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ABSTRACT

Presented are 22 papers given at a 1975 symposium on language and communication research problems with the deaf. Major papers have the following titles and authors: "Manual English--What We Know and What We'd Like to Know" (G. Gustason); "Communication with Foreign Deaf Signers--Attitudes, Experiences, and Observations" (R. Battison and K. Jordan); "Comparing the Intelligibility of Shared and Foreign Sign Languages" (K. Jordan and R. Battison); "The Eyes Have It--Linguistic Function of the Eye in American Sign Language" (C. Padden); "How Prelingual Deaf People Attain Command of the English Language" (R. Sutcliffe, B. Kannapell, F. Turk, A. Shuart, and R. Nomeland); "The Deaf--A Minority and Its Language" (J. Mitchell); "Factors Relating to Interpreter Proficiency" (L. Riekehof); "Research on Foreign Sign Languages" (J. Woodward and S. DeSantis); "Research Needs Regarding Development of Language Models in Hearing Impaired Persons" (O. Cornett); "A Preliminary Analysis of Correlates of Language Development of Hearing Impaired Children" (H. Bornstein); "Communications Comprehensions as Measured by the New Stanford Achievement Test" (B. Grant and C. Petty); "Within Speech Masking" (S. Reviole); "Within Speech Masking Effects in the Elderly Hearing Impaired" (R. Quinn); and "Arts as a Medium of Communication" (E. Bergman). (DB)

Proceedings of the Second Gallaudet Symposium on Research in Deafness

Language and Communication Research Problems

October 30-31, 1975

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WELCOME AND PREFATORY REMARKS

Clarence M. Williams
Associate Dean for Research

Again, for the second time, good morning ladies, gentlemen, friends, colleagues, and co-workers!

I welcome you to the second Gallaudet Symposium on the Role of Research and Language and Communication Research Problems. As you no doubt know, this is the second of a series of three symposia. The first symposium was on the Role of Research and the Cultural and Social Orientation Problems of Deaf People. You must also know that the proceedings of the first symposium has been published recently. If any of you did not receive the proceedings, please give your name and college address to Ms. Allerton today and she will send a copy to you. The third symposium will be held on January 21st and 22nd.

Last June I said that I believed that one aim of a meeting like this should be to bring out into the open all of our questions, ideas, and problems about and with research. I then spoke of our need for a research plan so that better allocations of our resources can be made. Next, I briefly described the three areas of research needs I had gotten from reviewing the research literature for the past year or two. These three symposia have been organized to get as much Gallaudet participation as possible so that we can begin to identify, with your help, the critical research problems in those areas. After that has been done, I plan to convene a National Deafness Research Advisory Committee here and have them look long and carefully at the problems and help us select and order them. Sometime in this coming winter or early spring, then, I hope to have a comprehensive listing and description of the most important research problems in these three areas and a selection and ordering of the most critical ones. It should be pointed out that the three areas are broad and practically any reasonable problem of sufficient merit can be subsumed under one of them.

One feature of this symposium is the inclusion of discussion times. Each half day will finish with a 30 minute discussion during which I hope you will all join us in trying to identify the critical research problems which have been raised in the presentations. To the extent you do join us, we will succeed. Thank you.

MANUAL ENGLISH - WHAT WE KNOW AND WHAT WE'D LIKE TO KNOW

Gerilee Gustason
Education Department

Although the concept of adding "formal" signs to the signs used by deaf people in an attempt to represent manually the language spoken by hearing people goes back at least as far as 18th century France, the first major publication in the United States of a work attempting to represent American English manually came in 1971 with the publication of David Anthony's Seeing Essential English. Since that time four years ago, interest in representing English manually has mushroomed. Presently there are four major published systems:

Seeing Essential English;
Linguistics of Visual English;
Signing Exact English; and
Signed English.

Of these four, the second had only a small-scale publication and is no longer available. Other systems in use today, such as the Washington State book Introduction to Manual English, draw heavily on the above publications and on traditional signs. In the summer of 1973, the Department of Education at Gallaudet sponsored a two week institute that brought in principal developers of each of these four systems to explain their principles and included work on sociolinguistic theory and the principles of American Sign Language. Papers presented at this institute were published under the title "Recent Developments in Manual English." The differences among these manual English systems relate chiefly to the degree of their acceptance or rejection of traditional signs, their degree of dependence on a "root word" sign, and the extent of their use of word endings such as -ing, -ment, -ness.

However, the basic problem attacked by them all is the same: how best to present language to a small deaf child. Since approximately 90% of the parents of deaf children are hearing, and since English is the language spoken by the majority of these parents, the provision of a manual, visual means for parents and teachers to convey the language they are speaking seemed likely to win more acceptance than the insistence that these parents and teachers learn to use fluently the signs and structures Louie Fant has labelled American Sign Language.

The interest in manual English may be exemplified by the fact that in two years 35,000 copies of Signing Exact English were sold. This does not include figures for Seeing Essential English or the Signed English storybooks. This interest has coincided with a rising interest in both Total Communication (according to the Office of Demographic Studies, some 1/3 of

all programs now state they use total communication), with a growth in the study of American Sign Language (numerous studies have been done in such places as the Salk Institute in San Diego and Gallaudet's Linguistics Research Laboratory and the publication of Sign Language Studies by the LRL provides reports on other studies,) and with a growing feeling of need for deaf adults to speak out, to participate in decisions concerning education of the hearing impaired. As a result, several areas have become thorny:

1. The interest in signing English exactly has led to the proliferation of new signs, often invented by hearing people with little or no experience with American Sign Language, and a resultant call for standardization which has produced publications in Illinois and Texas and the establishment of a special committee of the Convention of American Instructors of the Deaf to look into the matter;

2. There is an ongoing debate over who has the authority or expertise to decide on sign, with the often-heard statement that usage by deaf people will decide in the long run and avoidance of decision on current problems or conflicts;

3. Interest in the sociolinguistic study of American Sign Language and the concentration on how to teach and learn it has sometimes resulted in polarism between those who advocate such study and those who work in an educational setting with manual English, ranging from statements about ASL weeds and Manual English flowers to the publication of misinformation on Manual English systems;

4. The attention of linguists has primarily been from sociolinguists, whose interest lies in describing what is used by native speakers and so focuses on American Sign Language, rather than from psycholinguists. who could give greater attention to language development in children; and

5. Deaf adults are too often not involved in work with manual English, with the result that those who already understand English well see no need for "that stuff" while those who have poor English may have no formal introduction to new signs and often do not understand them. This results in a view of Manual English as "another" creation of "the hearies" against the wishes of deaf people whose sign language is being tampered with.

Caught in the confusion are teachers of sign language classes and their students, who are now faced with the necessity of defining what kind of signs they are teaching/learning, and why, and a growing need to cover more than just sign vocabulary. Developments have been so rapid, however, that many teachers of sign classes have been unable to keep abreast of these developments, and so cannot adequately explain either American Sign Language or Manual English.

Perhaps the most recent development is a bilingual approach, emphasizing the deaf child's right to all forms of sign language: natural gestures, American Sign Language, the signs used by deaf adults in his community, and English. With this bilingual approach, however, have come new problems:

1. Which language is the "native" language to be used/taught first with children?

2. How effective is the use of either language in the development of English skills?

3. Does manual English overburden the child -- should a simplified version be used at an early age?

4. How can the polarism of the two language communities -- American Sign Language and manual English -- be alleviated?

5. In teaching sign language to adults -- parents or teachers -- which language should be taught first?

Research has only begun on problems such as these. Kathleen Crandall, of NTID, did a study of preschool children, finding that children whose parents used manual English picked up English structures and inflections comparable to hearing children, though a bit later.

A survey is now in process of schools and classes for the deaf to attempt to get a picture of what is used where and to what extent in communicating in the classroom.

Many other studies are needed. Until more of them are done, the problems will remain largely theoretical. And great care will need to be taken if "pure" studies are desired, for one must remember that because a program is labelled total communication or Ameslan or manual English does not make it so. Don Moores, in his longitudinal study of preschool programs, pointed out that "Most teachers in combined programs did not consistently use Signed/spelled English in coordination with the spoken word. The signed or spelled element frequently represented key words and not full sentences." And many who say they use Ameslan are in reality using traditional signs in English word order -- signed English.

Problems and questions are legion. Research has just begun.

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COMMUNICATION WITH FOREIGN DEAF SIGNERS: ATTITUDES, EXPERIENCES, AND OBSERVATIONS *

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What we examine in this study is the global and international nature of sign language. We shall examine briefly some popular beliefs or myths about sign language in the world, formulate some questions for study and research, and present some of our own research findings relevant to these questions.

We will only deal with some very basic questions about the nature of sign languages used here in the U.S. and in other countries. We will certainly not exhaust the topic, since our own investigations are limited in scope and duration, and are still continuing.

Popular Beliefs

There are two related popular beliefs about sign languages on a global scale: 1) Sign language is the same throughout the world; 2) Deaf signers everywhere have no difficulty understanding each other. Naturally if the first statement is true, the second must be true also, but not vice-versa. What we would like to do is break down both these beliefs into statements which can be shown to be true or false.

But first, how do we know that people believe these things? Directly and indirectly, it is evident from the things people write and say when they discuss sign language. A very observant writer of the 19th Century, Garrick Mallery, even stated that the sign language of Indians and of deaf people and everyone else "constitute together one language--the gesture speech of mankind--of which each system is a dialect." (1881:323)

Another 19th Century writer, Berthier, who was deaf himself, made a statement typical of his time: "For centuries scholars from every country have sought after a universal language, and failed. Well, it exists all around, it is sign language." (1853:5). Even in very recent years, scholars such as Margaret Mead (1973, 1975) have made proposals that sign language could become a universal language for all of mankind, although no concrete analyses or proposals have ever been made.

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* This study was made possible by grants from the Gallaudet Office of Research and the Linguistics Research Laboratory. We would also like to acknowledge the very able assistance of David McKee, Joe McLauchlin, and Carol Padden during the collection of data.

There is also abundant evidence that deaf signers themselves believe in the universality of sign language, or at least its potential to easily become universal. For instance, there are many stories circulating among deaf people regarding communication with foreign signers. The main elements of these stories seem to be that: 1) Deaf people communicate with deaf foreigners better than hearing people with hearing foreigners; 2) Deaf people throughout the world are united by one basic sign language; 3) Sign language will eventually become a world language for everyone, both deaf and hearing.

Issues

Of course, there are also stories which contradict these beliefs, and this is one of the things that initially provoked us into the present study. After considering the many things people say and write about the issue, we formulated a basic set of questions:

1) Do deaf people around the world use the same signs?

2) Can signers understand each other's sign language?

3) Can signers from different countries communicate with each other even if they do not know each other's sign languages?

4) Do signers have a clear idea of the separateness of different sign languages, or do they feel and act as if they are all the same?

5) What attitides do people have about their own sign language and about foreign sign languages?

While some of these questions seem to overlap, the distinctions will become clear in the discussion which follows.

Method

From a number of sources, we began to collect information on interaction with foreign signers, including:

a) interviews with both American and foreign signers about their own language background and experiences;

b) our own observations of, and participation in, sign conversations involving American and foreign signers;

c) videotaping of unstructured conversations among foreign signers;

d) a referential communication experiment, a preliminary report of which can be found in the proceedings of this symposium (Jordan and Battison).

Most of these activities took place in July and August of 1975, when several thousand foreign deaf signers visited Washington, D.C. in order to attend the 7th Congress of the World Federation of the Deaf (July 31 - August 8, 1975). We also had ample contact with foreign students attending Gallaudet College, and with Americans who had travelled abroad, or who had interacted with foreign signers during the W.F.D. meetings. Whenever possible, the longer interviews were videotaped.

A total of 53 interviews were conducted with people from the following 17 countries:

Australia	India
Canada	Italy
Denmark	Malaysia
Finland	Mexico
France	Poland
Germany	Portugal
Great Britain	Sweden
Hong Kong	U.S.S.R.
	U.S.

Findings

The first question, on the uniformity of signs throughout the world, is rather easy to answer, because there is a lot of published information on the specific individual signs used in various countries. Some of the many available dictionaries include: American (Stokoe et al., 1965); French (Oléron, 1974); Australian (Jeanes et al., n.d.); British (British Deaf and Dumb Association, 1960); Swedish (Bjurate and Nilsson, 1968). From examining these dictionaries it is evident that there are a great variety of signs used by deaf people to denote the same thing. Signs are not uniform or universal throughout the world, nor are they necessarily standardized within many countries.

One detailed example we can offer to show this variety is from a comparison of French and American signs done by Woodward (1975). He compared a recent French dictionary (Oléron, 1974) to current American signs.

One would expect a high correspondence between French signs and American signs for two reasons; 1) French and American Sign Language are historically related--they share a common ancestor; 2) Oléron purposely chose for his dictionary those signs which are most easily explainable in "iconic" and "pictographic" terms (Woodward, personal communication), and thus one would expect that the correspondence between American and French signs would be maximal, since with the more "iconic" signs there would supposedly be less chance of arbitrary symbolism entering into the signs. What Woodward found in his comparative study was that, in spite of these two conditions (historical relations and iconic signs),

there was only 26.5% shared vocabulary. That is, only 26.5% of the French signs were highly similar or identical to the American signs.

Let us take up the next question: Can signers understand each other's sign language? From our interviews with Americans and foreigners, we got a range of self-reports on communication with members of other deaf cultures:

1) A German actor (whose company performs in mime, not any variety of German Sign Language) complained that one of the reasons they could not perform a stage show in their own sign language was that they would not be understood when they travelled to other German cities.

2) A young woman from Lyons reported that she refuses to visit Paris without her friend, who has been to Paris more often and understands the language better. Lyons and Paris are 250 miles apart.

3) A standard story, repeated by travellers and natives alike, holds that if you travel 50 miles in Britain you will encounter a different sign language that cannot be understood in the region you just left.

4) An Italian and a Pole who have both travelled widely were in a casual conversation with five Americans. They made no attempt to imitate or use American signs, they stated flatly that they did not understand American Sign Language, and they relied the entire time on a well-travelled American who knew many European signs and the international signs devised by the World Federation of the Deaf.

5) From Swedish, Danish, and Finnish informants we learned that the four Scandinavian countries have separate sign languages, but that people from Sweden, Denmark, and Norway have learned many of each other's signs and can understand each other with only moderate difficulty. On the other hand, interaction between Danes and Finns frequently requires the use of an interpreter.

6) An American reported that when he was with the Israelis during the W.F.D. meetings, "They signed so fast, I felt like I was hearing!"

7) Both an Australian learning American signs and a Dane learning Finnish signs reported that their comprehension of the new language exceeded their abilities to express themselves correctly in it. The Dane said, "After many visits, I can understand it with almost no problem, but can't sign it myself." The Australian reported, "I don't feel comfortable using ASL; I can understand, but not express myself."

What we can conclude from these reports and many others like them is that:

a) Not only do people use different signs in different parts of the world, they are largely unintelligible to foreign signers;

b) Geographical boundaries of sign language intelligibility do not always correspond to the boundaries of spoken languages. While many of the deaf in Scandinavia can understand one another with only moderate difficulty, we also have the opposite situation, where cities or regions within small countries (e.g. England, France, Germany) determine linguistic boundaries;

c) As with spoken languages that are learned informally (outside of a classroom) comprehension of a new sign language surpasses correct expressive usage of that language.

Now we shall take up the question of whether deaf signers can communicate with each other, and, if so, how?

Most of our informants, particularly the Europeans, say that communication with foreign deaf people is not a large problem. Depending on past experience and amount of interaction with foreigners, most people say that after two or three days they can understand each other fairly well.

This does not at all contradict the previous findings that sign languages are unintelligible to foreigners, because, when asked specifically about how they communicate with foreigners, many of them say specifically that they stop using their own sign language and start using mime and gesture. Other features of the communication are that it is slower than signing, very repetitious, and involves a lot of back-and-forth bargaining and checking about the meanings of various signs. Gradually, a shared meaning for various signs emerges through the conversation.

The general consensus of our well-travelled informants was that this type of communication is a skill than that can be improved with the experience of a great deal of foreign interaction. The communication may be augmented by other means; e.g. using agreed-upon international signs; fingerspelling words from a spoken language; gesturing and miming; speaking occasional words which are thought to be well-known.

In this preliminary report we shall not attempt a detailed description of how these cross-cultural communications take place, but we would like to consider briefly the factors of topic, situation, and motivation.

Many contacts between deaf foreigners take place when people are travelling, and are, therefore, concerned with the basic necessities of food and shelter. Also, when meeting foreigners for the first time, there is customarily much basic personal and social information exchanged--Where are you from? What do you do? Are you married? How many kids? Where are you going next? In other words, there is a high expectancy that certain topics will come up again and again before interaction is allowed to move to more intimate or less superficial interaction.

Motivation is higher in these interactions, partly because when one is tired, cold, hungry, or bored, one tries very hard to alleviate these situations by establishing communication with those who live in the areas, and with those people one can feel close to (i.e. other deaf people).

A consensus among our informants was that it was difficult to discuss very weighty or "deep" subjects with foreigners. Politics, religion, and philosophy were difficult, while travel, food, schools, jobs, family, and entertainment were much easier. Also, it was much easier to discuss things one-on-one than in a group.

Another motivational factor which may contribute to successful communication is the patience and perseverance of deaf people, most of whom are very used to dealing with weak communicative situations involving hearing people.

Moving to the fourth question: Do signers have a clear idea of the separateness of different sign languages, or do they feel and act as if they are all the same? Most of the evidence says they do keep languages separate, in spite of the fact that a terrific mixing takes place when in contact with foreigners.

The first type of evidence involves people who move to a different country. By all reports, these people forget their own signs rapidly as they acquire the sign language of their new country. We can report only one exception to this, a Finnish woman who moved to Denmark. Other foreigners in Denmark were surprised that she retained her native Finnish Sign Language.

It is interesting to note what happens when one of these expatriates has visitors from his native country. All of them report that they have difficulty readjusting to their first language (even when it is their native language learned from deaf parents), and that it takes several days of interaction with their guests before they begin to feel normal. They also report that they can understand, but not express themselves very well in these situations.

Another type of evidence which shows that signers are capable of keeping their languages separate is what happens when a multilingual person mistakenly substitutes one language for another. We can illustrate this with a very curious event: Two Finns, a Dane, and an American were travelling in a car. The two Finns were father and

daughter and were having a conversation in Finnish Sign Language. The Dane was multilingual and attempted to interpret from Finnish to American signs for the benefit of the American. However, in the confusion he started signing to the American in Danish Sign Language, and went on like that for a minute before the American stopped him and asked him to interpret into a language he could understand!

Attitudes

Finally let us consider attitudes toward language. Since most of our material on attitudes is from European signers collected during a three-week period, please bear in mind that these generalizations are not without limitations.

Europe consists of many small countries whose deaf people interact extensively through travel and emigration. The United States is large, relatively homogeneous, and linguistically isolated from the rest of the deaf world. Possibly because of this isolation, deaf Americans seem to mirror the language attitudes of the American hearing majority culture. This involves ethnocentricism, language chauvinism, and linguistic naïveté.

Europeans claim that Americans are rigid and inflexible in their language and hard to understand. One deaf couple from Europe had to resort to paper and pencil to communicate with deaf people when they first arrived in the U.S. They could make themselves understood, but could not understand the Americans when they signed, because they did not change their language or slow down at all.

There were several reports of American students being surprised that foreigners had different sign languages, and also surprised that deaf people needed interpreters to go from one sign language to another. When asked how foreigners communicate with each other, American students would describe their communication with labels like: home signs; all pictures; basic gestures; mime; or poor sign language.

Europeans who knew about these American attitudes suggested that the Americans were not judging them on their own national sign languages, but on the gestures and mime that they themselves used when communicating with foreigners.

To emphasize how language-related attitudes can affect cross-cultural interaction, we offer the following story of two foreign deaf students at Gallaudet College. Although they came from two separate countries, they had very similar backgrounds. Both were profoundly deaf, had deaf parents, and were native signers of their own national sign language. They learned English before arriving in the U.S., and had a good command of written and spoken English. Possibly because of this prior knowledge, and possibly because they learned American signs in a classroom, they used American signs with English syntax, just as most hearing

people do.

As a result, the other students thought they were either hearing or orally-oriented. The American students were not willing to believe that they had deaf parents, because they did not sign like the children of deaf parents should. Because of this suspicious behavior, one of the foreign students was briefly ostracized and falsely labelled as a narc (narcotics agent).

Mistaken identity worked the other way, too. In spite of the fact that they had been signing all their lives, several foreign students said they could not distinguish deaf Americans from hearing Americans on the basis of their signing, for the first six months or so.

For the European visitors during the W.F.D. Congress, America was full of pleasant surprises, too. Most of them were awed by the fact that people from California could really understand people from the East Coast without any problems, and that the U.S. had a truly national sign language. Many people from the European drama troupes, all of whom perform in mime, dance, and gesture, were astounded at the National Theater of the Deaf's performance in American Sign Language. Several of them had commented previously that a play in real sign language would be impossible to stage. And finally, several Europeans commented on how well sign language was accepted here in the U.S.--it was used in the schools, hearing people learned it, and deaf people could sign on the street and not feel ashamed. These people were surprised, since it contrasted with their own experiences in their own countries.

Conclusions

We have established and examined a number of questions relating to sign language communication between deaf people from different countries. From personal interviews and observations, we can suggest partial answers to some of them.

From examining some of the many sign language dictionaries available, and from our records of communication with foreigners, we do know that signs vary considerably from country to country. This much is not in dispute.

From the personal reports of foreigners and American travellers alike, we know that sign languages are not understood by signers who are not familiar with them.

From these two findings alone, we expect that the question of the universality of sign language will be put into a different, more restrictive perspective. The fact that deaf signers can and do communicate despite not sharing the same sign language is interesting, and bears more investigation. While being skilled in sign language prepares one for dealing with mime and communicating in difficult cross-cultural situations, the two should

not be confused. We need more information about the limitations and potential developments in communication between two foreign signers. We also feel there is a need for intensive linguistic investigation of national sign languages everywhere.

COMPARING THE INTELLIGIBILITY OF SHARED AND FOREIGN SIGN LANGUAGES

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and

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A great deal of research has been done by psychologists and psycholinguists in the area of communication accuracy or intelligibility. Simply, intelligibility is a measure of how well a receiver can understand the communication of a sender. In order to arrive at a precise measure of intelligibility, communication researchers have made extensive use of what is known as a referential communication design. First used by Carroll, and used most notably in the work of Krauss, Glucksberg, and their associates, a referential communication setting is a situation in which one person (the sender) describes a specified referent to another person (the receiver). Because the referent is known to the experimenter, a measure of intelligibility is very simple and straightforward. If, after attending to a sender's communication, a receiver can identify the correct referent from among others, the communication is said to be intelligible.

Referential communication settings have been used successfully by researchers studying the sign language communications of deaf individuals, from young, school age children to linguistically adult adolescents. Most frequently, the referents which have been used with deaf subjects were either photographs or drawings. These types of stimuli allow for a great deal of control while, at the same time, maintain a real lifelike aspect to the communication task. Previous work by one of the authors has shown that the less artificial the stimuli are, the more willing subjects are to "play the game," and the more confident the researcher can be that his subjects are, in fact, trying to communicate to one another.

The investigation reported here was designed to compare communication accuracy (or intelligibility) within and between various national sign languages. One major impetus for the study was the knowledge that while there is no natural, universal sign language,

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* A more complete report of this study will appear in Sign Language Studies, Linstok Press.

+ This study was made possible by grants from the Gallaudet Office of Research and the Linguistics Research Laboratory. We would also like to acknowledge the very able assistance of David McKee, Joe McLauchlin, and Carol Padden during the collection of data.

it is often reported that deaf people who do not share the same sign language can communicate with each other much more easily than two hearing people who do not speak the same language. While this is anecdotal in nature, it does resolve itself into a readily testable question: How well do signers of one country understand signers foreign to them? In order to test this question, a referential communication setting was used.

METHOD

Subjects. Subjects, both American and foreign, were deaf individuals who had used sign language as their primary means of communication since early childhood. All American Ss were prelingually deaf, and foreign Ss had all been deaf since childhood. Foreign Ss were recruited from among visitors to Gallaudet College during the World Federation of the Deaf in August, 1975, and American signers were recruited from the Gallaudet community and included both students and staff.

Stimuli. The referents were 3 1/2 x 5 inch black and white photographs presented to the subjects in six 36-picture arrays. There were arrays of cars, chairs, and of a group of three people. These photographs contained an unspecified number of cues, and those features which were critical for distinguishing one from another were not defined or highlighted for the Ss in any way. There were two car arrays and one chair array.

The people arrays were made in a very carefully controlled setting at the University of Maryland Television Studio. For all the pictures, background cues were constant, and critical features were specified by the experimenters. There were three 36-picture arrays of people, one with two critical features, one with three critical features, and one with four critical features.

Once the pictures which were to go into the arrays were decided upon, they were arbitrarily numbered 1 through 36, and were fastened to two display boards. For one board, the pictures were ordered numerically, and for the other board the pictures were in a different, random order. Thus, the position of a picture on the display board carried no information, and could not be used as a clue between Ss. Since the arrays were carefully constructed to be as homogeneous as possible, two target pictures (i.e. those pictures which were to be communicated) were chosen at random from each array. In sum, then, there were six 36-picture arrays, for each S, two of cars, one of chairs, and three of people, with two target referents from each array. While the location of the pictures were different on the two arrays, the 36 photographs were exactly the same for both Ss.

Procedure. For the communication task, subjects, who were run in pairs, were told the nature of the experiment and were then instructed to describe each photograph the experimenter (E) gave them "well enough that your partner can find it." Ss were seated where they could see each other clearly, and the sender (i.e. the S who described the picture, S) could also see the array by simply turning his head. During the entire communication, the receiver's (i.e. the S who received the description, R) array was covered, to avoid the possibility that he might be distracted.

