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Norma S. Rees  
*None*

Frederick Kruger

Deena Bernstein

Lynne Kramer

Marjorie Bezas

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## **THE ACQUISITION OF A FIRST LANGUAGE IN A BLIND-DEAF ADULT: A CASE STUDY OF A LANGUAGE DEVELOPMENT IN AN ADULT WITH A HISTORY OF DEAF-BLINDNESS**

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**NORMA S. REES, Ph.D., FREDERICK KRUGER, Ph.D., DEENA BERNSTEIN, M.A., LYNNE KRAMER, B.A., and MARJORIE BEZAS, M.A.**

The rehabilitation of the deaf-blind has only recently developed into an area of concentrated service (1). Various methods have been developed and adapted for the language and communication training of deaf-blind children, and social and vocational services for adults in this group have been designed and applied with encouraging results. The purpose of this article is to describe the rehabilitation experience with an unusual member of this population, Carl, a young adult with visual and auditory impairments since infancy and without any language system whatsoever, who partially regained his hearing at the age of 20 years.

In normal language development, the age range from two to three years is considered optimal for learning basic language skills, and the early teen years are regarded to be the critical age after which a first language cannot be established in the individual (Lenneberg, 1967). Carl, the subject of this study, was well past this age when a professional staff began the intensive effort to teach him a first language. The results of this effort and the lessons learned along the way will be of interest to other rehabilitation workers dealing with clients like Carl, who are frequently believed to be hopeless candidates for language and communication training.

The work reported here was conducted at the National Center for Deaf-Blind Youths and Adults in Garden City Park, New York. This agency is operated by The Industrial Home for the Blind under an agreement with the Social and Rehabilitation Service of the United States Department of Health, Education, and Welfare. The National Center accepts clients from the entire United States, offering services including communications, speech pathology and audiology, low-vision aids, mobility

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training, prevocational and vocational counseling, employment placement, social casework, and others. In addition to client services, the National Center supports a Research Department which develops and evaluates sensory and communication aids and maintains the National Register of Deaf-Blind, Children, Youths, and Adults and carries out research related to direct services. The program for Carl's rehabilitation was designed and implemented by staff of both client services and research.

### **BACKGROUND INFORMATION**

Carl was admitted to the National Center for Deaf-Blind Youths and Adults in September, 1970. He was then 19 years old. He was sponsored by the Tennessee Rehabilitation for the Blind, the agency in his home state. He had a history of spinal meningitis at the age of three months with subsequent impairments in both vision and hearing. He had had no formal education. He lived at home with his mother who was able to communicate with him using simple gestures and demonstration. He had no established language system and evidenced no spontaneous communication when he was first seen at the National Center. He had partial vision in his right eye (20/200) and light perception in his left eye. Otological and audiological evaluation revealed profound deafness bilaterally. (Deaf-blindness is defined at the National Center as "substantial visual and hearing losses such that the combination of the two causes extreme difficulty in learning.") Psychological evaluation revealed dull normal intelligence, limited alertness, confusion, apathy, and poor judgment.

At the time of his admission to the National Center Carl was described as robot-like and seriously deficient in initiative and in interpersonal relationships. He followed directions but never initiated or altered any action. He did not, in the beginning, establish any relationship with other clients. He showed little reaction to the presence or absence of staff whom he saw every day. His blank, openmouthed facial expression revealed no emotion. He seemed completely passive and almost unaware of his surroundings. He was noted to be clean and neat about his personal habits. He was easily frustrated to the point of temper tantrum if his routine were altered or anything unusual required of him, like being expected to ask for food before it was given to him. He could participate in sports activities, but did not seek them out or respond with enthusiasm. He seemed to like to work with his hands. Carl had no language system. The staff were able to communicate with him by means of gross gestures and demonstration. He did not vocalize at any time. He showed no awareness of environmental sounds.

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### REHABILITATION AT THE NATIONAL CENTER: THE FIRST PHASE, September 1970 - August 1972

*Speech and Language therapy.* The staff audiologist saw Carl daily for speech and language therapy after he was admitted to the National Center. During the first year of his stay Carl's progress was minimal. Even when he appeared to have learned a concept or skill, he was usually unable to retain it even for a few minutes. Early attempts to teach him sign language resulted in his acquisition of four signs (*airplane, boy, girl, shoe*) which he used only in the therapy session and retained poorly even there. He made no attempt to sign or to respond to signs, in spite of the fact that signing is a frequent mode of communication between clients and staff at the National Center.

