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ABSTRACT

The state of the art monograph on research trends in deafness reviews 60 research studies concerning the deaf sponsored by the Social and Rehabilitation Service. The first of four major sections focuses upon research trends in occupational conditions of deaf people and reviews both research and program experimentation studies. The second section, reviewing research on the cognitive aspects of deafness, covers language and thought studies and psycholinguistic studies. The survey of research trends in the psychosocial aspects of deafness reviews personality and psychopathology studies, summarizes research on community services and clinical tools, and predicts future trends in research on the psychosocial aspects of deafness. Research on communication patterns of the deaf is reviewed in two parts: studies analyzing communication and studies dealing with instruction of the deaf in communication skills. (KW)

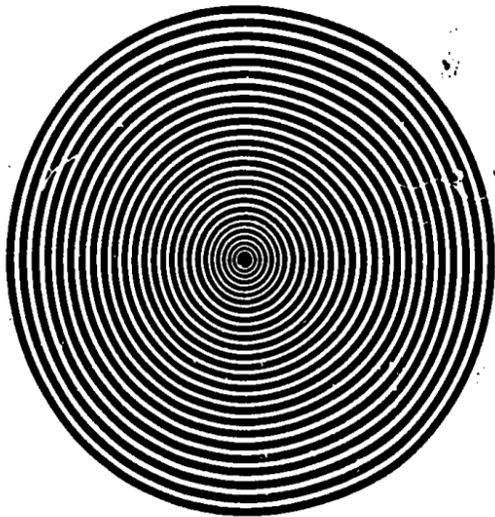
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**RESEARCH TRENDS IN DEAFNESS  
STATE OF THE ART**

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
Social and Rehabilitation Service  
Office of Research and Demonstrations  
Washington, D.C. 20201

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JUNE 1970

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STATE OF THE ART**

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DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
Social and Rehabilitation Service  
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Washington, D.C. 20201

## *foreword*

This monograph on research trends in deafness is being presented in the hope that it will provide useful information to individuals and agencies serving deaf people and that it will encourage further research.

The selective research reviewed in this first report on the state of the art in research on deafness represents some of the important efforts being made on many fronts to reduce the handicapping aspects of deafness.

In many cases, research on deafness has opened up areas for study that had never before been explored. A notable example is research on the mental health conditions of the deaf population. This research, which is providing knowledge on the mental health problems of deaf people and developing techniques to combat them, is drawing needed attention to a long neglected disability group. It is heartening to know that as a result of this research, many deaf people who formerly languished for years or a lifetime in hospitals are being restored to useful and satisfying living.

It is encouraging to note also that significant headway has been made in better understanding of the communication needs of deaf people. The exciting discoveries being made on the effects of early language training for preschool-age deaf children foretell that much future research will be concerned with parent education. Research has made a vital contribution in pointing to the need of deaf children for early communication in the home for more normal development and better school achievement.

There is great satisfaction in knowing that research is helping to improve the social and occupational conditions of deaf people. The National Theatre of the Deaf is enhancing the image of deaf people through display of their considerable talents. In an effort to reach those who are severely handicapped and to help them achieve their vocational potential, new service and training techniques have been developed. Community counseling and referral centers for deaf people are making it possible for many of them, for the first time, to share meaningfully in services that are routinely available to hearing persons. Special vocational training programs are helping to reduce the underemployment of deaf people and to open new employment areas for them. More adequate measuring instruments are available to assess the vocational potential of deaf persons.

We are indebted to the creative and hardworking researchers who

have made great strides in advancing the rehabilitation of deaf people. We look forward to further accomplishments in research to benefit deaf persons now living as well as those to come.

To the editors of this monograph we extend special thanks for their careful work in producing a report that should be helpful to many persons. We are also grateful to Drs. William Craig of the University of Pittsburgh and Solis Kates of the Clarke School for the Deaf in Northampton for their early work on this publication.

JAMES F. GARRETT  
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## *preface*

Since the Research Conference on Deafness held at Gallaudet College June 19-22, 1960,<sup>1</sup> the overall progress of research in this disability category has had little attention. Several pages of the Conference report were concerned with needed research, and a variety of problems basic to the rehabilitation of deaf individuals were covered during the 4 days of participant discussions. Now that 15 years have gone by since the passage of P.L. 565, it is most timely that the editors of this Monograph provide us with an opportunity to review some of our research coverage in this field, with some implications for utilization by rehabilitation workers.

The Division of Research and Demonstrations of the Social and Rehabilitation Service, Department of Health, Education, and Welfare, has supported over 1,600 research and demonstration projects since 1954, of which 323 are ongoing and about 1,280 have been completed. During this period, the funds expended annually for the program have risen from about \$300,000 to \$21,750,000. The purpose of this research has been to discover new principles and concepts basic to the understanding of the rehabilitation process, and to use such knowledge for the invention and demonstration of improved services to disabled individuals within the vocational rehabilitation process.

Three types of grants are available under this program: research projects which are intended to contribute new knowledge, principles, techniques, and devices to the field; demonstration projects which apply the results derived from previous research; and projects to establish special facilities and services for three or more States.

This research has covered a wide variety of problems and processes basic to the success of rehabilitation. It has dealt with medical, physiological, psychological, vocational, social, and many other kinds of problems encountered in rehabilitation work. It has also studied all major disability groups; the many aspects of the rehabilitation process, with emphasis on the work of the counselor; physical facilities, prostheses, and other "hardware" and devices essential to rehabilitation; and numerous other problems of interest to disabled clients, their families, and employers, and professional workers in the field.

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<sup>1</sup>"Research Needs in the Vocational Rehabilitation of the Deaf"—A Special Report Based on a Research Conference Conducted at Gallaudet College, Washington, D.C., June 19-22, 1960. Powrie V Doctor, Ph.D., Project Director. Published in the *American Annals of the Deaf*, September 1960, Vol. 105, No. 4, p.p. 335-370.

As the Final Research Reports from this program have come in over the past 10 years, a corresponding need has arisen to evaluate their findings in a comprehensive way. Such evaluation can uncover usable results not otherwise evident, give a picture of the "state of the art" in a given area, provide ideas for innovation, and highlight new directions for further research.

The present volume contributes significantly in all four of these respects. It is also an important resource in filling the constant requests received for information on the overall field of deafness and the rehabilitation of deaf persons. We are indebted to the editors for their analysis of numerous Final Reports from our program, and from other sources as well. Their work has produced a monograph on the present state of our knowledge in this area.

This monograph presents the first overall review of 60 research studies concerning deafness and deaf people sponsored by the Social and Rehabilitation Service. It was prompted by a growing need for an overview of the breadth and direction of SRS research in the area of deafness to bring about the utilization of the findings of important studies.

The review information is classified under four headings. These headings include research trends in occupational conditions of deaf people, research on the cognitive aspects of deafness, research trends in the psychosocial aspects of deafness, and research on the communications patterns of deaf people.

Decisions on research studies to be included in the review were governed by two factors, as follows: (1) that the findings of the research study be available; and (2) that the research study be significant to the understanding of deaf individuals in regard to occupational adjustment, cognitive development, psychosocial characteristics, or communication skills.

It is our conviction that utilization of research results should be on a scale commensurate with our research program and the social and rehabilitation services in the field. This monograph represents a forward thrust in that direction.

GEORGE A. ENGSTROM, Chief  
Research Utilization Branch  
Office of Research and  
Demonstrations, SRS

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## *occupational conditions of deaf people— research trends*

In the area of occupational adjustment of deaf persons, research effort has been directed mainly to gathering facts on their vocational outcome and on developing and demonstrating programs that provide deaf individuals with vocational adjustment training.

The task of investigating the distribution and status of deaf persons in the vocations and determining their community adjustment has been accomplished for the most part through use of structured interviews and short response questionnaires. Corresponding information on hearing co-workers is frequently given. Data on employment aptitudes, interests, attitudes and preparation, which are usually presented as percentages, may in some cases have been gathered before employment and then reworked to correspond with subsequent employment history.

Essentially, program development and demonstration in the area of service to deaf adults is a pioneer effort. Prior to 1960, few programs existed for deaf people outside of established primary and elementary educational programs. The field was wide open to research for the development and demonstration of training and service programs to meet the needs of deaf adults which are comparable to those of normally hearing adults. Research in this area is still in the developmental stage. The emphasis is on developing and demonstrating various training and service techniques and program operational procedures that are effective in work with deaf individuals. The size and the complexity of the research task requires that more time elapse before evaluation of the separate and different program approaches can be accomplished.

### **The Definition Problem in Research**

Research on deafness is made more difficult by the need to define this disability in its application to population. Definition is also a problem in describing vocational processes. In some studies, redefinition of terms in both of these areas was necessary after the investigation started.

It has been found that defining a deaf population in the context of vocational preparation and employment involves much more than determining the degree of hearing loss, the nature of this loss, the age of the individual when the loss occurred, and the type of hearing loss, important as this information is. Other factors besides the physiological description of hearing loss must be considered to determine the effect of a hearing handicap on training and employment.

The positing of hearing loss as sufficient for a person to be considered either deaf for all practical purposes or hard of hearing is a primary concern to researchers. Ascertaining the nature of the loss as inactive or progressive is also necessary to indicate the adjustive capacity of deaf persons and their employment possibilities. The age of the individual when hearing loss occurred may have great bearing on his future vocational status, especially if the loss was sustained in early childhood before normal language development took place. The competency of a deaf individual in speech, reading, speechreading, and creative writing normally determines his occupational status. The type of hearing loss may affect employment to the extent that individuals with certain types of loss may not be able to tolerate noisy surroundings or vibrations. The identification of individuals by type of hearing loss, namely, conductive, sensory-neural, or mixed, is important in determining their potential for amplification benefits and for increasing their communication skills through therapy.

The definition of deafness in the area of vocational adjustment is largely a matter of determining the effect of the handicap on the vocational processes. Implicit in this view is the need of deaf persons for special instructional procedures and consideration of their response to the demands of employment and their potential for possible advancement.

It is obvious that competency in communication and in language achievement are determinants of occupational status as well as of the method of training and response to the employment situation. The more limited deaf person may not go beyond a given training or vocational level. In other words, the handicap of deafness is multiplied for deaf individuals who aspire to callings for which they do not qualify for reasons of communication ability and language competence.

The treatment of definition problems in the area of vocational processes must also be met effectively. There is difficulty in defining terms such as employment, underemployment, and employability. The overlap in academic, prevocational, and vocational instruction requires special handling in definition. Terms such as technical and vocational cannot be defined precisely but may be distinguished by example.

The ambiguity of the term "employment" makes its use in research problematical. Situations such as temporary, seasonal, and day work are troublesome in their employment definition. Other questions arise. Is a

newly placed job holder considered employed? Is his status defensible in consideration of previous employment? Is unpaid housework employment?

Conditions that apply to employability, unemployment, and underemployment also need to be defined. How does the researcher determine employability in persons who have never worked, or have not been successful in their employment, or who have interrupted their employment? Also, what conditions ascertain that a person is underemployed? Research has provided substantive evidence that many deaf people are underemployed. However, this evidence has not led to a precise definition on underemployment of the deaf for research purposes.

When used as a research term, the word "underemployment" poses the same problems in definition as the word "employment." Researchers have responded more or less alike by defining employment and having unemployment stand for all other employment situations.

Training terms such as academic, prevocational, and vocational are difficult to separate from each other in their interdependence in the employment preparation setting. Academic programs may have vocational training for their outcome. Prevocational training has different interpretations depending on the employment training involved. Advanced vocational training to prepare persons for higher grade jobs in their chosen occupational areas may be academic.