The session was divided into six trials of 2 photographs each, with each subject acting alternately as S and R. The first car array was used as a practice trial to be sure the Ss understood the instructions (this step being especially important for the foreign Ss). The sender was given a target picture, and was told to find the matching picture in the array. When S had matched the picture, E indicated that he was correct and could begin his description. Sender then described the referent to his partner, and his description was recorded on videotape. When S indicated that he had concluded his description, E uncovered R's array and R attempted to locate the correct picture. The picture chosen by R and the length of time required to make the choice were recorded. S and R then reversed roles, the former R now communicating the second target picture from the array. The Ss were told whether they were right or wrong only for the first two practice pictures. On subsequent trials, E gave the Ss no knowledge of their results. Ss continued acting alternately as S and R until all 12 referents had been described, then were debriefed and the experimantal session was concluded.

At the conclusion of the first condition (the live communications between Ss who shared a language) the videotape of the best S pair from each of 6 languages was selected for use as the stimulus tape for Ss in the video condition. When a given language had two or more videotapes which were equal in communication accuracy that tape in which the descriptions were most concise was used.

In the videotape viewing condition, subjects were again told the general nature of the experiment and were told further that the tape they would see would show some signers describing pictures to each other. The Ss were told that their role was to try to locate the correct picture. If the Ss were to view a videotape of a foreign sign language, they were warned that the communications would be in something other than their own language, but they were told to try to understand as much as possible, and to select a picture based on what they understood.

The experiment was run the same way as in the live communication condition. Of a total of twelve pictures, the first two were practice trials to ensure that the instructions were understood. The pictures chosen and the time required to make the choice were recorded.

RESULTS

Communication accuracy. The first data analysis done was a simple tabulation of errors in the referential communication condition. While the Ns are very small, there seems to be some evidence, that for this task, there were accuracy differences among languages. For the ASL users (N=12), the range of errors was 0 - 5, with a mean of 2.5, and, for the French sign language users (N=6), the range of errors was 4 - 8, with a mean of 5.67. The Danish and Hong Kong Ss (N=2) descriptions all included only one error per session, one Italian S pair made 3 errors, and a Portuguese S pair made no errors. One very interesting finding is that the vast majority of the errors were made in descriptions of the people arrays. Since the people arrays have a clearly specified number of critical features, it is easy to review the tapes and note whether any of these features are omitted. (It is easy with the ASL tapes! With the end of the WFD, our access to foreign Ss and/or judges diminished very suddenly.) Often, this was just the case. S sometimes included two of three features (along with some unnecessary information) and R did not have sufficient information to make the correct choice, whether or not he understood S. At times, it became clear even with foreign Ss that only one critical feature was missing. For example, in a Danish session, R began to scan the array after receiving the description and almost immediately signed "book" and shook her finger at S. She then narrowed her choices down to the three pictures which contained all correct critical features except the location of the book and guessed--incorrectly.

Communication length. One factor which influences communication accuracy is length of communication. The communications of S pairs who made the most errors seemed to be either very long or very short. A correlation between the length of communications and the number of correct choices yielded an r of .45. A careful examination of the data showed that in the American tapes, there was a great deal of unnecessary information included in many of the longer descriptions. Among the foreign tapes, however, those which were most accurate seemed to be consistently longer. It will be interesting to further analyze the content of the foreign tapes.

Videotape condition. Communication accuracy scores for Ss who viewed videotapes of communicators with whom they shared a language were very high. For American Ss, the range of errors was 1 - 4 with a mean of 2. One Italian S made 3 errors (interestingly, he missed all and only those which the original S pair mis...), and Hong Kong viewers errors ranged from 2 - 5 with a mean of 3.5. It appears that the videotape descriptions carry enough information for Ss who watch their own sign language to locate the correct referent.

When Ss were asked to view videotapes of sign language, which were foreign to them, measures of communication accuracy dropped

drastically. Across languages, the range of errors was 3 - 10 with a mean of 6.29. One interesting analysis looked at the percent correct for the individual referents, across Ss. The percent correct for those who shared a language was higher for every single referent than for those who viewed a foreign videotape. A sign test yielded a probability value of less than .001 (see Table 1). While this is a very rough measure, because it includes all languages, it shows clearly that the viewers of their own sign language performed much better than viewers of foreign sign languages.

Self report. During the debriefing, Ss were asked to identify which of the stimulus types they thought was easiest to describe and were also asked to estimate how accurate their communications were, i.e., how many correct choices they made. Self reports were very accurate, people who acted as Rs know when they had enough information to make a correct choice. Often the Ss estimate of how many he got correct was exactly right. A correlation across Ss of self report with the actual communication accuracy measure resulted in $r = .88$. In the videotape condition, self report was again positively correlated with the actual number correct, ($r = .65$). The lower correlation coefficient can be explained by noting that Ss who viewed videotapes consistently underestimated their accuracy rate.

Subjects were also very accurate in their perception of which referents were most difficult to communicate. The people arrays were consistently ranked hardest, and as we have said, most of the errors were made among these arrays.

DISCUSSION

The most clear-cut result at this point seems to be simply that deaf signers can understand their own languages better than they can understand languages foreign to them. While this seems to be a very simple and uncontroversial finding, it is clearly at odds with the often made contention that sign language is an universal, iconic gesture system. Evidence of how difficult it is to understand a foreign sign language comes from the interviews during the debriefing of Ss. The majority of American Sign Language users, who viewed foreign videotapes, found it a very frustrating task. Often, the Ss remarked that they knew they were watching sign language, and they felt that they were always on the verge of understanding, but could never quite really understand. We think it especially interesting to note that even while these stimuli often lend themselves very easily to mime and gesture, senders seemed to use mime and gesture only when it was easier to do so than to sign. In later analyses, it is possible to see in the American videotapes how much of each communication is real signing and how much is gesture. Americans

who viewed foreign videotapes were asked how much of the description they thought was gesture. Often, they replied that the gestures were only part of the desicriptions which they could understand.

One very interesting finding during the study has been the occasional S who claims to be naive about a particular foreign sign language and then performs very well. One such S was a Frenchman who had been in the United States for only a few days. He viewed the ASL videotape, and made only 3 errors. When asked to estimate how many he correctly identified, he said he knew he got five right. He clearly was not guessing, but it was very clear from his conversation with us that he had a difficult time understanding American signers. An Australian S also did extremely well viewing a Danish videotape. He made only four errors, and among the four errors, two were chairs, usually among the easiest referents. This particular S was a well-traveled individual who, during the debriefing, said that he felt he could adapt to new sign language very well, and he had done so often in the past.

These are some preliminary findings from research which is ongoing. Data gathering is continuing on a regular basis with American Ss and on an availability basis with foreign Ss. In addition, data, which have already been collected, will be subject to further analyses.

Referent		Shared Language Percent Correct	Foreign Language Percent Correct
	GC 8	40	3
	15	60	29
	CH23	60	52
	24	80	34
	BC32	100	47
	1	80	58
P3	16	80	24
	36	80	26
P1	23	40	32
	31	100	32
P2	2	80	39
	29	40	34
		(N=15)	(N=38)

Table 1. Percent correct values for each referent, across languages, for the videotape condition.

WHAT ABOUT PRINT MEDIA?

Jack R. Gannon
Director, Alumni/Public Relations

When I think of "Language and Communication," I think of writing skills and information sharing. This leads me to ask: What about print media? How can it be used to develop better language skills and improve communication among deaf students and deaf adults? In using the term print media I am particularly thinking of all the publications of and for the deaf in existence in this country.

Close to 500 newspapers and magazines have been published for and by the deaf community in this country. The earliest newspaper was known as the Canajoharie Radii which appeared in 1836 or 1837. It served both deaf and hearing readers and was later renamed The Deaf-Mutes Journal. Thus began a long line of publications of the deaf.

Today there are about 225 publications in existence. This includes both school publications and publications of the deaf community. I would estimate their combined circulation at around 100,000 and their readership of probably 135,000 to 150,000.

School publications got their start in the mid 19th century when the schools acquired presses and some type and began teaching printing. Those early publications were often masterpieces of craftsmanship, and it is no surprise that so many deaf persons entered the printing trade. With the advent of photo lithography (offset printing), a method which makes the whole process much easier, quicker, and opened the doors to creativeness, it is rather ironical that the quality of a majority of these school publications declined!

Lithography has been a blessing to the deaf community, however. This inexpensive method has made it possible for many deaf communities to have their own papers. These publications range from religious publications to sports publications to general publications with the latter being the most popular. These general publications cover the happenings of the local community like a letter from home. They tell about marriages, births, vacations, new cars, misfortunes, sports events, and who won the bowling prize money. One could probably write a respectable history of the local deaf community based on the information found in these publications. And, don't knock this type of news. It's the same type of journalism which sells weekly newspapers!

How well are these publications read and enjoyed by the average deaf subscriber? To the best of my knowledge, a study has never been made to determine the type of consumption these publications receive from deaf readers. How well does the average deaf reader

understand and how much does he learn from the information appearing in these publications? I think this is an important question because without such answers we are running up a blind alley. I recall one editor who told me that an irritated subscriber cancelled his subscription because the editor used too many big words. And another editor recalled in jest the reader who thanked him because the reader's name had appeared seven times in a certain issue! This made the editor stop and wonder if the reader had simply looked for his name and not bothered to read the news. The point I am trying to make here is: With all the time, labor, and money going into all these productions, what are we getting out of them? They have a very important purpose, but are they achieving their objectives? Could we at Gallaudet College help them do a better job? How could we use their publications as a learning vehicle for their benefit presented in such a way they would enjoy it?

Is there a way to build on the success of the school publications and create a love for writing among our students who have a language handicap? With so many publications you'd think we would have an abundance of writers. But we don't. Why? Let me cite an example which I am afraid is rather typical:

Scene I. It's Class 4A's turn to write something for XSD Magazine. Johnny is thrilled to death that his news item will appear in print. He attacks the assignment with the relish of a lion sitting down to dinner for the first time in four weeks. Unfortunately, Johnny's English teacher (Mr. or Ms. Traditional English) feels the need to correct this and that and that and ends up changing everything. ("After all it's going to appear in print--you know--and it should look right.")

Scene II. Mom and Dad are casually skimming through XSD Magazine when they read the news item with Johnn's name in italics at the bottom. "Good grief or praise the Lord," they say, "that lad's English has improved overnight!" (Do you think it's total communication or oralism or cued speech or what-have-you? they wonder.)

Scene III. When Johnny comes home that weekend they praise him to high Heaven. The deaf lad says "huh?," reads the item a couple of times --probably turns it upside down in the process--and doesn't even recognize it as his news item.

With that kind of experience it's small wonder that Johnny gets turned off to writing. He decides early that writing is not his bag and shuns writing assignments as we would shun leprosy. As an editor I cringe as much as any English teacher every time I see a boo-boo (either mine or someone else's), but I cringe more at the thought of turning off another deaf kid to writing. I thought schools were for learning, and I have personally never been able to learn very much without first making a heck of a lot of mistakes.

From this experience, Johnny will probably develop a self-consciousness about his writing that will stay with him a lifetime. Yet, when he grows up we wonder why he won't write letters in support of television programs with captions or to his Congressman in support of programs for the deaf or contribute something to the local publication of the deaf!

If that example is not enough, let me cite another.

Do you recall the first time your news item appeared in print? Remember that sense of pride you felt? Remember how nice your name looked in printed form. No matter how many times you read it, remember how creative and wisely-worded you thought your news item was which began: "Last Saturday afternoon the "B" boys and I went to town . . ." Even after you learned later that that particular sentence has probably appeared in print a trillion times before, it still did not tarnish that glow of achievement.

How can we develop that glow of pride in other deaf students? How can we turn them on to writing instead of turning them off? How can we use our publications as a learning experience? As a reward? As a means of encouraging greater efforts? How did pre-lingual deaf people like Leo Jacobs, Vic Galloway, Frank Turk, Barbara Kannapel, and others succeed in mastering English where others failed? What's their "secret?"

And there are other areas we need to explore. What about teletypewriter news programs? As you may know the College Public Service Programs has a TTY news program with 12 schools. Each week classes in these schools tune in to the program and learn about the latest news events. How can this program be expanded and developed further to encourage language acquisition and close the information gap? How can these programs be expanded to reach a greater number of deaf adults?

Finally, there's captioned television programs. Out-of-state deaf visitors who come to my office and see our UPI news program just stand there drooling. I know a lot of red tape is involved but we simply must find a way to make these programs available to the deaf community. We must explore the possibilities of Cable television and make better use of public service time which is available on UHF channels.

They say tomorrow's newspaper will be in the form of a cassette. You plug it into your car dashboard, and as you drive to work you learn about all the day's news events. Good for you--if you can hear. But what about us deaf folks? (Of course there are those non-believers who say it won't happen. They argue that you can't wrap your garbage in a cassette.)

But the point is: Modern technology is not slowing down, it is accelerating at a rapid rate, and, as in the case of the rich who are getting richer, the hearing population hears and learns more and more and we deaf people . . .?

How can Gallaudet College work with the schools and the deaf community to use that vast gold mine of publications of the deaf to close the information gap? How can our publications, our TTY news service and captioned television programs contribute to language development?

How can these publications be used to the maximum benefit of [illegible] student? The deaf adult?

What is the dissemination of these publications and how can they be used to educate the public at large about deafness?

Just how well are we getting through to deaf people?

I wonder. If I knew the answers I wouldn't be asking the questions.

STRUCTURE AND CODES IN VISUAL COMMUNICATION

Earl Higgins
Office of Educational Technology
Film Media Unit

I would like to talk today a little about some research I am doing with deaf youngsters in their making and interpreting meaning in editing film sequences. However, I would like to preface those remarks with more general comments on communication, language, and research with the deaf.

I hold a view that does not have a particularly long academic tradition, though it has been before the linguistic and communication community in stronger appearance in recent years. This framework suggests that in almost any definition of communication that has surfaced, language is but one part of the communication act, generally within a verbal/aural mode, though not necessarily so as witnessed by sign language, and that the ways of communicating between and among people in patterning and interpreting meaning are related by common approaches. Indeed, it should seem obvious that no event stands unrelated to other events. Strategies and methods of communication are all bound up in the individual act of living and the group experience of cultural existence.

From this perspective, it is given that linguistic modes or systems for communication are infracommunicational--that is, on a level epistemologically below that of communication. Most might agree that, in the case of the deaf person engaging in sign language, nonverbal elements of body movement described by Birdwhistell, spatial relations studied by Hall, the facial orientations and expressions initially worked on by Darwin and more recently publicized by Ekman are all bound up within the communication act, a term borrowed and adapted from Hymes and the sociolinguists who are also involved in describing the multichannel, multilevel interrelationship of modes and systems within the communication environment. It seems particularly appropriate to hold a research symposium at Gallaudet on language and communication, for it has been partly through the work with deaf people in language acquisition, ASL research, and studies in cognitive development that more and more people have become aware of the complex relationship of modes and systems in communication.

If this framework is adopted, and I do not see any reason for our purposes that we cannot at least try it, then it seems to me that it is of particular interest to researchers and educators working with the deaf to understand something about the nature of making and interpreting visual messages or sequences of visual events and their relationship to other symbolic and communicational systems. Here I do not mean work in the area of visual perception or acuity, though naturally such work gives information about the physical and physiological boundaries within which such messages can be created. Rather, I am talking about:

> ... a social process, within a context, in which signs are produced and transmitted, perceived, and treated as messages from which meaning can be inferred.

I borrow this definition of communication from two people, Larry Gross and Sol Worth, with whom I have worked at the University of Pennsylvania. The emphasis is on 'social,' 'process,' and the 'treating as messages for the inference of meaning.' This being the case, and this also being a television and film society in which we may all only be related some times to each other by the television set, I have started to look at how deaf youngsters sequence visual events through editing film and how they make inferences of meaning from their active sequencing of that footage. As I suggested, coming from a framework that suggests all cultural, and thus communicational, activity is interrelated has produced the hypothesis that these children will in what is somewhat of a novel situation--editing 16mm film--borrow and incorporate into their tasks frameworks and structures for making meaningful events from what other symbolic systems they have available. And what is it that they have available? First, they have grown up with American television and movies and the conventions of Hollywood narrative style, though perhaps less so than hearing kids. Second, depending upon the child's background, he or she is familiar with structures and syntax, relations between events and units, found in English. Third, the deaf child has some capability in sign, be it ASL if the child has come from a particular environment or some other form of signing. It would not seem the case that these inputs, along with general cultural knowledge of how one tells and understands a story, are mutually exclusive. One would expect that at various levels and stages of the child's work with the film, the states of creation of communication, various influences and consequently various structures will be evident. Permitting the child to create messages also tells us about how he or she recreates, or interprets, meaning in visual sequences.

Before I report some of the preliminary findings from this pilot project, I want to say something about the implications of this kind of work. They have dramatic and focused impact upon mediated instruction and the deaf student. As has been suggested by some researchers (and reported conveniently in the most recent issue of the Journal of Communication), young hearing kids do not always understand the causal string of events in television programming and consequently interpret differently from adults what has happened and the consequences of actions by TV characters. Most of this work has been directed at the effects of violence on television and the social behavior of children. However, these findings in conjunction with Piaget's, Bruner's, and other's work showing that categorization, classification, and interpretation schemes and structures change during childhood can be generalized to the interpretation of meaning of any visual event or sequence.

This kind of work briefly raises the question of the nature of visual events. One should not be confused with the belief that there exists natural and innate ways of making visual sequences, be it slide, filmstrip, movie, or painting. They all have their conventions:

their shared rules of behavior similar to languages. One can only be successful in making use of that communicational or symbolic system when the conventions are known and the rules understood. Such is the case with symbolic events, be they linguistic or visual, more or less iconic. With this background of shared patterns of behavior given, one could suggest that the deaf child, isolated from some cultural knowledge, verbal language skill, and conventions, does not come to the interpretation of visual events with the same framework or schemes as do hearing children. Unfortunately, all visual materials assume certain membership with certain kinds of experience for interpreting those materials. The deaf child might not be using worse codes or structures for communication, but ones that are not appropriate for the needs of the situation. The interrelation of aspects of culture and communication, discussed partly in the first research symposium, is pointed up. Bernstein, though many times misunderstood it seems to me, has suggested the same kind of relationship between social environment, communicational patterns and frameworks, and codes in verbal language. The analogy can be directly made to any child, deaf or otherwise, who might grow up with linguistic, communicational, or cultural systems different from those used by educators or by filmmakers.

All of this is background to what may be anticlimactic in the preliminary results I want to share with you. I have given 16mm film footage that I shot to deaf youngsters to edit and tell a story with. They were shown how to work the editing equipment, but they have never been shown my way or any preferred way to put film together. My youngest students, between 9 and 12, have just recently completed work on "their film." They have made only minor editorial judgements in many cases and have constructed sequences that show two people meeting each other at the same place three times in a row, walking out through a door together and emerging alone on the outside. Illogical? I do not think it is necessarily so. Perhaps the task of actually developing the narrative by arranging and editing the film footage that was given them was too difficult. However, more interesting than the fantasy-like sequences that have emerged is the similar pattern found by researchers working with hearing kids in their reports of television or film programs. My students report, in signs to me, the most global of events in their footage and do not seem worried about the narrative or causal string of events in their report. Their reporting of what happens mirrors well their actual editing activity. They only worry how adjacent shots look next to each other, and not a shot two or three segments before. What is contiguous is important it seems, not an entire string of events. I say again, however, that these findings are preliminary and must be seen as such; but it does make me, a person involved also in visual resource development, wonder about what is being communicated in videotapes and films

used here on Kendall Green. This work also raises the concern for understanding t communicational setting as interpreted by the student in the editing room itself. What is being studied and how it is being studied are all tied together with communication questions.

The situation seems to be a little different with the teenagers that I am working with; and I suggest that what we are seeing is a continuum of activity. So far they have begun using structures and codes of Hollywood narrative, cutting on action, and making sure that all movements move smoothly along through time. There may also be "real time sequencing" in which what is shown in film is limited by how it must have happened physically. Flashbacks are out, for example. This would be analogous to the prevalence of real time structures found in ASL by Friedman. The older students do look at how one shot earlier in the sequence influences the arrangements of following, though not contiguous, shots and the interpretation of meaning in that sequence. I have not finished the analysis of their work, but perhaps some future and conventionalized filmmakers are emerging.

Well, I seem to have walked around, in, and about several different areas and disciplines. I do not think that this meandering is particularly misguided, for, in its form, it partly parallels the complex overlapping and interaction of modes of communication, structures and codes, and disciplines of research that must be involved in any discussion of language and communication. After all, I was trying to talk of structure and code in visual communications; that is, the relationship of events that transcend particular modes or media of communication. Communication, itself, then might be thought of as a code, for as a social and cultural activity it incorporates a variety of modes and media through time and space in the making of meaning.

THE EYES HAVE IT: LINGUSTIC FUNCTIONS OF THE EYES IN AMERICAN SIGN LANGUAGE

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Linguistics Research Laboratory

The discussion of eye movements as a communicative function is, for the most part, restricted to that literature in which eye movements are seen as "non-verbal" signals. Such eye movements are said to supplement the ongoing verbal behavior, and do not carry messages in and of themselves. (Birdwhistell, 1952; Hall, 1959; Bateson, 1963)

But in the case of American Sign Language (ASL), a visually-based language, the expression of the linguistic signal involves the use of the hands, the body, and as we will soon see, the eyes.

One might question whether eye movements could perform as reliable a signaling function as the hands and body do in ASL. We are talking here about the signaling function of what are often quite rapid and small changes in eye movement. This presupposes the ability of the interactants to first perceive such variation and then to respond to them as systematic signals. Siple, a psychologist of perception, presents both linguistic and perceptual evidence demonstrating that when two ASL signers stand six feet apart (a distance frequently found between adult male signers engaging in casual conversation (Baker, 1975; Moyer, personal communication)), the locus of fixation is the area between an interactant's eyebrows and his upper lip. Thus, it is within this central area of the face that the visual acuity of the interactants is highest. (Siple, 1972)

The following discussions of eye function in ASL draws primarily from investigations by Charlotte Baker of the University of California, Berkeley, and from our collaborative investigations undertaken at the Linguistics Research Laboratory this past summer.

Baker analyzed two videotapes of two people each, engaged in informal conversation. The initial five minute segment from each videotape was analyzed for a specific type of communicative behaviors that "signal and/or monitor the initiation, continuation and termination" (Baker, 1975) of conversing behavior. In spoken languages, regulators such as breath pauses, vocal intonation, and body shifts act in conjunction with the conversational flow to allow for smooth exchanges of speaking turns

between two people. These regulatory behaviors allow a person to begin speaking with the attention of an addressee, receive affirmative responses that he should continue speaking ("uh-hmm," "oh, really," or head nods) from the addressee, terminate speaking and allow the addressee to begin to speak. If regulator signals are not emitted at crucial points in the conversation, communication breakdown will result. (Duncan, 1973)

Baker's study of regulatory behaviors in ASL shows the same capacity for smooth exchanges of turns by means of speaker signals. The eyes, she notes, are one of the most powerful regulators in American Sign Language.

In ASL, a speaker cannot initiate a turn, that is, begin to speak, until he is certain of the other interactant's eye-contact. Various signaling devices, such as stylized hand or finger waving are immediately perceived by a native ASL signer as potential linguistic information. This is equivalent to a sharp intake of breath just before beginning to speak in some spoken languages.

Once the two interactants have established eye-contact, the eyes continue to regulate the flow of the signed conversation in very systematic ways.

Eye contact in ASL varies systematically with the function of the utterance. Speakers usually maintain "plus eye contact" (+EC), (looking at the other person's eyes) during questions, signaling that a shift may take place during which an addressee can take his turn in speaking. However, during most declarative statements, the speaker maintains "minus eye contact" (-EC), (not looking at the other person's eyes) a continuation regulator that signals that he is not to be interrupted. In the event of a challenge or an attempt by the addressee to interrupt the speaker and begin a speaking turn, the speaker will anticipate this by maintaining -EC, signaling in effect, that he will not allow the addressee to interrupt him.

There are social restrictions as to how the addressee can go about capturing the eye contact of the speaker in this case. The addressee can signal politely with small, sharp gestures, or, slightly less politely, tap the speaker on the shoulder - which is permitted between close friends. In extreme cases, a frustrated addressee may grab the speaker's hands in a last-ditch attempt to get him to return to +EC. Such measures are drastic and highly improper - much like clapping a hand over a speaker's mouth in spoken conversation.

In spoken languages, females are more likely to concede a speaking turn to a male who interrupts by speaking simultaneously than to a female who does so, (Baker, personal communication.) It seems that in ASL, females take less time to return to +EC if interrupted during a statement by a male.

Regulatory behaviors are learned along with the language, and both comprise a larger set of learned communication behaviors. Thus, a native speaker of ASL has no difficulty knowing when one person has finished signing and when another will begin in a group discussion. The reality of this set of behaviors may be clearer to those of you who, when observing a conversation between two signers, turn to the other speaker too late and miss the first few crucial signs, or, for that matter, turn too soon and miss the last few crucial signs.

From preliminary analyses, Baker (1975) and Lane and Grosjean (1975) have noted certain systematic variations of the eye gaze within an utterance. Eyes appe r to act as boundary markers, marking the initiation and the completion of a group of signs which we will tentatively label as a "sentence."

Lidell, of the Salk Institute for Biological Studies, is now preparing data which supports the existence of relative clauses in ASL. Such relationships were previously said not to exist by Fant (1972) and Thompson (1975) among others. Eye movements seem to be one of the indicators of the relative clause construction in ASL.