Attempts to begin teaching him to read and to write his name were not initially successful, although Carl could copy letters accurately. He was given intensive daily instruction in reading numbers and reading and spelling names of familiar objects beginning in February 1972. Several learning programs were attempted in that period, with little or no success. What learning he displayed during any session he lost easily.

*Auditory rehabilitation.* Additional otological and audiological examinations were performed after Carl arrived at the National Center. Reliable auditory thresholds could not be obtained. Repeated measures involving intensive conditioning between May 27, 1971 and June 24, 1971 yielded a composite presumptive audiogram, which indicated a profound bilaterally symmetrical mixed loss averaging 90 dB through the speech range (500, 1000, 2000 Hz). An air-bone gap ranging from 40-50 dB was found at all frequencies between 250 Hz and 4KHz (see Figure 1). Impedance audiometry yielded results usually associated with disarticulation of the ossicular chain.

Upon the recommendation of the audiologist, Carl was seen for further otological examination at the Long Island College Hospital. An exploratory tympanotomy was performed revealing disarticulation of the malleus and incus in the left ear. In October 1971 reconconstructive middle ear surgery was performed. Following surgery Carl responded to 50 dB signals presented to his left ear while the threshold at the right ear remained at 110 dB (see Figure 2). On June 29, 1972 Carl was fitted with an ear level hearing aid, acoustic gain 58 dB, to be worn in his left ear.

Carl's responses to sound, however, remained inconsistent and nonfunctional. Prior to the surgery, the audiologist had devoted considerable time over the period of a year to auditory training with noisemakers and audiometric signals with extremely poor results, except that Carl showed an unexpected ability to discriminate among some of the noisemakers. Following the surgery Carl's discrimination for the noisemakers fell sharply but gradually rose to percentages of 80-90%.

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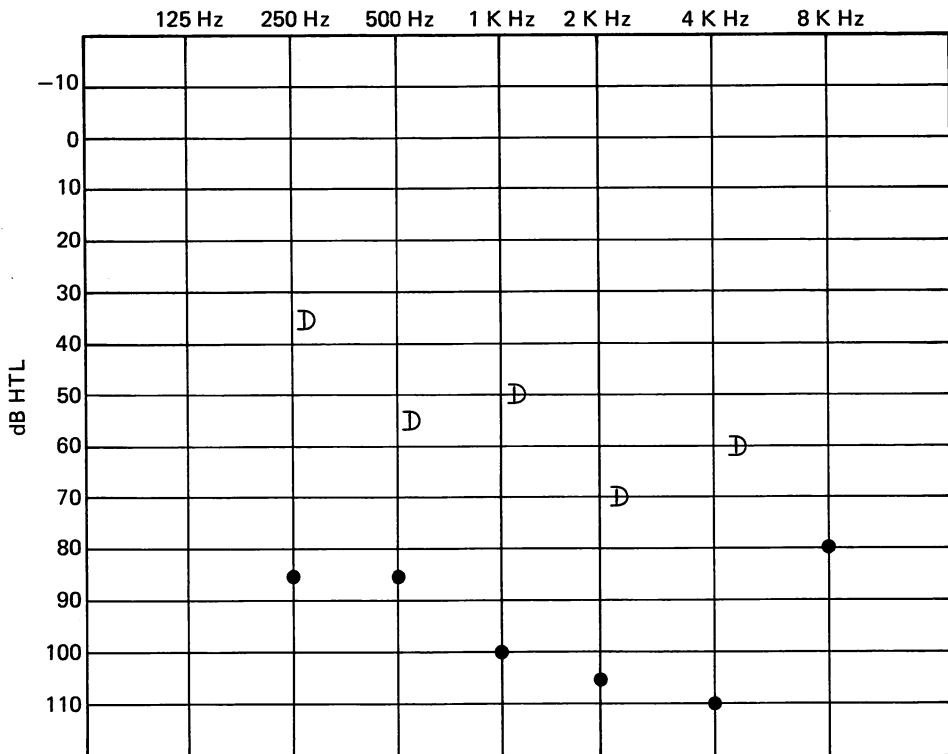


Figure 1. Carl's pure-tone audiogram, 5-24-71

In January 1972 the audiologist began a program of lipreading instruction. Over a period of six months Carl learned to lipread three numbers and five names of objects with inconsistent success. He developed no ability to recognize these same segments presented by voice alone, although considerable effort was devoted to auditory training by two of Carl's instructors. In June 1972 a series of programmed attempts was begun to teach Carl speech production totally without success.

