THE POTENTIAL FOR LANGUAGE ACQUISITION OF ILLITERATE DEAF ADOLESCENTS AND ADULTS

By DAVID A. SPIDAL, Ph.D. and GLENN S. PFAU, Ph.D.

It has long been recognized that the majority of congenitally deaf individuals mature physiologically with a significant retardation in language, though they have no deficiency in intellectual potential. Vernon (1969) has summarized scores of research investigations which reveal an essentially normal cognitive capacity for the population of the severely hearing impaired. Nevertheless, the vast majority of deaf adults experience difficulty in language, and find themselves often unemployed or under-employed.

Despite this language handicap, it is a fallacy to say that the deaf person is unable to interact in an intelligent manner with his environment. Heider and Heider (1940) state that the deaf child without language “has already organized the world of his experiences in much the same way as a hearing child.” Furth (1966) says that thinking is an internal system, a hierarchical ordering within the person of his interaction with the world. Language, as a symbol system, expresses that internal organization. Furth further states that, “The internal organization of intelligence is not dependent on the language system; on the contrary, comprehension and use of the ready-made language is dependent on the structure of intelligence.”

The purpose of this article is to summarize some significant aspects of the problem, discuss some theoretical constructs related to linguistic development in the deaf, present a brief overview of a program which incorporated a structured approach to teaching communication skills, and to discuss conclusions and implications of the study.

Related Literature

Educators in the field of the deaf have long recognized that severe, early auditory impairment frequently results in weak language skills but the

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extent of this linguistic retardation was not fully comprehended until the conclusions of numerous investigations were analyzed. Though there were exceptions, it was found that most deaf students of high school age were functioning at about the fourth grade level in language and reading skills (Furth, 1966a; Myklebust, 1964). Stuckless and Marks, 1966; Goetzinger and Rousey, 1959; Cooper, 1965; Mindel and Vernon, 1971; Fusfeld, 1955). Switzer and Williams (1967), authorities concerned with the employment of the adult deaf, state that a large number of deaf eighteen- and nineteen-year-olds are “functionally illiterate, reading below the fourth grade level, and expressing themselves correspondingly.” Streng (1967) even went so far as to state that, “Little or no progress has been made in teaching the deaf to read more efficiently during the last two decades.”

Moores (1970) suggests that all children, including the prelingually deaf, possess innate abilities to develop language competency, given effective input and appropriate feedback. He states that the deaf child “brings this ability to the language process and it need only be triggered off.” The majority of the data strongly suggests that educators of the deaf have been unable to find the trigger. That is, though there have been periodic breakthroughs with particular individuals, the overall language level of the graduating deaf adult has left a great deal to be desired. It is certainly no reflection upon the sincere and dedicated profession of deaf educators. Keys simply have not been located which would unlock the linguistic barriers that have hampered success.

Table 1 (Furth, 1966a) summarizes a comparison of reading test norms of deaf and hearing children from an investigation by Wrightstone, Aronow, and Moskowitz (1963).

| TABLE 1 |
| SILENT READING ACHIEVEMENT OF DEAF PUPILS COMPARED TO GRADE EQUIVALENT OF HEARING NORMS |

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Mean Grade Equivalent</th>
<th>Median Grade Equivalent</th>
<th>Percentage Scoring at Grade 4.9 or Better</th>
</tr>
</thead>
<tbody>
<tr>
<td>10½—11½</td>
<td>654</td>
<td>2.7</td>
<td>2.6</td>
<td>1</td>
</tr>
<tr>
<td>11½—12½</td>
<td>849</td>
<td>2.8</td>
<td>2.7</td>
<td>2</td>
</tr>
<tr>
<td>12½—13½</td>
<td>797</td>
<td>3.1</td>
<td>3.1</td>
<td>6</td>
</tr>
<tr>
<td>13½—14½</td>
<td>814</td>
<td>3.3</td>
<td>3.2</td>
<td>7</td>
</tr>
<tr>
<td>14½—15½</td>
<td>1035</td>
<td>3.4</td>
<td>3.3</td>
<td>10</td>
</tr>
<tr>
<td>15½—16½</td>
<td>1075</td>
<td>3.5</td>
<td>3.4</td>
<td>12</td>
</tr>
</tbody>
</table>