Researchers have been satisfied to refer to technical and vocational training by examples for want of a better way to define them. In the area of the deaf, an example of technical training in machine shop work would be tool design. Toolmaker and diemaker work would be an example of vocational training in this occupational area.

Investigation of the occupational conditions of deaf people is a difficult venture requiring resolution of numerous problems. Researchers probably find definition one of their greatest problems. The results of their studies are affected to the degree they are able to create clear conceptions of deafness as it relates to vocational preparation and employment.

### **Status Studies**

Status studies have concerned the conditions of deaf people in the hearing community. Investigation of the personal, social, and vocational adjustment of deaf persons has included, to a lesser extent, study of their interaction with and acceptance by hearing members in the community. Some studies have focused entirely on the occupational situations of deaf individuals.

Overgeneralization and overinterpretation are problems common to all status studies. Status studies of deaf populations are no exception. The studies that will be described in this document show evidence of

both. Nevertheless, the information provided by these studies has been helpful in indicating program needs of deaf people and in stimulating action for their promotion. Additionally, the operational baseline established by these studies provides research with a platform to launch other investigations in the dynamics of adjustment of deaf persons to the hearing community.

Researchers have used various approaches to describe the deaf population. Schein (RD-734), Furfey and Harte (RD-1012) (RD-1627), and Rainer, Altshuler, Kallman, and Deming (RD-7) have taken a more global approach in their description of deaf people than other investigators such as Lunde and Bigman (RD-79), Rosenstein and Lerman (RD-601), Boatner, Stuckless, and Moores (RD-1295), and Kronenberg and Blake (RD-1652), who have applied their attention to the occupational status of deaf people. Both national and regional profiles of the deaf population are obtained from this varied research effort.

A variety of sources have been used in status studies. Schools for the deaf were pioneers in vocational instruction (beginning prior to 1875) and in evaluating the occupational status of their graduates (1886, Connecticut). The first large-scale study of these programs was conducted in 1924 by the National Research Council when 29 schools were canvassed. The survey report, prepared by I. S. Fufeld, discloses that approximately 60% of the graduates of these schools were pursuing occupations for which they had been trained in school. Further, it was discovered that no official local, State, or school programs existed to assist graduates in job placement.

### **Occupational Conditions Among The Deaf**

Other smaller surveys were made but it was not until 1956 that the next major effort, a national survey conducted by Gallaudet College and the National Association of the Deaf took place. Lunde and Bigman (RD-79), the investigators, had two purposes for their study: 1) to collect information on the occupational status and experience of deaf persons and 2) to stimulate additional research. Questionnaires completed by 10,101 deaf respondents provided data on their personal, social, and economic characteristics and information to determine the relationships between their economic and occupational positions and their hearing loss and means of communication. The research population was also questioned on job satisfaction and the attitudes of co-workers.

The employment rate among the men respondents was high, with 90 percent reporting that they were employed. The rate for women was lower, with 60 percent working, the others being mainly housewives. The majority, 85 percent, expressed general satisfaction with working conditions, and 82 percent in their relationship with hearing workers. Earnings were regarded as adequate by 70 percent of the men.

Approximately two-thirds of the survey group were married, the same ratio as for the United States population. Marriage to other deaf persons or to hard of hearing persons was the rule, with only 5 percent reporting being married to hearing individuals. Deaf offspring were indicated by 17.3 percent. Residential schools for the deaf had provided all of the formal education for almost 70 percent of the survey population. One or more years of college training was reported by about 10 percent of the respondents.

Due to the difficulty in defining deafness in precise physiological terms, respondents in this survey were considered deaf if they viewed themselves as such and were accepted as deaf persons by others in the deaf community. This definition renders the survey population a socio-psychological group rather than a clinically defined population. The assurance of the investigators that the subjects were deaf however, may, be accepted as sufficient evidence that the population studied was indeed composed of individuals who had no hearing or, at best, very little.

The survey population was not intended to be representative of the deaf population. The investigators refer to the study group as a "chunk" and not as a sample of the deaf population. Underrepresentation of persons under 20 and over 60, women, Negroes, and persons at the lowest economic scale is acknowledged. The need for thorough research of the deaf population is clearly indicated. It is expected that this will be accomplished in a forthcoming national census of the deaf.

Employed subjects in the survey communicated on the job mainly through writing. Less than 10 percent used hearing aids at work, or elsewhere. The heaviest concentration of deaf people was found in skilled and semiskilled manual occupations, with 70 percent of the employed subjects reporting employment such as craftsman, foreman, and operative. It may be inferred, however, from the wide range of occupations of the total respondents that deaf people with appropriate skills and capacities can qualify for almost any position despite their handicap.

The average earnings of the deaf subjects compared favorably with the average earnings of the whole population. Deaf professionals tended to average lower than their hearing co-workers, a possible reflection on their more limited opportunities for training and experience. Figures in the report indicate that the employment stability of deaf workers was high. As this may be interpreted in terms of less opportunity for job mobility, limited chance for training is again seen as a factor, among other things.

A definite relationship was seen between the number of ways a deaf person could communicate and his occupational adjustment and job satisfaction.

Almost half of the subjects reported that they had had no help in

finding the jobs at which they were working. It should be stated here that at the time of the survey, employment services and vocational rehabilitation services for deaf people were not as adequate as they later became.

A significant finding was that most deaf men and deaf women did not follow the trades for which they were prepared. Current research on vocational guidance for deaf people should help to reduce materially the unsatisfactory employment patterns of deaf individuals in improved vocational preparation and occupational placement. Additionally, the growing availability of vocational rehabilitation counselors at schools for the deaf is enabling deaf youth to secure needed vocational information earlier.

The information provided by this research on the occupational conditions among the deaf has been of much benefit in promoting programs and encouraging further research to improve the vocational status of the deaf person.

### **Vocational Status and Adjustment of Deaf Women**

Former female students at the Lexington School for the Deaf were the subjects of a related type of study made by Rosenstein and Lerman (RD-601), who reported their findings in 1968. They were interested in evaluating the adjustment of this group to their postschool environment, principally in reference to their vocational attainments. The specific research task was to:

1. Tabulate vocational status in terms of first job and most recent job held.
2. Determine school and postschool factors relating to success or failure.
3. Identify the problem areas encountered during the total job process.

Questionnaires and interviews were used to obtain personal, social, and occupational information from a sample group of 177 deaf women who met established criteria concerning school attendance, hearing loss, and physical condition. The investigators found 116 to be unemployed, mostly because of marriage and home responsibilities. The survey report indicated that 90 percent of the total sample had been or were married and that those who were working or had worked did so because they needed the income or wished to upgrade family standards of living.

The majority of the women, 89 percent, reported no unusual difficulty in gaining employment. Combined speech and writing were used by over one-half of the working women for communication on the job. Subjects who had been academically trained demonstrated relatively

competent social skills and ability and willingness to upgrade their employment through training and job changes. Women who had completed their schooling in vocationally oriented programs were less motivated to enter postschool training, although they were in less skilled occupations and earned less money. The inference is that they were insufficiently prepared in those skills that normally lead to higher vocational attainment.

It was concluded by the investigators that schools for the deaf need to develop the capacities of deaf students for language, communication, and occupational awareness.

#### **Occupational Status of the Young Adult Deaf and the Need and Demand for a Regional Technical-Vocational Training Center.**

A survey undertaken by Boatner, Stuckless, and Moores (RD-1295), reported in 1964 had the following objectives:

1. The determination of the occupational status of young deaf adults in New England.
2. The investigation of formal vocational preparation of young deaf adults.
3. The establishment of the vocational aspirations, aptitudes, and opportunities of the young deaf adult.
4. The appraisal of the need and demand for a regional technical-vocational training center for the deaf.

Information was obtained through interviews with 177 juniors and seniors in 9 New England schools for the deaf and 101 employed young deaf adults, and through questionnaires sent to parents of 354 young deaf adults who had terminated their schooling. The investigation also included employers and officials of regular vocational and technical schools which had accepted deaf people as students in their ongoing programs.

In this study, young deaf adults were indicated to have a substantially lower occupational status than the general working population, as evidenced by the number of people in semiskilled and unskilled occupations, low wages, and unemployment. It is unfortunate that young deaf adults were compared with a population that included hearing adults. Reliable results were thus not obtained. Comparison of young deaf adults with a peer group of young hearing adults would have yielded a more valid picture. Young hearing adults are not ordinarily expected to have comparable vocational status with older hearing adults.

The report brings out that no vocational or technical programs for deaf people exist in New England. Training programs at schools for the deaf are recognized as prevocational rather than vocational. It was indi-

cated that more than 50 percent of the graduates of New England schools for the deaf enter technical or vocational training programs geared to the hearing from which approximately 32 percent of the total number of graduates of these schools are also graduated. It is significant that the investigators recommend that only superior deaf people should be encouraged to enter training programs for the hearing.

Young deaf adults were indicated to have vocational aptitude in tasks requiring refined manual dexterity and form perception superior to that of the general population. The survey provided ample evidence that their employment status was not consistent with their vocational aptitude or their aspirations. Among employed young deaf adults, 76 percent aspired to higher grade employment. Employers indicated that their deaf employees were either superior or satisfactory for the most part, adding, however, that opportunity for advancement for the majority was limited without additional vocational or technical training.

It is significant that 50 percent of juniors and seniors and over 50 percent of employed young deaf adults indicated that they would attend a regional technical-vocational training center for the deaf if this were available. Most parents approved of the concept of such a center for their school-age deaf children and for their young employed deaf sons and daughters.

The authors refer only briefly to the need for vocational counseling and job placement service. They do not draw references from their study as to how these services may be implemented to improve the vocational status of young deaf adults.

Since the time of this report, the feasibility of establishing technical-vocational training centers to serve deaf people exclusively has been questioned. In addition to cost of such programs, the continued educational isolation of deaf people is seen to be undesirable. New research will soon demonstrate vocational training programs for them at vocationally oriented junior colleges using special staff to assist with the integration of deaf students and hearing students. Vocational counseling, job placement, and followup services will be featured.

### **Young Deaf Adults, An Occupational Survey**

A survey (RD-1652) conducted by Kronenberg and Blake in 1964 and 1965 replicated the study made by Boatner, Stuckless, and Moores, drawing from the seven Southwestern States of New Mexico, Oklahoma, Kansas, Louisiana, Arkansas, Missouri, and Mississippi. It had been determined that information on the occupational status of young deaf adults in at least two different geographic and economic regions was needed to produce a national pattern that would recommend a course of action to guarantee young deaf adults appropriate vocational preparation.

As in the New England study, the investigators evaluated the vocational aptitudes and aspirations of juniors and seniors in schools for the deaf and graduates and dropouts of these schools. The rate of unemployment among the graduates and dropouts was found to be significantly higher than for a hearing group of comparable age. Among the 1964 graduates of 10 southwestern schools for the deaf, 18 percent were continuing their training at academic or trade programs after graduation.

It is interesting to note that State vocational rehabilitation agencies annually serve approximately 69 percent of the graduates and dropouts of schools for the deaf in the Southwest. Of 267 employed young deaf adults who were interviewed, 88 reported that they had received assistance from their State vocational rehabilitation agencies in job placement.

Supervisors of 92 percent of the employed subjects evaluated their work performance as superior or satisfactory. Most communication difficulties were considered inconveniences rather than significant problems. Negative work habits and attitudes of unemployed young deaf adults were commented upon by the survey interviewers who also took note of the marginal and submarginal vocational aptitudes possessed by the unemployed. Some interviewers indicated that a number of unemployed young deaf adults were in need of psychiatric services or extensive counseling.

The 10 schools for the deaf participating in this study regarded their prevocational training programs as inadequate in meeting the vocational education needs of deaf students. In addition to other training problems, it was determined that undefined vocational aspirations during the latter school years, when vocational courses are available, arrest the development of vocational skills.

