Orientation to Cued Speech

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Cued Speech is a lipreading support system in which eight configurations of one (either) hand are used in four locations to supplement the visible manifestations of speech. It is designed to raise the accuracy with which spoken language is perceived to approximately the level of persons with normal hearing, with regard to perception of phonemes, syllables, duration and stress.

Nicholls (1979) verified the reliability of Cued Speech in a study of eighteen profoundly deaf children in Australia (PTA's 97 to 122 dB): "The children in this study demonstrated the ability to receive highly accurate information on the speech signal entirely through vision... these findings...indicate that Cued Speech can provide profoundly and totally deaf children with access to precise phonemic information as a basis for verbal learning". Thirteen of the eighteen children scored 100% on the identification of the key (last) word in each of 36 four-word low-predictability sentences presented on videotape without sound. The average of the group was 96.0%. On key words in high-predictability sentences the average was 96%.

The accuracy with which Cued Speech is received can be demonstrated easily by presenting spoken words in a foreign language to a profoundly deaf child with hearing aids removed. If the child is accustomed to Cued Speech, and if he/she is capable of making the required sounds, he/she can accurately reproduce, without hesitation, words never encountered before.

Cued Speech utilizes eight hand configurations (see Appendix) to group the consonant phonemes into eight groups. The consonants within each group are visually contrastive on the mouth, and thus can be lipread in the presence of the cue (hand configuration). Consonants that look alike on the mouth, such as /m/, /b/ and /p/ look different on the hand, since they are made with different hand configurations (5, 4, and 1, respectively). Four locations of the hand near the face are used to group the vowels, as shown also on the chart. The vowels within each group, identified by a specific hand location, are visually contrastive. Thus, they can be lipread in the presence of the cue (location).

A hand configuration and a hand location are executed simultaneously. Thus, the basic unit of expression in Cued Speech is the consonant-vowel syllable. This makes possible the accurate synchronization of cueing with speech, in normal rhythm and at rates up to that of normal speech.

Cued Speech is designed to overcome the following major problems encountered by a large majority of children with prelingual severe or profound hearing impairment:

1. The problem of limited communication in the home during the early years, resulting in retarded or damaged personality development and delayed social maturation.

2. The problem of delayed and limited acquisition of verbal (spoken or written) language.

3. Failure to acquire an accurate mental model of the spoken language. Such a model is indispensible as a base for the development of reading as a natural, easy and enjoyable process.

4. Failure to develop the ability to communicate with society at large. An accurate mental model of spoken language is required for development of intelligible speech patterns, for speechreading, and for accurate use of written language.

Theoretically, the problem of communication in the home can be solved through use of signs, fingerspelling, or Cued Speech. In practice there are serious difficulties. About 95% of children born with a severe or profound hearing impairment have hearing parents. Fred Schreiber, for many years Executive Director of the National Association of the Deaf has estimated that only about two percent of hearing parents with hearing-impaired children who use signs become "competent" in signing. It is estimated that five percent of such parents keep up with their hearing-impaired child in signing, so that communication at home is limited by the inadequacies of the parents, not those of the child. Usually, parents have no difficulty in the first few years, when the child is learning signs from them. But, when the child starts pre-school and begins to pick up new signs by the dozens, the parents, in most cases, gradually fall behind.

An advantage of fingerspelling, which it shares with Cued Speech, is that it is a true code for verbal communication.
language. Once parents learn it, they have free access to the use of all the language they know. In practice, however, fingerspelling does not work out as the major mode of communication. It is so slow and laborious that gestures and abbreviations tend to be substituted for the full fingerspelling that would be required for the accurate learning of verbal language. Fingerspelling is very useful, however, as an adjunct to either signing or Cued Speech, for clarifying the written form.

Cued Speech, like fingerspelling, can be learned in a reasonably short time, and fluency can be acquired in a few months of use. As a visual code for spoken language, it can be used without vocabulary limitation as soon as it is learned, and speed is not a problem after the initial stages. For hearing parents, therefore, it solves the problem of communication in the home, permanently, if they learn and use it faithfully. Hearing siblings, other relatives and friends who learn the system can likewise contribute to the development of the hearing-impaired child through interaction and communication with him/her.

Delayed acquisition of verbal language is, for most hearing-impaired children, the principal barrier to learning throughout life. It inhibits not only communication with others, but learning in general. The sophisticated knowledge of human beings today has resulted from all the experience and learning of those who have gone before. These are handed down through interaction, instruction, and reading. Reading, of course, is completely open to a profoundly deaf person, without any handicap or limitation, should be reading. In practice, it is the area in which the failure of educational programs for the hearing-impaired is most evident. Approximately 95% of prelingually severe and profoundly hearing-impaired children have been estimated never learn to read well enough to locate an unfamiliar word in the dictionary and understand its meaning. The appalling significance of this is that such children never learn a word themselves. They have to be taught every written and spoken word they acquire. About the same percentage never read for pleasure, simply because it is too difficult for them to read anything at their level of interest.

Cued Speech was developed to make it possible for a profoundly deaf child to learn to read in the same easy, natural way as a hearing child. Research is needed to substantiate this assertion, and is presently in progress. Meanwhile, the reading accomplishments of most children who have grown up with consistent exposure to Cued Speech continue to surprise and delight their parents and teachers.

In a letter dated Nov. 8, 1888, Alexander Graham Bell wrote: "... the necessary preliminary to good speech is that the pupil should have a definite conception of how we pronounce our words—that he should have in his mind a definite model which he attempts to copy. With this model in mind, the defects of his speech will be due not to defective aim, but to defective execution." The typical profoundly hearing-impaired child grows up with an incomplete and inaccurate mental model of the spoken language. This limits the intelligibility of his/her speech as much or more than defects in articulation. Cued Speech contributes substantially to the acquisition of an accurate mental model of spoken language by a hearing-impaired child. It is therefore the ideal complement to a good program of auditory training and speech therapy.