It should be mentioned that the data of Table 1 represent a population of approximately one half of the deaf students in the United States between the ages of eleven and sixteen years. It may be noted that the eleven-year-old
deaf subjects had a mean grade reading equivalent of 2.7 and the sixteen-year-olds had a mean grade reading equivalent of 3.5 — a gain of only .8 of a grade over an age span of five years. It is also significant to note that only 12 percent of the students in the oldest age group were reading at a grade level of 4.9 or better. (Under conditions of normal reading development, this age group would be reading at approximately a tenth grade level.)

The Office of Demographic Studies at Gallaudet College conducted a survey of hearing impaired children and youth and reported the findings in the publication, Academic Achievement Test Performance of Hearing Impaired Students (1969). The survey summarized the Stanford Achievement Test performance of 12,000 students in schools and classes for the hearing impaired who were classified according to chronological ages and hearing threshold levels. Table 2 (Spidal, 1970) provides a summary of the survey in the areas of reading and language.

**TABLE 2.**
MEAN GRADE LEVEL OF STUDENTS WITH 60dB (ISO) OR GREATER HEARING LOSS.
Office of Demographic Studies, Gallaudet College, Washington, D.C.

<table>
<thead>
<tr>
<th></th>
<th>Age 7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reading</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test Battery</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary I</td>
<td>1.65</td>
<td>1.87</td>
<td>1.91</td>
<td>1.97</td>
<td>2.04</td>
<td>2.38</td>
<td>2.50</td>
<td>2.41</td>
<td>2.51</td>
<td>2.44</td>
<td>3.41</td>
<td>3.46</td>
<td>3.33</td>
</tr>
<tr>
<td>Primary II</td>
<td>2.51</td>
<td>2.51</td>
<td>2.44</td>
<td>3.97</td>
<td>4.31</td>
<td>4.24</td>
<td>4.17</td>
<td>4.02</td>
<td>3.42</td>
<td>3.54</td>
<td>3.41</td>
<td>3.40</td>
<td>3.48</td>
</tr>
<tr>
<td>Intermediate I</td>
<td>3.40</td>
<td>3.48</td>
<td>4.13</td>
<td>4.66</td>
<td>4.50</td>
<td>4.57</td>
<td>4.40</td>
<td>5.46</td>
<td>5.82</td>
<td>6.02</td>
<td>6.15</td>
<td>6.00</td>
<td></td>
</tr>
<tr>
<td>Language</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary I</td>
<td>2.98</td>
<td>3.17</td>
<td>2.99</td>
<td>3.04</td>
<td>2.87</td>
<td>2.98</td>
<td>3.17</td>
<td>2.99</td>
<td>3.04</td>
<td>2.87</td>
<td>3.42</td>
<td>3.54</td>
<td>3.41</td>
</tr>
<tr>
<td>Intermediate I</td>
<td>3.42</td>
<td>3.54</td>
<td>3.41</td>
<td>3.40</td>
<td>3.48</td>
<td>4.13</td>
<td>4.66</td>
<td>4.50</td>
<td>4.57</td>
<td>4.40</td>
<td>5.46</td>
<td>5.82</td>
<td>6.02</td>
</tr>
<tr>
<td>Intermediate II</td>
<td>3.41</td>
<td>3.54</td>
<td>3.41</td>
<td>3.40</td>
<td>3.48</td>
<td>4.13</td>
<td>4.66</td>
<td>4.50</td>
<td>4.57</td>
<td>4.40</td>
<td>5.46</td>
<td>5.82</td>
<td>6.02</td>
</tr>
</tbody>
</table>

An analysis of Table 2 should reveal to those of us concerned for the deaf, that it is incumbent that we continue searching for linguistic breakthroughs. The test results become even more alarming when one realizes that most tests should not be used with students scoring significantly below the average, and that there is a high probability that the scores are significantly lower than shown because of the “guess factor.” These testing considerations are best summarized by Edward Frye of Rutgers University, as so stated in the *Sixth Mental Measurement Yearbook* (1965):
These reading tests should not be used with below average pupils. There are several reasons for this. The first . . . each battery is so constructed that it does not contain easy items suitable for the seriously retarded pupil to answer correctly, and only a relatively few items simple enough for the low average learner to handle successfully. However, the upper level of each test battery has been extended sufficiently so that it overlaps the next higher battery to a considerable extent.