Information in the report reveals that slightly more than 50 percent of young deaf adults receive their training on the job rather than in a training facility. Most of the training facility personnel of programs that accepted deaf students, principally in drafting, printing, and automobile repair courses, indicated that extra effort had been given to provide them beneficial instruction. Only 10 of 57 deaf students who were enrolled or had completed courses at facilities established primarily for hearing persons were judged to be below average in general performance.

Satisfaction with their current employment was indicated by most of the young deaf adults who were interviewed, with 25 percent expressing interest in other work which invariably required extensive formal preparation in a vocational or technical training program. The vocational aspirations of junior and senior students at schools for the deaf also tended to be in those areas that demand formal training. In marked contrast to the findings of the New England study, young deaf adults

were found to be below average in finger dexterity and about average in form perception and manual dexterity. It is possible that the manner in which the general aptitude test battery was administered to the two separate groups is responsible for the difference in results.

As in the New England study, young deaf adults and their parents approved postschool vocational-technical training. It is interesting that less than one-half of the students and graduates indicated a preference to train only with deaf peers.

The high rate of unemployment reported in this survey suggests that characteristics of unemployed young deaf adults should have been defined for better comparison with employed young deaf adults. This information appears to have been accessible from the interviewers, the parents, and previous employers.

The results of the two companion surveys on the occupational status of young deaf adults, in spite of some conflicts, did produce evidence of the need and demand for postschool vocational-technical training. The more positive outcome of the New England study concerning the vocational aspirations and aptitudes of young deaf adults may be more a matter of difference in research method than in population. The excellent work performance of young deaf adults as evaluated by employers in both areas provides conclusive evidence that deaf people make a good adjustment to employment. This encouraging picture emphasizes the need of deaf people for training opportunities and for more counseling and job placement services. As the Southwest report pointed out, this is particularly critical for young deaf adults who are customarily employed in semiskilled and unskilled jobs that hold no promise for advancement with a given employer with or without additional training.

### **The Formidable Peak**

Another specialized study (RD-314) investigated the major characteristics of a sample of profoundly deaf persons and the opportunities and problems they encountered in achieving professional employment. Crammatte, the investigator, selected for his study 87 deaf individuals who had scaled the "formidable peak" of successful employment in professions requiring communication with hearing workers. The report, which has been published under the title *Deaf Persons in Professional Employment*, provides a glowing account of the achievement of deaf individuals who overcome their handicap of deafness to the extent that they are able to handle the duties and responsibilities of professional employment entailing the formulation of abstract ideas and interrelation with hearing people.

The study had the following specific goals:

1. To add to the existing information on the occupational status of deaf people.
2. To provide guidelines for rehabilitation counselors, social workers, and educators on characteristics that identify potential deaf achievers.
3. To examine systematically the problems, experiences, and abilities of deaf persons in professional employment.
4. To provide clues for further, more detailed research.

Selection of the subjects proceeded from interviews that established the subjects' hearing loss as severe enough to require visual means for communication such as writing, lipreading, and the sign language, and the confirmation of their employment for 3 years or more in occupations classified by the Bureau of Census as "professional, technical and kindred." Professionals who were serving chiefly deaf people or acting as independent agents were excluded.

A most significant finding of this study was that 52 percent of the respondents became deaf before the age of 6. Of these, 49 percent were deaf before the age of 3, and 30 percent had been born deaf. In the face of this conclusive evidence of superior achievement of early deafened persons, the investigator postulates on the need for appropriate curricula, methods, and philosophy of education so that deaf individuals may have full opportunity to develop those qualities of mind and personality that they possess.

Data on the educational experience of the respondents reveals that 56 percent received most of their elementary and secondary training at schools for the deaf. Over 70 percent of the persons interviewed had earned degrees. Graduate level work had been done by 22 individuals of whom five had completed the requirements for doctorate degrees. The report identifies three of these five high-ranking individuals as persons who were born deaf. Most of the respondents reported little difficulty at college due to deafness, although they were aware that difficulties existed.

The determination of the method of selection of occupations by the respondents was complicated in this study by factors beyond control. However, it was indicated that about 59 percent had made deliberate decisions in selection of occupation, 39 percent had entered their professions by chance, and 5 percent were unable to determine how their selection had been made. The majority had received help from a third party in applying for initial employment. The investigator points to the justification proceeding from the data on job application that a catalyst of some kind is necessary to trigger a favorable reaction to the prospect of employing a deaf person. The respondents in this study reported 29 occupations with almost 75 percent in scientific pursuits. All

but a few were in laboratory, workroom, or desk positions requiring minimal contacts with the public. Only 4 of the 87 respondents considered themselves to be engaged in occupations not appropriate to deaf persons. Favorable views were held by hearing colleagues on the performance of professional deaf workers. The colleagues declared them to be better than or equal to other coworkers in their jobs. These deaf persons in professional occupations enjoyed a high level of income, with the scientists tending to lead the field.

Typical on-the-job problems of the respondents were inability to make sufficient use of the telephone, limitations in participation in group discussions, and deprivation of information normally available to hearing persons by the grapevine. There was general awareness among the respondents of limitations on their further job advancement because of increased person-to-person verbal contacts. That the respondents were valued employees of their companies, nevertheless, is substantiated by figures which show a steady rise in the salary increments of 90 percent of them.

Communication with coworkers and strangers was not generally a problem for these professional deaf workers, the majority of whom were able to communicate more or less well orally in their employment. It is probable that their occupational accomplishments were largely owing to their speech skills and to lipreading, although less reliance was placed on the latter in the need to receive ideas clearly. It is conjectured by the investigator that the more facile day-to-day contacts made possible by the oral skills of the respondents provided the normality that made these persons accepted by their coworkers.

The study disclosed that in relations with their deaf friends, almost 80 percent of the respondents used manual communication. There was indication that in spite of their speech skills, many of the respondents would have preferred to use other means of communication also in their business relationships.

A significant finding of this study was that except for personal competence and drive there seems to have been no single determinant of success for deaf people in professional employment. The concluding statement of the investigator on this area of the study was, "In short, deaf people are people, and as such their talents and accomplishments will vary."

The steady growth in numbers of professional deaf persons which is the outgrowth of expanding training opportunities and better placement services suggests that a study of the attitudes of supervisors and coworkers of professional deaf workers would be timely in this burgeoning area.

### **The Deaf Community Study of Metropolitan Washington, D.C.**

The first community study involving a deaf population was made by Schein (RD-734), for which he selected the metropolitan area of Washington, D.C. In addition to his objective to learn how severe hearing loss affects the pattern of every day living of noninstitutionalized adults, including their occupational experiences, Schein was interested in the development of improved techniques for identifying and gathering information from deaf individuals.

For the purposes of this research, deaf people were defined as those without usable hearing in the speech range even when assisted by a hearing aid. Also included in the study were "the socially deaf" who are defined by the investigator as persons whose hearing ability is limited but may permit speech perception. It was determined in all cases that the condition of hearing loss had been sustained for 1 or more years before the date of the interview. A total of 1,132 deaf adults were enumerated for this study. Principal sources of names of deaf adults were organizations of the deaf, schools for the deaf, departments of vocational rehabilitation, deaf informants, a household survey, agencies, and churches. The investigator considered the enumeration of non-white deaf people to be possibly discrepant because of their limited number. It is not known whether this segment of the deaf population was less prevalent in the study area or the casefinding methods were not effective in locating more of them.

The investigator used two types of instruments to identify and to confirm the identification of the deaf population in the selected area. One, a Guttman type of scale which correlated successive items with an increasing ability to hear sounds and speech, enabled the persons interviewed to identify their degree of hearing loss which was then categorized for the purposes of the research. While it was indicated by the investigator that a hearing scale cannot supplant audiometric measurement, it was apparently an adequate tool not previously available for distinguishing amongst those who have a hearing loss. The other procedure, a household survey, did not add appreciably to the enumeration of valid names but was considered necessary as an independent check on the adequacy of the research frame.

The majority of deaf persons in this study were able to communicate orally and manually, using one or the other method at any given time according to the needs of the situation and the persons involved. The proportion of deaf people in the survey continuing their education into college was much the same as for the general population of this area. However, it is safe to assume that the sample is better educated than would be samples of deaf persons drawn from other metropolitan areas. The economic status of the white members of the study, which was higher than that for the general population of metropolitan Washing-

ton, D.C., exemplifies importantly the correspondence between the educational attainments of deaf people and their income.

As in other studies of deaf populations, the marriages of deaf persons in this survey were found to be stable, with divorces and separations being more frequent when one of the marriage partners was a hearing individual. The deaf families were found to have the same low fertility rate as hearing families with relatively high income. The traffic record of deaf drivers in metropolitan Washington, D.C. was significantly superior to that of the general population in this area. The low incidence of driving accidents and violations among deaf people was viewed as an index of their social maturity, a desire to conform to community standards. This important evidence of careful driving on the part of deaf persons, which is corroborated by other investigators, is helpful in creating a better public image of deaf drivers.

#### **Interaction of Deaf and Hearing in Frederick County, Maryland**

The above community study served as a prototype for a sociological study of deaf people (RD-1012) in the city and county of Frederick, Maryland, an area which has a much smaller population and differs in other respects from the aforementioned area of metropolitan Washington, D.C. Furfey and Harte, the investigators, had for their purpose a study of the interaction of deaf and hearing persons that would yield better understanding of the social environment of the deaf and knowledge on how the community helps or fails to help in their adjustment. Social casework methods were used to assemble demographic information on 80 deaf persons who were urban or rural residents of Frederick County. Of this number 61 were adults, 18 were school-age children, and one was a preschool child. Structured interviews were used with a probability sample of hearing residents of the County and both structured and unstructured interviews were conducted with manufacturers, merchants, health personnel, and clergymen—a total of 1,107 such interviews.

The study indicated that the occupational status of the deaf population of Frederick County was on the whole favorable. The close check on health care for deaf people, parent-child relationships, and social isolation demonstrate the sociological interest of the study.

The investigators conclude that the generalizations coming out of this study, although not necessarily applicable elsewhere, may suggest useful hypotheses for future studies.

A study of the deaf population of Baltimore, Maryland, by Furfey and Harte (RD-1627) used a more or less similar research pattern to investigate the socioeconomic status and the educational experience of a larger sample afforded by this city. The communication problems of deaf people were studied in particular depth for their effect on the

interrelations of deaf persons and hearing persons, including the family communication situation of deaf infants and older deaf children and their parents.

### **Summary**

The status studies described here make certain conclusions.

1. Deaf people are reliable and stable in their employment and employers are uniformly satisfied with their performance.
2. Most young deaf adults approve of vocational training if opportunities are available.
3. The majority of deaf workers are found in skilled and semiskilled manual occupations in which they tend to show little mobility.
4. Deaf people are generally satisfied with their employment. This may be an attitude born of longstanding lack of opportunity for vocational education.
5. Writing is the most dependable means of communication on the job for deaf people, many of whom are able to communicate both orally and manually as the situation determines.
6. The vocational aspirations and aptitudes of young deaf adults indicate that they have potential for higher level occupations than they normally hold.
7. So that deaf people may aspire for occupations for which they have potential, better preparation in communication skills, educational achievement, and vocational and technical skills is essential.
8. Improved public relations are needed to acquaint industry with the potential of deaf individuals as productive employees.
9. The difference in work adjustment between the deaf and the hearing person needs to be studied. Numerous recommendations for future research in this area are made by the investigators of the status studies.

### **Program Experimentation**

Research interest in the development of programs to prepare deaf people for employment has kept pace with status studies. These programs, which are aimed at vocational education and vocational adjustment, generally have been of two types. Freestanding facilities specifically designed to meet the needs of deaf persons, as well as modifications of existing education or rehabilitation programs, have been developed and demonstrated.

