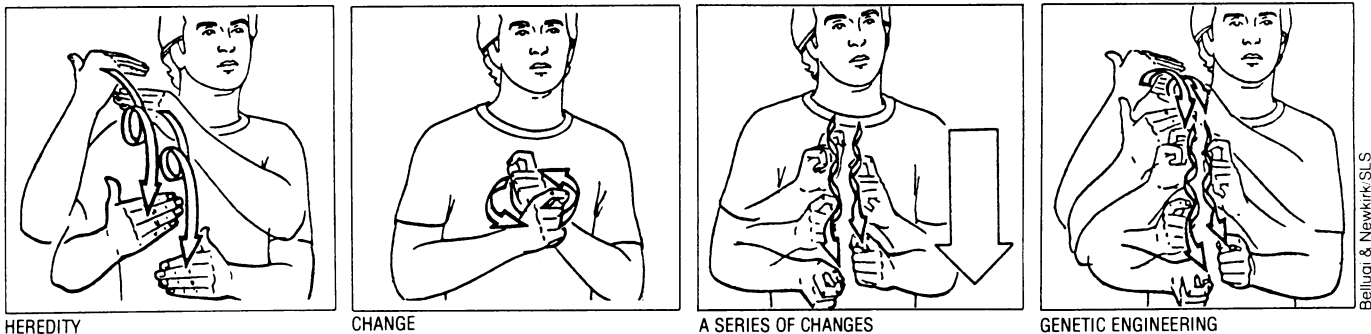
That philosophy goes against the very

grain of a sort of deaf-pride movement that now is gaining momentum. Part of this movement is a grassroots effort to increase the use of pure ASL—the "mother tongue" of American deaf people. At the present time there is a core deaf community of only about 250,000 to 500,000 Americans (at least 14 million Americans have some degree of hearing defect and 2 million of those are "officially" deaf) and Canadians who use ASL. In the past, this language was largely discounted as a classroom option, because educators felt that it was merely a "bad," broken or short-cut form of English that hampered deaf children from learning how to effectively read, write and speak English. Consequently, researchers developed a variety of signing systems built on written English models—Seeing Essential English, Signed English and Signing Exact English.

But even these systems are not without flaws. Basically, because they model, rather than exist as, a true language, they are complex and inefficient. And because they are based on written English, users are taught to sign the way they write and not the way they speak. "This problem is apparent every time a beginning signer tries to indicate future time," reports Thomas N. Kluwin of Gallaudet in the summer 1981 *SIGN LANGUAGE STUDIES*. "The spoken English (but uncanonical) word 'gonna' is converted into the more



"He can go" and "Get a coat" appear similar to a lip reader. Beadles and Cornett now are working on computerized glasses that would display cued speech signals to clear up such ambiguities. The computer would first analyze speech for specific criteria such as zero crossings (speech waves crossing normal atmospheric pressure) and peak-to-peak energy (the peaks in speech wave energy) and then emit the appropriate light-emitting diode (LED) display.



The ASL sign "heredity" was combined with a modified "change" (to imply "a series of changes"), and a new word was born.

laborious signed phrase *am going to*, and the novice attempts four signs (for *am*, *going* and *to*) where one would have done the job." Moreover, on the syntactic level "conventional sign systems are really only capable of representing simple declarative spoken sentences," Kluwin says. "They cannot represent the pitch and pacing variations that are used by speakers of English to indicate subordinate or coordinate relationships between clauses in complex sentences." Yet another problem with the manual English codes is their predilection "to select only a single sign to represent the various lexical items in a set of English homonyms, regardless of the number of different meanings." As a result, says Kluwin, "Deaf children are subjected to absurdities such as the teacher saying in speech, 'You are a real dear,' and signing 'You are a true fork-horned ungulate.'"

Despite his criticism of manual English systems, Kluwin does not support "those who argue that ASL should be the sole language of classroom communication; for such a position raises as many questions as it answers." Instead, he believes an entirely new system should be developed. The system "should be based first on the real goal of using manual communication, that is, to communicate with deaf children." And second, says Kluwin, it should be based on information gathered from studies of ASL.

Such studies began to mushroom about a decade ago after linguists finally acknowledged that ASL is a true language — one with its own distinct set of rules, form and development. Now, one of the particularly active areas of ASL research concerns how new words are coined.