**REHABILITATION AT THE NATIONAL CENTER: SECOND PHASE,  
September 1972 - January 1973**

Intensive instruction in sign language (Signed English) began in September 1972. Carl's progress was startling: he learned approximately 40 signs during the first week. The audiologist who instructed him reported that he could identify these signs accurately by pointing to the appropriate picture and in the absence of other, nonverbal clues. He was able to generalize the signs he learned to other pictures of similar objects. He made considerable progress in acquiring a vocabulary of signs during that fall and early winter (1972). In January 1973, after being home for

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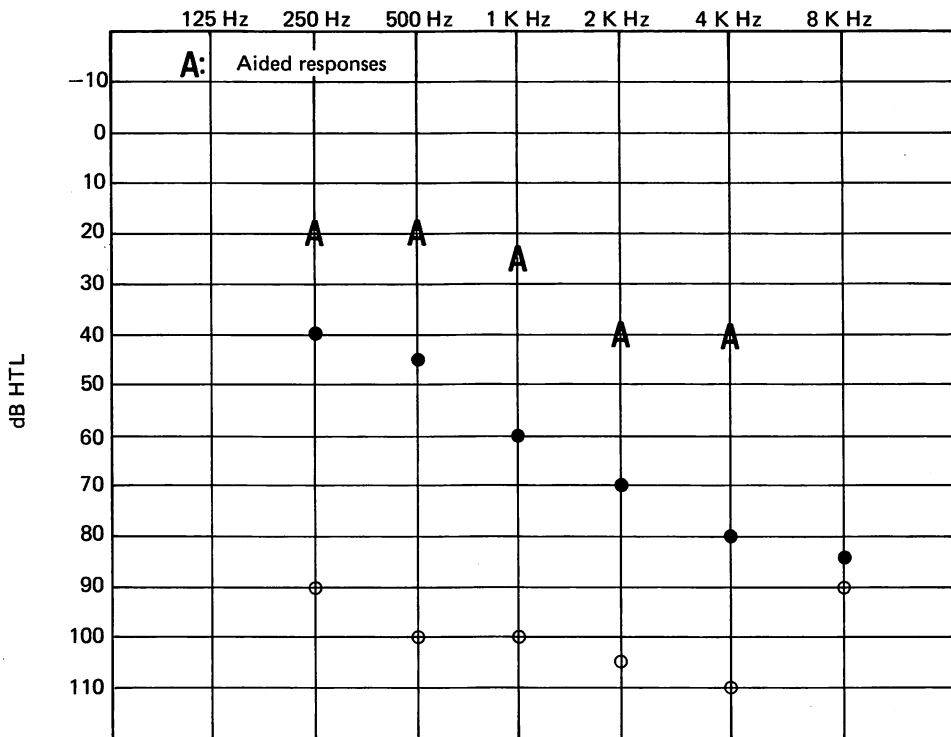


Figure 2, Carl's pure-tone audiogram, 1-3-72 (post surgery)

Christmas, Carl for the first time used some signs spontaneously to communicate to the audiologist about his recent airplane trip. By February he could identify over 70 signs for concrete picturable objects, as well as several others.

**REHABILITATION AT THE NATIONAL CENTER: THIRD PASE,  
February 1973 - June 1973**

February 1973 marked the beginning of a special project aimed at developing functional communications by sign, written word and sound. A Doctoral trainee supported by the Social and Rehabilitation Service, HEW, was assigned to work with Carl and the staff under the supervision of a consulting speech pathologist. The trainee's first responsibility was to assess Carl's functioning at that date. The following information was obtained by interviews with the staff and by observation and testing.