The utilization of schools for programs to provide deaf individuals with vocational training and the development of evaluation, diagnosis,

and adjustment training centers have been the foci of interest of a number of research workers. In this sphere, vocational, technical, or academic training are considered to be instructional concerns and evaluation, diagnosis, work adjustment training, placement, and followup to be vocational adjustment.

The diversity of those programs in purpose, type, and techniques used should be helpful in determining appropriate methods to prepare deaf people for employment. Research persons who have background experience in the education of deaf people have been interested in the evaluation and development of school programs as preparation for employment. Rosenstein (RD-1380) has completed a study on the vocational development of deaf adolescents enrolled in schools for the deaf. A second objective was to determine some of the major variables that are related to the prevocational behavior of deaf adolescents.

### **The Vocational Development of Deaf Adolescents**

A research population of 340 normally functioning deaf adolescents between the ages of 12½ and 20½ was drawn from four residential schools for the deaf located in the northeastern sector of the United States. For purposes of comparison, a sample of 85 hearing siblings whose sex/age distribution duplicated as far as possible 85 corresponding deaf children, was selected from among those in the deaf sample with hearing brothers and sisters.

The information required for the study was obtained in three ways: 1) a personal data sheet, 2) a parent questionnaire, and 3) a series of testing and interviewing sessions with the subjects. An analysis of such factors as communication skills, social maturity, vocational choice and aptitude, and the influence of parents and teachers, yielded needed data on the prevocational behavior of deaf adolescents for comparison with that of hearing siblings.

An interesting feature of this research is that it used as a measuring instrument an adapted form of the Career Pattern Study developed by Dr. Donald Super for use with normally hearing adolescents. Modification of the Career Pattern Study for use with deaf adolescents to measure their vocational maturity involved the deletion of criteria that was indicated to be unrealistic in testing deaf persons and the addition of criteria determined to be appropriate to the investigation at hand.

The results of this study indicate that the vocational development of deaf adolescents differs from that of normally hearing adolescents whose vocational adjustment is seen to be the end result of a developmental process. The vocational information and planning of the deaf subjects was seen to relate largely to their language and communication competence, and the level of stimulation available in the home.

The study suggests that existing programs for vocational training and orientation have little impact on deaf adolescents.

In conclusion, it is held that the school, the home, and rehabilitation services must develop channels for increasing information, changing attitudes, and developing potentials, particularly at early ages.

#### **A Preliminary Study of Minnesota Program for Secondary Age & Young Adult Hearing Impaired**

In 1964, Mangan et al (RD-1341) conducted a three-pronged survey to gather information on the characteristics and practices of secondary school programs for the hearing impaired, that would lead to study of postschool program needs in Minnesota.

The composite survey included:

1. A survey of existing secondary residential and day school programs throughout the country.
2. A survey of information obtainable from secondary school records in Minnesota.
3. A questionnaire survey of the social and vocational adjustment of Minnesota hearing impaired young deaf adults.

The national survey revealed a uniform need for more adequate vocational preparation for deaf school-age youth including departure from traditional course offerings and the establishment of effective guidance and counseling programs.

The combined survey data fell short of expectations but was helpful in indicating a course of action for a more advantageous Minnesota program. The consequence to research due to survey problems arising from differential school records and mailed questionnaires to deaf people may be appreciated.

The investigators concluded that meeting the need for improved school and postschool programs for hearing impaired young adults in Minnesota is a Statewide problem demanding immediate cooperative multiagency and multidisciplinary measures.

#### **Education of Deaf and Hard of Hearing Adults in Established Facilities for the Normally Hearing**

Vaughn (RD-1054) wished to determine the effectiveness of a comprehensive trade, technical, and academic program in existing educational facilities for the hearing impaired when certain techniques are employed to help overcome the problem of limited communication.

Specific program goals for this project conducted by Idaho State University included:

1. Achievement of improved communication skills and adaptation of communication media.
2. Study of educational adjustment needs and educational placements of deaf and hard of hearing students and the effect of integration on normally hearing students.
3. Development of realistic personal-social orientation of the project subjects, their families, and associates.
4. Establishment of satisfactory vocational placement.

The limited area population of deaf and hard of hearing people from which the research group was drawn required acceptance criteria to be broadened. Necessary inclusion of regular students with mild hearing loss as affiliates and deaf people who were nonreaders or extremely low achievers affected this study.

Nevertheless this 3-year project demonstrated that important vocational rehabilitation goals may be achieved by qualifying deaf and hard of hearing students at existing facilities for the normally hearing when their communication and learning needs are met. An interesting outcome was the increased motivation of the subjects to achieve communication skills because of the need to cope with a normally hearing environment.

#### **A Personal Adjustment & Prevocational Center for Nonfeasible Deaf Adults**

Butler (RD-801) was interested in setting up a prevocational and adjustment training center to demonstrate, with help from research, the possibility of readying severely handicapped deaf men for vocational rehabilitation.

The specific research goals of this freestanding facility sponsored by a project at the Michigan Association for Better Hearing were to discover and establish:

1. The extent to which vocational rehabilitation can be achieved.
2. The time required.
3. The cost.

The 33 Michigan candidates who were accepted for this project, which was located in Lansing, were referred by State vocational rehabilitation agencies, social and private agencies, families, State hospitals and training homes, and education institutions.

Eligibility for admission was determined by:

1. Extent and severity of hearing loss.  
Hearing impaired persons were accepted only if they had the characteristics of a behaviorally deaf person.

2. Age.

The candidate had to be in the age range of 17 to 46 years or had to have at least 20 years of employment potential.

3. Extent of need for:

- a. Retraining.
  - b. Prevocational training.
  - c. Academic training.
  - d. Preparation for job placement.
  - e. Job placement help.
  - f. Social and personal guidance.
  - g. Vocational guidance.
4. Communication skills.
- a. No developed communication skills.
  - b. Poorly developed communication skills
5. General physical condition.
6. Emotional and intellectual level of functioning.

Principal reasons for referral or statement of the problem were 1) unemployment, inability to get a steady job, unsuccessful employment; 2) no job training; 3) lack of basic skills; and, 4) lack of social, personal and/or academic adjustment. Eight of the referrals had no previous job experience. The number of employment ventures by referrals prior to their entry in the program ranged from 1 to as many as 24. Where dismissal occurred, the reasons most frequently given were lack of production and inability to interrelate on the job.

The low social adjustment of the referrals was manifested in recurring behavior problems by nearly 45 percent of the accepted men during the training period. Approximately 33 percent of the men came from parental or single-parent homes reporting marital problems. More than 50 percent of the trainees were found to be emotionally disturbed or to have psychiatric or personality problems.

The social maladjustment of the subject group is further mirrored in figures relating to involvement with the law. Over 33 percent had charges made against them before the age of 19.

An interesting disclosure was that almost 50 percent were discovered to be vision impaired, a factor that may have contributed to their educational failure. Two of the 33 trainees had no formal education. The school experience of the others ranged from 4 to 22 years at schools and day classes for the deaf and at regular public schools. All except two were prelingually deaf or severely hearing impaired persons.

An average of 368 training days for the sample did not include weekends, thus providing opportunity for self-direction in meeting personal and social needs. Independent living at a local YMCA, which necessitated money management, fostered responsibility and readiness for employment.

The project staff included the director, a clinical psychologist, a supervising teacher and placement counselor, two academic teachers, a vocational evaluator and a field consultant. Training included actual classroom work in reading, creative writing, manual communication, lip-reading and speech, basic arithmetic, social studies, and driver education. Social and personal adjustment, as well as community education with employment exploration and counseling diagnosis, were emphasized.

At the close of the project 19 trainees were in full-time employment, seven were in part-time employment related to supervised work experience, and three were receiving vocational or on-the-job training. Of the remaining four, one had to discontinue training because of severely debilitating diabetes, one left voluntarily, and two had serious emotional problems.

In conclusion, this investigation in prevocational and adjustment training for severely handicapped deaf men produced decisive evidence that vocational rehabilitation is an attainable goal granting needed training time and costs are expended.

In contrast to the above project conducted as a freestanding facility, four other studies concerning services for severely handicapped deaf people were initiated at multidisability rehabilitation centers. Three of these studies have been completed. The fourth is in progress.

#### **A Demonstration to Determine the Efficacy of Providing Rehabilitation Services to the Deaf in an Ongoing, Comprehensive Rehabilitation Facility for Handicapped Hearing Persons**

Little (RD-1932) used a laboratory approach to evaluate the overall feasibility of providing services to deaf persons, including the severely handicapped, within a large comprehensive rehabilitation facility, in this case, the Hot Springs Rehabilitation Center. This completed research, which accepted 45 to 50 deaf clients annually from Arkansas and eight neighboring States, investigated hypotheses relating to staffing patterns, services, admissions, evaluation, training, and counseling problems, and psychosocial adjustment of deaf persons in this type of setting. The concurrent service program for deaf clients developed as needs were documented through demonstration. Deaf clients were served by regular as well as project staff in an integrated environment that extended to living arrangements and social activities. Project staff provided needed supportive services such as tutoring, counseling, and interpreting.

A second project, one for severely handicapped deaf people only, is now in progress.

### **A Vocational Rehabilitation Program for the Deaf in a Comprehensive Vocational Facility**

Hurwitz (RD-1804) is utilizing a workshop setting supplemented by a supportive community to demonstrate social and vocational development for severely handicapped deaf clients. Program scope for this project, situated at the Jewish Employment and Vocational Service in St. Louis, includes rudimentary basic education, behavioral guidance, and skill training of vestibule/entry level. Both on-the-job training and foster homes have been found to be highly effective training approaches for the low literary project clientele.

### **Demonstration of Methods of Serving Deaf Adults in a Comprehensive Vocational Evaluation & Work Conditioning Center**

At Morgan Memorial, Inc. in Boston, Lawrence (RD-1576) demonstrated diagnosis and evaluation services, work adjustment, tutoring, counseling, vestibule training and job placement provided by specially trained staff for preponderantly severely handicapped deaf clients. Work sampling afforded as a regular facility service, implemented the evaluation of the clients' current functioning, interests, and capabilities. Skill training at the vestibule/entry level was available to deaf clients in an integrated workshop setting. The original design of the project was extended to include a summer program for deaf students still attending school and needed mobile evaluations.

### **Comprehensive Mental Health Services for the Deaf**

Rainer and Altshuler (RD-1197) wished to explore means to close the remaining gaps in their clinical program for deaf mental patients in New York to implement their return to employment and community living. An occupational therapy program set up in a special ward for deaf patients at Rockland State Hospital provided a simulated work setting for evaluation and promotion of individual interests, motivation, and work tolerance and habits. Manipulative tests were used to assess vocational aptitude. Prevocational training administered by the project vocational rehabilitation counselor prepared patients for intramural employment and carefully selected outside employment.

This investigation in the vocational rehabilitation of deaf mental patients stimulated further research now in progress which is utilizing "halfway houses" and workshops to effectuate greater restoration of deaf ex-patients to employment.

### **Identification and Vocational Training of the Institutionalized Deaf Retarded Patient**

The promising results of a program for deaf retarded patients at the Lapeer State Home and Training School encouraged Abruzzo and Stehman (RD-800) to extend it and to include patients from all Michigan State institutions for the retarded. The goals of the 4-year study were to provide:

1. Definitive diagnostic measurements of that group of institutionalized patients who were previously characterized as mentally retarded and deaf or hard of hearing.
2. The information essential to the planning of a training program which would include considerations of vocational rehabilitation.
3. Measurable results of those training techniques and procedures most productive with specifiable groups of patients.