The second reason for being wary and often, in fact disregarding low scores, is that these tests . . . do not have a cut-off point at chance guessing probability score. For example, if a student just guesses at each item on the reading vocabulary section of the SRA Achievement Test for the grades 1-2 test, on the average he would get a raw score of 10 (there are 41 four-choice items) and this would yield a grade level score of 1.6. On the grades 2-4 form his guessing score vocabulary would place him at grade level 2.1; on the 4-6 form it would be 3.9 and on the 6-9 form his guessing vocabulary score would be 5.7. Notice what nice progress the non-reading student can make by just guessing at higher forms.

By analyzing the language achievement scores of deaf students within and between test batteries, one might conclude that we have even more reason for concern than originally thought. Also, the concept of evaluating the hearing impaired student by means of standardized tests designed for normally hearing children presents an area of deep concern to all involved in the educational process. Despite this, many educators feel confident of the progress that their students are making based upon achievement scores. In light of Professor Frye’s statements, it may be extremely risky to determine a deaf student’s achievement level, academic grouping, or vocational expectations when judgements are based upon tests of this type. All would conclude that a major need in education of the deaf is the systematic development of a valid instrument for providing the deaf educator and vocational counselor with a true assessment of the child’s level of academic functioning in all areas.

Since expressive language is contingent upon a receptive language system, it is not surprising to note that deficiencies are similarly prevalent in this area (Myklebust, 1964; Brannon and Murry, 1966; Simmons, 1962; Stuckless and Marks, 1966; Quigley, 1969). Myklebust examined the written language of deaf students in three ways — productivity (number of words, number of sentences, and the number of words per sentence), syntax (grammatical accuracy and the correctness of the language used, including punctuation), and abstract-concrete (the relationship between the language used and thinking or imagination). He found that the productivity of the seventeen-year-old deaf student was comparable to the hearing child of ten...
years of age; the syntactical level of the same deaf student was equivalent to the normally hearing child of seven years; and his abstract level was approximately equal to that of a normally hearing child of eleven years.

**Linguistic Considerations**

Language has often been identified as being synonymous with the act of speaking, with the sounds made in speaking, or with both. Deese (1970) claims that it is a mistake to view language in this manner. Wood (1957) provides a more acceptable definition by stating, "Language is any means, vocal or other, of expressing or communicating thought or feeling." John Dewey (1933) defined language as, "Anything deliberately employed as a symbol or sign — gestures, movements, pictures, and the like." The present authors contend that when discussing language development, especially for the hearing impaired, the definitions such as Wood's and Dewey's are the most appropriate.

Linguists concur that there are optimal periods for language learning, regardless of whether it is one's native language or a second language. This optimal period usually precedes the beginning of formal school, and possibly peaks as early as three to four years of age. Thereafter, the ability to acquire language, and particularly one's native language, steadily declines. The graph in Figure 1 demonstrates this optimal period of language acquisition. It shows that the relative ease of acquiring language is a direct function of age. That is, above the age of four, one's ability to acquire language is inversely proportional to chronological age.

**FIGURE 1.**

**RELATIVE ABILITY TO ACQUIRE LANGUAGE AS A FUNCTION OF CHRONOLOGICAL AGE**

Vocabulary development, as well as the acquisition of grammatical principles, decelerates with an increase in age. Joos (1964) indicates that a child has possibly acquired the full extent of his grammar by the age of eight
and that his vocabulary is basically stationary after the age of twenty. Though it is highly possible that a few grammatical concepts continue to be acquired throughout one's lifetime, and that some vocabulary (primarily nouns) continues to be learned, the rate of their acquisition is extremely decelerated after the optimal learning period.