*Status in February, 1973.* Carl did not wear his glasses or hearing aid consistently. He frequently left the aid behind at the residence. He did not respond to auditory stimuli of any kind. He did not vocalize.

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Carl could identify 73 signs by pointing to the appropriate picture; he could make 72 signs correctly in response to the presentation of these pictures. He could follow a few simple signed commands: *sit down, stand up, run away*. He did not use the signs he knew to communicate with others; he neither initiated nor responded to attempts to communicate for social purposes. He used no signs spontaneously, but did communicate with gestures and demonstration. He did not respond to greeting.

Carl could match colors, shapes, objects, numbers, and letters. He did not know any color names. He could copy numbers and letters. He could write 1-10 in sequence, and could add by ones but could not subtract. He could appropriately categorize pictures. He did not understand time concepts as applied to his daily schedule of instruction. He could not identify any written words. He could fingerspell 19 letters and could fingerspell his own name. He showed frustration by throwing his hands up when the task became too difficult.

*Goals.* The team of personnel then developed a plan for a rehabilitative program to include the following short-term goals:

1. developing communication behavior through the use of signing; improving social behavior.
2. increasing Carl's knowledge of language and ability to put the language (sign language) to use.
  - a. expanding the lexicon.
  - b. expanding the use of syntactic structures (subject-verb and subject-verb-object construction; expanded noun phrases; Wh-questions).
3. developing beginning reading skills.
4. developing consistent responses to auditory stimuli.

The procedures designed to implement these goals involved as many persons on the staff as possible in order to provide a comprehensive and coordinated program for Carl's rehabilitation. The projected period for this phase was from February 1973 through June 1973.

### PROCEDURES FOR DEVELOPING COMMUNICATIVE AND SOCIAL BEHAVIOR

During the daily training sessions a structured program to instill communicative behavior through signs was begun. An example of this procedure used early in the period reported occurred when two instructors working together taught Carl to request desired objects. Carl and his two instructors sat round a table. Instructor #1 (the trainee) took from the shelf a book that Carl was known to enjoy and began to look through it,

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turning the pages. Instructor #2 then tapped Instructor #1 on the shoulder and signed "Book please," simultaneously speaking the words. Instructor #1 immediately gave the book to Instructor #2, who responded orally and in sign "Thank you." Instructor #2 looked through the book for 20 seconds. Instructor #1 tapped Instructor #2, and said and signed "Book please." Instructor #2 returned the book to Instructor #1, who responded "Thank you" as before. The entire sequence was repeated. When Instructor #2 had the book for the third time, Instructor #1 tapped Carl and asked through signs if he would like to see the book. She encouraged Carl to ask Instructor #2 for the book as they had previously modelled the behavior. Carl signed "Book please" to Instructor #2, who immediately gave him the book. Instructor #1 signed "thank you" and gestured to Carl to do the same. On the third day when this sequence was begun Carl spontaneously signed "Book please" before any modelling had taken place. In subsequent sessions Instructor #1 ate candy, pretzels, and cookies with Carl and Instructor #2 looking on. Instructor #2 requested the snacks and received them; Carl spontaneously did the same. In a later session Instructor #1 asked Carl to write his name but did not provide a pencil. Carl signed "Pencil please" without modelling or encouragement. Subsequently the instructor asked Carl to write numbers but did not provide any paper. Carl spontaneously signed "Paper please" and, after receiving the paper, "Thank you."

At the start of each of these sessions the instructors greeted each other with the signs for "Hi, How are you" and responded "Fine thank you." When Carl had observed this exchange three times Instructor #1 taught him the signs for "Hi," "How are you," and "Fine." At the start of each session thereafter Carl and the two instructors exchanged these greetings. It is notable that Carl learned in a remarkably short time to adopt a communicative role using signs that he knew, although before this stage of training he had never used any of the signs he had acquired for a communicative purpose.

The other instructors and staff personnel were directed to encourage Carl's use of signs for communicative purposes. If he indicated that he wanted some object, he was not permitted to snatch it from someone's hands, but had to request it using appropriate signs. If Carl did not initiate the request, the staff member was directed to model the behavior and ask Carl to imitate. Following the successful imitation, he was to be given the desired object. If Carl did not respond with "Thank you," the staff member modelled that behavior for Carl to imitate.