The project had two distinct 18-month assignments. The first was the assessment of a diagnostic phase to provide a base for planning and the second phase was the training program.

In the 169-sample population, over 25 percent were determined to have no speech or hearing loss in spite of the fact that they had been referred by institution staff members as deaf. In addition to hearing and speech evaluation, the sample was tested for intellectual function and personality using the Weschler Scales, the Goodenough "Draw-A-Man Test" and the Hutt adaptation of the Bender-Gestalt Test. The Wide Range Achievement test was used to obtain grade scores in arithmetic, reading, and spelling.

A physical examination identified the extent and type of multiple handicaps suffered by these patients. Physical disorders that would preclude participation in a program of rehabilitation were also identified.

As a result of these tests, 32 suitable deaf retarded patients were selected to participate in the educational training phase of the program. A separate program served seven hearing and speech impaired patients.

The 32 deaf-retarded subjects were divided into two experimental groups of 12 each and a control group of eight. One group of 12 received educational training only, the other, a combined educational and psychotherapy course. The control group was involved only in the routine institutional program. The three groups were matched on three variables—overall estimate of IQ, educational achievement, and degree of psychopathology. The experimental groups which were further subdivided, yielding four groups, were taught by four specially trained teachers of the deaf. Psychotherapy was administered by the facility psychology staff. It centered around activities designed to encourage expression and control.

Besides prevocational training which emphasized basic work skills, habits, and attitudes, a vocational training program that encompassed

an institution sheltered workshop, institutional work, and outside work placement provided both training and employment for the project sample and others.

Overall improvement in intellectual function, personality, and wish to communicate was manifested by both experimental groups with the education-only group showing greater change.

Last locations of 32 deaf-retarded subjects who participated in the vocational training program were 13 in the institution sheltered workshop, four in institution work, nine discharged for community employment, and six considered ready for placement in community work.

In summary, it may be concluded from this study that there is no question that deaf-retarded patients can be vocationally habilitated after appropriate preparation, including academic, communication, and job training, and psychotherapy. However, training programs for patients as severely handicapped as the deaf-retarded should be viewed more in terms of improved communication skills and better adjustment to institutional living than in terms of independent living and vocational placement in the open community.

### **Professional Theater for the Deaf**

Hays (RD-2474) wished to explore the feasibility of a demonstration in the theater arts which would provide new vocational opportunities for deaf persons and enrich their cultural lives. This ongoing program sponsored by the Eugene O'Neill Memorial Theater Foundation is demonstrating with exceptional success, as a repertory theatre company, the vocational aptitudes of talented deaf individuals in acting, directing, administrative work, writing, and costume designing. In addition to the annual tour schedule of the National Theatre of the Deaf, individual members of the company are demonstrating new occupational opportunities for deaf people that are developing as a direct result of this research program. Incentive provided by this unique experiment in vocational rehabilitation, in a previously untried employment area, has led to professional appointments such as instructor in an advanced degree program in drama for deaf students, a feature role in a leading TV program, and professional costume work.

The tremendous impact of this excellent deaf theatre on the public is improving the image of deaf people and has great significance for their rehabilitation.

### **Summary**

It is seen in these ten program experiments that research has used a great variety of approaches to help resolve the vocational rehabilitation

problems of deaf people. In determining the program needs of particular segments of the deaf population such as the hard core unemployed, the emotionally disturbed, and the institutional mentally retarded, the investigators have yielded considerable usable research. Greater public support for programs for deaf people are anticipated as a result of this varied research and the new studies it is stimulating.

### **Preparation of Professional Personnel**

In spite of the acute shortage of trained manpower to work with deaf people, little research has been done to investigate and develop effective methods for the recruitment, selection, and preparation of quantities of professional personnel. Recruitment techniques have been studied in part in one research effort.

#### **Recruitment of Personnel for Training in Hearing Rehabilitation**

Kennedy (RD-485), at the Boston Guild for the Hard of Hearing, utilized over a 3-year period various recruitment approaches at liberal arts colleges in New England. In this research, demonstrations involving hearing impaired children proved to be the most effective recruitment technique.

### **Direction of Research: Occupational-Vocational**

Three discrete areas stand out as principal investigative points in research in the occupational-vocational conditions of deaf people.

- They are:
1. The development of needed measurement scales and techniques for evaluation and prediction of educational and vocational preparation and employment performance of deaf persons;
  2. The design, development, and demonstration of innovative training and treatment programs to meet the needs of deaf people more effectively.
  3. The definition of deafness and deaf people and various comparison studies of the deaf with the hearing and the deaf with other deaf.

Also, there is considerable interest in experimenting with as yet untried research methods in opening up further study areas.

Researchers are directing questions such as these in this broad area of study:

1. *Implementation of Adequate Evaluation and Prediction Tools*

- How can appropriate intelligence and projective tests for deaf people be developed or adapted?
- Can the results of separate treatment techniques in a mental health setting be evaluated?
- How can occupational areas be assessed for necessary and desirable language function?
- Is selection a salient factor in vocational choice by deaf students?
- What are the forces that influence the occupational spread of deaf people?
- Can employment success be measured scientifically?
- What procedure and tools need to be developed for early detection of hearing loss and more immediate medical treatment or training?
- What criteria can be used to predict vocational success?
- In evaluating the vocational adjustment of deaf people, what factors need to be considered?
- How can new occupational outlets for deaf people be evaluated?
- How can basic neurophysiological and psychological correlates of deafness be determined?

2. *Program Development*

- How can it be predetermined that deaf individuals have the necessary vocabulary and grammatical skill for specific occupations?
- How can it be determined that a deaf person has the language qualifications for specific vocational training?
- What adaptations in program structure at existing rehabilitation centers are necessary to accommodate deaf people?
- What qualities are needed by deaf persons to succeed in a school for hearing students?
- What steps need to be taken by schools and rehabilitation centers to increase motivation, social adjustment and personality effectiveness?
- What kind of deaf person can be helped in a sheltered workshop proper?
- What special services are required by severely handicapped deaf clients such as the retarded and the emotionally disturbed for optimum training and employment opportunities?
- How can a counselor prepare himself for greatest effectiveness in working with severely handicapped deaf clients?
- What program changes or supportive services are necessary to open more rehabilitation facilities to deaf people?
- How can deaf persons in training be provided with more reality experiences?

- What improvisations in instruction media and techniques would be helpful to deaf students?
  - What particular prevocational training do most deaf people need?
  - How can deaf people be prepared for effective interaction with employers?
3. *Descriptions and Comparisons*
- How may the incidence of deafness be reduced through better understanding of genetics?
  - How can the restricted language competency of aspiring deaf vocational students be delineated?
  - Can new census instruments provide more accurate data on the incidence, distribution, and extent of deafness?
  - Do deaf people function in a social subcommunity? If so, can its structure be described?
  - How can the employment pattern of deaf people be analyzed for factor content?
  - What factors contribute to the immobility or stability of deaf employment?
  - Which training methods are most successful for given deaf individuals and groups?
  - How do deaf employment patterns change and how do the changes relate to national trends?
4. *New Approaches*
- What place does longitudinal study have in the treatment of mentally ill deaf people?
  - What are the prospects for applying research methods designed for a normally hearing population to a deaf population?
  - Can the environmental interrelationship pattern of deaf persons be determined through long-term study?
  - What preventive mental health services do deaf people need and how can they be provided?
  - How effective is group therapy and role playing in counseling deaf persons?
  - How can a data bank on deafness be developed as an available standard reference?

Thus, research on the occupational conditions of deaf people has suggested numerous directions that future study can take. In summarizing research progress, the following conditions hold forth.

1. Surveys have yielded usable data on the occupational status of deaf people.
2. Promising educational and rehabilitation programs have been developed for further demonstration of their value to specific deaf populations.

3. An important start has been made in developing techniques and instruments that are compatible for deaf people. Much more needs to be done.
4. Data is available on employer attitudes to deaf employees although depth information on interrelationship factors is lacking.
5. Improved technology is reducing considerably the handicap of deafness. The vigorous use of research which has produced the means for this development promises to carry it far forward.

Although numerous points of inquiry remain to be investigated, research has established a beachhead for future studies.

*research  
in the  
cognitive aspects  
of deafness*

**Language and Thought Studies**

A number of researchers have been interested in comparing the ability of prelingually deaf persons to learn, to control, and to use concepts with that of normally hearing people. Thought provoking questions surround the propensities of concept learning and utilization by deaf persons whose language development has been impaired by absence of or insufficient stimulation. Language is generally held to be an indispensable tool of conceptualization in human development. Perforce, should research findings determine that the assumed relationship of thinking and language is not critical to logical thinking, new theories on learning may be developed.

**Standardization of Nonverbal Concept Learning Tasks for Deaf Adults**

*Thinking Without Language*, a book prepared by Furth (RD-704), presents the results of an original study of the intellectual functioning of profoundly deaf persons. The work addresses itself to thinking in general as well as to the practical implications of language deficiency for deaf people in terms of ability to learn and to transfer learning.

The investigator developed a series of 12 experiments involving nonverbal procedures in various areas of intellectual behavior to compare the performance of deaf and hearing persons from preschool age to adulthood. Two additional experiments with samples of culturally deprived persons followed the basic studies to test certain hypothetical outcome.

Specific areas studied included concept discovery and control, memory and control, memory and perception, Piaget-type tasks, logical classification, and verbal mediation.

These experiments were independent of each other and each contributed particular and pertinent data and conclusions on the cognitive as-

pects of deafness. In respect to a general summary of the research reported in the book, the following general findings may be complementary:

1. Experimental rather than linguistic deficiency accounts for the deficient performance by deaf individuals on certain intellectual tasks.
2. In conceptualization, thinking, language, and symbols are distinguishable properties.
3. Linguistic limitations of the deaf person reduce comprehension of highly verbal operations.
4. Deaf people do not differ greatly from hearing people in their basic intellectual development and thinking processes.
5. Environmental restrictions are held to be the cause of underdevelopment in deaf people in personality, motivation, and value systems.

The research points to the need of deaf children for early language training in the home, using speech and signs that follow the English order. Language instruction beginning in the school is considered by the investigator to be remedial at best. The study also advances new conceptions of thinking which question the role of language as an indispensable tool in human development.

### **Cognitive Processes in Deaf and Hearing Adolescents and Adults**

A study conducted by Kates, Kates and Michael (RD-549) matched deaf and hearing adolescents and adults to secure a measure of standard language development covering the period of early adolescence to adulthood. Three experiments involved categorization, the process by which a person organizes environmental characteristics into classes and, verbalization, or the matching of a word with its nonverbal referent.

In order to compensate for the variance in school achievement between deaf and hearing children of the same age and intelligence, two groups of hearing controls were used, one matched with the deaf in school achievement, sex, and I.Q. and the other in age, sex, and I.Q.

The Goldstein-Gelt-Weigl Object Sorting Test was used in the first study. It requires subjects to free sort, target sort, and verbalize why 33 everyday objects are grouped together. This test performed by deaf and hearing adolescents indicated that the former do not differ from hearing peers in categorization tasks that are independent of verbalization. Further, the experiment determined that retardation in verbalization is a developmental factor and does not pertain to intelligence.

The second study concerned categorization and verbalization of 33 words signifying appearance, intelligence, personal characteristics, and transportation. The test involved word grouping according to belong-

ingness with eight target words which were presented one at a time. In this experiment, a significant difference was noted in the ability of deaf adolescents to group words and to verbalize about them in comparison to hearing adolescents matched with them in age. However, as in the first study, they performed as well as hearing subjects matched in school achievement.

The third study which involved deaf and hearing adults matched in age, sex, I.Q., and occupational status, was a test of categorization and verbalization skills regarding everyday objects. It was found that the deaf and hearing subjects did not differ in verbalization ability or in general reactions to the test situation. The results confirm substantially that word association is a developmental process continuing and responding to the stimulus of age, education, and experience.