Lacy, also of the Salk Institute for Biological Studies, has shown that the orientation of the head and eyes mark complex pronominal relationships. In English, the sentences, "He told him about his problems" is ambiguous in that it is not clear who is telling whom about whose problems. Such pronominal ambiguities and/or double meanings do not exist in ASL, where the distinction is with the hands and the eyes.

In conditional sentences, for example, "if you do that, I will do this," ASL handles the two clauses simply by lifting the eyebrows and enlarging the eyes for the "if" clause, then returning to a normal expression at the onset of the main clause. The use of the sign IF is seen as redundant and unnecessary.

Occasionally, an undefined sort of discomfort is experienced by a native ASL signer when watching an inexperienced signer who allows his eyes to continually wander about in unsystematic ways. Considering the ways in which the eyes do take on an essential function in signed communication, we can begin to understand how, in the absence of systematic use of the eyes, communication breakdown can result either from a misinterpretation of information received or from an inappropriate use of the eyes in regulating the conversation.

Eye movement in ASL occurs conjointly with the hands, face and body. Much vital grammatical information is expressed in a very short segment of time. Whereas the arrangement of successive segments over time such as by word ordering and word endings

have a grammatical function in spoken languages. In ASL, this arrangement of segments is not present to any great degree. The expression of grammatical relations in ASL is usually simultaneous. In investigating ASL it is therefore necessary to reconsider traditional ideas about grammar which are based on spoken languages.

In conclusion, the eyes do play an important role in encoding both linguistic and non-linguistic information in American Sign Language. The extent of this role appears to be highly developed, and warrants continued investigation. We plan to incorporate in our investigations additional physical components such as the facial expression and body posture that also relay linguistic information in conjunction with the hands and eyes.

The expression of linguistic information by means of the hands, eyes, face and body in a simultaneous form seems to occur to a large extent in ASL. From what is known about visual perception, this simultaneity of expression appears to allow for a highly efficient language. (Siple, 1972) Since artificial languages rely heavily on sequential expression, we ask whether the forcing of sign language into sequences may not result in redundancy and inefficiency. Certainly more investigation will contribute to the understanding of these perceptual processes and how they may be used to our advantage, for example, in the teaching of English as a Second Language.

An investigation of systematic uses of hands, body, face and eyes may help us to construct a grammar of ASL. Such a grammar would be an invaluable aid to sign language teachers and teachers of English as a second language who may need to take not only language differences into consideration but also the more basic difference between the visual and auditory modes.

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THE GIFTED STUDENT AT GALLAUDET

Bernard Greenberg
Director of Admissions and Records

I think we can all agree about the painfully evident fact that deaf students have serious language problems. Nonetheless, I think, also, that we have all seen striking evidence that many deaf persons emerge linguistically unscathed from the handicap of deafness. It is on this second group that I would like to dwell for the next few moments.

Each year Gallaudet enrolls between 250 and 300 students. Of this number, because of deficiencies in language, about 75% spend their first year in the preparatory curriculum. Twenty-five percent are given outright freshman placement, based primarily on their high performance on our Entrance Examination (or high SAT/ACT scores), mainly in the language areas. The percentage of such students has tended to remain constant in the past few years and we have certain data about these gifted students which you may find of interest. In general they comprise a very different group from the preps. The exam results of the two groups present a bi-modal distribution with very little overlap; in effect each entering class contains two distinct populations.

In the language areas (reading and writing) the freshman group performs at the national median (or above) for 12th grade norms. Significantly, too, their rate of attrition is about 40% (as compared to the 50-60% for entering preps).

This segment of our student body, though a welcome addition to most classrooms, has heretofore received comparatively little attention. Yet it is evident that they belie some of the glib generalizations about the deaf. I have, therefore, undertaken a research project intended to probe the causes of this linguistic excellence. The research study will attempt to elicit and analyze information about the backgrounds of these students to determine the common factors shared by language-gifted students at Gallaudet. (A further projection of the study may relate to success after graduation.)

This year I am exceptionally fortunate in being able to teach a class made up of such students (English 205-Intensive English), which is limited to students scoring at the 90th percentile in reading and writing on entrance and placement tests. It does not include <u>all</u> the very best since some, as transfer students, have already fulfilled their freshman English requirements; some could not fit the class into their schedules; and others did not desire to take it. Nevertheless, the 15

students in English 205 function in reading and writing well above the level of the average student in most Gallaudet College classes. This is not to state that these students have achieved perfection in English, but that it is unusual to find among them examples of the familiar linguistic difficulties common to most deaf students.

Such a class may well offer in microcosm the kinds of backgrounds presented by the larger gifted student population. In terms of hearing loss (a factor one might suspect to be critical) 10 have losses of 80 db or greater and most of these became deaf before the a of three. The other five have a db loss of from 78 to 48 and onl two were of recent onset. Twelve are from public high schools.

These students are able to read college level material easily and to write, in most cases, correctly and often even with flair and imagination. A superficial survey of the educational backgrounds of these students reveals language development at a very early age and, generally, an educational environment that nurtured this development.

The research study we have planned will attempt to explore the education of such students to obtain information which will help us to understand how such language excellence is achieved. First, we i nd to conduct structured interviews with 50 to 60 language-gifted students to determine some of the basic areas of relevance. From this we plan to develop a questionnaire covering the factors that might possibly relate to language. These will be sent out to 250-300 graduates of Gallaudet who demonstrated at entry a high language level. They will also be sent to the same number of graduates who entered Gallaudet achieving at a comparatively low level of language (typical preparatory students). From the completed questionnaires we hope to be able to extract a broad variety of information which should provide clues to the phenomenon of high language achievement. We have speculated on the many possible factors which make for good language -- degree of deafness (or pattern of hearing loss), age of onset, type of education, geographic location, family structure and other socio-economic date; also considered will be specific related skills such as lip-reading ability, auditory training and the like.

We hope to mount the study this winter and expect to have the correlational data completed by next year. Naturally, we hope that the study will illuminate some factors which can be fostered in order to extend the benefits of excellent language to a larger part of the deaf community.

PANEL - "HOW PRE-LINGUAL DEAF PEOPLE ATTAIN COMMAND OF THE ENGLISH LANGUAGE"

Ronald Sutcliffe
Auxiliary Services

OPENING STATEMENT

I am pleased to be with you today, presenting a panel of Pre-lingual Deaf Persons on their English language development. We are aware that English language development has been a challenging task for teachers of the deaf, as well as for teachers of minority students. There have been a number of research projects on the development of teaching English language skills. Most of these projects eventually fade away after implementation. In the bookstore we have seen texts for the underclass English courses being changed every year. In spite of these changes and/or research projects, teachers stick to the same objective: develop the English language skills. In the mail order department of the bookstore we often get letters from people all over the country asking for the "best" books teaching English to the deaf. All I can do is to send them the booklist on Language Development. Because of these reasons we are here, not as experts in language development, but as pre-lingual deaf persons who have experienced the struggle of learning the English Language.

We have with us four pre-lingual deaf persons, including myself. Two are from deaf families: Ms. Kannapell and myself: and two from hearing families: Mr. Turk, and Ms. Shuart. Each of us will speak up to five minutes summarizing our learning experiences and including some family history. Following these presentations we will respond to questions.

How I Developed My English Language Skills

Ronald E. Sutcliffe

Although I lost my hearing at the age of four, I am considered pre-lingually deaf from a deaf family living on a farm in Iowa. Lacking speech skills, I went to a residential school for the deaf for speech training. Shortly after being admitted to the school, I was a victim of mastoiditis in an epidemic and lost my hearing. That might be unique, however, I am grateful I did not attend a school for the blind.

As I remember all those years in my English language development, it was as frustrating as learning statistics. We lived in an environment where we were told the deaf could never master English because we must be able to hear before we could write very well. We were taught by many English teachers who had their

own way in language styles. It was also true with my having three statistics instructors in sequence who had their own way in "statistics" styles.

I was satisfied with my limited skills in English until I became the News Editor of the Buff and Blue. Eventual I was motivated into improving my writing with hopes of becoming an editor through the guidance of an advisor, Mr. Greenberg, who was willing to spend time explaining why I made mistakes. After some readers familiar with my prior writing skills complimented me on my improved writing, I felt motivated to become aware of my writing ability. But that was not enough, because writing for the college paper limits one mostly to concrete thinking. Abstract thinking is difficult to express in writing.

After graduation from Gallaudet, I was employed as a clerk in the Business Office, which was then a very small office. I was eventually promoted to the budget planning position. At that time, I thought I would do only the number work and projection while the business manager would take care of narratives because I thought the deaf could not write in the abstract. To my surprise, the business manager asked me to do the whole thing including narratives. After trying to tell him I could not do it very well, he just said "Sutty, I thought I could not write that well twenty-five years ago. I know you can write." Accepting the challenge for the sake of my job, I struggled with writing an opening paragraph for the budget of Auxiliary Services (ironically, that is where I am now). I took a whole day and night, plus two packs of cigarettes for that paragraph. As time passed, I eventually wrote the whole budget book. I must say my writing still requires editing.

Those experiences in English language production have resulted in a change for the better. A magic word might be required to make the change. In Arthurian legend, a prophet named Merlin spelled the magic word "ABRACADABRA" which resulted in a change in one's favor. Today, magicians use "PRESTO" to accompany some illusion which they hope is pleasing to their audience. The magic spelling or model of my English development could be referred to as that of the psychologist, Norman Maier who uses in his motivation theory the "magic word" "S-O-B-A" (the casual sequence in behavior).

Stimulus $\longleftrightarrow$ Organism $\longrightarrow$ Behavior $\longrightarrow$ Accomplishment

The stimulus includes light, sounds, job routine, actions of supervisor or other people, and any aspect of the environment to which an individual is sensitive. The organism represents a composite of hereditary, maturation, biological needs, and many learnings. The behavior includes bodily movements, talking, emotional responses, and thinking. The accomplishment includes actual changes, for example, attaining command of the English Language.

Therefore, the relations in the S-O-B-A sequence can be illustrated through my growing experience. Being elected news editor with an opportunity to be editor providing English language command must be attained (S), I (O) was determined to prove my skills, (B) to the Editorial Board, resulting in accomplishment in writing skills (A). That was true with the Business Manager (S) who made me (O) write the budget narratives (B) that eventually gave me the ability to write the whole book (A).

Now I, like many of you, was frustrated with statistics. Many of us managed to pass with good grades although we may lack appreciation for statistics. Likewise, many of us also managed to make passing grades on our English composition without really understanding the rule of rules. Then when it was time for me to complete my research paper to fulfill my Master's degree requirements, I appreciated the statistics better with the help of the magic words: the S-O-B-A sequence, ABRACADABRA, or PRESTO?

HOW I LEARNED ENGLISH

Barbara Kannapell
Educational Technology

I was born into a deaf family--mother, father, uncle, two aunts, only one sister with normal hearing. I believe that was where I was constantly in a bilingual atmosphere. My uncle and father had an excellent mastery of English as well as American Sign Language and, also, their speech was good enough for hearing people who were familiar with their voices. I think my uncle's deafness resulted from an injury from a fall but I didn't consider him as post-lingual. My father was born deaf and so was my mother.

My uncle was well known in the deaf world and many deaf people would come to his house to seek his help concerning problems with their work, insurance, legal rights, etc. During that time, I felt normal growing up in the deaf community.

If I remember right, my hearing relatives were anxious to see to it that I would be like my uncle and my father. I believe I was sent to oral school at age four under pressure from hearing relatives, so it seems that I lived constantly in two different worlds. I was not supposed to use sign language at school and it was "okay" for me to sign at home. My parents' number one goal for me was going to college, so my mother often tried to make me study to develop writing and reading skills during my free time. I rebelled against the idea of studying the materials bought by my parents. I believe I developed the bilingual skills due to the fact that I had deaf relatives as role models when I was very young. I could ask them questions freely in ASL or in English. They could explain to me in ASL or in English. I am in favor of having deaf people work with young deaf children of hearing parents as well as the hearing parents themselves.

"IF YOU HAD A PRELINGUALLY DEAFENED CHILD..."

by

Frank R. Turk
Director, Youth Relations

I have been asked this question often: "If you had a prelingually deafened child, what special efforts would you make for his education?" My answer is simple. I would, first of all, send the child to any school whose program strongly emphasizes pupil participation in all instructional procedures, along with an extensive after-school educational support program utilizing exposure to successful deaf adults from a wide area of leadership.

Our prelingually deafened children learn better, particularly in the language development areas, when they understand educational goals through actual participation, for they know what is there for them to conquer and are thus self-motivated. Of necessity, due to the absence of sound experiences, learning must be a continuous and continual conscious thing for them, as opposed to the unconscious learning of the hearing child. Ideally, teaching the deaf should center upon the organization and conduct of the pupil's carry-over learning experiences, learning experiences that may be carried over to other areas of the school work such as the vocational shop, gymnasium, dormitory, and carefully-planned after-school activities where learning may continue to weave. For maximum results, these experiences should duplicate the deaf pupil's real-life situations, not book-learned situations, because he learns better through repetition and familiarity. The teacher should exert his greatest energies to arrangement of the environment for learning as well as stimulation and guidance of the pupil's activity in that environment. The pupil learns best when he knows that he can and must do his own learning. A deaf child realizes that learning is fun and is interesting when he is convinced that he CAN learn on his own -- that his own learning is an adventure all his own.

A football coach, for example, would get the maximum mileage out of his individual players if he would share with them at all times his total picture of the sport itself as well as of the games to be played. Let's take his philosophy of football, for example. Most coaches neglect to present this vitally important personal phase of the sport, much less its achievable goals, and, hence, encounter the unasked-for chore of getting the team up week in, week out for the games. Basically, a football philosophy exists to serve as a guide in achieving the ultimate goals, both individually and collectively. When a team shares the coach's philosophy,

it develops a sense of direction so necessary for consistency of performance -- the secret of virtually all winning football programs. With a collective sense of direction, the coach finds his players highly cooperative in synchronizing their efforts with his total program goals and a winning attitude results.

The same goes for language acquisition skills -- all teachers, parents, social workers, interested adults, and administrators should establish some kind of a partnership in the pupil's "around-the-clock" language acquisition program.

We tend to explain away our problems and failures when we say that the pupils are not ready for the task. The term "readiness" is not, in my opinion, a mysterious component of the language program of any child, much less the deaf child. The real problem is in getting the deaf child motivated for the task; the child must be motivated before learning and becoming take place.

I am no "masterpiece" but I would attribute my present level of language attainment to the wonderful philosophy of education at the Minnesota School for the Deaf, to the education-conscious dormitory life at Gallaudet College, and to self-discipline.

The educational program in Minnesota places heavy emphasis on an integration of formal academic and after-school activities that is seldom possible in other environments. This integrated learning is often enhanced by consultation with successful deaf people regarding the secrets of their achievements which I believe to be far more fruitful than pure academic effort alone in an attempt to foster real learning among language-handicapped deaf learners. To be with adults on an informal basis is to learn. There are many ways to communicate but there is no better way than by inspirational example. By striving to emulate examples of older people, the young are being taught how to live and, in the process, they are disciplined to elevate their standards of thought, expression, and action. Informal exposure to those adults with a good command of the English language on a continuing basis is conductive to the deaf child's language development. They are, for instance, being disciplined to systematize, and at the same time minimize, their own use of the sign language, using only those signs that have exclusive meanings, refraining from using signs that represent several words. For example, the deaf children use the same sign for all forms of the verb "to be." When they use this sign, they tend to think in pictures, not in words, possibly because it does not matter if their choice of words is wrong so long as the sign represents the same idea. This "corner-cutting"trick is the "cancer" of their English language. Suppose a child is sick today. He should be encouraged to use signs only for the words "I" and "sick" and to combine them with fingerspelling-oral methods for the words "am" and "today" because the signs for "am" and "today" are ambiguous, that is, they represent several distinct concepts.

My personal experience has been that nothing can be more effective in acquiring language skills than to write, write, and write until that

skill is eventually achieved, along with the confidence that only inspirational support can provide as explained herein. I needed the encouragement during my formative years much more than my language-proficient deaf peers. My efforts were so monumental and the end results often so small that I was easily discouraged. I responded to discipline only when I knew it was being done fairly and in my best interests. I needed mature, sympathetic persons who had the experience and understanding to convince me that I had the ability to develop the language skills -- those who continually took the initiative to discipline me to perform up to my innate abilities.

After-class situations were my greatest English teachers. Regardless of research efforts and findings, my conviction will always be that the prelingually deafened child's language development cannot be successfully facilitated through an academic medium alone. He can be given much teaching in school but the chance of his developing it is questionable unless opportunities arise to put it to use in concrete situations. The dormitory, gymnasium, or home are the places where an array of language-conscious situations occur daily. It is in the bull-sessions, the informal parent-teacher-counselor-pupil conversations, and, above all, in learning motivated by practical experiences that we come fully alive to the fundamental language skills. When a deaf pupil has contact with sympathetic adults and has an opportunity to discuss with them essential ideas and ways of life, ways of utilizing the learning process, this is the heart and soul of education as distinct from mere learning.

I am a strong advocate of "total communication" for the prelingually deafened simply because my observation is that any child's first stage of mental activity is based strictly on imagination. A little hearing child hears, thinks, and identifies things without the ability to write them. The primary importance here is to develop imagination. The other things will come later. When you refrain from using signs with the deaf child, how else can his imagination be developed? An abstract idea, as we know, is not a word-symbol, it may be experienced in non-verbal form, as for example, a cartoon which conveys a very subtle thought without a word. The sign language, even when employed improperly, is highly expressive. It may be disordered when judged by grammatical standards but it nonetheless develops in the deaf child the valuable power of imagination and expression around which we may clothe and feed his basic ability to read and write intelligently. After all, if you consider carefull, oral communication is only an aural form of sign language with arbitrary sounds standing for ideas.

When the child reaches the golden age of learning, he is then introduced to a word-oriented discipline with emphasis on the sequence of the signs in good order. The teachers, counselors, parents, and social workers thereafter correct the errors of the child's manual English, just as they do the child's written English. This practice should be made a conscious part of the

child's everyday activities, as his hearing brothers and sisters are being unconsciously exposed to verbal and grammatical experiences. Our deaf children spend more time talking manually than they do in preparing written assignments; therefore, they will master the English language quicker if we correct both their manual and written English with special emphasis on the former. An added benefit here is often impeded due to lack of follow-up interest. When the teacher does something especially for a certain child, this often makes all the difference in the world in his motivation to learn to read and understand. Often this makes it possible to teach the child much that he cannot otherwise grasp.

HOW A PRELINGUAL DEAF PERSON OF HEARING PARENTS ATTAINS AND DEVELOP LANGUAGE SKILLS

Adele K. Shuart
Continuing Education

I am a prelingual deaf person who has developed language skills. My parents, who were born in Russia, came to the U.S. separately during the early 20th century when there was a peak of Russian immigration. My parents, like most Russian Jews, were first cousins who married. So in my case, I am the product of consanguinity.

As I mentioned about the origin of my parents, they had not acquired a good command of English--only broken English ... peppered with Yiddish.

Nevertheless, my home language background did not help me but it did motivate me to develop language skills. I do not recall anyone who taught me to read or to speak nor anyone who sparked the motivation in me. However, I give credit to one who planted this in me.

I have learned to read and to speak. In my childhood home, we were not surrounded by books and I was constantly reminded by my mother to talk and/or to read the lips. It was not the case that I was trained or prodded. You can take the horse to the water but you can't make it drink, so to speak.

As for reading experience, I do recall distinctly that when I first had a reading lesson, I was baffled. It must have happened in 2nd or 3rd grade. I do not recall how the reading has interested me ever since. When I was in 4th or 5th grade, I practically lived in the library. I spent many afternoons in the school library. I had borrowed books from my hearing friend who had deaf parents--spent several summers reading books borrowed from the public library.

As for writing skills, I do recall my writing experience in high school days. I was asked by an English teacher to write a composition. This I did and it was grammatically perfect. The teacher, who was farsighted and without any word, handed me the papers collected from other students for me to look through. I got the meassage and have learned to develop my writing style. This had been done for a part of the semester until I had acquired it sufficiently to pass a grade.

My sign language skills--I am certain anyone who has known or heard of Lexington School for the Deaf and/or has heard of it in name only, would be amazed to know that I learned sign language there from the time I started school when I was 5.

In summary, as I saw my parents, being limited in their communication, my learning to communicate was assisted by my motivation to be able to communicate with other people.

HOW PRELINGUAL DEAF PEOPLE ATTAIN COMMAND OF THE ENGLISH LANGUAGE

Ronald E. Nomeland
Educational Technology
Kendall Demonstration Elementary School

As you know by now, I came from a deaf family, which consisted of my father, mother, one sister, and myself. Both my parents lost their hearing due to illnesses. I might admit that I was fortunate to have an older sister because, when she was at school, I had the attention of my parents at home.

Although I had command of sign language since early childhood, my earliest recollection with words was vocabulary building at home with the aid of playing blocks. They had illustrations of some objects with words beneath them and one or two sides would have a letter of the alphabet, and my mother and I would play with them. We would read the words, spell them, make a sign if there was one, and write them. I do not remember if I was able to write simple sentences before entering school.

However, I can recall three things upon entering school for the first time at age six. The first-year students were not able to sign (and the older students were surprised that I was able to sign). They also were not able to spell their names or did not know their ages. There was no finger-spelling of words in the dormitory and classrooms (and most house-parents were not able to sign). Thus, the first year of school was sort of a drag for me.

As for language development, I believe I was influenced by three sources: First, at home I was exposed to my family's interest in reading newspapers, magazines, and books. Second, the use of Wing's Symbols at school. With the aid of the symbols, the teachers were able to communicate with the students regarding the language patterns, but the real impact came later in junior high school when I discovered that the symbols were based on grammar. The third and most important influence was my love for books. I was an avid reader and, whenever there was a free moment, I would find myself reading one of the books that I would carry with me.

At school, we were bombarded visually. There were three sides of chalkboard in each classroom and we were required to write on them at least once every day--news, stories, anything--with the idea that we would be continuously reinforced by our own and other's writings. There were also charts on the stands--words, sentences, with a Wing's Symbol over each word. Of course, we had no use for radios, and television was in its infancy. And that was before we had captioned films.

My recollections with grammar and language workbooks that were designed for hearing students might be of interest to you. I learned all my mistakes from it, the ones that are common with the hearing population, i.e., their problems with the words "have" and "of", and "lay" and "lie". I was also exposed to the double negatives and the spelling problems, among others. However, they helped me to understand the role phonetics play, for example, in jokes.

I believe these are the influences that led to my present command of the English language. My affiliation with the Kendall School has given me an additional insight to the use of sign language with younger children. For example, a teacher might ask me what sign to use for the word "broccoli" and I found myself at a loss, in spite of the fact that I came from a deaf family. It seems that we either spelled the word, or did not eat broccoli.

RESEARCH NEEDS IN THE AREA OF SIGN LANGUAGE TEACHING AND EVALUATION

Willard J. Madsen
Director, Sign Language Programs

At the recent World Congress of the World Federation of the Deaf held here in Washington this past summer, I presented a paper on "The Teaching of Sign Language to Hearing Adults." I stressed the point that in pursuing the goal of "Full Citizenship for All Deaf People," we could not ignore the implications of the formal teaching of Sign Language in our time because it is an important task and it is a serious responsibility.

As I asked then, I will ask now: What better way can we help achieve the desired goal of full citizenship for all deaf people than by fostering understanding of and respect for this marvelous language we deaf people know and use to better communicate with one another? What better way can we help achieve this desired goal than by planting the seeds out of which will develop and grow our future interpreters on whom we deaf people must depend a great deal in order to enjoy the fruits of society on par with the hearing world? What better way can we help achieve this desired goal than by seeking full recognition of Sign Language as one of the major languages of the world which it can well become?

As we all know, over the past twelve years or so we have witnessed a tremendous growth of interest in the teaching and learning of Sign Language and in interpreting for deaf people. This growth has been nothing less than a national phenomenon. Our own program here at Gallaudet is indicative of this and the growth has not stopped. We have already heard some discussion on the subject of "Manual English" and the problems arising from the various systems of signs which have developed in recent years. These developments have, without question, had a profound effect upon the growth and widespread interest in the use of manual communication in this country. We will come back to this again shortly. I think, first of all, in considering the needs for research in the area of Sign Language teaching and evaluation, we should look at questions which are relevant to the teaching process.

The first question is, "Whom are our students?" It is important to keep in mind the fact that, traditionally, Sign Language has never been taught to young deaf children since the early days of education of the deaf. Today in this country, there is a trend towards the teaching of a modified form of Sign Language called "Signed English" which has been developed here as an educational tool by Dr. Harry Bornstein and his assistants. There are other systems of signs being propagated also with the very similar aim of "facilitating the learning of English by deaf young people in American

schools." All of this deals with the major problem of teaching the official spoken and written language used within them. We are seeing, to some extent, a return to the idea of formally teaching Sign Language or some system of signs to young deaf children although probably in a very limited way.

The real growth in Sign Language classes, which have sprung up in almost every corner of this country, have been concerned with teaching mostly adults...hearing adults. These people come from all walks of life and many classes are of a mixed and public nature, more or less the same as a variety of continuing education classes are. Some of these students are teachers of the deaf; many are parents, or neighbors, or friends of deaf persons; some are professionals or government workers; and many are simply people who wish to try learning something different. Some of the students of Sign Language are college or university students who are majoring in special education, and, who are thinking of eventually going into some field of work associated with deafness. Some of the students are older or retired people with time on their hands. The point is: we are talking mostly about the teaching of adults, and, as such, must consider methods and problems associated with the teaching of such people. We must also consider the problems involved in teaching that population of young deaf adults who, like some of our own students, became deafened later in life or who have not had the opportunity to learn Sign Language before entering our college.