The trainee took snapshots of all personnel involved in Carl's program. The team assigned name signs to each person, consisting of the first letter of his name together with the appropriate sign (e.g., the sign for the audiologist was "L" made at the ear). Carl learned these name signs which the instructors later used in directions like "Give this to John," "Ask Margie for a book."



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*Procedures for increasing language skills.* The trainee and the staff audiologist were the team primarily responsible for direct language instruction. They employed a variety of materials to increase Carl's lexical repertoire. Carl learned to decode and then to encode the new signs in various games. In one of these games seven cards were displayed. After Carl had viewed them all he was instructed to close his eyes. The instructor removed one card, tapped Carl, and signed "What's missing?" In the next stage Carl played teacher, signing the instructions "Close your eyes" and "What's missing?"

Development of syntactic structures was also stressed. For example, Carl was taught to sign "Man work" in response to a picture of a man working. (Although Carl knew both of these signs his spontaneous response at this time was "man" or "work" but never both.) For structures consisting of subject-verb-object (e.g., for a picture of a girl riding a bike), Carl at first was reinforced for *S-O* responses ("girl bike," "boy milk"). When he had mastered this construction the *S-V-O* construction was introduced. Three-sign responses ("girl drink milk," "lady buy food," "man fix bike") were taught. The same procedure was used to teach expanded noun phrases ("two balls same," "three fish different," "three balloon(s) blue," "two small house(s)," "purple car"). The signs were accepted in any order Carl gave them. Constructions using relational terms "in," "on," "under," "between" were taught similarly. Wh-questions were introduced using the name-signs Carl had previously mastered: Carl was to respond with the appropriate name-sign when the instructor asked "Who is this?" as she pointed to a person or to his snapshot. Carl also learned to respond appropriately to questions like "What is Margie doing?" "What is the boy eating?" "What is in the box?" and later to "Where is the ball?"

*Procedures for developing beginning reading skills.* The instructor responsible for teaching reading and spelling, after many discouraging attempts at instilling reading skills, began to make structured use of the language Carl was beginning to develop through the use of signs. Referring to a structured model of cognitive development, this instructor carefully planned and implemented the program by insuring at every step that Carl was required to do only that which was appropriate to his level of concept attainment. She taught Carl to read common nouns (*man, lady, boy, girl*) for which he already knew the signs. The instructor required Carl to match picture to sign, then printed word to picture, and finally sign to printed word. His word recognition and comprehension increased. He developed a reading vocabulary of nouns and action verbs and could make the signs accurately for written noun-verb combinations (e.g., *boy run, lady sew, man sleep*).

*Procedures for developing consistent responses to auditory stimuli.* Conditioning techniques were employed to train Carl to respond to

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auditory stimuli. The first signal used was music from a pocket radio and from an auditory training unit. The trainee turned on the radio and took Carl's hand, depressing a lever on a panel that caused a light to go on. After pressing the lever, the trainee gave Carl a token (a white chip that could later be traded, in amounts of 20, for rewards of candy, soda, or gum). After Carl had learned the routine the sessions were transferred to the audiometric booth, both to eliminate unwanted noise and to permit the instructor to present the stimulus without being observed by Carl. Recorded music was the stimulus. An additional instructor sat with Carl and recorded his responses. Twenty stimuli (at 65dB sound field) were presented at each session; responses were recorded as *Correct* (within 3 seconds following termination of the 5-second stimulus), *Late* (after the 3-second interval), *No Response*, or *Response/No Stimulus*. Tokens were supplied only for *Correct* responses.

### **STATUS AT THE CLOSE OF PHASE THREE, June 1973**

*Progress in communicative and social behavior.* Carl's robot-like passiveness had disappeared. He interacted with other clients and was more alert and enthusiastic. He initiated and responded to greetings and requested desired objects and activities through appropriate use of signs. He enjoyed joking with his instructors, inventing games like pretending not to know what was wanted of him and later pulling the desired object from his pocket indicating with glee that he had understood all along. He began to demonstrate resourcefulness in finding solutions to problems that had not been made explicit.

His tantrums had disappeared. Whereas in the early period Carl became uncontrollably upset when denied a shopping trip, at this stage he accepted the explanation that it was not his turn or that the schedule had been changed.