This research dealing with verbalization and categorization indicates that simpler thought processes and categorization are not appreciably affected by retarded or impaired language. The investigators do agree however, that verbal language plays an important role in higher forms of conceptualization.

### **Social Conceptualization Abilities of the Deaf**

In another study, Kates (RD-1097) investigated and compared the conceptual abilities required for dealing with social and emotional stimuli in deaf persons and in hearing persons.

In the initial study of a series of studies on categorization and verbalization, 16 deaf, 32 hearing, and 16 psychotic adolescents were required to group four different sets of pictures of social and nonsocial character according to relatedness with predetermined target cards. They were then asked to provide the reason why their grouped cards belonged together.

All of the adolescent subjects were matched in I.Q. Additional matching included age for the deaf, the psychotic, and 16 of the hearing boys. The remaining 16 hearing boys were matched with the deaf in school achievement.

This same test was given to groups of 32 deaf adults, 32 normally hearing adults, 32 good premorbid schizophrenics, and 36 poor premorbid schizophrenics. Premorbidity refers to the status of the schizophrenics before their diagnosis. The selection of good premorbid subjects and poor premorbid subjects for this study was based on their scores on the Phillips Premorbidity Scale. The four groups of adults were matched in age, intelligence, occupational background, and education.

In both the adolescent and adult experiments, the results indicated that the deaf had ability similar to that of the hearing in categorization

and verbalization of social and nonsocial elements and events. There was no likeness to psychotic subjects.

The same deaf and hearing adults of the previous study were the subjects for an experiment involving evaluation of four films for durations of 3 to 5 seconds. Most subjects who view these films, which show two white rectangular figures on a black background moving toward and away from each other at varying speeds, evaluate them as scenes of love and anger.

The results of the test showed that the deaf subjects evaluated the evolved emotional and interpersonal scenes in generally the same way as the hearing subjects. Significant exceptions were more pronounced perceptions of anger and love in the deaf adults than in the hearing adults. The greater response of the deaf subjects to love and anger references may serve to explain subtle behavior differences that are thought by some observers to be characteristic of certain deaf adults.

In the next study, deaf and hearing adolescents were compared in a grouping experiment involving simple and complex levels of social and nonsocial stimulus matter. Attributes such as color, design, borders, stick figures, two or three dimensional human figures and facial cues were used to signify the simple and complex levels. As in the other tests, the subjects were asked to group cards to predetermined target cards and to give reasons for the grouping.

The deaf adolescents who were matched in age and I.Q. with one group of hearing adolescents and in school achievement and I.Q. with the other, did not differ significantly in the overall grouping task. Although the overall test results in verbalizing reasons for grouping favored the hearing subjects significantly, separation of the tests into simple and complex, and social and nonsocial, indicated that differences were not significant. Similar results were seen in tests of verbal integration, the measure of use of certain verbal forms to describe card groupings.

Replication of the above study with deaf and hearing adults matched in age, sex, intelligence, and socioeconomic background completed the series of investigations. In this test, deaf adults were demonstrated to be equal to hearing adults in grouping and in verbalizing reasons for their grouping but inferior on the verbal integration measure.

### Summary

It is indicated that the findings of those studies concerned with certain adult cognitive performance have considerable significance to the education and the rehabilitation of deaf persons. Also, the findings on reaction of deaf people to emotional cues might be helpful in their training involving normal interpretation of emotional states and behavior of others.

## Psycholinguistic Studies

### Language Habits, Cognitive Functions and Self-Attitudes in the Deaf

Blanton and Nunnally (RD-846) became interested in investigating the development of symbolic and language habits in deaf people in the course of a study of cognitive and affective processes which might differentiate disabled persons from nondisabled ones. The purpose of the larger study extended to the development of measures of such processes that could conceivably be useful in the rehabilitation process.

During the 3-year project period, a series of tests were conducted using 260 deaf students of high school age at the Tennessee School for the Deaf and the Pennsylvania School for the Deaf in Philadelphia and approximately 300 hearing controls in Williamson County, Tennessee. The experiments and their findings are as follows:

1. *Locus of Control and Locus of Evaluation Tests.*— Deaf subjects tended to localize responsibility for events externally and to assign responsibility for the evaluation of events to others. This was considered to be consistent with the pattern of generalized dependency shown by the deaf with the additional implications related to their special language problems.
2. *Gottschalt Figures and Category Width Tests.*—The deaf subjects displayed no significant differences from the hearing subjects in ability to perceive segments and wholes, in distinguishing figures embedded in other figures, or in the width of categories used. These results support other studies that indicate deafness does not necessarily interfere with perceptual and sensory functions.
3. *Semantic Differential Tests.*—Five concepts were investigated in these tests: 1) my parents, 2) me, 3) the future, 4) deaf people, and 5) blind people. Deaf subjects tended to be less positive about all of these concepts than the hearing. Their particular performance was attributed to more limited emotional and affective vocabulary, narrower experience, and the fact of their own handicap.
4. *Word Association Tests.*—In this test, deaf and hearing subjects were asked to give three guess association responses to each of a number of stimulus words. The results show that the word association performance of the deaf subjects is not dramatically different from that of the normally hearing subjects. Principal differences were greater commonality in the responses of hearing subjects and the less mature response pattern of the deaf subjects.
5. *Binary Choice Word Association.*—In comparison to the hearing subjects, deaf subjects gave more passive function responses, fewer synonyms, and fewer spatial relation responses. The last-mentioned

outcome was unexpected for deaf persons, who are considered to be more visually dominated than hearing persons. Although the hearing subjects ranked higher in the test, the difference was not large.

6. *The Morphology, Homophone, Homonym, and Rhyme Measures.*—Though the large deficiency of deaf subjects in this test was expected, it was held to be important to determine whether and to what degree they may have learned by rote verbal responses having auditory cues.
7. *Retention Measures: Paired Associate Learning Test and Nonsense Syllable Learning.*—In this test the deaf subjects demonstrated that they retain successively presented stimulus materials apparently as well as hearing subjects. A qualitative difference in retention was the ability of the deaf subjects to retain pronounceable and nonpronounceable syllables equally well in contrast to the hearing who did better on the pronounceable syllables.
8. *Grammatical and Metaphorical Processes.*—One of two approaches used in this investigation of the metaphorical variable in the language behavior of deaf persons was through a study of some of the metaphorical aspects of verbs. The task required subjects to choose from the five sensory acts—seeing, hearing, smelling, touching, tasting—the one they associated most closely with target verbs denoting physical acts, interpersonal acts, and cognitive acts. An unexpected outcome was the predominant use of the chemical and tactile senses by these deaf subjects, whereas the expectation had been that they would typically use visual associations. This is being studied further. It would seem desirable to replicate some of these tests with other populations of deaf people to consolidate further the insights gained on psycholinguistic theory and on the personality, attitudes, and language habits of deaf persons.

### **Psycholinguistic Processes in the Deaf**

A continuation of the above study by Blanton and Nunnally (RD-1479) examined some aspects of language learning and performance by deaf adolescents with the intent to provide evidence and materials which might be of value in the development of new training techniques.

One experiment had to do with the acquisition of meaning or semantics. The conclusion was that this was not a critical problem for the deaf subjects because of their rote learning, which is comparable to that appropriate for the hearing. However, there appears to be a greater dependence on rote learning among deaf children.

Another study dealt with competence in the use of logical connectives, specifically, *and*, *or* and *then*. It tended to indicate that vocabu-

lary deficit and particular language inexperience of the deaf subjects rather than inability to use logical connectives appropriately was responsible for their low performance.

In one study using a standard "cloze" procedure and a multiple-choice completion task, deaf and hearing subjects were compared in both semantic and syntactic response. Although the deaf subjects were inferior to the hearing controls on both tasks, it was concluded from the results that there was an orderly progression in proportion of correct restorations, both semantic and syntactic, from the deaf fifth graders to the deaf twelfth graders.

An investigation of phrase recall in deaf and hearing subjects utilized whole phrases, English word order nonsense phrases, and non-English word order scrambled phrases. Though the total number of words recalled was the same for both groups, the hearing controls as hypothesized, recalled best the whole phrases whereas the deaf subjects showed no differential performance.

Preliminary investigation of the properties of sign communication as a potential initial language training medium for deaf people recommends that research should be undertaken to develop a more effective sign system that follows the syntactic structure of English as closely as possible.

The investigators do not appear to be overly optimistic about the utility of training program instruction materials for deaf people developed in this research. However they conclude that the findings in the report will be of value in encouraging the development of new language training media and methods for use with deaf people.

### **Analysis of Communicative Structure Patterns in Deaf Children**

An earlier small scale investigation of the private visual communication of deaf children led Tervoort (RD-467) to undertake a 6-year longitudinal study to prove the presence of two blended communication systems, a privately developed visual system, termed esoteric, and a socially official acoustic system, termed exoteric. The interaction of the two systems was to be analyzed in the process of development of linguistic skills.

The study sample consisted of 48 prelingually deaf children in the 7 to 17 age range selected from residential school populations at two schools in the United States, one in Holland, and one in Belgium. The 112 otherwise normally functioning deaf subjects at each school were paired to have six groups of two age-matched children.

Methodology involved filming with a telescopic lense each matched pair of deaf children while engaged in private communication for conversation periods of 10 minutes. In all, 6 filmings were made of each set of paired subjects covering a 6-year period. The decoding of the films

was done by the subjects themselves, other students, and people familiar with the communication of the children. Necessary grammatical sophistication for making correct protocols came from the author.

Important findings of this report regarding the communication patterns of the subjects are as follows:

1. The subjects are far less successful, as a rule, in acquiring speech than in acquiring language.
2. The filmed conversations in which the subjects followed their own preference for method of communication, which in all cases was a combination of speech with fingerspelling or signing, or signing only, were characterized by happiness and relaxation. Throughout the years of study, frustration and inhibition were never evident in the film sequences.
3. Some subjects perform well insofar as the usage of speech is concerned, but score poorly in language construction.
4. In this report, some of the subjects prove that nearly complete incorporation of speech-only into their own private conversation in correct language can be achieved with complete success.
5. Initiative gesturing, which is typical for all very young deaf children, tends to disappear earlier in American children, who have adult manual communication to draw on for more controlled communication.
6. The mistake that occurs most frequently in the subjects' conversational sentences that are otherwise grammatically correct is the omission of a word.
7. A little over 10 percent of the mistakes consist in using the wrong word, although the replacement stays within the same word-class.
8. There is an increase in grammatical mistakes of the subjects from the youngest age up, but this increase is a function of the overall increase of correct grammatical sentences and runs parallel with the latter.
9. In their sentence structure, the deaf subjects show lack of command of the syntactical span prior to utterance. Deaf students need to be given a surveying grasp on the syntactical span of what they are going to say to help them learn correct complex sentences.
10. Exoteric language usage of the groups did not occur significantly until the age of 10, after which there was progressive growth in both incidence and ability.
11. A significant finding was that the method of execution of sentences did not affect their grammatical-syntactic quality. In other words, the use of speech and spelling versus the use of signs is of no influence upon the correct syntactic structure of sentences.

12. The subjects understood each other quite well, although misunderstanding seemed to occur somewhat more frequently than in normal conversation.
13. Conjunctions which appear about the time the subjects are 10 years of age show a tendency above normal to feature as initial marking.