There are three radically different kinds of mechanisms for lexical expansion of ASL. Ursula Bellugi and Don Newkirk of Salk Institute for Biological Research at La Jolla, Calif., report in the spring 1981 *SIGN LANGUAGE STUDIES*. First, there are external mechanisms — ways of borrowing from English, the dominant language of the surrounding community. Examples of external borrowing include the finger-spelled abbreviation S-F for "San Francisco" and the sign "quotation marks," made with two fingers bent on each hand and a movement describing the shape of quotation marks. But borrowing from English accounts for only a small proportion of ASL words. A second, more important enrichment occurs via internal expansion.

For example, "in the early 1970s, the word 'streaker' became popular," report Bellugi and Newkirk. "We were curious about how this new concept, which figured prominently in the news, would be expressed by signers whose primary language is ASL." Bellugi and Newkirk first discovered an expression formed by stringing together the sign for "nude" with a sign that means "to run away in a hurry." However, what spread with "surprising rapidity through various communities of deaf signers from California to Washington, D.C., was 'nude' followed by a sign that means 'to zoom off.'" Streaker became "nude zoom-off." A new word had been coined.

Similarly, the ASL sign compound "soft glass" now means "plastic," "machine copy" means "xerox," "prevent pregnant" means "contraceptive," "signature rectangular" means "credit card," and "letter number" means "zip code."

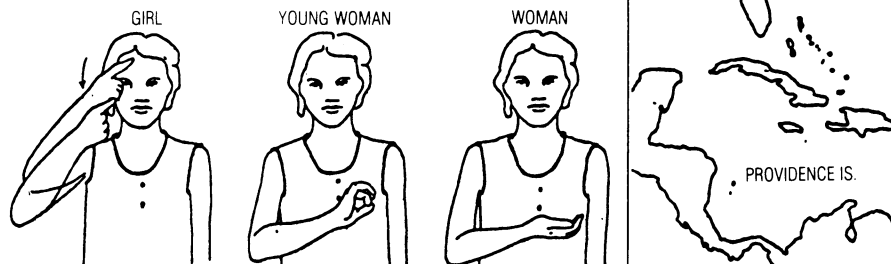
Finally, there are processes for creating new words for ASL by mimetic depiction. "One three-year-old deaf child invented a sign for 'cinnamon roll,' which she made with a cupped hand representing the roll and an active pointing hand indicating the swirls of cinnamon sugar on top," Bellugi and Newkirk report. The researchers conclude that "the vocabulary of ASL is far richer than has been claimed, expanded by a large number of active, living processes for the creation of new names from existing signs."

In addition to studying the expansion of ASL vocabulary, researchers also have gained further understanding of the language by comparing it to the evolving languages of other groups of deaf persons. In the winter 1980 *SIGN LANGUAGE STUDIES*, for example, William Washabaugh of the University of Wisconsin at Milwaukee describes the Providence Island Sign Language (PSL).

Providence Island, Colombia, is a 15-square-mile volcanic island located 150 miles east of Nicaragua in the Caribbean. Deafness on this small, isolated island probably results from an inbreeding through which the genetic traits for deafness become expressed, Washabaugh says. Because the deaf community is small and homogeneous, PSL is highly iconic — that is, signs seem to be natural representations of their referents — and weakly coded (signs "are ambiguous as isolates; they acquire determinate meaning only when set into a context."). By comparison, ASL is more highly structured and composed of more arbitrary, digitally distinguished signs. "All this is necessary if the members of the [relatively] large[r] and [more] diverse ASL community are to comprehend one another," says Washabaugh.

But what is perhaps his most interesting observation of PSL is that the hearing members of the island have come to acquire it as a second language. "In addition, the deaf of Providence Island are not offered any schooling, and as a result, they have not been made to believe that their signed language is inferior to some spoken standard language." So, says Washabaugh, "The deaf ... have a much more positive attitude toward themselves than do the deaf in societies where the deaf are subjected to an oppressive literacy." □

"The PSL sign 'woman' does not merely refer to a biological and objective characteristic but to a cultural categorization of 'woman,'" Washabaugh observed.



Washabaugh/SLS