Carl spontaneously reported his experiences to his instructors using signs. He asked if he didn't understand. He learned gradually that most of the people at the National Center could understand his signs, thus slowly expanding the community with which he communicated verbally.

In the early period Carl either ignored others or laughed inappropriately at other clients on occasions when they burned themselves or walked into the wall. This anti-social behavior was very distressing to the staff and clients. At the end of Phase Three, Carl's behavior in this respect had changed dramatically. He not only greeted people he knew but asked after those who were unexpectedly absent ("Where's Lynne?") He began to help other clients who are totally blind. On one occasion he expressed concern that one of the blind clients had left his coat behind at the end of the day. Carl reported this situation to one of the instructors, who told Carl to go back to the bus and tell that client. Carl returned to the bus,

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took the client's hand and made the sign for *coat* on his body. Then both left the bus and returned to the Center for the forgotten coat.

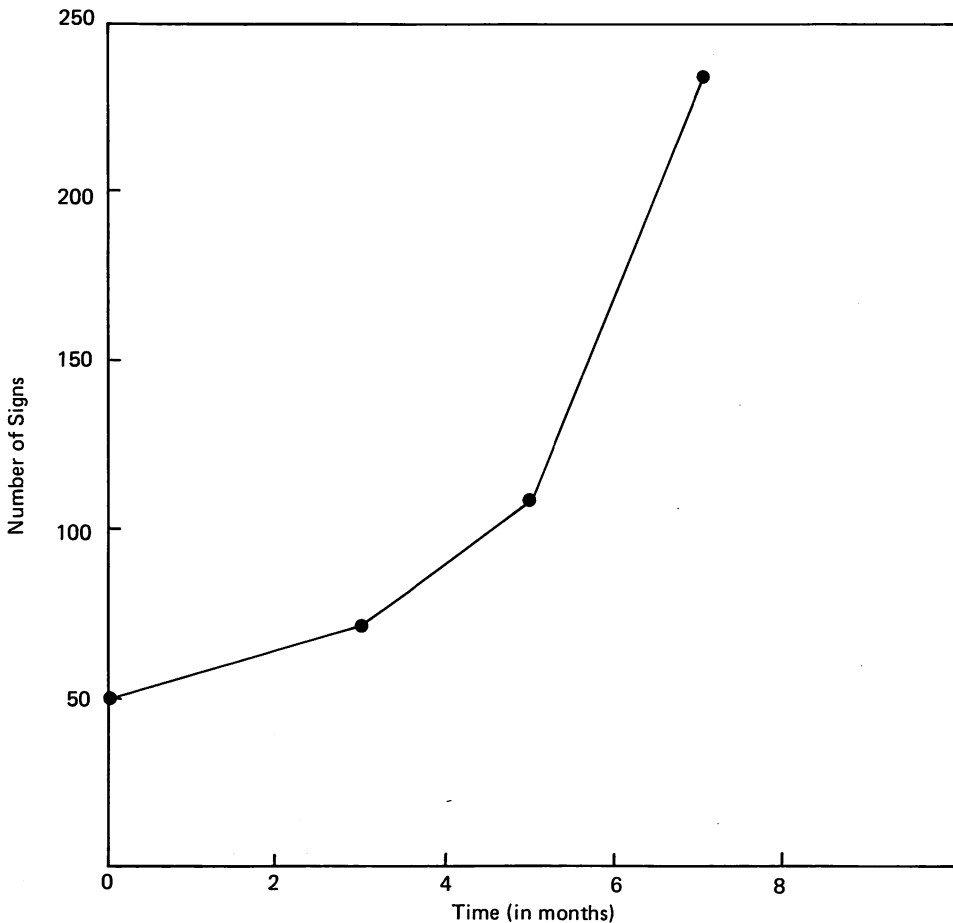
*Progress in language skills.* Carl's vocabulary and syntax grew rapidly. He had considerable functional expressive language and even greater receptive language.

a. *Lexical growth:* Carl's vocabulary of signs that could identify and produce upon presentation of a picture stimulus was measured at four times during this period, showing steady progress (see Figure 3).