Correct usage increases with experience in exoteric communication. Tervoort draws a number of conclusions from his observations of the esoteric-exoteric private communication of prelingually deaf children. They are as follows:

1. The acquirement of speech and the acquirement of language are two quite different achievements. The author contends that the consequences of this fact are of great importance to the different philosophies on the teaching of the deaf.
2. The deaf child who can live happily thereafter with speech-only is the exception as matters stand now.
3. Success in language teaching is possible with fair or poor results in speech training.
4. Speech teaching practices need to be revised.
5. Nearly complete incorporation of speech-only into their own private communication in correct language can be achieved with complete success by some deaf persons.
6. In addition to the first prerequisites of good education, deaf students should receive every possible aid in developing speech and lipreading skills.
7. The study provides definitive evidence that progress slows down at the age of 12 or 13 and even disappears in the years thereafter.
8. The deaf subjects show a preference to execute words in combinatory forms, speech with spelling and signing, or signing-only above speech-only.
9. Preference for the word-class of nouns indicates a rather poorly diversified vocabulary.
10. Deaf children need much conversation and good reading rather than visual aids to develop categorical competence.
11. Knowledge of the specific deviating categories of esoteric expression should be helpful to teachers in improving the language of their pupils.

The extensive data provided by this pioneer study should be stimulating material for educators and research people alike in their search for solutions to the many problems that continue to surround language training for deaf people.

### **Summary**

In review of the above reports, the implications of the research on the cognitive aspects of deafness may be summarized in the following points:

1. It has been concluded by Furth explicitly, and by Tervoort incidentally, that logical thinking by deaf persons can function independently of conventional language. Though the concept of thinking without language has implications for the education of all children in general, it is treated here in light of the total communication needs of deaf children, many of whom need the support of nonverbal methods of communication to develop language. It was further concluded by Furth in experiments with normally hearing mentally retarded subjects that acquisition and use of verbal language is not so much a function of intellectual capacity as of hearing.
2. The investigations made by Furth, by Kates, Kates, and Michael and by Kates, provide conclusive evidence that deafness complicated by verbal deficiency does not affect appreciably, if at all, ability to perform in nonverbal conceptual tasks. The fact that deaf subjects with inferior language ability consistently compared favorably with hearing subjects on these tasks indicates that intelligent thinking is possible with or without verbal competency.
3. The experiments of Kates, Kates, and Michael, of Kates, and of Blanton and Nunnally, treating categorization and verbalization ability indicate that competence in this area is subject to stage of normal development. Deaf adults were found to be equivalent to normally hearing adults in the assigned categorization and verbalization tasks, whereas deaf adolescents showed retardation in responses to these same tasks.
4. A disassociation is apparent in the performance of deaf adolescents in categorization of objects on the one hand and verbalization of these categories on the other. Replication of categorization and verbalization tests with deaf adults demonstrates, however, that disassociation tends to disappear with age, further education, and experience. From these results, it may be hypothesized that the deaf adolescents tested would have normal ability in categorization and associated verbalization tasks when they reached adulthood.
5. The results of the many experiments indicating that retarded or impaired language does not substantially affect conceptualization tend to obviate to a degree the influence of language on thinking. Thinking at the developmental stage is perceived to be possible without a symbolic system. There is agreement that conceptualization of a high order for all individuals, including the deaf, depends on the mastery of the language system of our society.

6. In his study of the interaction of the two communication systems used by all deaf children in residential schools, namely, a privately developed visual system and a socially official acoustic system, Tervoort concluded that the findings should be helpful in suggesting needed changes in the education of deaf persons.

*research trends  
in the  
psychosocial aspects  
of deafness*

**An Overview**

A number of highly creative researchers have given their attention to the social and psychological aspects of hearing loss. It is seen that the deaf individual must live with the same handicap throughout a lifetime of family, community, and work relationships. His success in achieving the normal satisfactions of social interrelationships, economic security, and marriage and family life is determined by his ability to overcome unique deprivations occasioned by his hearing loss. The core problem of most early profoundly deaf persons is indicated to be deficient communication. The ramifications of this problem as they affect the social and psychological adjustment of deaf individuals are the subjects of this section.

**Personality and Psychopathology Studies**

The seven research works reviewed here dealing with the psychosocial aspects of deafness include a pioneer study of the mental health problems of deaf persons, three demonstrations of mental health care for the hearing impaired, a study of hereditary deafness in man, a study of the adjustment of adolescents to hearing loss, and a study of estimate of handicap due to auditory failure.

Other research efforts surveyed in this section pertain to community services and clinical tools. The basic communication problem of deaf people isolates them from the community with concomitant under-service seriously affecting their well-being. The research in community counseling services described in this section emphasizes the important chain-effect of such facilities in stimulating community interest to develop needed service programs for deaf people. Three studies on the design of clinical instruments which are appropriate for use with deaf

persons exemplify one of the most challenging aspects of research. The need for effective instruments that will yield desired information on deaf persons whose meaningful response requires measures sensitive to their unique psychosocial experience poses a particularly troublesome albeit challenging area to research.

#### **Family and Mental Health Problems in a Deaf Population**

Rainer, Altshuler, Kallman, and Deming (RD-7) had for their long-range goal the development of effective methods of diagnosis, therapy, and prevention to make it possible for deaf people to benefit from modern psychiatry and related disciplines to the same extent as do hearing persons in distress. The virgin area of mental health care for deaf people required an exceedingly broad approach covering three general areas: research, psychiatric guidance, and training of specialized guidance workers. These three phases were scheduled to proceed simultaneously so that the work could be coordinated as it progressed.

In order to obtain all essential information about the range of adjustive variations in deaf populations, the following areas were investigated using deaf residents of New York State as the study groups:

1. Genetic aspects of early profound deafness.
2. Particular demographic aspects such as number, distribution, marriage and fertility rate.
3. Intelligence tests in deaf twins.
4. Sexual patterns and family relationships.
5. Patterns of socialization and community integration.
6. Educational background and vocational adjustment.
7. Outstanding achievement of deaf persons.
8. Delinquency and crime.
9. Psychological testing.
10. Psychotherapy with the deaf.
11. Deafness and schizophrenia.

As a part of the total research project, a pilot outpatient mental health clinic was established to define common mental health problems among the deaf and to develop and provide appropriate therapeutic methods and services. In all, 217 deaf persons applied to the clinic, representing disorders that fell into almost every known psychiatric category. Types of therapeutic service rendered to deaf clinic patients in order of frequency were: psychotherapy, hospitalization and inpatient supervision of treatment, formulation of vocational goals, marital and parenthood counseling on genetic risks, marriage counseling, counseling parents or relatives with regard to assistance to patient, and periodic observation.

The main findings of this pioneer study of the family and mental

health problems of deaf persons can be briefly summarized in the following points:

1. The relationship of deafness to genetics may not be sufficiently understood or appreciated by deaf persons.
2. Well adjusted deaf people can establish adequate socialization patterns and are able to make good use of community services.
3. Schools and correctional institutions are not equipped to handle deaf delinquents.
4. A total hearing loss is not likely to increase the chance of developing clinical symptoms of schizophrenia.
5. Deaf people can be provided with adequate inpatient and outpatient psychiatric service by understanding therapists who have the necessary communication skills.
6. Manual communication is essential in the diagnostic evaluation of emotionally disturbed deaf persons.
7. Preventive mental health service should be made widely available to deaf people.

In conclusion, the investigators specify a number of recommendations for further research that will lead to more useful knowledge regarding family and mental health problems in the deaf population. They are as follows:

1. The determination of the relationship between deafness and
  - a. psychopathology,
  - b. thought processes,
  - c. abstract reasoning and communication, and,
  - d. personality development.
2. The perfection of intelligence and projective tests for deaf persons.
3. The design of a measure for the most prevalent characteristic of this group, immaturity.
4. The evaluation of the results of pharmacological treatment and group therapy for deaf persons.

### **Comprehensive Mental Health Services for the Deaf**

Using the background information provided in the first study, Rainer and Altshuler (RD-1197) initiated a clinical demonstration of comprehensive mental health services for a deaf population. A significant result of this program has been the establishment of a permanent psychiatric unit for deaf individuals by the Department of Mental Hygiene of the State of New York. This new program, the first of its kind in the country, if not in the world, offers both ward and clinic services where specially trained staff with well-developed manual communication skills work with the deaf patients.

The aims of this research program were stated to be:

1. The illustration of particular essential requirements for comprehensive psychiatric services for the deaf in a densely populated area.
2. To indicate that inpatient and outpatient services for deaf persons could be effectively organized within an existing mental hygiene system on a statewide basis.
3. To demonstrate that a specialized psychiatric unit might not only be the most appropriate, but also the most economical way of dealing with the particular emotional, rehabilitative, and family problems of a deaf population.
4. To establish a psychiatric unit consisting of a vertically organized inpatient, outpatient, and aftercare facility expected to develop the following services: diagnostic evaluation of psychiatric disorders in the deaf population, with emphasis on early detection and possible prevention of severe psychopathology; comprehensive and fully coordinated treatment procedures at the inpatient and outpatient levels, including psychotherapy and pharmacological and other somatic procedures; suitable occupational and group therapy programs for hospitalized patients; consultative community service with family guidance programs and counseling facilities, and possible prediction of genetically determined forms of deafness.
5. To investigate methods for providing vocational rehabilitation, social service, housing, and other aftercare services for discharged patients to supplement their psychiatric followup.
6. To aid various agencies in evaluating their deaf clients.
7. To recruit personnel from all areas in psychiatry, rehabilitation, nursing, and allied fields, and train them to work with deaf persons.

Rockland State Hospital in Orangeburg, New York, was selected as the site for the inpatient demonstration which was housed in a single ward with accommodations for 30 patients, half of whom were male, and half, female. Due to the limited size of the ward, only patients who could be expected to benefit from the treatment program were admitted. They were drawn from a list of all deaf patients in New York State Mental Hospitals. A total of 50 deaf patients entered the program, which lasted about 2½ years. Suitable treatment and rehabilitation plans were formulated for each of them based on the results of extensive evaluation. It was found by the investigators that the establishment of sympathetic human relationships between therapists and their deaf patients contributed materially to the treatment process. Insight-generating therapy was less successful as a result of the low motivation of the patients for change and their lack of verbal skills.

A very effective therapeutic mechanism developed during the course of this program was group therapy, in which the principal catalyst appeared to be the interaction of patients guided by the therapist, resulting in their increased social perception and capacity for emotional response to others.

The outpatient program maintained at the New York Psychiatric Institute interviewed 119 new patients, 96 of whom were seen for a total of 1,224 therapy and evaluation sessions.

In the matter of psychological testing, an effort was made to administer a test battery to the vast majority of patients, where question of diagnosis suggested their potential usefulness. A group of 22 inpatient and outpatient deaf schizophrenics comprised a special test sample. Although the investigators conclude that this study was not adequate, it has served to provide hypotheses which can be tested as further data accumulate.

Training and education were essential portions of the project. The principal aim of the project training program was to develop a highly specialized cadre of mental health workers equipped to admit, treat, care for, and rehabilitate into the community deaf patients with a wide range of psychiatric difficulties. In addition to training in manual communication, instruction included orientation to the educational, psychological, and vocational implications of deafness, the detection, assessment, and differential diagnosis of deafness, and the dynamics of patient-staff relationship and ward management problems.

The demonstration in this project of the use of halfway houses to implement more effective restoration of deaf ex-patients to the community is being carried further in a research program now in progress by the same investigators.

The fact that 22 patients who had diagnoses of schizophrenia and behavior disorders had been discharged to convalescent care during the 3-year period of this project attests to its success. The effectiveness of the specialized treatment provided can be further proved in that only 2 of these 22 needed additional hospital care and that from one-fourth to one-third of the outpatients made substantial progress in resolving severe personal and emotional adjustment problems.