We are learning now through experts and people involved in general continuing education some of the problems associated with the teaching of adults and older people...problems having to do with things like visual acuity and, perhaps, auditory acuity and the like. Life experiences of adults is another very important factor in adult teaching-learning and, perhaps this area becomes even more pronounced when you deal with very mixed classes such as many of our current Sign Language classes are. But, in dealing with the teaching of Sign Language, per se, we probably need more than anything else some study into how these factors affect the learning of a largely visual means of communication. This, then, is one suggested need.

We know already that the people who are studying Sign Language are basically trying to learn a new skill in order to be able to communicate more effectively with deaf persons they know. Because of this motivation, these people need to learn some orientation to deafness itself. Therefore, the teacher of Sign Language must be knowledgeable in this area and possess the ability to explain and clarify the many-faceted points of deafness. There are many questions in this area which have not yet been fully explored... questions such as, "Is there a psychology of deafness?" Some people say "yes"; some say "no"; and others are not sure. There is no question but that much has been published on deafness in the past few years, but there is presently not available one source that could serve as a useful guide to teachers of Sign Language...a source that would be easily translated into meaning-

ful terms for an average teacher to use. Perhaps research is the place for this to be done. What I am suggesting is the need for someone to look into the whole question and put together an easily accessible source of information on deafness in general which could be used by many other people besides Sign Language teachers. This would include, of course, studies into cultural aspects of deafness.

Knowledge of Sign Language (as a language) is perhaps the most crucial aspect in the teaching of the language. We have a number of terms used in the U.S. to refer to the American Sign Language. We have Ameslan, which is an acronym for American Sign Language. This term is in addition to an abbreviated form which has been in use longer...ASL. Both are one and the same...that is, they refer to the language of signs as used by the majority of deaf Americans. Linguistic studies are helping to show the important language aspects of our Sign Language. However, there are too many people, including deaf people who have used this language all their lives, who do not understand nor respect it for what it really is. I have observed, even among our own students here, a common lack of respect and understanding of what Ameslan or ASL really is. I attribute this to the fact that we have failed to teach it as a language until very recently and, even now, mostly to hearing people, not the deaf themselves. In addition, I think a bigger factor is simply that it is often looked upon as the reason for the "bad English" when nothing could be further from the truth. Again and again such students, when asked what Ameslan is, will answer with a statement such as: "Oh, it's the sign language used by low-verbal deaf...mostly slang signs." By such rationale, I am, therefore, "low verbal" (though the term is, in my opinion, very misleading) because I use Ameslan everyday in my contacts with other deaf persons like myself. We must begin to change this and create respect for the language and the culture of deaf people, who are by circumstance, if not by nature, more or less bilingual in their communication modes and needs. I know there are questions as to the validity of the "bilingual character" of deaf persons and because of this, research is needed almost immediately to clarify the issue. I think most of us will agree that because there are so many variables in deafness itself, it is difficult to define characteristics of deafness. Yet I think many of us see out there a real bilingual nature in many deaf individuals as witness the way they communicate among themselves as opposed to the way they try to communicate with hearing people.

In our own Sign Language Programs, we have tried to build into our curriculum a flexibility that enables hearing people, trying to learn to communicate with the deaf in general, to develop a basic understanding of the American Sign Language while, at the same time, allowing the student the freedom to communicate in as comfortable a way as possible. Our students are exposed to many communication modes used on this campus and we think it is our obligation to try to teach them about the

many signs they will come into contact with and to help them understand, at the same time, many of the manual English signs commonly used here and elsewhere today. We have been criticized for this... for not teaching one mode at a time...for introducing the student to Ameslan at the beginning level...for not teaching Manual English or just teaching signs in English order first because "that would be easier for most hearing people." We have even been criticized for teaching Ameslan as a foreign language which we do not. We do use Louie Fant's book, Ameslan, at the beginning level so that the student learns some of the basic patterns of the language and understand them, but our curriculum includes all other aspects of communication inherent in the American way of signing in addition. We believe that we have sufficient evidence to show that the majority of the students who successfully complete the course are better equipped to communicate with a wide range of deaf individuals, but we need to study what really happens in a program such as ours and to find out if, in fact, this is the most realistic approach to the teaching of Sign Language. We think it is, but we need to study the question carefully, especially in view of the fact that there are other opinions which may be equally valid.

Some people contend that Sign Language is limited. That may be true when one compares the basic vocabulary with the basic vocabulary of a written/spoken language; however, it is possible to do so many things with certain signs, such as those denoting size or shape, that it is often more accurate in description or in giving a precise picture of something than any written/spoken account could be. That limitations exist is not to be denied, however, simply because Sign Language, being a language with a syntax of its own, with a vocabulary of its own, and with a method of conveyance of its own, was never intended to be a substitute for English. With the use of fingerspelling, in addition to signs, it is possible to present English syntactically and visually with some degree of approximation, but never one hundred percent accurately. I think the reason for all this is simply that we too often tend to confuse signs with words and vice versa. We often, and, I think mistakenly say that a certain sign means a certain English word when, in reality it does not and cannot. Written, printed, or spoken words are one kind of symbol while signs are an entirely different kind of symbol. It would be more accurate, perhaps, to say that a certain sign represents a certain English word or concept. It may be equivalent in meaning or it may just be an approximation, but <u>one is not the other</u>.

As a result of this confusion, much of what we take from English and attempt to restate using Sign Language must be interpreted to get accurate and equivocal translation, and there are, as we all know, certain terms in both Sign Language and in English that almost defy exact translation. This, however, should not be surprising because the same thing is generally true when you compare any other two languages. We all know, too, that some signs in our American Sign Language are ambiguous when it comes to trying to use them to express specific English words or ideas, but the converse is also sometimes true. The problem only becomes apparent when we try to

match one sign to one word, and Sign Language, being a language of concepts rather than of words, being visual rather than spoken or written, does not work that way. I believe this is another area that calls for careful research to help clarify this common confusion. I am not saying that we cannot use signs we have to help make English visible, but only that we need research into the process involved in using one kind of symbol in place of another in communication.

This brings us back to the question of "sign systems" or more specifically the subject of "Manual English" which we have already seen discussed here earlier today. I think it is appropriate to pause here briefly and look once again at the broader significance of Sign Language in general. I know from personal experience now that Sign Language in various countries in the world has a broad commonality and that it has an almost universal syntax; however, there are basic differences and it is these differences that are important. Basically, they stem from what I consider cultural influences. English is a language that has borrowed a great deal from other languages of the world and there are very real differences between the English used in England and our own American English. The point is simply that when you have two or more languages used concurrently, these languages are bound to interplay upon one another. In my opinion, this partially explains the natural evolution of American Sign Language which, quite some time before new sign systems came into being, was using initialized signs to represent many English words, and which was following a syntactical pattern that might be considered "mixed."

There seems little question that new sign systems have had a profound effect upon the use of American Sign Language in recent times. There seems to be little question that influences from English and from efforts to make more English words "signable" will continue for some time to come. I do not question the right of individuals to explore, create, or attempt to find new ways of teaching English more effectively to deaf people because English is the predominant language in our culture. We need to remain open to new ideas, but we need also to be careful not to lose sight of the basic premise of Sign Language...that it is a language of visual concepts, a picture language, if you wish, and any attempt to add to or modify the vocabulary of signs should keep this in full consideration at all times. Failure to do so will only lead to further proliferation of signs which we definitely do <u>not</u> need if we are ever to get out of the present situation...which, I think, will, if allowed to continue much longer, be self-defeating.

I believe the time has come when we must take a hard look at what has been happening in the area of so-called "Manual English." We have one common English language with dialectal differences, perhaps. Do we need four or five different "systems of Manual English," each of which is trying to accomplish the same purpose...

to teach English more effectively to deaf children...and each of which is only adding to further proliferation of signs to everyone's consternation???? I think not. I believe we have waited long enough...we have allowed open-endedness long enough to see that it is not going to get us anywhere as it is. Many people say there is nothing to worry about because the ultimate outcome will be what the deaf themselves decide to accept and what to reject. Maybe so because, as a rule, users of a language determine what is and what is not acceptable, but deaf people, having so long been told what to do and when to do it, could easily end up the losers in what appears to be a cause in their favor. I think we do have something to worry about as long as we have otherwise intelligent, well-educated young deaf people among us who have grossly distorted misconceptions of what their language, the American Sign Language, is and what it is not. And I think we have the obligation to assume leadership and try to resolve the question once and for all so we can go about our business of teaching Sign Language and a practical system of Manual English, side by side. There is little question, it seems, that we do need a system of Manual English for instructional purposes. We do not need more than one. Cannot research help to resolve this question?

There are other areas related to the teaching of Sign Language that need to be explored more fully. To be brief, I would suggest a study on how methods used in teaching English as a Second Language (ESL) might not effectively be applied to the teaching of Sign Language to hearing adults and, perhaps, youngsters, including families with deaf children and hearing children.

Finally, we need to look into the whole question of evaluation procedures.

When Gallaudet first took over the Sign Language program that had been in operation here under the National Association of the Deaf, the committee charged with the responsibility for developing the program agreed that there should be some kind of formal evaluation procedures for determining proficiency at different levels: beginning, intermediate, advanced, and interpreting. It was decided that videotape should be used as this seemed to be about the only way to make any such testing program truly standard. After one year's trial and after listening to numerous complaints about the procedure, many of which were directed at the "flatness" or lack of life dimension on black and white television, we changed procedures to permit an evaluation team to present the evaluations instead of using videotape. From this experiment, we found that there was not any significant difference in overall results between personal presentation and videotape presentations, so we went back to using videotape.

Complaints and suggestions continued to be made and we had our staff of Sign Language instructors work on the problem. They decided it might be best to go from the general to the specific. We had followed a format of presenting, at first, only a number of unrelated sentences using sign vocabulary that was taught. Later

we broke the tests up into three parts: (1) vocabulary; (2) sentences in connected discourse; and (3) a short paragraph which was to be read and then summarized. In considering a change, we simply reversed that order and started with the paragraph. Since then, our teachers have concluded that the original pattern or procedure was better and we have returned to that format.

We need research to help us determine what really happens in a Sign Language evaluation and what we really should be measuring as well as to determine the best way to measure proficiency, both expressive and receptive.

THE DEAF: A MINORITY AND ITS LANGUAGE

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Introduction

In regard to the rather vague title given this talk, "A Minority and Its Language," I feel, in hindsight, that this paper should better be titled, "A Minority Through Its Language," for it is the status of "minority" achieved by the deaf and the role of language in that status to which I shall address myself and make a general statement.

What Is A Minority

The term "minority" is a word, the meaning of which is often accepted as "understood," i.e., without need of definition. However, when one refers to another as being, a) in the minority, or, b) a member of a minority, normally the usage implies distinctly different meanings. In "a," you are not a part of the majority point of view and have been out-voted on some decision. In "b," however, you are a psycho-social being, a member of virtually any homogeneous, but smaller, group within a societal group that is "different" in some way from the "majority" of persons composing that society. Thus, implied is a singling out or separatism, not of individuals on a personal level, but of groups of individuals on a cultural level under the guise of being included as a part of the whole, but only to a predetermined degree.

In order to establish whether or not a group has achieved such social status, as to be labeled "minority," it is necessary to briefly define minorities in still other ways. Minorities then are groups within the general society which tend to stay and thrive "outside" that society, who are bound by a common identity based upon some physical, social, political, or economical feature which causes them to be a more visible entity, often resulting in their separatism from a more dominant majority. Further, minorities are such groups of individuals who choose to remain separate, not only because of a lack of ease in trying to assimilate into the "dominant" structure, but also because of an acquired awareness of and pride in their own cultural, social, and economic worth.

From the above, which are more personal definitions of what constitutes a minority, it can be discerned that the term dominant recurs with frequency. Separate, different, etc., used in a

cultural reference, set up a vocabulary peculiar to the psycho-social phenomenon termed "prejudgment."

Prejudgment and its basic ingredients of ignorance, misunderstanding, generalization, and hostility is exactly that which forces the separation of a part of the culture from the whole, sometimes without possibility of reconciliation. The ignorance lends itself to heaping generalization after generalization upon a minority group, thus creating stigmas and stereotypes. As the stereotype is often used as a yardstick with which to measure members of minorities, so emerges the misunderstanding, and, ultimately, the hostility. For example, as a minority, the deaf are expected to "integrate" themselves fully into the hearing world. Notice here again that it is their responsibility to "fit in" as it were, not that of the dominant hearing community to involve them. As is seen, time and time again, due primarily to an inability to communicate in the language of the hearer, i.e., spoken English, the deaf child begins to retreat in his early learning stages to being defensive, and, as a deaf adult, his defensiveness forces him into the preservation of self as a minority being, thus creating or imposing sub-culture environment.

Gordan W. Allport, in his book, The Nature of Prejudice, speaks of a stereotype as..."an exaggerated belief associated with a category, whose function is to justify (rationalize) our conduct in relation to that category." He explains throughout that the human mind tends to form all its life experiences into categories or generalizations, and that this process seems essential for easy identification or labeling, i.e., stereotyping in some cases, when and if the category has a fixed mark upon it.

It is this last statement and the use of the term "fixed" which illustrates the difficulty involved when those who are "different" try to assimilate into the dominant culture. When we look at the basic ingredients necessary for assimilation, we touch on many aspects, some positive, some negative, the most basic of which is acceptance. First, as a child, we wish to be accepted by family and friends. If we find that the environment in which we grow up is one of love and understanding we feel secure and we usually have a positive self concept and are motivated to strive and attain. From a sense of achievement in our interaction with peers, we tend to become and remain motivated. It is not unless or until such motivation to achieve is thwarted by a lack in communication, emotional or intellectual, that we de-emphasize it.

For the deaf child who finds himself in such highly motivated families, where he has felt secure and understood, many studies show that he carries that motivation into areas of learning which result in high achievement as well. However, if in an effort to do what is "right", the family over-emphasizes achievement, thus equating it with acceptance, the deaf child then withdraws or blocks out attempts made for meaningful

communication. Still further, when the realization that he is constantly shut off from the important things because he is deaf and cannot be communicated with easily, a retardation of his psychosocial development often occurs. This is directly related to his inability to communicate his innermost thoughts and/or fears, for he cannot always successfully verbalize his good feelings when he achieves, or his disappointment when he has failed in a learning situation. This, his first personal defeat lowers self-concept, and therefore the desire to communicate, thus retarding intellectual growth.

When we speak then of the deaf as low achievers, then we often speak of the lack of motivation as a personal defect, i.e., they are given a stereotype. They cannot learn because they cannot communicate. However, if no emphasis is placed on achievement in the learning situation or in the home, then it is said the deaf child is devoid of meaningful communication with no understanding of how to fit into a larger social environment.

Assimilation: Dominant vs. Sub-Culture

Hearing vs. Hearing-Impaired

In the earlier reference to minority groups, the word "physical" was used apart from that of racial. Indeed, those with physical handicaps find themselves prejudged in much the same way as racial minorities. However, the hostility mentioned as part of the formula for prejudgement is often, not always, initially replaced by indifference. We have only to look at some of the earlier educators of the hearing impaired and their unfortunate disregard for the individual psyche and development of many deaf children; such disregard leading to the total misunderstanding of how a deaf child learns, speaks, and thinks. For example, in Environment and the Deaf Child, 1955, Steven Getz, Ph.D., a school clinical psychologist-audiologist, begins by stating "there is no field of special education that has suffered more misleading half-truths and propaganda than that of the deaf. This has reacted seriously against the educational welfare of deaf children." Getz then cites many instances in the period of the '30's - '50's where the hearing impaired child was often thought of and referred to as "inorganic passive matter - a lump of clay." Such children with hearing defects could not learn successfully for it was solely their defect which arrested mental progress. Such individuals were dissatisfied in their interpersonal relationships with their peers because they were dissatisfied and unfulfilled individuals. They had no language and, therefore, could not learn as a hearing child learns.

Since much of our learning in the early years is incidental, i.e., language perceived by our ears as the way things are said, actions perceived by our eyes the way things are done, those who have hearing consider themselves quite normal, normalcy unconsciously based on the ability to hear and to verbalize what is heard. One tends to forget or ignore that large part of learning which comes from gesturing and reacting to such gestures, i.e., the non-verbal language. So, those who would rely solely on communicating non-verbally find themselves not considered an integral part of the whole, but an attached part to it.

Just as Allport stated, a category becomes subject to prejudgment and is stereotyped, i.e., "normal" becomes synonymous with "verbal" in the case of the hearing and those deaf who have mastered the mainstream language of the dominant culture, and "abnormal" is then synonymous with "non-verbal," referring to those hearing minorities who speak other than the "accepted" standard and the deaf, who sign.

The Role of Language in the Minority Status of the Deaf

As pointed out by Vernon and Makowsky in They Grow In Silence, 1969, Chapter 2, pp.3-6, "the hearing often approach the idea of a deaf person as one who was once able to hear and develop his language skills fully and then lost his hearing." In trying to envision what it must be like to be deaf, the hearing try to conceptualize the condition of deafness intellectually or act indifferent to what it is like.

When we do stop to think about deafness, however, we must question how language is acquired by the deaf and to what degree. First of all, language is not learned in the same manner by a deaf child as by a hearing child, unless that child is born to deaf parents and is a native user of sign. The more conventional English language system is not present, yet a dynamic system of communication does exist. This dynamic and linguistically sophisticated language, though non-verbal, combines so many aspects of the human experience in communication, that it must be queried as to where and why biased attitudes begin.

The acquisition of verbal language is often imposed upon the deaf child earlier than is expected in hearing children. However, if, as a result of the experts' support given to oralist methods, parents feel this method is best for them, they will often retard the child's language development and reasoning powers by waiting until age three to five before beginning any form of verbal stimulation. A direct result of barring any manual communication is that all natural interpersonal language development between family, friends,

teachers, and, most especially peer learning, is stymied and oft times completely impossible.

Value judgements are closely linked to the type of education one has received, again a hearing frame of reference. When a deaf learner is in an oral school, he is there with the primary purpose of learning adequate oral communication and then to be successfully returned to the hearing society. If, then, this learner was also a high achiever, his teachers' attitudes would inflict more demands on him by trying to regiment his communication. Even now sign is often banned lest it infiltrate the oral approach and contaminate the pure language learning process. The need to communicate ideas successfully is often overlooked. Educators in earlier times felt that intellectual knowledge could only be obtained through hearing the spoken word. Therefore, when a large majority of deaf learners did not meet the challenge to assimilate, deafness, in all aspects, meant inferiority and/or abnormality as evidenced by the misinterpretation of the stigmatized "deaf and dumb", "dumb" not being equated with lack of speech, but with lack of intelligence.

For those who tried to rise above the stigma and who refused to suppress their use and recognition of ASL, ground was lost in the battle for status within the deaf community. ASL was only tolerated by the hearing with stares and smirks. In earlier years, no reference was ever made to a child who acquired sign as a first language, where spoken English was the second language and his native language, Sign. Today, it is still not completely accepted as a viable idea.

Within the deaf community success in the hearing world and in deaf schools meant the degree to which a deaf individual could disguise his hearing loss and pass as a hearing person. In certain areas, such as employment, the deaf were and are again discriminated against as a direct result of their inability to converse and successfully use the Engligh language, although their work may be well done and of high quality.

It was Alexander Graham Bell who was opposed to the hiring of deaf teachers for deaf children for he saw this as an adverse and degrading influence on the learner. Without oral facility the deaf could only be hired for non-teaching positions with unequal salary scales. Today, things have improved, but in every human being there is the need to identify in some positive way with the leaders of the community, those who represent progress and status, i.e., those who have "made it" in the dominant culture.

There are those within and without the deaf community who address themselves to the demands made upon it by suggesting that speech and speech reading are the "proper" and only way to

communicate with the hearing. Much too late does it become clear that a normal life can be led without active verbalization, although accurate manipulation of spoken English is necessary for economic and political mobility amongst the hearing and often amongst the highly educated deaf.

The necessity for such mobility is a present day concern of the deaf community, and, in a great effort to raise the educational levels of deaf learners, through better use of the target language, alternative methods are emerging rapidly as evidenced by the many programs presently in gear at Gallaudet and those of the future.

Communication can only be made useful when all channels for communicating are open. More participation-oriented language models where the student is totally involved, emotionally, socially, as well as intellectually, will result in meeting the challenge of attaining sufficient English language facility.

When one speaks of teaching language to the deaf, the focus perhaps should be on the manipulation of a second language, for in this context "second" refers to a language in which there is a need to communicate well, but where such proficiency has not yet been achieved. Often the ESL learner has had some exposure to the English language and can identify somewhat with its orthography and structure. As to motivation, the hearing ESL learner usually has a strong desire to communicate, i.e., to be understood in English by native speakers for the purpose of integration into the culture, economically at least. The deaf speaker of sign, however, who has been instructed in his early learning years that he is a user of the English language already, instead of a learner of a second language not "native" to him at all, tends to throw up a barrier. He resists the idea that he needs English language instruction for communication since he is already a native user of the language. Which of the newer methods to promote better English language competency should be used is not at issue here. However, the fact that the deaf learner is often not aware that he is not communicating well in English is not to be overlooked in any method used to teach him. After all, it is not his frame of reference, sign language is. Any important information is decoded out of the English idiom into sign. As for speaking, the native signer rarely uses the English idiom to converse and, therefore, doesn't feel a pressing need to be understood by the hearing; he is always understood and accepted by his deaf peers. When, in fact, he is confronted with the hearing world and its English language, he finds himself often misunderstood and frustrated because he is totally unable to communicate his needs even in writing, for he is basically spoken oriented.

In the final analysis, it must be realized that the ultimate decision to integrate into society at large is an individual

choice. Also, since the language of the dominant majority is English, then the effort must be made toward proficiency if only in order to obtain economic and political equality, without the suppression of the use of sign. However, if the individual chooses not to integrate himself, then the language skill he has achieved and the use of it will not progress, but remain stagnant. The individual, on the other hand, remains solely aware of himself in a minority environment, thus reluctant to bring the world outside totally in.

In Retrospect: At this time I wish to clarify my use of the term "non-verbal." It is, at best, an unfortunate label used for want of a much more definitive term in regard to the diminished presence or lack of audible linguistic facility. It is recognized fully that the undesirability of the term "non-verbal" stems from the premise that no being with a communication code could possibly be considered "without language." Whether that language can be uttered or whether it is transmitted through gesture, a "comprehensible" code of letters, sounds, and/or appropriate symbols can be said to constitute "verbality."

FACTORS RELATED TO INTERPRETER PROFIENCY

Lottie L. Riekehof, Coordinator
Interpreter Training Program

In the last decade, since the establishment of the national Registry of Interpreters for the Deaf, there has been an increased awareness of the need for skilled interpreters who can function in many types of situations -- educational, medical, legal, religious, vocational, and in a variety of related areas including entertainment and cultural events. As interpreters are becoming available, deaf people are becoming increasingly interested in participating equally in all that is offered to the general public. This progression leads to both the need for a greater number of interpreters and for more highly trained interpreters.

Deaf people are enrolling in colleges and universities across the country, seeking degrees in many fields. There was a time when the Bachelor's degree at Gallaudet College was considered the ultimate criteria of a successful education. Today it is not uncommon to see deaf people studying for degrees in many fields in any of the country's universities. For the most part, deaf people are utilizing the services of interpreters for such educational programs.

In the early days, interpreting was primarily the work of children of deaf parents who grew up with this responsibility, considering it almost as natural a function as breathing. Such interpreters are with us today and will continue to serve, but a new breed of interpreters is coming on the horizon, and these are hearing people who have no deafness in the family and who are interested in becoming professionals in the field just as teachers, counselors, and audiologists are.

This year, for the first time, a program has been initiated at Maryville College in Maryville, Tennessee offering a four-year B.A. degree in interpreting for deaf people. Seattle Community College is offering an Associate of Arts degree in interpreting and is in its second year of operation, while other states are in the planning stages of similar degree programs.

Just 10 years after the establishment of the R.I.D., the National Interpreter Training Consortium was born when Dr. Jerome T. Schein of New York University received funding through the Rehabilitation Services Administration. The purposes of the N.I.T.C. are to increase the number of qualified interpreters, to assist state vocational rehabilitation agencies in improving their use of available interpreter resources as well as to develop new resources, and to develop in each state at least one facility for training interpreters.

Members of this national consortium include six training centers: New York University, University of Tennessee, University of Arizona, California State University at Northridge, St. Paul Technical and Vocational Institute, and Gallaudet College. The consortium is currently in the first year of a five-year program designed for the training of interpreters in every state. Gallaudet College, for its part, offers fall and spring evening programs, a six-week summer program (in units of two weeks), and currently a new ten-week full-time program in which fifteen men and women are living in our residence halls, taking coursework in the classroom, and participating in observation and practicum experiences.

As a result of the increased need for interpreters and the establishment of training programs across the country, attention must be focused on the screening process for such interpreter trainees. All of us in the field of deafness are aware of the fact that some interpreters become experts while others with the same amount of training and background never quite make it. If we can find predictors of success in the interpreter training process, we will be served well because applicants will then be chosen on the basis of objective measures and time and money will not be invested in candidates who may never succeed.

Let us look at some of the questions which need to be answered. What are the components needed for a person to be considered an effective interpreter? The R.I.D. in its certification process has included five sections in its evaluation:

a. Expressive interpreting at approximately 140 words per minute.

b. Expressive translating at a similar rate.

c. Receptive translating.

d. Receptive interpreting.

e. An interview which covers ethics and situational principles and procedures as well as a general over-all assessment of the candidate's effectiveness and acceptability.