b. *Syntactic growth:* In February 1973 Carl used only single nouns or single verbs. In April 1973 Carl could use two word subject-verb, subject-object, or noun phrase segments, including:

boy run  
girl sit  
boy ball

girl milk  
two flowers  
fish different



**Figure 3. Number of Signs Carl Could Identify and Produce Measured Four Times from 11-72 to 6-73**

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In June 1973 Carl could handle two- and three-word segments of the above types and also S-V-O constructions, including:

boy ride boat	girl drink milk
boy climb tree	rock under box
two flowers same	man in car
three flowers yellow	book on table

In June 1973 Carl could respond appropriately to Wh-questions beginning with *Who*, *What*, *Where*. He could follow complex commands like "Go to my room and get me a pencil and some paper" or "Go ask Sam for your glasses and a pencil."

c. *Spontaneous use of signs*: In June 1973 Carl had been observed to use 38 different single signs spontaneously outside of the training session. For greetings he signed and responded to *Hello*, *How are you*, *Fine thank you*. He asked for desired objects. He spontaneously used *please* and *thank you* in 80% of the situations sampled. He produced the following novel combinations outside of the training session:

cut hair  
shoe broken  
drink water  
more paper

His syntax outside of the training sessions remained limited to one and two-word segments.

*Progress in reading skills*. In June 1973 Carl had a sight vocabulary of 42 single words and combinations of these words (*girl shop*, *lady cook*). On one occasion he spontaneously wrote BOY and placed the paper under a picture of his nephew.

*Progress in development of responses to auditory stimuli*. Training sessions aimed at developing consistent responses to recorded music began on May 8 and a total of 14 sessions were held during this period. In each session 20 stimuli of 5 seconds duration were presented through the audiometer in the sound-field. Responses were recorded as *Correct* (within 3 seconds following the termination of the signal), *Late* (after the 3-second interval), *No Response*, and *Response/No Stimulus*. Carl's responses improved to a level of 80% Correct and 20% Late at the last session. These data are summarized in Figure 4.

It may be noted that although Carl did not reach 100% accuracy by the 14th session there were no responses in the *No Response* or false positive columns after the 11th session.

A further result appeared in the outcome of the audiologist's most recent attempt to obtain a reliable pure-tone threshold audiogram on June

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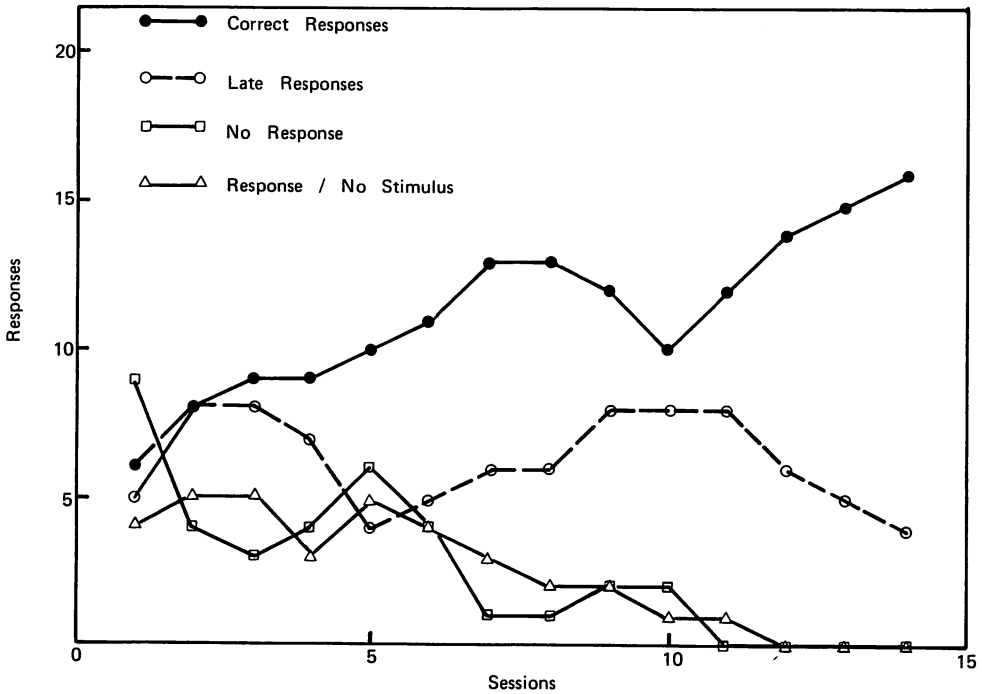