Optimal periods of learning as related to language may have physiological bases. That is, there is a genetic time table regarding general maturation of the central nervous system. For example, the brain of a child more than triples in weight during his first two years of life. Furthermore, the central nervous system has reached maturity by twelve years (Berry, 1969). Also, the child develops a preference in handedness and by nine years of age has a strong lateralization preference. For most children, by the age of twelve cerebral lateralization is probably irreversible.

The authors contend that the above physiological findings have direct and profound relevance to the education of deaf children. Since there are optimal times for language learning and since these stages are during the early years, we must strive to maximize language instruction during these critical phases of physiological development. It may require some introspection of educational techniques and philosophies, as well as a possible rearrangement of priorities. It is incumbent upon us, as educators, to identify and establish a viable systems approach to language instruction during these critical years. This may require an increased emphasis on relevant and meaningful language instruction during the child's twenty-four hour day, while at the same time recognizing the child's right to his childhood. It seems obvious that increased importance must be given to systematic language instruction during his regular school hours. In addition, innovative programmatic planning will have to be identified for incorporating other aspects of the child's environment to the attack on language deprivation. That is, the child's after school, evening, weekend, holiday period, and summertime hours will have to be recognized as an integral component of the language system.

There is a mounting body of evidence that indicates that language failures are closely related to the educational environment. Just as many learning problems for the normally hearing have been related to the lack of interaction between the child and his learning environment (Faust, 1970), so this same principle has equal application to education of the deaf child. The learning environment is defined in terms of the type of school, the utilization of materials, teacher, peers, educational philosophy, and parent and teacher expectancies, to mention a few. All of these vital components must be cumulative in nature for learning to occur at an optimal rate.

Though stress has been placed on the importance of language learning in the early years, one must not forget those deaf adults who have passed through these stages of the educational process without acquiring a functional language system. Some illiterate deaf adults have been "counted out" in terms of their potential for ever acquiring a meaningful language
system. Too often, these people are "tracked" into a vocational program
which requires little language ability but also presents the person with
minimal professional challenge throughout his lifetime. Many times, these
illiterate deaf adults continue to be unemployed or under-employed and
abandoned for further language instruction.  

The purpose of the following report is to empirically demonstrate that
deaf educators should never cease in their attempt to provide language
instruction, regardless of the age of the individual.

THE ILLITERATE DEAF ADULT—AN INVESTIGATION
IN COMMUNICATION SKILLS

Purpose

An investigation under the direction of Virginia McKinney was
undertaken to determine if a highly structured instructional program could
enhance the language and communicative skills of a group of subjects
classified as "illiterate deaf adults." The investigation was carried out in a
program in Los Angeles, California, which was established to provide media
and services for the deaf and hard-of-hearing.

Subjects

The adult population was comprised of nine males and five females,
ages 16 to 53. A condensation of biographical information on each subject is
provided in Table 3.

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1 Boyce R. Williams, Director, Office of Deafness and Communicative Disorders,
Rehabilitation Services Administration, Department of HEW, estimates that 40% of the
adult deaf are functionally illiterate (reading below the fourth grade level). Since there
are approximately 250,000 deaf adults in the United States, 100,000 might be
considered functionally illiterate.
2 Virginia McKinney, Communication Skills Center, 3770 Tracy Street, Los Angeles,
California, 90027.
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#### TABLE 3.
SUBJECT INFORMATION FROM THE CASE STUDY FILES OF THE COMMUNICATION SKILLS CENTER