The evaluation panel of five members consists of three deaf and two hearing persons who are themselves certified with the R.I.D. The R.I.D. rates interpreters' performances on criteria such as the following:

clarity	extent of sign vocabulary
speed/time lag	fluency
expressiveness	appropriate mouth movement
correctness of concept	comfort factor
attitude	

Let us relate these factors to the day-to-day situation in which the deaf person finds himself using an interpreter. Does he, in fact, use the same criteria in deciding that a person is a good interpreter? I believe that, for the most part, this is the case. However, there may be a factor which is not included above, since there are known to be fully certified persons who are unacceptable to some deaf people. What is this factor, and, if it is there, it must be an over-riding one since some candidates who do pass the five-part test still are not acceptable. Can any of the factors used in the R.I.D. evaluation be used in finding predictors of success? What is the correlation between expertise in two groups of interpreters -- those having deaf members in the family and those entering the field with no background of deafness in the family?

Dr. Schein has reported a study on personality characteristics associated with interpreter proficiency. His study, done with interpreters already functioning, shows that a personality picture emerges for the successful interpreter, and, it appears as follows: desires to be the center of attention and to be independent, is not overly anxious, does not seek sympathy for self, and is not rigid. Schein does emphasize the need for a cross-validation of his results. If this study is validated, can it be used as a predictor of success in the screening of new applicants for interpreter training?

An interesting fact in Schein's study is that the judges' ratings did not correlate highly. Although he used male and female, deaf and hearing, there must have been some dissimilar element which caused their ratings to lack agreement. I suggest that rating an interpreter has much to do with the amount and kind of previous experience one has had with interpreters. In other words, if a deaf person has utilized the services of many interpreters, he has a broad background on which to base his judgement. He will be much more sophisticated about his choice and rating of interpreters than the deaf person who has seen an interpreter in action very few times and who, therefore, rates a poor interpreter highly because he has not ever seen a better one.

The cognitive process involved in interpreting needs to be studied. Breakdowns can occur anywhere along the line -- in the reception, in encoding, or in decoding. Could it be possible that some persons are strongly visually oriented while others are more responsive to sound stimulation? Some may be oriented to whole concepts in gestalt fashion, while others focus on detail. Could this be tested by comparing results in paragraph reading with tests in individual word meaning? And is there a relationship?

The physical process of interpreting cannot be overlooked. Is there a definite set of motor skills involved which can predict

successful delivery in manual communciation? What is the relationship of physical skill to the cognitive skill? There would appear to be a definite need for speed, both in motor skill and in recall of signs.

Some have expressed the thought that ability in foreign languages may relate to ability in sign language. Would a test which predicts foreign-language ability also predict success in the interpreting field?

What about correlation with musical talent? This thought has been suggested by some as being related to ability to sign well, although the fact that it may relate to manual communication skill may not necessarily mean there is a relationship to interpreting. Will persons who sign well become the best interpreters? Is there a relationship between skill in simultaneous communication which is self-generated and that of interpreting which conveys another speaker's thought?

It goes without saying that general intelligence is probably one of the first predictors of success in interpreting. Since a rich vocabulary is obviously a necessity for the interpreter, a minimum score on one of the accepted vocabulary tests should be established before a prospective interpreter enters a training program.

To what extent does the ability to be expressive enter the picture? Is there a way to test whether persons who are naturally shy can overcome this sufficiently for the type of interpreting needed for deaf people? Foreign language interpreters can function in a booth behind the scenes while sign language interpreters must of necessity be in the public view. It may be that the kind of person who applies for interpreter training is aware of this need and that those who feel they could not function in this capacity have already screened themselves out by not applying for training in the first place.

What about reverse interpreting? We are all aware that very few interpreters have developed this ability. What is it about this skill that makes it so difficult? Is it simply that reverse interpreting is not required of us, and therefore the lack of practice contributes to the lack of ability? Or is there something about seeing the signs in rapid progression and having to speak out the message that requires a special cognitive skill or combination of them? Could it be that the "hand is quicker than the eye" and that what we see passes by so quickly that we have lost it? Will eye training be of help in training interpreters, and, if so, how can this be done? At a workshop on the subject of reverse interpreting conducted by Willard Madsen and his staff, the following items were felt by those present to be the basic needs of the reverse interpreter:

1. Ability to simultaneously receive and express the communications of the deaf.

2. Increased familiarity with colloquial sign language idioms.

3. Skill in conceptualization.

4. Advanced skill in reading fingerspelling.

5. Knowledge of the nature of the construction of the sign language and signed sequences.

6. Public speaking techniques - facial and vocal expression.

7. Lipreading and understanding of "deaf speech."

8. Skill in "word choices."

9. Increased involvement with deaf people and in their activities.

10. Reverse translating vs reverse interpreting.

Interpreting is becoming a recognized profession, and, therefore interpreter training programs must incorporate into their selection of candidates a screening process which will make it possible to accept only those who show promise of ability to function well. This meeting has been organized for the purpose of asking the research questions. The main questions I would like to see investigated here at Gallaudet College are "What are the factors which will predict profiency in interpreting?" and "What are the components of good interpreting skills?"

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DIFFERENT RECEPTIVE COMMUNICATION MODALITIES

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It would seem appropriate that at a symposium of this nature, we should focus part of our attention to a situation that has and is causing confusion in schools and programs for the deaf child. I am talking here about total communication. I feel that all too often total communication has been viewed as a method and not a philosophy - Total Communication is not something that you do, it is something that you believe. Perhaps the most quoted statement or definition of Total Communication is the one proposed by David Denton, "The right of the deaf child to use, ...etc." I'm sure that you all know the rest. And yet this statement avoids the fact that communication is a two-way street. Not only must we consider and respect the mode of communication preferred by the child but we must now begin to focus on the teacher's choice of communication modes. However, what happens in reality is that, while teachers may accept or in many cases tolerate the child's use of varing modes, all too often they themselves use only the simultaneous method of communication.

I would submit that a wider view of Total Communication is needed. Such a view is, one which views Total Communication as a philosophy or attitude of determining the objectives, ascertaining the demands and constraints of each communication situation and utilizing and accepting those communication strategies which are best suited to that situation and to the learning style of the individual child in the process. Consequently, it is necessary to ask the following types of questions in determining the selection of communication strategies:

> What are the goals of this situation - mine and the child's?
>
> What are the child's most effective receptive modes of communication?
>
> What expressive modes can and should be expected from the child at this time?
>
> What strategies at my disposal will best suit this situation and this child?

The communication strategies available may be employed singly or in multiple combination. The choice of strategies depends on the goals of the situation (counseling, discipline, recreation, etc.) the individual child involved (hearing loss, speech potential, signing ability, etc.) and the adult's skills (signing skills, skills in auditory training, etc.).

The eleven major modes of communication strategies that may

be used are:

ASL

Manually Coded English

Read and Written Modes

Audition

Speech

Speechreading

Gestures

Pantomime

Dramatics

Media

Art

While these comprise the major strategies that are at one's disposal, the question of effectiveness must be raised. This year, at Kendall School, we are developing and designing a sign language for the students - to my knowledge the first such program in the country. In the course of beginning this development, we have found it necessary to obtain base line data on the signing skills of our students. We have devised six tests or assessment tools to provide us with this data. I would like to explain briefly one of these tests and share the results of another test with you.

One test or measurement that we will be employing is a speed differential test. Basically this is designed to give us an individual student's optimal, comfortable rate for receiving sign with and without lip movement. This test consists of two 16mm films - one with lip movement and one without - shown separately to each student on a variable speed 16mm film projector. The rheostat on the machine is placed at the fastest speed and the student then regulates the speed of the film until he finds out the speed that is best for him. Afterwards, a set of comprehension questions are asked to insure that there was understanding. We have only recently begun this test, and, unfortunately, I have no data with me, but it will be available shortly.

The second test, and one that I do have the data for, is a modality effectiveness test. This test was designed to help us determine the student's most effective receptive mode from among the following eight modalities:

signs alone

signs w/lip movement

signs w/voice

fingerspelling w/lip movement

fingerspelling alone

fingerspelling w/voice

lip movement alone

voice alone

The procedure was as follows:

A list of high intelligibility words in lip reading collected by C.I.D. was chosen. Words on that list were eliminated if there was no clear, distinct sign and/or if it was not possible to find an object for that word. Twelve words were randomly selected and objects were found for these 12 words. These words were then arranged in pairs, and each pair of words was randomly assigned to one of the eight modalities; this procedure was repeated until four pairs of words were attained for each of the eight modalities. These 32 pairs of words with the assigned modality were then randomized. A color video tape was then made placing each pair in the following sentence in the appropriate modality:

Put the _____ on the _____.

An introductory tape was male which demonstrated the appropriate sign, spelling, etc., for each item and showing each item. The tester would use this tape to insure that the student had expressive knowledge of each item, i.e., the student could, based on the video-taped clues, give the sign, spelling, and some form of vocalization for each item. The student was then required to manipulate the twelve objects, which were on a table in front of him, according to the 32 sentences on the video-tape. The task was simply an object identification task - whether the student put the glass on the book or the book on the glass was of no immediate concern; the crucial factor was simply identification of objects based on a controlled variety of modalities.

This test has been completed for the 29 students in Fenda'll's Middle School. It is currently being used with the primary students and will be done with the elementary students shortly. The results:

Looking at a group profile for these students, we obtain [illegible] a good picture of the receptive functioning of this group.

First,

for lip movement alone, we note this type of curve	mean 57.3%
for voice alone, we see	mean 61.6%
for fingerspelling alone	mean 76.7%
for fingerspelling with lip movement	mean 80.1%
for fingerspelling with voice	mean 78%
for signs alone	mean 93.1%
for signs with lip movement	mean 93.1%
for signs with voice	mean 92.6%

I feel there are several significant results from this information.

First, it would appear that the addition or overlap of modalities or clues with fingerspelling and signs does not significantly improve understanding. In fact, the case of adding audition to the visual modes of lip movement with signs or fingerspelling decreases receptive efficiency. Possibly this suggests that the simultaneous decoding of both auditory and visual input may present problems to the deaf child which impede efficiency.

Second, since currently class groupings are based on academic performance rather than communicative facility, it is highly probable that in a single class of five students, each one may have a different receptive mode of communication which is most effective for him. Thus, the teacher, who may be unaware of this, may continue to communicate using signs and voice and may frustrate the students who have not acquired facility in receptively dealing with that mode.

Third, with such results communication skills classes can be developed and designed which will afford the opportunity to develop in students those weaker modalities and utilize and expand those modalities in which he is efficient.

In brief, more research is needed in the field of receptive communication modalities in order to assist the teachers and schools in truly realizing the importance and implications of Total Communication. We need instruments which will help us predict a student's most efficient receptive modes.

L'EPÉE'S METHODICAL SIGNS REVISITED

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The Abbé de l'Epée, the benevolent priest who over two hundred years ago started the systematic education of the deaf, is still respected today for the dedication and the selflessness he brought to this task. It is generally known that the Abbé learned sign language from his students and then proceeded to complement their language by means of signs which he invented. He named these new signs 'methodical signs,' but not much is known about them and how he used them and how he used them to educate deaf children.

Currently, new attempts are being made to teach English to deaf children by means of invented signs. It is, therefore, an opportune time to take another look at de l'Epée's methodical signs in the hope of gaining some insights into the present artificial systems.

De l'Epée's aim in educating the deaf was to provide them the means for intellectual development. He decided that for this purpose it was imperative to teach his students the French language. He felt that the easiest way to accomplish this goal would be to use their native language supplemented by his methodical signs.

De l'Epée's decision to use sign language was a consequence of the philosophical climate of his time. As a young man he had learned from his tutor the "Lockian premise that there is no natural connection between metaphysical ideas and the articulate sounds associated with them . . . .' (Seigel 1969:109) Words are associated to the ideas they represent by convention only. De l'Epée concluded that these associations could be established just as well between ideas and the written word, with speech acting as an intermediary between the written word and ideas. In the same way, for the deaf, signs can be the intermediary between written words and ideas. The written word would represent the sign and the sign would represent the idea (de l'Epée 1776).

De l'Epée considered sign language to be the native language of the deaf. He thought that in order to learn French the deaf must follow the same process a non-Frenchman must follow, namely translating from French into their native language. However, de l'Epée felt that the native language of the deaf was too limited in vocabulary and in grammatical complexity to convey all the meanings of spoken language. He therefore set out to complement the native sign language with his methodical signs.

In 1827, Baron de Gérando, administrator of the Paris Institute for the Deaf after Sicard, published an historical perspective on the education of the deaf (1827). It is extensive, critical, and by far the best available description of the methods employed by de l'Epée and his successor, the Abbé Sicard. I will present a synopsis of de Gérando's account of their methods with particular regard to the use of methodical signs.

There were two basic types of methodical signs: lexical and grammatical. De l'Epée began a dictionary in which words for complex ideas were analyzed into simple signs already known to his students. De l'Epée contended that by means of this analysis the deaf students could learn the meaning of any word that he wished to teach them. De l'Epée never completed the dictionary, but illustrations from his other books indicate that his sign descriptions often consisted of several sequences of pantomime. For example, to teach the concept 'I believe,' he first wrote the following sentences:

I believe
- My mind says yes. I think yes.
- My heart says yes. I like to think yes.
- My mouth says yes.
- I do not see with my eyes.

To sign 'I believe' de l'Epée first made the sign for 'I,' then he put his finger on his forehead, then he made the sign for 'yes,' then he pointed to his heart, then again the sign for 'yes' while touching his mouth and moving his lips, and finally he touched his eyes while making the sign for 'no.' In some cases, de l'Epée's analysis of complex words was based on Greek and Latin etymologies. Once the students had understood the explanatory signs, he used abbreviated signs which he had invented as well.

De l'Epée also invented conventional signs to represent all the grammatical features of French in sign language. For example, a verb consisted of a radical, followed by four other signs to indicate inflections for person, number, tense, and mood. The students memorized the complete conjugations of various verbs and then learned the different signs associated with each of the above inflections.

In this way, French and some other European languages could be translated into the new sign language. The entire education process consisted of a continuous translation in which, essentially, the students were provided with a systematic interpretation of the meaning of words.

In order to propagate his method so as to help educate more deaf people, de l'Epée held public demonstrations in which his students performed in front of large numbers of spectators. His audiences included royalty, religious figures, and intellectuals. In a typical exercise, students responded in writing to questions addressed to them in methodical signs. They also wrote down passages from books or letters which had been dictated to them in methodical signs. These exercises were conducted in French, Latin, Italian, Spanish, and English so as to impress foreign visitors with the universality of methodical signs.

A copy of the program for the public demonstration held August 13, 1783 (de l'Epée 1784) indicates that, in this particular exercise, the students responded in written French, Latin, and Italian to two hundred questions pertaining to religious matters, such as "What is the Mystery of the Holy Trinity? Is the Father eternal? and, What are the five Sacraments?" De l'Epée admitted obligingly that he had previously provided the answers to all of these questions by means of methodical signs.

De l'Epée's method came under criticism by some of his contemporaries on the grounds that his students were unable to write on their own a correct sentence in French. The explanation for this situation is provided by de l'Epée in two letters he wrote to Sicard, who at the time headed the school in Bordeaux. De l'Epée wrote Sicard not to expect his students to be able to express their own ideas in writing, because French is not their language. It is enough for them to be able to translate into their own language--sign language. In his second letter de l'Epée criticizes Sicard for trying to make writers out of his students, when his method can only make them into copiers. He admonishes Sicard to teach them conjugations and declensions, without expecting them to be able to write on their own in French.

Having pointed out the limitations of de l'Epée's method, de Gérando states that some, including Sicard, criticized de l'Epée too severely. Although his students were not able to express themselves on their own in written French, they had undergone an intellectual development, and they acquired a certain body of knowledge. Nonetheless, it is in their own language that they exercise their mental capacities, and they continue to think in that language.

Sicard accepted de l'Epée's basic principles and undertook the completion of the work started by his predecessor. However, for Sicard the essential goal of education of the deaf person was to provide him the means to express himself. Therefore, according to Sicard, it was not enough to teach him syntax, it was also necessary to show him how the spirit of these rules represent the laws of thought.

In actual practice, Sicard's approach did not differ substantially from de l'Epée's. Sicard completed and published the dictionary started by de l'Epée (Theorie des Signes, 1814). He modified some of de l'Epée's descriptions, but they still consist of sequences of pantomimes. In practice, deaf people reduced these sequences to single signs. Other descriptions were simply definitions, or descriptions using words.

According to de Gérando, both de l'Epée and Sicard state that the language of methodical signs is formed by usage, by the reduction and ellipsis of the mimed descriptions. And, therefore, the true methodical signs had not yet been described. Gérando indicates that only lexical signs had been modified by the deaf in this way, while some grammatical signs were retained. However, in another place he states that the deaf omit grammatical signs entirely. De Gérando provides a description of "The Lord's Prayer" as it was recited in sign language daily by the students in his institution. He points out that it did not follow French word order, and no grammatical signs were included. De Gérando concludes that methodical signs were transformed from living, animated pictures into arbitrary signs. Almost 150 years later, using a complicated linguistic model, contemporary linguists corroborate de Gérando's observation that signs which are originally iconic eventually become arbitrary (Frishberg 1975, Woodward and Erting 1975).

De Gérando brings out an interesting fact concerning Sicard's student Massieu who was well-known for astuteness and originality in the many public methodical sign exhibitions in which he participated. It appears that Massieu never learned to write in correct French. His equally famous class-mate, Laurent Clerc, did acquire this ability, but de Gérando credits this to extensive reading rather than Sicard's method. In any event, there is no doubt that both men were highly developed intellectually and culturally. In 1818, the year following his arrival in the U.S., Clerc addressed a speech written by himself in English to the governor and the legislature of the State of Connecticut.

As a disciple of Sicard, Clerc brought his teacher's method to the U.S., where methodical signs were adopted to teach English. It was used in all the American schools from the time the American Asylum was founded in Hartford, Connecticut, in 1817 to approximately 1935 (Keep 1871).

By 1853, at the Third Convention of the American Instructors of the Deaf, one speaker stated that Sicard's system of methodical signs was a piece of quackery, and he expressed the hope that all the American schools would follow the wise example of the Paris Institution which had discarded it from its course of instruction (Rae). Another speaker, however, suggested using methodical signs to teach grammar to deaf students (Turner).

The author of an article published in the American Annals of the Deaf in 1871 reports that a modified version of Sicard's method was still being advocated by some teachers. As described by the article's author, the Rev. Keep, the system under consideration involved the sequencing of natural signs into the word order of English. No invented signs were included. Today we would call this system signed English, but its historical relation to the methodical signs of de l'Epée and Sicard is not generally acknowledged. Keep presents several arguments against this system and in favor of retaining the natural language of the deaf intact. Inverting the order of signs to make them conform to English word order appeared Quixotic to the author. He claimed that it would spoil some aspects of sign language, without leading to a greater competence in English. Deaf people would continue to sign and think in the order dictated by the structure of their own language. Besides, deaf people are quite capable of accepting that the word order of English differs from the order of signs in their own language. If they are shown the differences, they will be able to learn English as well as hearing people learn foreign languages.

Keep then asserts that, although sign language is restricted in its capacity to express complex abstract ideas, the deficiency does not reside in the structure of sign language. Rather, it is caused by the fact that sign language has not been used to deal with certain abstract subjects. All spoken languages, according to Keep, have at one time been in the same state. He concludes that sign language would achieve the same level as spoken languages if the deaf were allowed to develop it by using it to the exclusion of other languages. However, as long as the primary goal of education is to get the deaf to use English, Keep doubts that sign language will progress any further than it has. Those elements essential to sign language alone, such as 'spacialization,' will be lost to younger children who learn only a contrived form of sign

guage. To them the contrived langu[illegible] appear vague and unintelligible, but they will not have any [illegible] way to express themselves.

Keep's astute assessment of the situation is no less valid a hundred years later. There has been a concerted attempt in this century to wipe out the natural sign language of deaf people by oralism. Even now that educators recognize the value of a manual-visual system for educating the deaf, as opposed to purely oral training, this same threat to the natural development of sign language may exist from the use of the new artificial sign systems.

In this paper I have presented a historical overview of the methodical signs from the time of their invention by de l'Epee in 18th Century France to their use in American schools for the deaf a century later. Certain aspects of methodical signs and their underlying assumptions were pointed out to demonstrate their relevance to the contrived sign systems currently in vogue in the teaching of English to young deaf children. This preliminary look at methodical signs indicates that further research in this area is warranted on the basis of the insights it provides into the assumptions, use, and results of these systems.

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RESEARCH ON FOREIGN SIGN LANGUAGES[1,2]

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1.0 Introduction. We would like to discuss two on-going research projects as the Linguistics Research Lab: Historical Bases of American Sign Language and Providence Island Sign Language. For each project, we will summarize the rationale for the study and present some findings and theoretical and practical implications of the research.

2.0 Historical Basis of American Sign Language. Historical Bases of American Sign Language is supported by a research grant from the National Endowment for the Humanities. The grant is concerned with lexical, formational, and grammatical changes in American Sign Language (ASL) and with the sociolinguistic factors influencing rate of change.

2.1 Rationale. There are two basic reasons why this research has been undertaken: theoretical linguistic interest in ASL and applied linguistic interest in language policy and attitudes within the deaf community and the educational system that purports to serve deaf individuals.

Because ASL is produced through a manual-visual channel, it has characteristics that help broaden the understanding of the phenomena of human languages (Bellugi and Fischer 1972). Since most linguistic studies have concentrated on oral languages, linguistic theory has not captured all appropriate generalizations about the nature of language. For example, assimilation is a general process that happens in all languages, however the types of things that assimilate and the factors influencing assimilation are very different in oral and sign languages. Because a growing number of linguists are not viewing language as basically dynamic or always in the process of change (Bailey 1973), we are concentrating on this project on on-going and completed variation in ASL.

Secondly, "this study will give further support to the view of deaf people as a highly structured minority group, by presenting an objective historical view of American Sign Language. Language is one of the most cohesive forces in the deaf community (Meadow 1972). A dynamic description of historical change in ASL should give important insights into the history of the deaf community as an autonomous minority group with strong linguistic traditions, as a group in which forced assimilation into the dominant society is the rule, not the exception." (Woodward 1974. 5)

2.2 Findings. It is naturally impossible to attempt to summarize all [illegible] findings. There is not enough time and not all the data has been analyzed. What we would like to do, however, is summarize

some of the findings that we consider exciting. References are listed where appropriate; these references will describe each of the studies in detail.

To the present, we have concentrated on systematic formational differences in French and American Sign Language. What we have found is that French signers retain more older forms than American signers (Woodward 1975a; Woodward and DeSantis 1975a). If we compare American signers, we find that southern signers use more older forms than northern signers (Woodward and Erting 1975) and that blacks under the age of 47 in the South use more older forms than whites of the same age (Woodward and DeSantis 1975a).

Let us look at three studies that show these results in a little more detail. In the first study (Woodward 1975b), signs from Oleron's (1974) dictionary of Parisian French signs were compared with ASL signs of various regions. Some of the findings are startling. Oleron (personal communication) has stated that the signs chosen for his dictionary are the signs he felt were most easily explainable as iconic or picture-like and, therefore, the signs that should be the most universal. Indeed, even if the signs were not that iconic, one would expect a great deal of similarity, since ASL is historically related to FSL, and a time span of less than 160 years separation is not that long in linguistics. The comparison, however, showed that 42.7% of the 872 French signs in the dictionary had no formational or semantic relation to American signs. (We also hope to have an ASL informant in his/her eighties anlyze the French signs to see if any of the signs were previously used in America but now are not.) The remaining 30.8% of the signs were related to American signs but were not the same in form and meaning. For example: 22.3% of the signs had the same meaning but a different related form; 6.3% of the signs had the same form as an ASL sign and a different but related meaning (FSL BIZARRE = ASL VARY), and 2.2% of the signs has a slightly different form and meaning from ASL (FSL FAITHFUL, ASL SWEETHEART, where FSL makes the sign in an uncentralized position over the heart and ASL has centralized the sign.)

The second study (Woodward 1975a) goes on to demonstrate the systematic nature of the formational changes in fluidity of compounds, handshapes, locations, and movements. While the study contains too much information to completely summarize here, a very obvious trend that developed was that if a French sign had a historical relationship to an American sign, the French sign was the older variant. For example: compared with FSL, ASL has fewer compounds, more signs centralized on the body, more simplifications of movement, and more assimilations of handshapes. There were only four exceptions to this trend, indicating that 92.6% of the signs, that were related because of historical processes, followed the pattern: French signs older than American signs.

The third study (Woodward and DeSantis 1975a) compares data from 60 French signers from Paris, Toulouse, Albi, and Marseilles and 75 American signers from New Orleans and Atlanta (35 black and 40 white) on signs on the face that are made with two hands or one hand. The two hand forms are older (Frishberg 1975). The pattern of change was the same for all signers at a 93.3% rate of scalability. French signers used older two-handed variants more than American signers (x^2=52.01, df=1, $p < .001$). White Americans over the age of 47 used older two-handed forms more than whites under the age of 47 (x^2= 5.17, df=1, $p < .05$). Blacks under the age of 47 used older two-handed forms more than whites under the age of 47 (x^2=6.89, df=1, $p < .01$). Again, these patterns are evident: French signs are older than American, and, in America, southern black signs are older than white signs.

2.3 Implications. The studies discussed are only a small part of the grant activities but they have important theoretical implications. First, the studies show that ASL and FSL display continuities that one would expect to find in languages that have an historical relationship. The study of two-hand-to-one-hand variation (Woodward and DeSantis 1975a) illustrates continuum variation between FSL and ASL. However, the study on the comparison of French signs with American signs (Woodward 1975b) presents evidence that ASL probably did not develop solely from FSL. The fact that 42.7% of the FSL signs had no formational or semantic relationship to ASL signs does not fit with what is currently known about historically related dialects that have been separated for less than 200 years. Compare the 42.7% difference with evidence from Gejl'man (1957) on Russian signs that show only 2.5% of Russian signs that he had historical information about lacked similarities to modern Russian signs used today. Gejl'man was working with a 135 year time span. Looking at one method in linguistics for dating historical relationships (Gudschinsky 1964), the percentage of change found by Gejl'man is appropriate, but the percentage we found between modern FSL and modern ASL signs would hypothetically date the arrival of FSL in America around 30-108 A.D. with a 90% level of confidence.