Figure 4. Responses to Auditory Stimuli (Recorded Music) Between 5-8 and 6-18

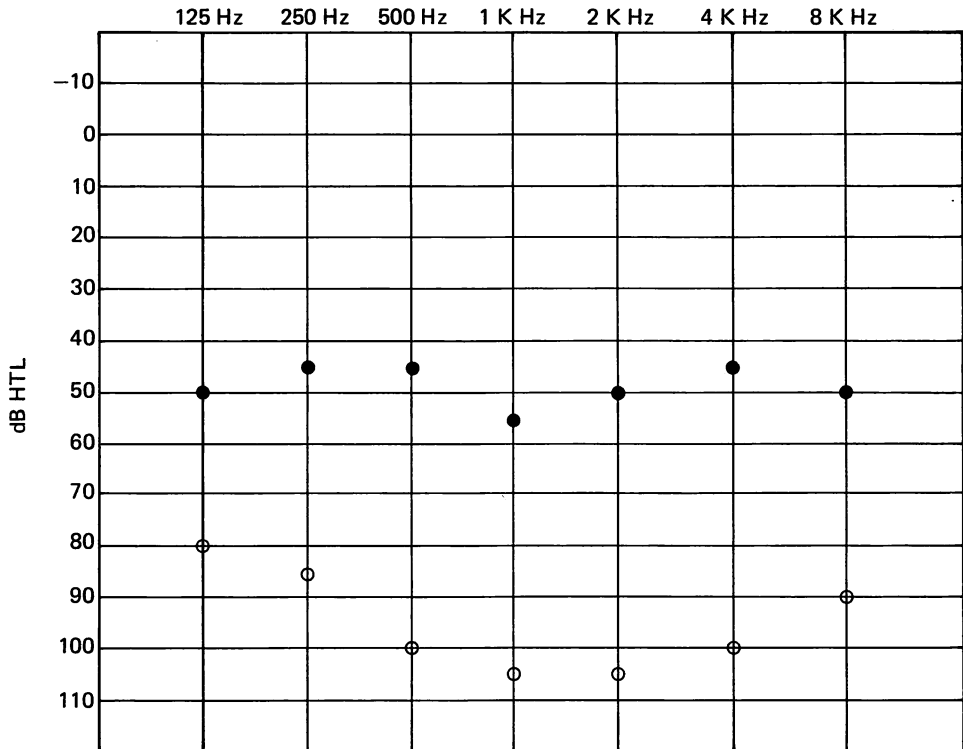


Figure 5. Carl's pure tone audiogram, 6-18-73

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18, 1973. Unlike previous tests, on this occasion the audiologist's impression was that for the first time Carl's responses were consistent and reliable using ascending technique exclusively (see Figure 5).

### SUMMARY AND FUTURE GOALS

The project to demonstrate that an adult with severe sensory handicaps who had developed no language system could be rehabilitated in the areas of language and communication may be deemed a success. Carl made remarkable progress beyond his initial status at the time he entered the National Center in September 1970. From a passive unreacting, noncommunicative organism he became a young man with severe and limiting handicaps who could nonetheless relate meaningfully to others, use a limited linguistic system to communicate with those around him, and learn selected cognitive, linguistic and academic skills. In place of complete lack of affect or temper tantrums, he manifested enthusiasm, humor, sociability, and concern for others.

Among the more important goals for Carl's future development are: increased mastery of language skills; increased ability to communicate with signs; cognitive development in the areas of time, number, and money; additional reading and writing skills; development of the auditory channel as a source of information through spoken language; and, as a long-range goal, development of the ability to use oral language. With a continued intensive program involving a team of instructors and counselors, there is reason to suppose that Carl will continue to make progress toward these goals.

### REFERENCES

- Lenneberg, E.H. *Biological Foundations of Language*. New York: John Wiley Sons, 1967.
- Salmon, P.J. *Out of the Shadows: Final Report of the Anne Sullivan Macy Service for Deaf Persons*. New Hyde Park, New York: National Center for Deaf-Blind Youths and Adults, 1970.