<table>
<thead>
<tr>
<th>I.D.</th>
<th>Sex</th>
<th>Age</th>
<th>Hearing Loss</th>
<th>Entry Behavior Characteristics</th>
<th>Type of Formal Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Female</td>
<td>27</td>
<td>Profound</td>
<td>dysrhythmic hypoplasia</td>
<td>day and residential</td>
</tr>
<tr>
<td>2.</td>
<td>Female</td>
<td>19</td>
<td>Unknown</td>
<td>hyperactive short attention span</td>
<td>oral day</td>
</tr>
<tr>
<td>3.</td>
<td>Male</td>
<td>18</td>
<td>Unknown</td>
<td>low frustration level neurologically handicapped, behavioral problem</td>
<td>oral day</td>
</tr>
<tr>
<td>4.</td>
<td>Female</td>
<td>23</td>
<td>Profound</td>
<td>born and reared in Vietnam, no communication skills</td>
<td>oral day</td>
</tr>
<tr>
<td>5.</td>
<td>Male</td>
<td>21</td>
<td>Profound</td>
<td>behavioral problem, school expulsion, juvenile record</td>
<td>oral day</td>
</tr>
<tr>
<td>6.</td>
<td>Male</td>
<td>53</td>
<td>Unknown</td>
<td>catatonic spells, extremely tense, central disorders</td>
<td>none</td>
</tr>
<tr>
<td>7.</td>
<td>Female</td>
<td>35</td>
<td>Unknown</td>
<td>born and reared in Mexico, complete lack of symbol system</td>
<td>none</td>
</tr>
<tr>
<td>8.</td>
<td>Male</td>
<td>25</td>
<td>Unknown</td>
<td>limited retention, preservative behavior</td>
<td>regular classes, day classes for hearing impaired</td>
</tr>
<tr>
<td>9.</td>
<td>Female</td>
<td>33</td>
<td>Unknown</td>
<td>behavioral problem, expulsion from school</td>
<td>oral day</td>
</tr>
<tr>
<td>10.</td>
<td>Male</td>
<td>19</td>
<td>Unknown</td>
<td>mentally retarded</td>
<td>institute for MR high school for the deaf</td>
</tr>
<tr>
<td>11.</td>
<td>Male</td>
<td>19</td>
<td>Unknown</td>
<td>cerebral palsied, aphasic, epileptic, low frustration level</td>
<td>oral day</td>
</tr>
<tr>
<td>12.</td>
<td>Male</td>
<td>25</td>
<td>Profound</td>
<td>no symbol system, no communication</td>
<td>oral day</td>
</tr>
<tr>
<td>13.</td>
<td>Male</td>
<td>16</td>
<td>Profound</td>
<td>hyperactive, minimal attention span, uneducable, excluded from school</td>
<td>oral day (started age 10)</td>
</tr>
<tr>
<td>14.</td>
<td>Male</td>
<td>16</td>
<td>Severely Hard of Hearing</td>
<td>born and reared in Mexico, no communication skills</td>
<td>none</td>
</tr>
</tbody>
</table>

#### Procedures

The concentrated program, designed to enhance communicative skills of illiterate deaf adolescents and adults, utilized the language system developed by Project LIFE—Language Improvement to Facilitate Education (Pfau, 1968; 1969; 1970). Though the programmed language instructional...
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materials were designed and validated on primary age deaf children, it was decided to utilize them in this investigation since they were carefully sequenced in a hierarchy from the very simple to the increasingly complex. Also, the LIFE system has diagnostic tests to allow for prescription of programs at a person's linguistic level.

The subjects met three times each week for a period of six hours, or a total of eighteen hours per week. This report covers a period of approximately six months of 1970-71. (The program was continued during 1971-72 but the results are not reported herein.) The objectives of the program were:

1. To develop a mode of symbolic communication (oral, graphic, or manual) for the students who communicated primarily through the use of primitive gestures or who had no communication skills whatsoever;
2. To enhance and/or develop oral and graphic modes of communication for the students who had some proficiency in the language of signs; and
3. To develop independent study skills.

The rationale for the program was based upon the fact that the students, with two exceptions, were unable to communicate by any symbolic mode upon entering the program. They were unable to communicate with the therapist, their own family, or with other students. Most of the students were only able to read a few nouns (the range of recognized nouns was from 3 to 30). A high percentage of the students had apparently become so frustrated by their previous educational experiences that they literally "backed away" when confronted with the printed word.

Each student was given an opportunity to interact with the LIFE materials (For further information about materials and equipment contact: General Electric/LIFE Program, Education Support Project, General Electric Company, P.O. Box 43, Schenectady, New York 12301.) and other specially prepared materials for the first hour in the morning and again for one hour in the afternoon. Following the exposure to the language materials, the therapist and teacher aides would work with the subjects in small groups. Also, some individual attention was given to students in further developing the communication skills of the language taught by the Project LIFE language system via the Student Response Program Master.