This lack of similarity is even more suprising when one considers that the signs were chosen because of their supposed iconicity. One possible explanation for this is that there existed a sign language or languages in the U.S. before the time Gallaudet and Clerc introduced FSL to America. The language(s) may have been creolized (mingled and massively restructured) along with FSL. Some of the differences between FSL and ASL have similarities to structural change that has occurred in oral creoles (Woodward 1975b).

Given more time and space, we could go on with implications for linguistic theory and the linguistic history of ASL. However, this research also has at least three applied implications that should not be ignored.

First, the studies along with related research (Battison and Jordan 1975; Jordan and Battison 1975) give counterevidence to various myths about sign languages. Contrary to popular opinions,

these studies show 1) that sign language is not universal, 2) that L'Epee did not invent sign language but merely tried to standardize FSL to parallel French grammar, 3) that sign languages are no more conceptual than oral languages since the number of differences between FSL and ASL are in formation, not in semantics, 4) that ASL probably did not develop solely from FSL, 5) that sign languages are rule-governed in terms of their own dynamic principles, etc.

Secondly, because the research demonstrates that FSL and ASL have characteristics such as regular historical change that all languages have, it becomes more impossible to justify linguistic discrimination against ASL and the deaf community.

Thirdly, the filmed data and findings have immediate application in promoting deaf awareness and deaf pride among hearing and deaf people.

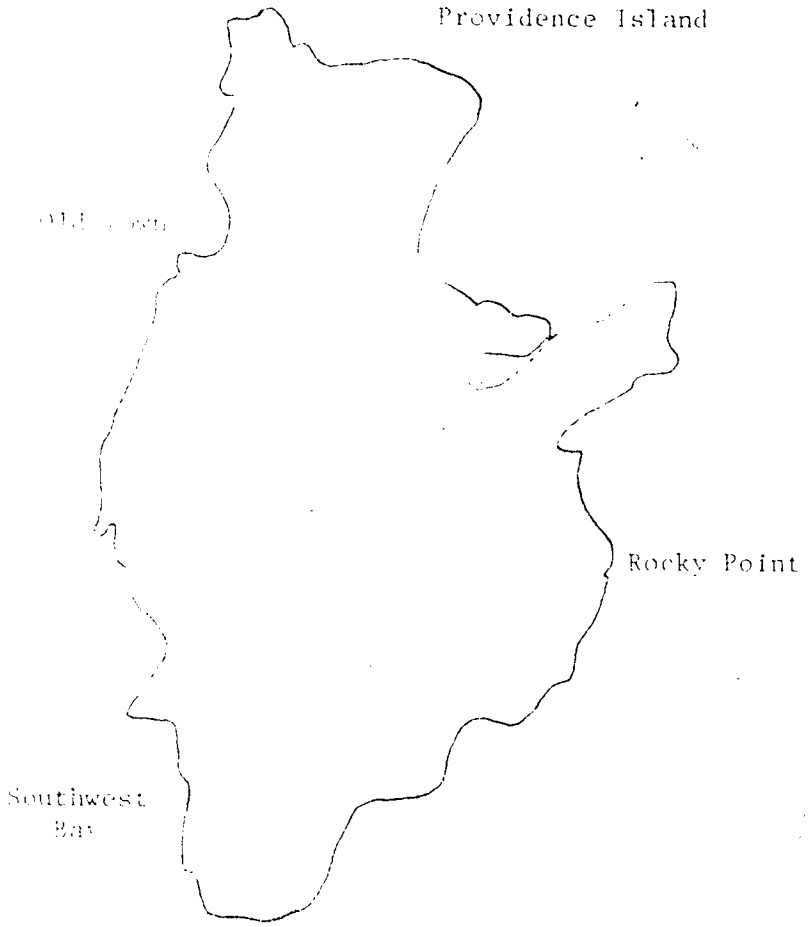
3.0 Providence Island Sign Language. The Providence Island Sign Language study was initially supported by a small grant from the Gallaudet College Research Committee. This project is investigating the form and use of this sign language using sociolinguistic methodology.

3.1 Rationale. Data collected from this research will provide insights into sign language that seems to have developed in isolation without influence of other sign languages or educational planning and enforcement. We wanted to see differences and similarities in processes of variation and change occurring in ASL and Providence Island Sign Language. This information will be extremely valuable in discussing universals and uniqueness in sign languages.

3.2 Findings. Providence Island is situated in the Caribbean, 150 miles east of Nicaragua and 50 miles north of San Andres Island. Providence is 15 square miles in area and is quite mountainous, thus one must use the main road which circles the island to travel from community to community. Though the island is owned by Columbia, the first language of most of the approximately 2000 inhabitants is an English-based Creole; Spanish is used when the islanders are in contact with Columbians.

In the past, the population of Providence was engaged in slash-and-burn agriculture and fishing, but within the last 20 years government jobs and construction on the island have attracted the majority of the hearing males. Deaf males interviewed have kept the more traditional occupations in agriculture and fishing, resulting perhaps from the fact that none of the deaf inhabitants of Providence have attended schools.

Our Study 3 primarily involved signs elicited from six deaf informants; two people from Old Town, three from Rocky Point, and one from Southwest Bay. Social attitudes towards skin color isolate



signers in Southwest Bay as effectively as geographic location. Patterns of linguistic variation indicate Southwest Bay signs are more similar to Rocky Point signs than to Old Town signs. For example, signers in Old Town have signs for BLACK, WHITE, and RED, while signers in Rocky Point and Southwest Bay do not have a sign for RED. This pattern of variation in color terminology has been demonstrated to be universally expected in oral languages (Berlin and Kay 1969).

What we encountered on Providence was a sign language with regional, historical, and social variation. The region in which an informant lived influenced some of the variation noted in tabs or locations where signs are made. For example, the sign HARD is made on the face by deaf signers in Old Town and in zero tab by the informant living in Southwest Bay. Rocky Point signers made the sign on the elbow or in zero tab.

Historical variation, related to ages of informants, influenced assimilation and simplification of compound signs. As expected, older signers tend to use more compounds and non-assimilated signs.

Social variation between hearing and deaf signers was exemplified by one hearing interpreter during a story-telling session in Old Town. The hearing interpreter constantly encouraged the two deaf

informants to change their signs to become more like English word order.

We are specifically investigating handshapes used in producing signs on Providence Island and have found the common use of A,B,C,5, G,bO, and F handshapes which also occur in [illegible] ASL. Research on child acquisition of ASL (Boyes 1973) has [illegible] that five handshapes A,B,C,5,G are among the first to be learned by children. Related research (Battison 19[illegible] has also shown that these handshapes are the least restricted in [illegible] in ASL.

3.3 Implications. [illegible] research on Providence Island sign language expands linguistic theory by adding descriptive knowledge of an isolated non-FSL related sign language. For example, we have additional evidence (c.f. Kegl 1974) that shows that past and future time are not represented in universal ways in sign languages. On Providence Island, future time is expressed by inward movement and past time by outward movement, exactly the opposite of ASL.

There are also practical applications of this research. We have further evidence against claims of universality in sign languages and against claims of invention of sign language by hearing people. In an indirect way, Providence Island Sign language offers supportive evidence for the possible existence of a sign language or languages in the U.S. before the 1800's.

The research on handshapes in Providence Island signing also gives support to the theory recently postulated by some linguists that artificial Manual English signs may be very unstable because of complex handshapes, for example, F handshapes, used in ways that are not compatable with naturally developed sign languages, as in the Natural English sign FATHER. The fact that these complex handshapes are learned later by children (Boyes 1973) and do not occur in various sign languages give support to the claim of complexity and possible instability.

Finally, because Providence Island is a unique situation, information on the lives and language of the deaf people there would be informative for anyone wishing to know more about people coping with environments.

4.0 Conclusion. What we have attempted to show is that both of these projects on foreign sign languages, which might appear somewhat esoteric to a non-linguist, not only broaden our knowledge of linguistic theory, but also give us important descriptive insights into the structure of ASL which then can be applied in an educational framework.

In conclusion, we would like to point out one brief example of the unpredictability of research. While looking for grammatical correspondences between FSL and ASL, we found by accident one exciting piece of information that had been searched for directly but never found in previous studies (Woodward 1973a,b): sign variation related

to the social variable of sex. Among our FSL informants, females used more Negative Incorporation than males (Woodward and DeSantis 1975b) ($x^2=3.79$, df=1, $p<.05$). Sex differences have been noted in oral languages (Haas 1964; Trudgill 1972) but never actually demonstrated in a sign language.

Although we may have very clear ideas of what our research will look like, there will always be surprises that cannot be anticipated.

NOTES

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[2]This paper was presented at the Second Gallaudet Symposium on the Role of Research on Language and Communication Research Problems, Gallaudet College, Washington, D.C., October 31, 1975.

[3]Some preliminary findings of the Providence Island study were reported in Woodward and DeSantis 1975c. A more comprehensive report, co-authored with William Washabaugh, will be ready by February, 1976.

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RESEARCH NEEDS REGARDING DEVELOPMENT OF LANGUAGE MODELS IN HEARING-IMPAIRED PERSONS

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Typically a person with normal hearing develops an extensive and relatively complete auditory-motor-speech language model by the time he is six years old. By complete is meant that the language model has no great gaps in it; it includes all the essential language patterns, plus a vocabulary large enough to handle communication in connection with the common activities of young life. The auditory language model, of course, will continue to expand, to be refined, and to be altered, throughout life.

The foregoing statement is not intended to imply that the initial language model of the hearing person is exclusively auditory. In early childhood, quite a number of basic concepts are likely to be formed and first associated with gestures, rather than spoken language, but the auditory model soon takes over and becomes the dominant language modality which serves in both receptive and expressive (spoken) communication. It is also the foundation for learning to receive and express verbal language in the written form.

As reading skill develops, a secondary (visual) model of the language (written) is developed. In the beginning, the elements of this model are associated on a one-to-one basis (probably on a word-for-word basis, or even to some extent a morpheme-by-morpheme basis) with the elements of the auditory model. With increased skill at reading, the written form of the language, though never truly independent of the auditory model, manifests many of the attributes of a separate model. Thus, many persons reach a point at which they can read several times as fast as a person can speak, with no or little conscious subvocalization. Many people become so oriented toward the visual model of the written language that they actually become confused about how they pronounce certain words, being under the impression that they pronounce them as they are spelled. This is true, in part, because speech becomes automatic to such a degree that one may not be conscious of it in as much detail as one often is regarding the written form.

We know much more about the language models of deaf persons than we do about those of persons with normal hearing. One reason, of course, is that there is doubtless a great deal more variation among the language models of hearing-impaired persons. At one end of the scale is the person who loses hearing in adulthood, and who (for a time, at least) has essentially the same language model as a hearing person. We do not know much about the extent to which the auditory language model deteriorates (or fails to deteriorate) with time in such a person. Whether or not the

learning and use of signs by such a person creates a separate and relatively independent language model, or simply a direct translation "code" for the adventitiously deaf person to use, would appear to depend upon how he learns signs, and how he uses them. If he learns them through direct association with deaf people who use some variation of Ameslan, it would appear reasonable that he might learn to think in signs, without having to translate into or from a verbal language, within a relatively short time, and thus be truly bilingual. On the other hand, if he learns signs the way most hearing people learn them, he is likely to remain in the direct translation stage for a long time, and may never acquire speed and fluency in communication with persons who use Ameslan. When I say that the adventitiously deaf person is at one end of the scale, I mean that he is likely to be at the top end of the scale so far as the accuracy and completeness of his auditory language model is concerned, and he is likely also to have a similar advantage as regards his model of the written language. He is likely to be at the bottom end of the scale, however, insofar as concerns his understanding and appreciation of sign as a language in its own right, and insofar as concerns his ability to think in signs and to use them for communication without translation to verbal form. Signs are quite likely to exist in his language model in a form which ties them primarily to words, rather than to the concepts which they really represent. Thus, he is much more likely to have to go through words to get to concepts, when reading signs, for at least a year or two. Similarly, he will likely have to go from concepts to words to signs in expressing himself in signs. Time, however, may make him truly bilingual.

It is ironic that so little research has been done on the language models of persons who can think and communicate in the language of signs, without thinking words in either spoken or written form. It is ironic that the attributes, the distinctive features, and the integrity of such a language have not been given more attention. Certainly, the importance of a language has to be judged to some extent in terms of the number of people who use it, and in terms of its impact on society. This has not kept linguists from being interested in doing research on obscure languages used by relatively small numbers of people, whenever such languages have appeared to have characteristics that would warrant research interest. Not only is research on the language of signs warranted by the extent of its use, but it is virtually mandated by the fact that information about it is essential in devising solutions to the basic problems in the education of the deaf.

If we knew more about the language of signs, and more about the thought processes of those who use it, we might be forced to conclude, for example, that signs and verbal language should be kept separate, just as Spanish and English should be kept separate in order to promote true bilingualism. The separate use of two languages by a given person, for extensive communication, tends to produce bilingualism. To learn and use one language through translation from another language tends to militate against bilingualism.

We need research into the language of signs, including [illegible] language models of persons who use it extensively for [illegible] tion, in order to learn how to make it possible for [illegible] persons to be truly bilingual, [illegible] home in the language of signs and equally at home in the use of verbal English [illegible] written English as a minimum, spoken English as a goal).

Though we do not have an accurate understanding of what the language models of typical, prelingually hearing-impaired persons [illegible] like, we can be reasonably sure that they represent combinations of many different elements (signs, auditory elements, written language, fingerspelling, facial expression, natural gestures, etc.) It is probable that in most cases there is no simple, complete, internally consistent language model, other than the language of signs itself, and the latter will be the case only if the hearing-impaired person has learned the language of signs through consistent use of it for communication, without any constraints relating it to English, for an extended period of time. We need to know more about all this. We need extensive research on the characteristics of the language models of hearing-impaired persons, and on the relationships of these characteristics to both the experiences of the persons themselves and to the etiology and characteristics of their hearing impairments. We need to know how deaf persons "think" language.

Now let us turn our attention to the way in which language models can be developed in the hearing-impaired person. I would like to divide these methods into two groups: those which utilize a defective, unclear and inaccurate input, accompanied or followed by extensive remedial activity; and those which depend upon an essentially clear input, so that remedial activity is minimized.

In general, all of the oral-aural approaches, in the attempt to develop a model of spoken language, rely upon the combination of unclear input and remedial activity. This is true whether the unisensory (acoupedic) method is used initially, followed by multisensory training, or whether the approach is multisensory from the beginning. The pervasive problem which is encountered in any method employing a defective or incomplete input is illustrated by an analog in which the language model in process of formation is represented as an iceberg. The portion of the model below the water can be thought of as the receptive portion, and that above the water as the expressive. Additions to the language model are made only through reception. Many, even most internalizations of new words or language patterns contain errors if the input is unclear. The only opportunity to correct these incorrectly internalized forms presents itself when they are used expressively. Because a great deal of time may elapse between the internalization of a new language form and its expressive use in a situation in which there is an opportunity for a friend, a teacher or parent to observe and correct it, there may be many

... the internalizations of an incorrect pattern before correction is attempted. It may be necessary to correct the same error many times, because it has been so firmly internalized.

The basic characteristic of a language model formed through detective input and remedial activity is that of a slowly developing model in which most elements are initially learned incorrectly, correction is accomplished only through many repetitions and extensive effort, and the resulting model is still grossly inaccurate. The use of a highly structured language development curriculum, in which each new, internalized word or pattern is tested immediately through expression, is advantageous in minimizing the amount of remedial activity required. This applies, however, only to language development during instruction.

Theoretically, the oral-aural approach utilizes a clear input in the formation of a model of written language. Because the development of reading skills is greatly dependent upon the prior existence of an accurate model of the spoken language, however, and also because it is not practical to introduce the written language during the first three years of life, the oral-aural approach usually falls far short of producing an accurate model of the written language. To summarize, the oral-aural approach uses the detective input-remedial activity approach for spoken language, and a clear input for the written language, but the overall effect, for most profoundly deaf children, appears inadequate to produce accurate models of either spoken or written forms. Research is needed to supply more accurate information on the language models which do result.

The Rochester method (fingerspelling accompanied by speech) has the advantage of utilizing a clear input for development of a model of the written language during both instruction and communication. The transition from the spatial-temporal patterns of fingerspellings to the pure spatial patterns of written language appears to present little difficulty, if a hearing-impaired child learns the language initially through the consistent and uninterrupted use of finger-spelling. The practical difficulties of this approach have to do with the fact that it is quite laborious, and that in utilizing the method children tend to invent gestures and abbreviations to avoid fingerspelling. A second difficulty, which actually contributes to the first, is that fingerspelling cannot be read accurately at speeds near that of normal spoken communication. Another problem with the Rochester method is that the motor skills required for expressive fingerspelling do not usually develop until late in the second year of life, or in the third, so that it may be necessary to accept the natural gestures of the child as the expressive mode until he is older, at which time the gestures may be replaced with expressive fingerspelling.

If the Rochester method is used, the problem of creating in the deaf child a mental model of the spoken language is essentially the same as for the oral-aural method, except that the model of the written language does support the spoken language model to some extent. Since written English deviates so much from a one-to-one relation to the spoken form,

however, the spoken language model is likely to be highly approximate when the Rochester method is used, unless there is a tremendous amount of remedial effort.

Total Communication is characterized by a clear input of signs, thus providing the potentiality for the development of a mental model of the sign language used without the inefficiency of the defective input-remedial activity process. If sign language is used without reference to verbal language, there would appear to be no problems in the development of an accurate (sign language) model, internally consistent and natural in development. If, however, the sign mode is an approximation of so-called "signed English," the development of a mental model will be compromised (theoretically) if the same signs are used in two different modes, signed English and Ameslan (or the modification of Ameslan referred to as Ameslish). So long as only one form of sign language communication is used, however, it should be possible to develop an accurate sign language model through a clear visual input. Research is needed to see whether this is accomplished in practice. There appears to be some evidence that most deaf persons use signs in both contexts, semi-signed-English and Ameslan. We need to know whether they are able to avoid syntactical confusion in the two modes. We know that some deaf persons appear to be able to do so.

Total communication has the advantages of a clear input also in connection with written language, presented through fingerspelling and/or writing itself. The only point at which total communication suffers the same disadvantages as the oral-aural method is in connection with the creation of a model for the spoken language, since in this respect it also depends upon the combination of a defective, incomplete input, plus extensive remedial activity.

The hearing-impaired person has three basic needs in connection with communication skills in the development of language models:

1. A method of clear, easy, face-to-face communication, capable of being used without fatigue for relatively long periods of time, and resulting in communication which is relatively free from strain or necessity for heavy concentration of effort. Available for this purpose are the American Sign Language, Manual English and Cued Speech.

2. A method or methods of clear presentation of the written language, resulting in formation of a relatively clear, complete and accurate model of written language. Available for this purpose are fingerspelling and writing.

3. A method for reception of a clear representation of the spoken language, facilitating the formation of a clear mental model of spoken language, supportive of expressive speech, speechreading, and serving as a foundation for the development of reading skills. Available for this purpose is Cued Speech.

At present, Cued Speech is the only method of providing a clear representation of the spoken language. Used as the basic and exclusive method of communication between parents and a hearing-impaired child in the home, it can satisfy needs 1 and 3, and its use up to the age at which the child is ready to learn to read (say, 6 years) equips the child to learn to read in essentially the same way that a child with normal hearing learns to read. In at least 75% of the programs in which Cued Speech is used, however, it is not used as the basic mode of communication. In many total communication programs, it is utilized as a tool for teaching spoken language. It is used in a good many oral-aural programs for the same purpose: for teaching pronunciation and spoken language patterns, but not as the basic mode of communication.

In summary, the oral-aural method, without Cued Speech, provides a clear input for only written language. Face-to-face communication and the development of a mental model of the spoken language are both accomplished, insofar as possible, through a defective input plus remedial activity. Supplemented by the use of Cued Speech for teaching the spoken language, but not for face-to-face communication, the oral-aural method still leaves the hearing-impaired child without the relaxed, easy communication that is needed for appropriate social and educational development. This defect, of course, can be eliminated by the use of Cued Speech for the two purposes: for face-to-face communication, and for teaching of the spoken language. This is the recommended way of using Cued Speech.

Total communication, as traditionally used, provides easy face-to-face communication and clear presentation of written language. Its one defect, lack of a clear method of presenting the spoken language (and thus developing a mental model of that spoken language) can be remedied by the use of Cued Speech as a tool for teaching spoken language.

A PRELIMINARY ANALYSIS OF CORRELATES OF ENGLISH LANGUAGE DEVELOPMENT OF PRESCHOOL HEARING IMPAIRED CHILDREN

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About two years ago I wrote that those who offer a new tool designed to facilitate the English language development of deaf children must accept the responsibility of demonstrating that the tool is worth using. I felt so strongly about this point that we began our first evaluation of the Signed English system when it was still only about 40% complete and was being used in programs where most of the teachers had little or no experience with the teaching aids which are an integral part of the system. The results described today, therefore, should be viewed as preliminary with a real possibility that future evaluations will offer still more positive results. Further, the specific statistics discussed represent a partial analysis of our 113 variables. We have several hundred more variables still being coded for computer input which describe the language development of these children. More complete reports will be made in at least two journal articles this year. Over the next two years we will continue to collect data and report upon the effectiveness of a much more complete system used by more experienced teachers.

Table 1

Participating Programs in Signed English Evaluation*

Program	N
Gallaudet Preschool	23
Columbia Branch of Maryland School for the Deaf	10
Prince Georges County Program (two schools)	15
Parent Counseling Program Maryland School for the Deaf	13
Total	61

*Note: Children in the Maryland Parent Counseling Program and below three years of age in all other programs are not included in the preliminary analysis described on October 30, 1975.

In Table 1 you can find the names of the participating programs as well as the number of children involved in each program. Since this preliminary analysis deals with relationships of possible correlates of English language development, this report is limited to relationships with two tests of language development which have been standardized on hearing children: the Peabody Picture Vocabulary Test (PPVT) and the Northwestern Syntax Screening Test (NSST). Because it is very difficult to get and hold the attention of very young children, these standardized tests were only administered to those children who were three years and older in the day class programs. In effect, this means that the children from the Maryland Parent-Counseling Program and from the youngest "class" of the Gallaudet Preschool are not included in today's analysis. The maximum N our data are based upon, therefore, is 39.

Table 2

Variable	CRITERION Mental Age (in months)		VARIABLES Intercorrelations			
	Mean	S.D.	1	2	3	4
1. PP Vocabulary* (signs and speech	32	10	—			
2. PP Vocabulary (speech only)	9	12	.75	—		
3. NSST* Receptive	13	22	.78	.68	—	
4. NSST*** Expressive	1	6	.33	.33	.32	—

* Peabody Picture Vocabulary Test (PP Vocabulary)

** Northwestern Syntax Screening Test (NSST)

*** The NSST Expressive Test is scored so restrictively that only one child managed to achieve a score which had an equivalent mental age. The tabled figures for this test, therefore, do not really reflect these children's expressive abilities. Alternate scoring procedures are being devised and will be reported later.

In Table 2 you will find the English language performance of these children as measured by the PPVT and the NSST. The PPVT has two alternate forms, A and B. Both forms, in random order, were administered to each child. On the first administration the examiner, using speech only, asked the child to point to the correct picture. On a second day the examiner, using speech and Signed English simultaneously, administered the alternate form of the test. The difference in means is striking. The combined Signed English and speech administration shows a mean mental age* of 32 months. The "speech" only administration mean of nine months suggests almost no language competence. In fact 25 of the 39 children were unable to score anything on the PPVT in the speech only administration. There is a fairly high relationship, however, .75 between the performances on both administrations. Most important, however, a mean mental age of 32 months for the speech and Signed English administration represents a significant amount of language accomplishment for hearing impaired children three to five years old.

On the other hand the NSST clearly was too difficult for these children. This is the usual finding for hearing impaired children with this test. Nevertheless, of those standardized tests that are available, the NSST still appears to be the most appropriate. The expressive portion of the NSST, when scored as required by the test manual, gives the children almost no credit for expressive language. The actual records do indicate the children can express themselves albeit not in full conformance to standard English. For example, if a child was asked to say, "the boy is running," he sometimes just said "boy running" or another child might say, "boy run." We plan to rescore these test records to see if we can come up with usable alternate criterion measures of expressibility.

*Mental Age is the term used by the test constructor. In this context, we view it as representing a relative measure of vocabulary acquisition, not intelligence.

Table 3

Categorical Grouping of
First 113 Variables in Signed English Analysis

1. Descriptive Information about Child
   age, sex, hearing loss (with and without amplification) cause of deafness, age of onset, other physical problems, other problems.

2. Educational History of Child
   kind of previous instruction, duration of previous instruction, age entered program, time in program, days absent, kind of absence.

3. Description of Family Members (mother, father, siblings) age education, occupation, hearing status, family trauma.

4. Interaction with School Program
   type of contact, frequency (at home and school).

5. Family Facility in English and Signed English (S.E.) (as judged by teachers) facility in English, ability to use markers, use of Signed English by mother, father, siblings.

6. Use of Signed English by Teachers (as reported by Teachers) frequency of use, alternate strategies, minutes read to children, free time allowed with S.E. materials, formal language instruction, speech instruction, auditory training, Aide use of S.E., Teacher and Aide training in S.E., Desired Training, Speech Encouragement, Class Structure, Teacher and Aide Self-Ratings on facility with S.E.

7. Parent Report on Signed English Materials
   read S.E. books to children, allowed free use of S.E. materials, how many signs Parent can copy, accuracy of reproduction from dictionary.
   Can child copy Sign words from book, Can child copy Sign markers from book, Is child comfortable with S.E., Use of Markers, Formal Course, Hours of Instruction, Deaf Friends and Relatives, How often do they see deaf friends and relatives, Number of Beginning, Growing Up, Stories and Poems, Posters, References Bought and Borrowed.