Speechreading is another important skill, for which prior knowledge of spoken language is a necessity. A typical word with five or six letters in it will have a hundred or more homophones, words which look the same on the mouth. Thus, no one can lipread individual words reliably without considerable support from hearing. A typical five-word sentence has tens of millions of possible interpretations from what is seen on the mouth. The speech reader must be able to select the one of those interpretations that fits the rules of spoken language and whose words fit into all the groups of "look-aikes".

Speechreading is a highly sophisticated activity in which many factors are involved. Among them are the following:

1. The degree of familiarity with the relationships between configurations and movements of the mouth and the elements (syllable, words, phrases) of the spoken language. These relationships are not one-to-one. Speechreading is not a process of direct recognition of verbal elements. In fact, O'Neil and Davidson (1956) reported that skill in speechreading does not involve recognition of verbal elements as such.
2. Completeness and accuracy of the spoken language model.
3. Proficiency at a computer-like process involving thousands of "yes-no" decisions which the mind must make in considering and rejecting possible interpretations (of the patterns visible on the mouth)
not consistent with the language model, and in selecting from those that are consistent.

4. Proficiency at combining with (3) a similar rejection-selection process utilizing situational clues, facial expression and other non-labial stimuli.

5. Confidence, flexibility, and patience, ability to withstand confusion without giving up — these are attributes which contribute to the development of speechreading ability.

There is wide variation in the speechreading skills of hearing-impaired children who have grown up with Cued Speech. I know of none, however, if exact except for hearing loss, who is not a substantially better speechreader than most.

Because the hearing-impaired child must use the information visible on the mouth in order to receive and understand Cued Speech, he/she cannot avoid becoming familiar with the mouth patterns of specific words and phrases, and the way they fall into "look-alike" groups. In addition, because Cued Speech is a direct visible representation of the spoken language, he/she automatically acquires a mental model of that spoken language in the Cued Speech code, through consistent reception and use of it. In most cases, the child needs no specific training or special practice in speechreading. Inter-action with persons who do not cue will provide ample opportunity for development of speechreading skills.

Cued Speech shares with signing one specific disadvantage. Most hearing persons simply will not learn a special system or method for communication with profoundly hearing-impaired persons, who constitute a small fraction of one percent of the population. The rate at which a deaf child learns language through Cued Speech seems to be directly proportional to the amount and quality of his/her exposure to Cued Speech. Thus, hearing siblings, other relatives, hearing friends, classmates or others at school, baby sitters and others willing to learn and use Cued Speech with the child can contribute substantially to language and social development. A great advantage is the short length of time required to learn Cued Speech, plus the fact that it can be used without language limitations long before one becomes fluent in its use.

The quality of use of Cued Speech has to do primarily with the fact that the language used must relate directly to what the child is thinking in order for him/her to associate concepts with language, social benefits but substantial language-learning opportunities.
Appendix

Cued Speech for Speakers of English

(Symbols are from the International Phonetic Alphabet)

The added notes make the system complete, covering all "brands" of English

side position

/th/ /æ/ (father, palm)
American short /o/, as in not
/th/ (nickel, the)
/th/ (fur) (British)
/th/ (otation)

throat position

/thæ/ (that)
American /i/ (it)
/th/ (book, put)

chin position

/æ/ (hot)
American /a/ (jaw)
/a/ (get)
/a/ (food, blue)

mouth position

/s/ (butter) British (only
if lips are opened enough
to confuse with a)
/ʃ/ (feet)
/ʃ/ (jaw, bought) British
/a/ American (fur)

Diphthongs are cued as guides of the hand between appropriate positions; e.g., /at/ from /a/ to /t/, /au/ from /a/ to /u/, and /ou/ from /i/ to /u/, and /ei/ from /e/ to /i/.

Fig. 1 Fig. 2 Fig. 3 Fig. 4 Fig. 5 Fig. 6 Fig. 7 Fig. 8

/ʃ/ /a/ /i/ /æ/ /æ/ /a/ /a/

*The hand shape shown in Figure 1 is also used with an isolated vowel — that is, a vowel not preceded by a consonant.
There are evidences of a trend toward wider acceptance of Cued Speech as a useful tool for use in educating deaf children. A dozen or so Total Communication programs intent on improving their stewardship of the oral communication and reading skills of hearing-impaired children have introduced the use of Cued Speech for teaching spoken language, while continuing the use of some form of signed English for communication and interaction. The Board of Directors of the Alexander Graham Bell Association on October 29, 1983, approved a resolution recognizing "...the method of Cued Speech is to be that of an adjunct to oral communication...". Included in the resolution were expressions of concern that the method "...be considered for use only with those students whose residual audition does not provide adequate information..." and that "...the long-term use of Cued Speech has not been tested in terms of removing the information set of cueing, in order for an individual to receive information only through the avenues of speech-reading and the auditory mode." This guarded recognition is indicative of increasing realization among oralists that more hearing-impaired children should develop good oral communication and language skills, and could, if provided additional support by a system designed to do so. Likewise, the move toward use of Cued Speech in Total Communication programs, though still only a beginning, is indicative of increasing recognition that most hearing-impaired children could and should develop better oral communication and language skills, even in programs using signs.

References
Nicholls, Gaye H. Cued Speech and the Reception of Spoken Language. A thesis submitted to the Faculty of Graduate Studies and Research, School of Human Communication Disorders, McGill University, Montreal, Canada 163 pp. 1979.
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