The program was conducted by Virginia McKinney, a habilitative audiologist, with assistance from volunteers. Each student in the program was required to complete the available Project LIFE language filmstrip series. Some other specially prepared materials were used but commercially available materials were of little value since they started at a level exceeding the students' ability.
Results

Each of the subjects varied in their level or progress during the reporting period, but each made substantial gains in their linguistic competencies and communication skills. Below is a summary of each subject's post-program language and communicative behavior.

Subject No. 1 could initially identify about 50 nouns but refused to take a simple reading test which had sentences. As a result of the program, she learned to use many standard signs and to fingerspell other words outside of her signed vocabulary in acceptable sentence form. At first, she required up to two hours to complete one language filmstrip, but her speed gradually increased so that she was able to complete a filmstrip in 30 minutes. At the end of the program, about 90% of her responses were syntactically correct and appropriate to the question or situation.

Subject No. 2. For a long while it was doubted whether this person was receiving any real benefit from the Communication Skills Center and her written responses seldom reflected improvement. However, the change in her signed responses was phenomenal. At first, her signs and gestures were so sloppy and lacking in any precision that it was difficult to interpret them. However, the non-oral responses improved so much that at the end of the reporting period 95% of her signed responses were both responsive to the questions asked and correct syntactically. In reading, the subject first rejected any task associated with the printed symbol, but after a few months wanted to use the same type of materials that other students were using and successfully handled reading material at about the second grade level.

Subject No. 3 made rapid strides in developing abilities in the use of standard sign language and vocalization in face-to-face communication. His responses in the classroom were usually oral, and were correct syntactically and easily intelligible. He also became able to identify errors in the signed responses of other students. He was able to make written responses and was successfully working with reading tasks at the 2.0 reading level.

Subject Nos. 4, 6, and 14 had never received any formal education. They developed simple communication skills in writing, reading, speaking, and signing with adequate syntax.

Subject No. 5 was able at first to handle and interact with the Project LIFE filmstrips as long as the responses involved only one or two words, i.e., man, some boys, woman, and the like. When he viewed filmstrips having responses containing several full sentences he used guessing behavior. One morning, he walked into the center, apparently determined to conquer the filmstrips; he did so, studying carefully each frame before selecting a response and studying it again if the light failed to confirm a correct answer. Thereafter, he began to take pride in his achievements. His case file states that, "His conquest of the Project LIFE materials really, I feel, represents his first breakthrough into the realm of syntax and connected language. Thereafter, this was reflected in his language work in face-to-face
communication.” The client improved in both reading and writing ability, although his motivation seemed to be least in these areas as compared to the other communication skills. He could speechread much of the lesson vocabulary and showed significant improvement in his ability to approximate the speech stimuli. He continued to use gestures in spontaneous communication, but incorporated approximately 100 standard signs, and could fingerspell or sign some 200 words, including the Project LIFE vocabulary to which he was exposed.

Subject No. 7 could not work in a group situation since she lacked any meaningful symbol system. The Project LIFE filmstrips provided the only means of allowing her to constructively use her time while the instructor was busy working with the other students. She literally “fell in love” with the materials and would sit patiently for long periods of time working with the Program Master, studying each frame carefully while fingerspelling every word. She made excellent progress during the time she was at the Center, but had to leave the program because of home problems.

Subject No. 8 developed the ability to communicate adequately through the use of a combination of signs, fingerspelling and speech. It was possible to carry on simple conversations with him and he communicated freely with the other students. His retention problem was still apparent, but gradually he was able to retain more and more words in the graphic, oral, and manual levels so that his spontaneous communication continued to increase. His speechreading improved and he easily speechread most of the lesson materials. He learned to use approximately 200 standard signs.

Subject Nos. 9 and 12 quickly mastered the task of the Project LIFE filmstrips and worked rapidly to complete all of the films that were available. Upon entering the program these subjects displayed very limited communication skills but became motivated to improve communication skills. They made rapid strides in oral, manual, and graphic skills and were reading above the 2.0 level.

Subject No. 10 was simultaneously taught the appropriate signs for the Project LIFE vocabulary as he worked his way through the first four units. He became able to work in group situations with connected language. He began to attempt spontaneous communication via sign language in sentence form. He was still unable to approximate speech stimuli. He was very proud of his increased ability to communicate and was highly motivated to continue his studies.