These four test scores then, represent the available criteria measures against which we would relate potential predictors. I chose two of them to serve as criteria for this analysis: the scores on the PPVT (sign and speech administration) and the receptive scores on the NSST. The scores on the oral administration of the PPVT and the expressive part of the NSST varied over too small a range to serve as useful criteria in this year's analysis. In Table 3 you will find a highly condensed statement of the first 113 variables coded in our analysis. The variables have been clustered in groups of roughly similar information or from information gained from one kind of source. They deal with information about the child, his family, the classroom situation, and Parent reports on the Signed English material.

Table 4

Significant Correlations with Criterion Variables

	PPVT Vocabulary Test	NSST Receptive
1. Descriptive Information about Child		
NONE		
2. Educational History of Child		
NONE		
3. Description of Family Members		
education of mother	.30	32
occupation of father	.34	-- .38(?)
hearing status of first sibling	.41	.46
4. Interaction with School Program		
father's presence in home	.35	.44
use of S. E. by father	.46	.57
5. Family Facility in English and Signed English (as judged by teachers)		
father's facility with English	.33	.36
6. Use of Signed English by Teachers (as judged by teachers)		
minutes of free time allowed with S. E. materials	- .49	- .35
minutes of formal language instruction	- .36	- .39
Aide's Use of S. E.	.27	.41
7. Parent Report on Signed English Materials		
number of signs parent can copy from a new S. E. book	.37	.29
number of sign words child can copy from S. E. book	.64	.61
number of sign markers child can copy from S. E. book	.50	.42
number of S. E. Growing Up books bought*	.48	.21
number of S. E. Stories and Poems bought*	.45	.39
number of S. E. Posters bought*	.48	.26

*Number of Growing Up, Stories and Poems, and Posters BORROWED had small negative relationships.

Since our largest N is 39, a correlation, to be significant at the .05 level, must be at least .32. In order to be doubly sure that we are dealing with relationships that are reliable, I have listed in Table 4 only those variables that have relationships that exceed or approach the given .32 level with both criteria. Please remember that we will repeat these analyses in the next two years to see if we can replicate these relationships. Some of the correlations listed in Table 4 are of considerable interest. You will note that half of the six variables which are significantly related to language performance in the first five clusters of variables deal with the father, i.e., father present in the home, his use of English and his use of Signed English. Other variables describing the father show similar but not significant relationships. These findings suggest that the father's role in the home language environment of the child may be very much more influential than we have imagined heretofore. Similarly, the positive correlations obtained for the teacher's aide further suggests the importance of "fuller" language environment.

There are two pairs of negative correlations that are most interesting. These are minutes of free time allowed with Signed English materials and minutes of time allocated to formal instruction by the teacher. At first glance, these appear to be surprising results. It is possible, however, that both variables may actually represent a diminished flow of language to and from the child. Free time may simply be play time and the structure implicit in formal instruction may also result in a diminished rate of "language exchange." At any rate, these variables will be looked at again during the next two years.

Finally, and most important from our point of view, the parent report on the use of Signed English materials in the home furnishes results that are deeply gratifying. A correlation of more than .60+ between the number of sign words that a child can copy from Signed English books and performance on the language criteria shows that skill with the materials strongly parallels better language performance. The patterns of correlations obtained from these parent reports suggest that the Signed English system is proving very valuable for aiding the language development of these children. As an aside, negative relationships between borrowing materials and language development may be explained by one or any combination of the following: (a) if a given book is bought, it can't be borrowed, (b) buying may reflect more commitment than borrowing, and (c) those who borrow just may be poorer and more pressed for time.

SUMMARY

As I stated earlier, this is a very preliminary analysis of some of our very first data. We will further refine this analysis and report our findings in a suitable journal. Even so, these initial findings are gratifying. They suggest that our work is having a desirable effect. Since our experimental evaluation will continue for at least two more years, I will be able to report upon the effectiveness of a more complete system in the future and one which will have been used for a second year by most of the teachers involved in these programs. They and we, I hope, will have learned a great deal from this first year. Our results may be even more encouraging than those reported here today.

COMMUNICATION COMPREHENSION AS MEASURED BY THE NEW STANFORD ACHIEVEMENT TEST

William D. Grant
and
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The 1973 Form A, HI version of the Stanford Achievement Test (StanAT) offers researchers the ability to gauge the performance of impaired hearing students in relation to a nationally normed population. The resulting information can be utilized by teachers, counselors, and researchers in the construction of educational decisions.

In order to most closely align the thrust of this paper with the purposes of the symposium, we will focus on the performance of students of the MSSD on the Communications subtest of the StanAT.

The StanAT is offered in six levels in varying difficulty. Level 6 represents the most advanced level. The Communications subtest, however, is administered only at test levels 1-5. No Communications subtest is given at level 6. At levels 1 and 2 the subtest includes 26 items. The subtest at levels 3, 4, and 5 is composed of 50 items. In levels 1 and 2 of the StanAT the student is "required to mark an appropriate picture or a letter option representing a dictated statement in order to indicate his comprehension of a passage or question read by the examiner."

"...The groups of objectives are similar to those in reading comprehension; the student is to determine:

1. The central focus of the passage.
2. Specific meanings.
3. Implied meanings.
4. Perception of concepts and relations.
5. Identification of inferences."

"Two primary purposes of the Communication Comprehension test are (1) to evaluate the pupil's progress in comprehension through receptive communication, and (2) to use the communication test results to improve diagnosis of reading comprehension." (Madden, 1972)

The administration direction description of the subtest for levels 3, 4, and 5 indicates that the subtest is designed to measure the ability to comprehend direct communication from the test administrator. Although similar to reading comprehension in its objectives,

communication comprehension is achieved by use of skills which differ from reading skills. The classification of items and major purposes are the same as listed for level 1 and 2 (above).

At the MSSD, the Communications subtest is administered using Total Communication. Test administrators are instructed in the speed of delivery and in the use of specific signs and/or fingerspellings which are to occur during the testing situation.

Lawrence Rudner and Herbert Rosen of the MSSD have prepared for the PDP 10 a computer program which performs item analysis of tests. The program, which can handle up to 150 items and 9 subscales, includes calculation of:

means

standard diviations

reliability coefficients for subscales and total battery using Cronbach's alpha

standard error of measurement

right-wrong scoring

frequency distributions

point biserial correlations with subscale and battery

histograms of total battery

subscale students' responses

This program was used to analyze results of student performance as measured by the HI, StanAT.

The test was administered to 104 students in levels 1-5. Table 1 indicates the number of students at each level.

Table 1. Number of MSSD Students at each test level (1-5) of the StanAt, HI, administered May, 1975.

Test Level	Number of Students
1	15
2	38
3	27
4	7
5	17

Answer sheets were machine scored and a computer tape copy of student responses was purchased from the scoring service. This tape was used as the data source for subsequent analysis.

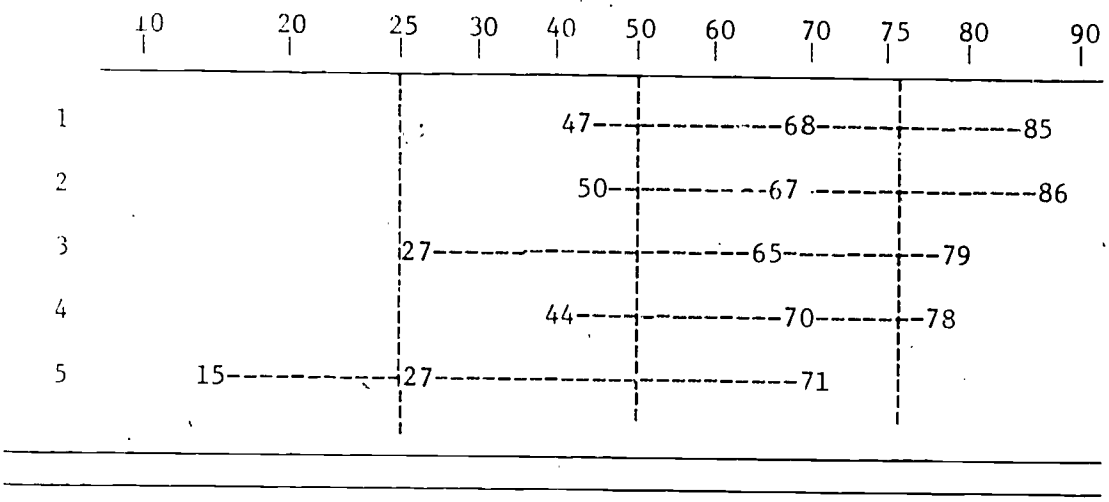
Table 2 presents the summary results of the performance of the MSSD students on the subtest. It should be noted here that students who took level 1 comprise a unique group. These students are in a special program due to their lack of skill in English. As is evident from the S.D. of level 1, as shown in Table 2, any interpretation of data for level 1 should be made with extreme caution.

Table 2. Summary of student performance of MSSD students on Communications subtest of StanAT, HI, Administered May, 1975, by level.

Level	Mean Grade Equivalent	S.D. of G.E.	Stanine Summary--National HI					
			Below Average		Average		Above Average	
			N	%	N	%	N	%
1	K.6	0.6	1	7	10	67	4	27
2	1.0	0.7	4	11	21	55	13	34
3	2.6	1.2	5	20	14	54	7	27
4	3.7	2.2	1	14	5	71	1	14
5	3.4	1.2	6	35	9	53	2	12

Table 3 is a quartile profile of students by level. Using level 1 as an example the scores are as follows: The lower quartile of students scored at the 47th percentile. The national median would be a percentile rank of 50. These students from the MSSD scored at the 68th percentile. The upper quartile scored at the 85th percentile rank. Part of the performance of students at level 1 must be due to the fact that they are older than most students who might be expected to take level 1.

Table 3. Quartile profile of MSSD students performance in Communication Comprehension as measured by the StanAT, Form A, HI, Administered May, 1975.



Items in the Communications subtest are grouped into 5 areas. Table 4 presents student performance by item grouping.

Table 4

STANFORD ACHIEVEMENT TEST, FORM A HI, 1973
ADMINISTERED -- MAY 1975
Subtest -- Communication

STUDENT PERFORMANCE, NUMBER CORRECT (per cent correct) BY ITEM GROUPS, COMMUNICATION

Item Groups	LEVEL 1 Total Items	LEVEL 1 X Correct	LEVEL 1 S.D.	LEVEL 2 Total Items	LEVEL 2 X Correct	LEVEL 2 S.D.	LEVEL 3 Total Items	LEVEL 3 X Correct	LEVEL 3 S.D.	LEVEL 4 Total Items	LEVEL 4 X Correct	LEVEL 4 S.D.	LEVEL 5 Total Items	LEVEL 5 X Correct	LEVEL 5 S.D.	LEVEL 6* Total Items	LEVEL 6* X Correct	LEVEL 6* S.D.
Literal Meaning	-	-	-	-	-	-	3	1.4 (47)	1.0	5	2.7 (54)	1.3	5	1.9 (38)	0.8			
Explicit Detail	5	2.1 (42)	1.1	5	2.9 (58)	1.4	9	5.7 (63)	2.1	12	6.3 (53)	2.7	14	6.5 (46)	3.4			
Implicit Meaning	4	1.3 (33)	1.0	4	1.8 (45)	1.1	5	3.6 (72)	1.3	10	5.4 (54)	2.4	8	3.8 (48)	1.9			
Conceptual Mean.&Class.	5	2.3 (46)	1.3	5	2.2 (44)	1.3	10	5.5 (55)	2.1	9	4.7 (52)	2.1	9	3.4 (38)	1.9			
Inference & Log. Anal.	12	6.1 (51)	1.7	12	6.7 (56)	2.1	23	13.3 (58)	4.6	14	7.7 (55)	3.6	14	5.8 (41)	2.6			
TOTAL TEST	26	11.7 (45)	3.5	26	13.6 (52)	4.2	50	29.4 (59)	9.8	50	26.9 (54)	10.7	50	21.4 (43)	9.0			

* No test given at Level 6

At each level except level 1, the mean raw scores fall within the accurate measurement range of the Communications subtest. Thus for levels 2-5, the scores, in general, reflect student's performance as it is measured by this test.

The MSSD has not as yet had the opportunity to administer the HI version of the StanAT a second time to these students. A testing is scheduled for March, 1976. At that time comparisons can be made which will hopefully begin to yield indications of trends in student's performance.

As Table 3 indicates, at level 2, 3, and 4 the average quartile of MSSD students was above the national average quartile. At level 5 the average MSSD quartile approached the lower quartile of the national norming sample.

As further data becomes available, MSSD program effects will be investigated in relation to students' scores. The research and communications departments of the MSSD have now at their disposal a useful assessment tool.

References

Madden, R., Gardner, E. F., Rudman, H. C., Karlsen, B., Merwin, J. C. Stanford Achievement Test: Primary Level 1, Directions for Administering to Hearing Impaired Students. New York: Hartcourt Brace Jovanovich, 1972.

----. Stanford Achievement Test: Level 3, Directions for Administering to Hearing Impaired Students. New York: Hartcourt Brace Jovanovich, 1972.

COOP EDUCATION: SOME COMMUNICATION PROBLEMS

William Varrieur
Cooperative Education

QUESTIONS RAISED APPLY TO A GALLAUDET STUDENT AND/OR DEAF COLLEGE GRADUATES

I. Communication - Preparing for the Job

A. Is the student aware of his communication skill?
B. Can the student improve his communication skills?
C. How best can the student utilize his skills?

II. Communication - Getting the Job

A. What are the interviewing techniques necessary?
B. What communication skills are required for the job interview?
C. What communication skills are available for the job interview?

III. Communication - On the Job

A. What is the appropriate language required to express, to see and to understand on the job?
B. What are the communication skills required of the work? Do they vary with jobs. Can they be identified?
C. What gadgets or mechanisms can the student use on the job to increase his communication skills? Practicality of such gadgets. The cost of such gadgets.

IV. Communication - Job Advancement

A. At what level of work does communication become a major problem?
B. Are there specific areas of employment where advancement on the job is prohibitive because of communication problems?
C. What are the particular communication problems that confront workers?
D. Is there a point of saturation where hearing workers become "turned off" on methods of communicating with deaf workers other than using voice?

APPLICATIONS OF SPEECH SCIENCE TO COMMUNICATION HANDICAPS: I. RESEARCH ON SPEECH-FEATURE AUDIOMETRY FOR HEARING AID FITTING

James M. Pickett

Director, Sensory Communication Research Laboratory

A person who wants to function easily in society, with maximum flexibility and a wide choice of social roles, must be able to communicate through speech. People with loss of hearing suffer from impairment of their speech communication in varying degrees depending on the age of onset and nature of loss.

What is the size of this problem? A summary of studies of the hearing-impaired population gives 6.5 million people with "significant impairment" in both ears (Schein and Delk, The Deaf Population in the U. S., National Association of the Deaf, 1974). Three and a half million of these are 65 years or older; 420,000 are "prevocationally deaf."

How can our present knowledge of speech communication be applied to benefit this population? The basis of speech communication is much better understood now than when hearing aids were first introduced over 60 years ago. Especially during the past 30 years there has been a tremendous increase in our knowledge about how speech is spoken and about the sound-code that makes speech communicative.

I wish I could now say that there have been corresponding large advances in the fitting of hearing aids and in the development of successful electronic aids to speech communication for the deaf. As we learned more about speech sounds we developed a knowledge base that could be used to rationalize the prescription of hearing aids. And for the past 20 years it has been easy to build visual speech indicators for the use of deaf persons. There has been plenty of research on these possibilities but the applications thus far have not been earth-shaking. Yet there is still a great potential in unapplied research findings, and in electronic techniques that appear to be applicable. My purpose today is to describe two examples of application now under study and to discuss what kind of efforts are needed to further capitalize on our knowledge and capabilities. First I will describe our research on measuring auditory distortion through speech-feature audiometry. In a second paper I will describe a visual electronic aid to speech reception that we are testing.

AUDITORY DISTORTION AND HEARING-AID FITTING

Hearing aids help the hearing-impaired a great deal, but there are consistent complaints about distortion of sound and difficulty in hearing in noisy or reverberant conditions. Only a small part of the distortion is in the hearing aid. There are serious auditory distortions caused by the damaged auditory system of the listener.

Up to 1960 our knowledge of speech patterns had not been applied to the hearing-distortion problem; it was not known which features of speech sounds were distorted nor what types and degrees of distortion were prevalent. Thus the situation in prescribing hearing aids was analogous to trying to fit glasses for poor eyesight without having ways to measure distortions of outline (sharpness of focus) or distortions of shape (astigmatism), and thereby knowing what corrections to build into the eyeglasses.

SPEECH-FEATURE DISTORTIONS

Some insights into auditory distortion of speech features have been gained by analyzing the hearing-impaired listeners' confusions of the consonant sounds. However, until recently there were only a few such studies, and their analysis of results was not very sophisticated in the use of current knowledge about consonant sound-patterns. We carried out a better analysis using the listening responses of 99 Gallaudet students who had residual discriminative hearing (about one in every four of our entering students in 1967 and 1968). We found that they had subnormal discrimination as a whole but there were systematic differences in discrimination of the sub-features of consonants. They had much better discrimination for the nasal and voiced features of consonants than for the manner and place features. When the data were analyzed in subgroups of listeners according to level of discrimination and type of audiogram, this same order of hearing for speech features was found to occur across the range of discriminative hearing, and it seemed to be independent of the contour of audiogram.

Undoubtedly there would be important individual differences in auditory distortion of speech features, but we do not yet know how to measure these quickly for a clinical diagnosis. However, we have developed methods for discovering and carefully measuring the distortions, and, using these, we have firmly established the existence of certain types of distortion. We are now ready to develop faster procedures and test them as predictors of how best to set the individual's hearing aid.

PLACE FEATURES AND FORMATS

Let us now consider what auditory distortions we have found thus far. The place features of consonants are the most difficult for the impaired listener to distinguish. The place feature refers to where in the vocal tract the consonant is formed. The lips and tongue can make the constriction for a consonant at the front, middle, or back. This differentiates among the consonants, p, t, and k; and among m, n, and ng. We know from speech science that the movements to and from these constrictions produce different speech sound patterns depending on the place of the constriction. The listener must be able to hear

these differences in order to distinguish within the sets of place-differentiated consonants. The sound-differences for place have been found to exist in a resonance of the vocal tract, particularly the second resonance, called the second format (F2). The first resonance, F1, is lower in frequency, and does not function to differentiate place. As a consonant is articulated by movement of the lips or tongue, the frequency position of F2 moves toward a new position; for example F2 moves down for lip-constrictions (front constrictions) but it moves up for middle constrictions by the tongue.

In the middle 1950's the resonances of speech were first synthesized electronically by basic researchers who were working on the nature of speech. This technology then developed to be more or less routine, and by the middle 1960's we began to use synthetic formants here in our Lab for the study of auditory distortion in sensorineural hearing impairment. We have studied Gallaudet students with moderate-to-severe impairment and elderly persons with different degrees of impairment. Dr. Revoile and Miss Quinn will explain in the next papers the listening tests that we use in these studies and the results we have obtained.

WITHIN-SPEECH MASKING AND HEARING-AID FITTING

In general the most important distortion we have found, in relation to hearing-aid fitting, is one in which the patient cannot discriminate the occurrence of a transitional change in the second formant, unless the first formant is reduced in loudness. We may call this phenomenon within-speech masking; and its alleviation may be called release from within-speech masking.

Our subjects vary widely in their susceptibility to this masking and in the degree of release obtainable by reducing the loudness of F1. Therefore it is reasonable to expect that those who show a release would benefit by adjusting their hearing aids to reduce the loudness of the low first-formant resonances because these are always present during the F2-transitions. This remains to be proven, and especially we need to develop fast ways to measure release from within-speech masking, otherwise release could not be quickly assessed in the clinic, or by the hearing-aid dealer.

DEVELOPMENT OF SPEECH-FEATURE AUDIOMETRY

We are now beginning to study these possibilities for clinical use of speech feature discrimination tests. The format-discrimination tests we now use will be the basis for developing new clinical techniques with which to measure auditory distortion. These would employ artificial sounds, formants that are speech-like, generated by a speech synthesizer under the control of the clinician. The clinician could adjust the formants for the patient to find the smallest

difference the patient can hear. The difference we have used is in formant transitions as they differentiate the manner and place features of consonants. The clinician would begin with a very large amount of difference which the patient can easily hear, and then gradually the amount of difference is reduced until it cannot be heard. Then the difference is increased until it can just be heard, decreased again and increased again, until the "threshold" amount of difference is located. This procedure may be called speech-feature audiometry.

We believe that speech-feature audiometry will describe auditory distortion in ways that will be very valuable in the designing of aural rehabilitation training and in the fitting of hearing aids.

We consider the hearing-aid problem to be a primary one. The degree of speech-feature distortion could be measured under different simulated settings of hearing-aid characteristics. The simulated setting that yields the least amount of distortion would be chosen for the patient's hearing aid. Currently there are no such methods for setting up hearing aids; the only rapid tests used now are to have the patient listen to speech for a few minutes under different settings, or with different aids, and choose the one that sounds best. This method is not very reliable. Reliable speech tests would require about a half-hour of word-reception testing under each setting. Thus the assessment of only four settings would require two hours, an amount of time that is prohibitive in clinical schedules. In contrast we believe that a useful measure of speech-feature distortion could be obtained in about five minutes, thus allowing the testing of six settings in a half-hour.

The research necessary to develop speech-feature audiometry will probably be a long-term effort, on the order of 5 to 10 years. We expect to find other types of auditory distortion, and we need to carry out extensive tests on the reception of natural speech through different settings of the hearing aid. We have applied to the Public Health Service for funds to carry out this research.

WITHIN-SPEECH MASKING

S. Revoile, E. Danaher, M. P. Wilson, and J. M. Pickett
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If you have ever had difficulty hearing a signal or stimulus because of the interference of another sound, you have experienced masking. In audition "masking" refers to the fact that unwanted sounds can interfere with the reception of another sound. When masking occurs during speech communication the auditory reception of speech is disrupted. Masking can affect speech by changing its message or rendering it partially or completely inaudible.

Past studies of the masking of speech have been concerned with unwanted sounds extraneous to the speech signal. Conversely, this paper discusses speech masking that may result from sounds within the speech signal itself. The term "within-speech masking" refers to this effect, i.e., the interference in the reception of some speech sound characteristics by other sound characteristics in the same speech signal. The occurrence of within-speech masking has been suggested by some findings from research in the Sensory Communication Research Laboratory on the perception of speech-like stimuli by persons with sensorineural hearing losses. This research was undertaken to explore the extent to which the different acoustic characteristics within speech sounds can be detected and discriminated by the sensorineural listener.

In this research speech-like stimuli or synthetic speech have been used instead of real speech. The synthetic speech is generated by a computer that is programmed to simulate various acoustic characteristics in real speech. Through the use of the computer the acoustic characteristics of the synthetic speech can be varied systematically in small segments, a capability not possible with real speech.

The speech characteristics simulated in the synthetic stimuli were segments of vowels, called formants and transitions. Vowels are comprised of formants, which are concentrations of energy at different frequency regions. In speech, steady formants occur during vowels and transitions in formants occur between vowels and consonants. Transitions, particularly those of the second formant (F2), are used by persons with normal hearing for differentiating certain consonants in speech. For this research we wanted to determine how well these formants transitions could be discriminated by persons with sensorineural hearing losses. The results from this work on transition discrimination indicated the existence of within-speech masking.

STUDIES OF TRANSITION DESCRIMINATION

In a series of experiments conducted over several years diffe-

ent groups of Gallaudet students participated as listeners. The listeners had moderate to severe hearing losses and audiometric-pure tone threshold contours that were either flat or sloping downward. Each listener participated in a paid one-hour listening session twice a week over one or two semesters. The listeners were presented test stimuli monaurally using the ear that had the better pure tone audiometric thresholds. They heard the stimuli at a level each had selected as his most comfortable listening level.

For all experiments discrimination of the occurrence of the second formant (F2) transitions was studied. The frequency size of the transition was varied to determine the smallest F2 transition that could be discriminated in relation to no transition.

In the procedure used to measure discrimination of the F2 transition, a group of three stimuli were presented for each trial. In each group the three stimuli were alike in all respects except that one stimulus had a transition in the second formant at the start of the stimulus; the other two stimuli had second formants which started at the steady-formant and remained there. The listener's task was to pick the stimulus that had the transition. The correctness of his choice determined the transition size for the next group of three stimuli. If the subject chose the correct stimulus as having the transition then the size of the transition was decreased for the next group of stimuli. If the subject chose an incorrect stimulus as having the transition, the transition was increased in size in the next group of stimuli. Feedback of the correct answer was given after each trial. The transition discrimination threshold was taken as the amount of transition for which 75% of the transitions were discriminated correctly. At least three thresholds were obtained for each experimental condition.

Throughout all experiments transitions of the second formant were discriminated with F2 alone and with F2 in the presence of another formant, the first formant (F1) which, as in real speech, was always lower in frequency than F2. The acoustical characteristics of F1, F2, and the F2 transition were changed among experiments. Within-speech masking was found in all experiments. However, the discussion here will be limited to describing the effect for two experimental conditions that showed different types of within-speech masking.

Upward masking. In one experiment the amplitude of F1 was varied relative to the amplitude of F2. F2 remained constant in amplitude while F1 was presented at its natural speech amplitude or reduced by 5, 10, or 15 dB. Some results for these conditions are shown in Figure 1 for two groups of hearing impaired listeners according to whether they had sloping or flat audiograms. The smallest transition threshold (best performance) was obtained when F2 was presented alone. A very large transition threshold (poorest performance) occurred for the "0" condition of F1, i.e., when the amplitudes of F1 and F2 were closest, and approximated their amplitudes in natural speech. As the amplitude of F1 decreased,

transition discrimination performance improved. Similar improvement in transition discrimination for reductions in F1 amplitude appear for both groups of subjects.

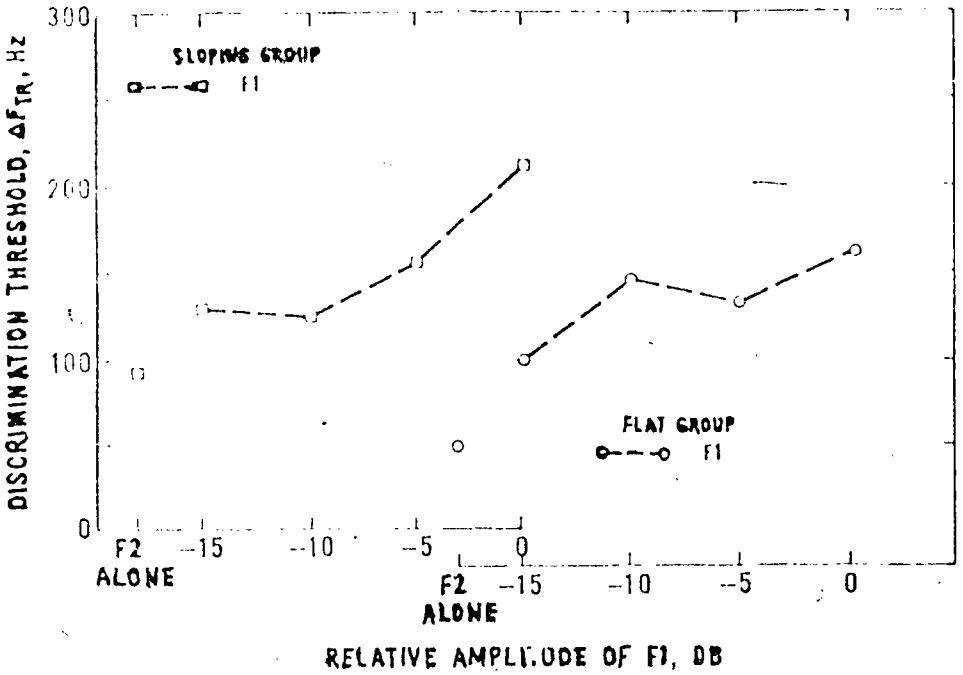

Figure 1. Effects of relative amplitude of F1 on discrimination of F2 transitions in the vowel [A]. The "0" condition of relative amplitudes represents the amplitudes of F1 and F2 in natural speech. Seven subjects with sloping sensorineural losses and four with flat sensorineural losses were tested. Mean transition discrimination thresholds (ΔFtR) for F2 alone are shown and can be used as a reference for evaluating the amount of masking produced by F1.

This effect shows the masking or interference of the first formant on the frequency discrimination of the F2-transition. It indicates that low-frequency vowel formants can produce a type of upward masking that reduces the ability to discriminate transitions of higher frequency formants. This finding raises the possibility that a similar effect might occur in real speech, that is, that low-frequency vowel-formants may cause within-speech masking of acoustic cues located in higher frequencies. Furthermore, for those listeners who show improvement with lower amplitude of F1; i.e., release from transition discrimination-masking, we might expect that they would benefit from using a hearing aid that has reduced response in the low frequencies.

Backward masking. In another experiment the onset of F1 was cut back in time relative to F2 and its transition. In different

test conditions F1 was present either during the entire length of F2 and transition or delayed in its onset (cutback) by 50, 100, or 200 msec. The F2 transition occurred during the initial 100 msec of F2. Hence, when F1 was delayed by 100 msec, F1 began after the F2 transition had been completed. When F1 was delayed by 200 msec, the F2 transition and 100 msec of steady-state F2 had occurred before F1 began, and F1 was present only for the final 50 msec of F2.

Some results for F2 transition discrimination with F1 cutback appear in Figure 2. As above, the smallest transition threshold was discriminated (best performance) when F2 was presented alone. The largest transition threshold was obtained when F1 was present during the entire length of F2. Transition discrimination thresholds improved as the delay in F1 onset increased. Similar improvements in transition discrimination appeared for both groups of listeners; the listeners with flat losses performed better in general than the listeners with sloping losses.

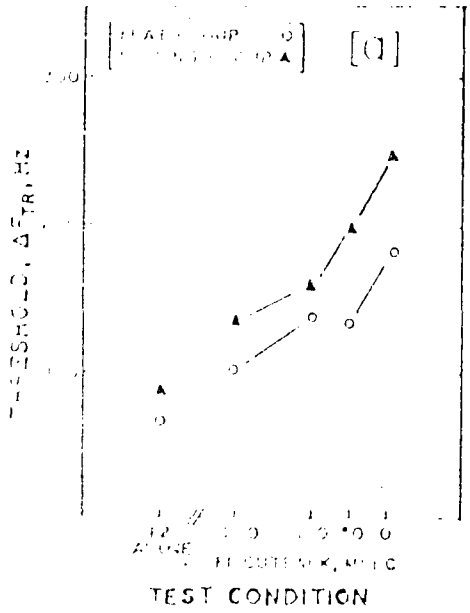

FIGURE 2. The effect of F1 onset delay on the discrimination of initial transitions in F2. Discrimination of F2 transitions was measured when the onsets of F1 and F2 were the same ("0 cutback") and when the onset of F1 was delayed (50, 100, and 200 msec) relative to that of F2. The F2 transition was 100 msec in duration. Steady-state F1 and F2 were at 640 Hz and 1100 Hz, respectively. Twenty-three subjects with [illegible] were tested.

These data indicate that discrimination of F2 transitions can be affected by F1 even when there is no F1 energy present during the transition. This finding reveals that F1 can produce masking of a temporal nature. F1 can spread backward in time to reduce discrimination of frequency transitions that precede the onset of F1 in a vowel. If such temporal masking occurs in speech, then discrimination of some consonant acoustic cues might be reduced as a result of the temporal proximity of the consonant to a vowel.

Significance of Results. The results of these studies add to our knowledge of the perception of speech-like stimuli by persons with sensorineural hearing impairments. Such information provides

a basis for understanding the speech discrimination problems that usually accompany sensorineural hearing losses. Of greater importance, however, is the potential application of this information to aural rehabilitation methods and the design and selection of hearing aids. For example, if, in a given individual, reduced speech discrimination is the result of low-frequency masking effects, we could reduce the low frequency energy produced by the person's hearing aid. Or, perhaps, in auditory training, we could concentrate on detection and discrimination of cues in the presence of masking.

WITHIN SPEECH MASKING EFFECTS IN THE ELDERLY HEARING IMPAIRED

Regan Quinn
Sensory Communication Research Laboratory

Two years ago our Laboratory began a pilot study to examine the F1 masking effects on F2 transition discrimination ability of elderly hearing impaired subjects. The primary purpose of these tests was to investigate the effects of strong low-frequency energy, F1, on discrimination of transitions in F2.

We believe it is important to study elderly subjects for two reasons. First, there are many more elderly persons with sensorineural hearing loss than young persons, and we cannot rationally extend our findings with young subjects to predict the discrimination characteristics of older subjects. As early as 1948, Gaeth reported finding a syndrome he termed phonemic regression in the older clinically-assessed hearing impaired population. The term phonemic regression implies that while the loss of loudness acuity for pure tones is in good agreement with the loudness loss for speech, there is greater difficulty in understanding speech, as revealed by appropriate discrimination tests, than the type and severity of loss would lead one to expect. A second reason it is important to study elderly subjects is that the elderly ear may be made available for anatomical study within a reasonable time after measurement of the discrimination characteristics. This has great potential for leading to a better understanding of the anatomical basis for discrimination loss.

We originally searched for appropriate subjects by reviewing existing audiological records made available to us in various clinics in the area.

Our first group of subjects were residents in a nursing home. All of these subjects had been pre-selected by the home's social service director as active, cooperative, well-functioning members of the community. However, much difficulty was encountered in training these subjects even after considerable simplification of our experimental procedure. Many subjects exhibited an inability to attend, fatigue, lack of motivation, and difficulty learning and retaining the same/different listening task. Some of the subjects became unwilling or would forget to attend the listening sessions. These were still persistent problems after two months of training.

We then selected a second group of subjects of the same age who were living independently and did not display as many of the characteristics of advanced senility as did the nursing home population. It is the results obtained with this second group that are discussed in this paper.

Experiment

Subjects. All of our subjects (Ss) were healthy, independent elderly persons who were residents of an apartment building for the aged. There were 16 subjects, ranging from age 70 to 95 years, with mild to severe sensorineural hearing losses. Three of the subjects wore hearing aids. None of the Ss had any history of hearing loss or otological problems prior to late middle age. None had a history of excessive noise exposure or early familial deafness. The Ss reported experiencing from very little, to severe, communication problems resulting from their hearing loss.

Procedure. Much of the procedure used in this pilot study differs tremendously from that used in the studies done within our Laboratory. Due to the lack of mobility found in the aged population, test equipment was set up in a relatively quiet (but far from noise free!) room in the Ss' resident apartment building. The Ss all listened to the same stimulus through individually attenuated headsets in groups of five. The test stimuli were generated in our Laboratory by a vowel synthesizer and then recorded onto a two channel tape recorder. Tapes with each formant of the test sound recorded on a separate channel were used to present the stimuli. Originally we had prepared our stimulus tapes with a format of presentation similar to that which is used in our Laboratory with young hearing impaired listeners. The Ss' task was to make a three alternative discrimination and record his choice on an answer form. However, during early test runs with a nursing home population we found it necessary to simplify this procedure to a stimulus pair same/different presentation with only verbal subject responses required.

On each trial the S heard two sounds. If both of the sounds were the same, there was no transition and the formant remained at a fixed frequency for the duration of each sound. When a difference occurred, the second sound had a frequency transition over the initial 100 msec of the second formant (F2). The formant frequency of the sound without the transition was the same as the final frequency of the sound that had the transition. These Ss were able to give written responses after each stimulus pair presentation. The testor then immediately provided the correct answer prior to presentation of the next stimulus pair.

A constant difference procedure was used to estimate the S's threshold for discrimination of the transitions. The stimulus pairs were presented in sets of 10 pairs, five of which contained frequency transitions of the same size. A session usually began with sets with large transitions, and, in each set of 10 that followed, the size of the transition was reduced by 100, 50 or 25 Hz. Mean scores were established from the subject's responses. Thresholds were determined from psychophysical functions plotted using the mean scores for each size transition.

The final frequency of F2 was either 700, 1000, 2000, or 3000 Hz; correspondingly, the largest transition size for the 700 and 1000 Hz final frequency states was 300 Hz, and 500 Hz for the 2000 Hz and 3000 Hz final frequency states. All transitions were rising in frequency. Nine different amounts of transition were available to cover the range from the largest to the smallest transition. The duration of the transition within the 250 msec stimuli was always 100 msec. F1, when present, was a steady state 300 Hz or 500 Hz signal with no frequency transition. An F1 of 300 Hz was present with an F2 with final frequency of 700 Hz and 2000 Hz. An F1 of 500 Hz was present with the F2's with final frequency of 1000 Hz and 3000 Hz.

Four F1 + F2 frequency combinations were used, and each combination was presented in three amplitude conditions. In one condition, F2 was presented alone. In another condition, F1 + F2 were presented together at the same relative amplitudes as they normally occur in speech. In the third condition, F1 and F2 were presented together with F1 attenuated 10 dB. From day to day, the order of presentation of the 12 test conditions was randomly varied. The subjects listened to all 12 test conditions with their listening level set at the level they chose as most comfortable (MCL) when both F1 and F2 were present. These levels were set at the beginning of each session.

Results. As mentioned earlier, the primary purpose of these tests was to investigate the effects of F1 on discrimination of transitions in F2. If the presence of F1 does create a masking effect, the thresholds obtained when F1 and F2 are present will be larger than those obtained for F2 alone. The mean scores at each transition size were plotted as psychophysical functions to obtain threshold values. A 70%-correct level was established as threshold. (See Figure 1).

The group means obtained do not really reflect the large differences in F1 masking effects among Ss. For some individuals the masking effects are very large. Discrimination of the F2 transitions was markedly reduced when F1 was added to the signal. Other Ss showed no significant upward spread of masking produced by the presence of F1. Still others showed better discrimination for the F2 transitions when both F1 and F2 were present. However, these masking effects were not consistent at all test frequencies for any individual subject (see Table 1). The finding for some subjects of better discrimination fo F1 and F2 together than for F2 alone was not consistent with young sensorineural subjects. We are presently retesting some of the same group of elderly subjects to determine if this unusual effect is due to experimental artifact or is an actual psychoacoustical phenomenon unique to the elderly sensorineural listener.

During the year, we brought our Ss to Gallaudet for clinical audiological evaluations. In addition to assessing the type and degree of Ss hearing loss, we carried out word-recognition tests

especially, to find out if any relationship existed between the individual S's maximum obtainable word recognition score and his F2 transition discrimination. Analysis of this audiologic information and our transition discrimination data yielded a significant correlation between the F2 transition discrimination thresholds and clinical word recognition scores. It seems that the Ss who had better discrimination for the higher frequency F2 transitions also had better scores for recognition of monosyllabic words (see Table 2).

Discussion. When we have completed the retesting we are presently doing in this pilot study of formant transition discrimination, we hope to continue our study of the discrimination problems of the elderly sensorineural hearing impaired person. We plan to test this same group of Ss using frequency filtered word discrimination tests to see if the upward spread of masking that occurs with synthetic speech also occurs in a real speech signal. We plan to vary the amplitude in the low frequency region of the real speech stimulus and look at how it affects speech reception.

We also plan to adapt our transition discrimination procedure for clinical use, to measure transition thresholds with F1 reductions in level, and to evaluate these measures as predictors of the optimal amount of low-frequency suppression for speech reception. This information could be used to provide more appropriate hearing aid fittings.

We plan to ask our Ss to pledge their ears to the Temporal Bone Bank. In our tests thus far with the elderly listeners, we find a large amount of variation in F1 discrimination masking that remains unaccounted for. A great deal of this variation is theoretically traceable to differences in peripheral conditions, i.e., to anatomical and physiological differences in the organ of Corti, in the cochlear spiral ganglion cells, and in the distal portions of the VIIIth nerve. However, there is very little evidence on the relation of auditory discrimination to sensory peripheral status. Important evidence on this relation may be found through correlated anatomical and discrimination studies of the ear.

FIGURE 1: METHOD OF DETERMINING F2 TRANSITION DISCRIMINATION THRESHOLD

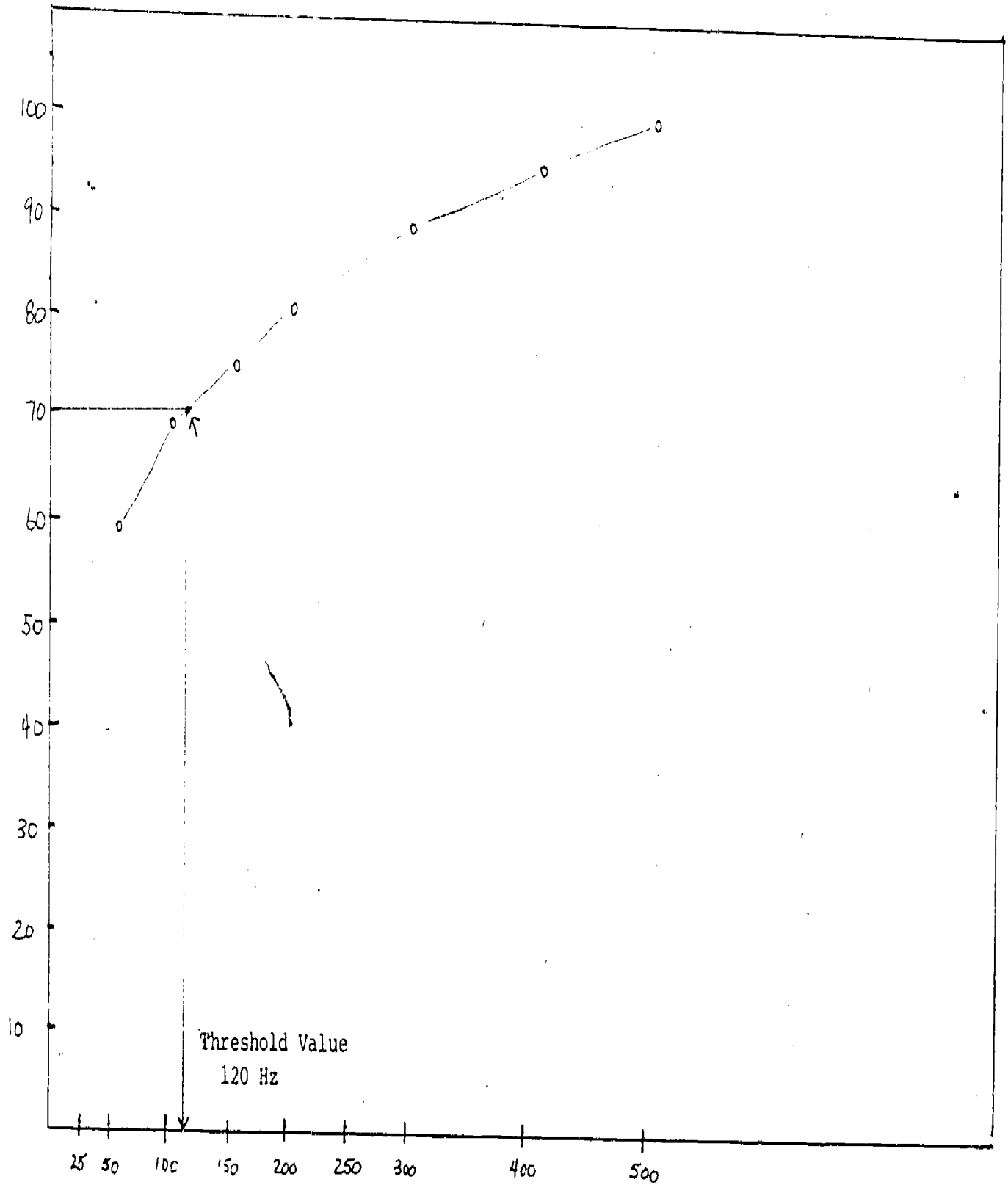

TABLE 1. Threshold Values (Hz)

Subject #	F2 700 F1 300	F2 1000 F1 500	F2 2000 F1 300	F2 3000 F1 500
1	F2 Alone 40.00	F2 Alone 35.00	F2 Alone 25.00	F2 Alone 50.00
	F1 -10 44.87	F1 -10 80.95	F1 -10 203.33	F1 -10 350.00
	F1 + F2 61.54	F1 + F2 68.80	F1 + F2 166.06	F1 + F2 500.00
2	F2 Alone 41.17	F2 Alone 26.81	F2 Alone 100.00	F2 Alone 181.81
	F1 -10 37.51	F1 -10 42.15	F1 -10 150.00	F1 -10 200.00
	F1 + F2 43.75	F1 + F2 44.24	F1 + F2 160.42	F1 + F2 200.00
3	F2 Alone 100.00	F2 Alone 44.02	F2 Alone 150.00	F2 Alone 340.00
	F1 -10 43.37	F1 -10 60.67	F1 -10 150.00	F1 -10 200.00
	F1 + F2 40.56	F1 + F2 120.00	F1 + F2 140.00	F1 + F2 295.00

TABLE 2. Correlation Coefficients of Maximum PB-Word Recognition Scores with Audiometric Pure Tone Threshold Averages (P.T.A.) and with F2 Transition Discrimination Thresholds

F2 TRANSITION DISCRIMINATION THRESHOLDS

F2 700 F1 300		F2 1000 F1 500		F2 2000 F1 300		F2 3000 F1 500	
F2 Alone	.15	F2 Alone	.18	F2 Alone	.74	F2 Alone	.53
F1 -10	.12	F1 -10	.20	F1 -10	.58	F1 -10	.67
F1 + F2	.19	F1 + F2	.43	F1 + F2	.41	F1 + F2	.57

P. T. A. (.5-1-2K Hz)	.41
P. T. A. (2-4-6K Hz)	.63
Low to high frequency slope	.47

An r of .514 or higher is significant at the p = .05 level or better

ART AS A MEDIUM OF COMMUNICATION

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In her well-known work, Psychology of Deafness, Dr. Edna S. Levine observes that psychological tests in general show that those deaf individuals who attend residential schools for the deaf are generally more socially and emotionally stable than those deaf or hard-of hearing who attend oral schools and day schools where sign language is either frowned upon or in disuse. It thus appears that growing up together in a cohesive milieu where sign language, the natural language of the deaf, is the dominant language produces an undoubted maturing and socializing effect on the deaf.

This has its disadvantages, however, as indicated by scrutiny of autobiographies by deaf artists and intellectuals, such as the American actor and painter Albert Ballin, the British poet David Wright, and the French writer Eugene Relgis. Ballin, the author of The Deaf Mute Howls, states flatly that one of the greatest wrongs inflicted upon deaf children is their enforced herding together under one roof. To Ballin, the greatest evil produced by this wrong is the formation of "uncouth mannerisms, peculiarly their own"--a conclusion which now strikes us as somewhat ridiculous. David Wright, who spent part of his childhood in an English school for the deaf and went on to graduate from Oxford University, observes poignantly that on moving from the deaf to the hearing world he missed "the freedom and ease that comes from being the same as everyone else," but in the same breath he goes on to condemn that world of freedom, of ease because:

> "The deaf do not, because they cannot, deal in the nuances--particularly the verbal nuances--of personal relationships. Their dealings are direct--may appear outrageously direct: their handshakes are ungloved. They have a naivete, and also a plain honesty of intent, that often makes the polite wrappings-up of ordinary people seem, by contrast, hypocritical."

The world of the adult deaf is an extension of the school for the deaf: except that where, in the school the association of individuals is compulsory, outside the school it is voluntary but just as close, clannish, in fact. In that world the same attitudes and patterns of behavior, the same mentality, prevail--directness, naivete, and plain honesty of intent as Wright terms them. Obviously, such a world has enormous socializing advantages to the deaf who otherwise would remain as imprisoned in the shell of their peculiarly isolating physical handicap as, say, a prisoner penned up in the solitary. But the qualities of bluntness, of roughness, of the provincialism inherent in the clannish nature of such an inbred community made up of

persons with the same handicap and attitudes, repel the more sensitive deaf individuals to whom deafness is "the shameful infirmity, the pivot of an entire destiny, the sobriquet which sums up a man," in the words of Miron, the narrator of Muted Voices, the veiled autobiography of the deaf Frenchman Eugene Relgis. (p.33)

If, however, we take a broader view of the friction existing between the deaf artist and the deaf community, we find it to be merely a symptom of the isolation existing between the artist and society, in any society. The artist, whether deaf or hearing, needs solitude and concentration in order to create: his privacy is vital to him, it goes without saying. The problem reduces to a question of privacy rather than of friction or alienation. If in the deaf world this problem seems somewhat magnified, this is connected with the broader fact that deafness is by its very nature more sharply existential in the Sartrean sense as the deaf individual remains an outsider in relation to society. The position of the deaf is indeed unique because they represent the only category of the physically handicapped whose handicap remains invisible. There is nothing in their posture, gaze, looks that distinguishes them from ordinary men, is higher and more impervious than for any other group of the physically handicapped. A blind man with his dark glasses and white cane or a paraplegic in his armchair is easily identified and receives sympathy and understanding. The deaf, who blend more with the crowd than the blind and the paralytic, are at the same time less of the crowd, because of the special difficulty people encounter in communicating with them.

Thus their problems are the least understood and the number and scope of the misconceptions entertained about them by the public are amazing. As outsiders they are not accepted by society as equals (this, is, of course, a question of physiological rather than legal discrimination), and, since they are not Martians suddenly dropped upon earth (although in some ways they seem to be so to those who do not understand them, this being the vast majority of the public), but have always been with us, they are a historically oppressed group which survived legal discrimination and partial attempts at its extermination in infancy in Greek and Roman times only to lead a brutalized sort of existence in the Middle Ages and evolve into a minority with theoretically equal rights but with an image flawed by its past history and persisting communication barrier. To an overwhelming majority of the public they are Calibans.

They are thus forced to associate mutually, to prefer the company of each other to that of hearing people, because the only alternative they have is that of living in much more absolute isolation. One unfortunate corollary of living in such an optimal but closed world, however, is its mentally stultifying atmosphere, its lack of nuances as David Wright terms it. Perhaps no other group of men resorts to more cliches in their conversation than the deaf: it is as if they were trying to reassure themselves that they are human, too. This is of course also due to their unfortunate linguistic inadequacy which hinders their social advancement even more than their deafness, and which is even more responsible than their deafness for their generally poor image in society.

All this makes the creative development of the deaf artist more difficult compared with that of his hearing counterpart. He must overcome greater obstacles if he is to exploit h's potentialities. Yet he has a lot to give, too, considering that the visual literacy of even the average deaf individual is much more refined than that of his hearing counterpart. This term refers to acuteness of perception, to ability to visually distinguish and discriminate, among many other attributes. David Wright may be right in claiming that the deaf cannot deal in verbal nuances, but, when it comes to their dealing in nuances of the visual perception in the visual distinction of a thousand and one subtlest nuances of feeling and sensation, they are demonstrably superior to the hearing. In this I believe lies the great potential of the deaf in general and the deaf artist in particular.

The deaf artist, however equivocal may be his feelings about the deaf community, needs it because of "the freedom and ease that comes from being the same as everyone else." This bond between the artist and the community will become much stronger once the deaf succeed in translating into reality their great potential by developing to the fullest their special compensatory powers of visual literacy.