Subject No. 11 started on the Program Master and Project LIFE materials and “loved working with them.” His mother was so excited with his response to these materials that she wanted to purchase a set for him to use at home. He completed Units 1 and 2 successfully. The parents were “thrilled” to finally feel that they were on the road to establishing functional communication with their son.

Subject No. 13 made marked progress in his ability to remain seated in the classroom for up to an hour and attended well for periods of up to 15
minutes. His favorite activity at the Center was the use of the Program Master and the Project LIFE filmstrips. When he began, he needed someone sitting by him for encouragement before he would attend to each frame and make a response. His progress was very slow. He worked with each filmstrip many times before he had success. As time progressed, he was able to work more independently and finally was able to work alone. Sometimes he was so involved in this work that he would not stop for lunch, and became annoyed if someone else was using the equipment. He spent as long as 6 hours at the Project LIFE machine and materials. He worked through the first three units and was using the language spontaneously in signs.

Summary and Conclusions

Upon entry into the program, the students were almost totally unable to communicate by any symbolic mode with the therapist, the family, or with other students. At the end of the program, they could and did communicate with others at the simple sentence level in speech, writing, and in the language of signs. At the outset, the students would not attempt to interact with the group; as a result of the program, they engaged each other (both individually and on a group basis) in enjoyable and successful dialogue.

In receptive language, the students progressed from the recognition of a small number of nouns to the reading and comprehending of simple connected language. In addition, there was an intrinsic change in attitude, from a strong aversion of tasks associated with reading to a desire for more contact with more reading materials at their ability levels. Also, attention spans related to learning activities were increased from a few minutes to several hours.

More specifically, it was found that the Project LIFE materials truly fostered independent study skills, one of the program objectives. The Summary Report from Virginia McKinney states:

For several students, initial responses to each frame had to be reinforced by the therapist or a trained volunteer to avoid frustrations. Gradually, this extrinsic reinforcement was withdrawn, and the student learned to function with only the intrinsic reinforcement supplied by the Program Master. Once a student reached this point, he resented any attempt to interfere with his independent use of the materials, and this attitude was usually generalized to his acceptance of responsibility in the learning of other materials as well.

Since three of the students were reared in foreign countries and had received no formal training in either English or their native language, they
POTENTIAL FOR LANGUAGE ACQUISITION

had virtually no language. The situation was complicated by these students entering the program late and, thus, they could not immediately be absorbed into small group instruction because of their almost complete lack of and exposure to a symbol system. Here, the Project LIFE materials proved invaluable. Students with literally no symbols could acquire in an independent manner a nucleus of connected English. After they had completed language level Unit 1, they found themselves able to work in group situations. Simultaneously, these students were exposed to oral and manual communication to further reinforce the Project LIFE vocabulary. This resulted in their increasing ability to expand their use of connected language in group situations. Two of the students were markedly less nervous when working on programmed materials than when involved on a one-to-one interaction in a group situation.

All students were self-paced; that is, each was allowed to proceed through the programmed language filmstrips at his own rate. Times were not recorded and students were asked upon completion of a filmstrip whether they desired to continue working with the LIFE materials or to participate in some other activity. Thus, there was a wide variation in the amount of time expended weekly by each student at the Program Master. Some students spent only a short time each week and others were literally “glued” to the machine for periods of time ranging up to six hours. There were several arguments over the use of the machine since only one Program Master was available. For those students with the least language ability, the Project LIFE materials were the activity of first choice. The therapists concluded that the materials were sequenced in increments small enough to insure success, while at the same time providing a challenge.

Mastery of the Project LIFE materials was immediately reflected in classroom work. Retesting of the students who had completed the materials early in the program revealed excellent retention. For instance, even 6 months later no student failed a unit that he had previously passed.

The research coordinators anticipated negative feedback regarding the Project LIFE materials, since they were designed for children and were being used by adults. It was interesting to note that no comments of this type were received. It is presumed, however, that the students would have been even more enthusiastic if the materials would have had visuals and language of adult orientation.

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