The consequences to deaf people of this project, the initial study, and other investigations in mental health services are so great that it is difficult to align them properly. It is known, for example, that many deaf persons languish for years or a lifetime in hospitals in contrast to relatively short-term hospitalization of hearing people, attesting to their serious undercare. Prevalent milder forms of emotional disturbances that interfere with the successful living of deaf people also tend to remain untreated. The difficulty in differentiating severe personal and social deprivation from true mental illness in many deaf persons places special burdens on many of them.

The investigators of this pioneer research in mental health services for deaf people are to be especially commended for their work which, in addition to its immediate value to a deaf population, is stimulating other service programs and drawing public attention to a long neglected group of people.

Two other research and demonstration programs in progress in mental health service to emotionally disturbed and psychotic deaf people are concerned particularly with the language learning and social adjustment problems of preschool age and older deaf children. These factors are being studied as the possible cause of psychopathology and rehabilitation failure in deaf adults. As in the New York State mental health program, manual communication is used extensively by the staff of both of these programs in clinical work with deaf patients.

#### **Mental Health Service for the Deaf**

Schlesinger (RD-2408) wished to demonstrate the value of a comprehensive community mental health program for deaf people and their family members in the San Francisco Bay area. An important feature of this program located at the Langley Porter Neuropsychiatric Institute which serves deaf adults as well as children, is a clinic for parents of deaf infants and older children. Trained staff help parents to develop constructive attitudes toward deafness, with emphasis on the need of deaf children for early language training in the home and opportunity for effective interrelationships within the family and in the community. Additionally, this project is reinforcing the findings of Kay Meadow (RF-265) in a replication of her research using a day school deaf population.

#### **Psychiatric Diagnosis, Therapy and Research on the Psychotic Deaf**

As a result of his outgoing research work with psychotic deaf adults at Michael Reese Hospital, Vernon (RD-2407) became interested in exploring the basic psychological coping mechanisms parents of deaf children use in their adjustment to the problems of deafness. This research in preventive psychiatry includes service to parents and their deaf children with particular emphasis placed on the development of effective communication channels, such as manual communication, for improved family relationships. Classes at the Henner Speech and Hearing Clinic provide parents of deaf babies and older children with information on the implications of deafness and instruction in manual communication.

### **Hereditary Deafness in Man**

A 3-year study completed in 1968 at Johns Hopkins University (Konigsmark RD-1786) undertook to define more clearly those types of hereditary deafness about which little was known. Specific families were identified and studied. Differential points that were used in defining hereditary deafness included familial deafness associated with other defects, the severity of deafness, mode of genetic transmission, the particular sound frequencies involved, and whether the deafness was stationary or progressive. The majority of persons who were studied were found to be normal except for their hearing impairment.

The investigator concludes in a report on this research that as knowledge is developed about familial deafness, diagnosis of the various types of hereditary deafness will become easier and more accurate. Prognosis may then follow and the best therapy for a particular disease can be prescribed. Information to families about the possibilities of transmission of a hearing impairment to children and grandchildren is foreseen.

A report on the entire field of hereditary deafness in man is being prepared for publication by the Johns Hopkins Press.

### **Adjustment to Auditory Disability in Adolescence**

A study by Bobrove (RD-1440), one of a unified series of studies dealing with adjustment to physical disability in adolescence, concerned the adjustment of adolescents to hearing impairment. The two-fold purpose of the investigation regarded 1) the comparative assessment of the adjustment of deaf, hard of hearing, and normally hearing adolescents, and 2) an attempt to compare the mothers of these adolescents on their attitudes towards an understanding of their children, and to assess the degree of relationship that these attitudes and understanding process have to the adjustment to the child.

The study sample was composed of 40 profoundly deaf, 30 hard of hearing, and 15 disturbed adolescents between 13 and 18 years of age. Tests used were those devised for the unified series of studies of which this study was a part. As the investigator points out, the tests were not entirely appropriate for this group. Nevertheless, the findings on significant differences in adjustment of the three adolescent groups reinforced certain hypothetical determinations on the adjustment capacities of totally and partially handicapped adolescents. Although the control subjects were indicated to be the most adjusted to their environment, they were not consistently better than the deaf group who in turn were seen to be more adjusted than the hard of hearing subjects as hypothetically anticipated. The fact that the deaf subjects compared favorably to the hearing subjects on the tests appears to indicate that a total hearing loss does not affect environmental adjustment appreciably. This is attrib-

uted to the definitiveness of their sensory disability, a condition which does not exist for hard of hearing persons. The marginal situation of the latter, whose hearing impairment is a constant determinant of their inclusion in or exclusion from the majority hearing group, depending upon situational influences, creates for them more adjustment problems.

The attitude adjustment relationships in this study were not well established for the mother groups owing to matters beyond control. However, it was ascertained that a positive relationship exists between the degree of maternal understanding of the adolescent and the level of satisfactory adjustment in the corresponding adolescent.

#### **The Relationship Between Audiological Measures and Handicap**

The lack of evidence in available literature pertaining to the handicapping effects of various types and degrees of hearing loss led Nett (RD-167) to explore the relationship between certain audiological measures and handicap. The kinds of problems and the degree of handicap reported by 378 deaf and hard of hearing adults in Pennsylvania were examined. Specifically, the social-psychological-vocational handicapping associated with hearing loss was estimated from the observed inadequacy of the subject's responses to auditory failure. Handicap, for the purpose of this study, is described to be observed, inadequate responses to auditory failure and the consequent effect on the behavior and feelings of the hearing handicapped person. Further delineation of the term "handicap" determines that, within the framework of this study, it cannot be equated with "adjustment," which usually involves the total personality of the individual.

The Critical Incident Technique, originally developed and described by Flanagan at the American Institute for Research, was used with context appropriate for hearing handicapped subjects to make needed observations. The results of this analysis of critical incidents, involving the nature of the situation and the behavior observed, were used to describe the kind of difficulties involved in various categories of hearing loss and the reactions to these predicaments. Measures of auditory disability, family, social, vocational, and psychological handicap completed the investigation.

The following conclusions are suggested by this study, which had, as one of its major goals, the arrival at some decisions about the efficacy of the various measures which were used or developed:

1. Social-psychological-vocational handicap is a function of associations between the hearing impaired individual and persons in different role relationships to him, size and function of the group, and frequency of auditory failure.
2. Degree of handicap as measured by ratings is determined by the

rater's knowledge of the hearing loss and the individual's life situation.

3. Handicap as measured by the three different kinds of scales—Rating Scales, Guttman-type Scales and Critical Incident Scales—appears to be comprised of several components which are fairly independent of each other.
4. Particular aspects of handicap may or may not relate to the amount of sensory impairment.
5. The Social Adequacy Index and the AMA Percentage Loss take account of more of the components of handicap than any other measure.

### **Community Services and Clinical Tools**

Six service programs, four of which are ongoing projects, are presented in this section. Three of the studies in progress are national in their reach, having for objectives and aims the development and demonstration of resources that will effectuate improved community services for deaf people everywhere. The particular facilities that are involved in this research on community services include:

1. Directories of services for deaf persons.
2. Counseling services in a college setting.
3. Counseling and community services for deaf individuals in a metropolitan area.
4. A council of organizations serving the deaf.
5. A registry of interpreters for deaf people.

#### **The Directory of Social Services for the Deaf of Metropolitan Washington, D.C.**

The above directory (RD-734) is a byproduct of the research study, "The Deaf Study of Metropolitan Washington, D.C." It lists and describes 73 agencies that make services available to deaf persons. The agencies include those offering evaluation, medical, vocational, recreational, educational, welfare, and other services. Religious, social, and fraternal organizations are represented.

#### **An Annual Directory of American Services for the Deaf**

Doctor (RD-2050) was interested in developing a reference handbook that would be useful and helpful to organizations, schools, and individuals providing services for deaf people. Essentially, the previous educational directory, published annually by the *American Annals of*

*the Deaf*, has been expanded to include reference information and directories pertaining to schools and classes for the deaf, research projects in progress on deafness, rehabilitation centers and services, adult education programs for the deaf, speech and hearing clinics, religious workers with the deaf, organizations and affiliates providing services in education, and social welfare, summer camps for deaf children, State Departments of Health and Education having hearing conservation and speech and hearing programs, teacher training centers, professional training programs in the area of deafness, a review of publications, periodicals, and a cumulative index of dissertations and theses on deafness.

There appears to be no question that this project is rendering a valuable public service in developing and establishing the *Directory of Services for the Deaf in the United States* which maintains up-to-date information needed constantly by agencies and persons working with deaf people.

#### **Counseling Center for the Deaf**

A counseling center (RD-642) was established in 1960 at Gallaudet College, a college for deaf persons, to provide counseling services to students of the college and to other deaf persons in the area, to serve as a model for counseling centers in schools for the deaf, and to promote research in the psychological problems of deaf people. Though it did not realize its goals and is no longer in operation, this pioneer effort did indicate the need of deaf people for effective counseling services.

#### **Counseling and Community Services for the Deaf**

Craig (RD-2264) wished to demonstrate the effectiveness of a counseling and community services center for deaf people in a metropolitan area. The experiment was based on the need to broaden the service base for deaf people, many of whom are not aware of or are not able to make adequate use of regular community service facilities because of the problems of communication and rapport. The serious consequences of underservice on the well-being of deaf individuals have long been recognized. This ongoing project, therefore, is providing an important opportunity to demonstrate techniques whereby community services available to the general population may be made more available to deaf persons.

The specific objectives of this research and demonstration program sponsored by the Pittsburgh Hearing and Speech Society are as follows:

1. To increase the use of community services by the deaf population through imparting information to deaf persons on the availability

- of appropriate community services, to provide support to deaf clients so that they are likely to use these services, and to provide consultation and interpreting services to these agencies in order to bring optimum benefit to deaf clients.
2. To develop new and more effective resources in the community to serve deaf people such as rehabilitation facilities, mental health facilities, new educational facilities and others.
  3. To provide direct counseling services to deaf clients where outside community services are not available.
  4. To establish a program of adult education for deaf people designed to reduce the need for special services either within the counseling center or in outside agencies.
  5. To provide for the training of personnel working with deaf people.

Significant activities of this program, which is staffed by a director, two counselors, interpreters, and adult education instructors, include: 1) the development of programs for deaf people in a mental health facility, a vocational rehabilitation center, and a sheltered workshop; 2) increasing in quality and quantity the direct counseling services that are provided for a growing caseload of predominantly self-referred deaf clients, which indicates the high degree of acceptance of the Center services; 3) conduction of a program in orientation to deafness for key personnel in selected agencies; 4) provision for instruction in manual communication to persons who work with deaf people.

When this project is completed, the counseling service program for deaf people is expected to become an integral part of the Pittsburgh Hearing and Speech Center program for hearing impaired persons.

#### **Study of the Establishment of a National Council of Organizations of and for the Deaf**

The National Health Council, Meek (RD-2074), undertook in 1965, a 1-year study to determine the feasibility of establishing a *Council of Organizations Serving the Deaf*. The study grew out of a long recognized need to bring voluntary organizations of and for the deaf together in one council to provide a unified voice for the deaf and important backstopping to public programs.

The specific responsibilities of the investigator in this study were to examine objectively the accomplishments of various voluntary organizations in behalf of deaf people, to determine what possible values a council might have for the organizations, and to make pertinent recommendations.

An investigation of 14 organizations which, although revealing differing philosophies about what constitutes a gratifying life for a person

who is deaf, did determine that these differences did not dilute a basic concern, the welfare of deaf people.

The major recommendation of this impartial study was that it was vital that the organizations should have a common meeting ground where experiences could be shared and coordinated strength be brought to bear upon problems of mutual concern.

Other recommendations were incorporated in a proposed set of bylaws which outlined for the recommended corporation, *Council of Organizations Serving the Deaf*, purposes, membership composition and procedure, management, protocol for officers, committees and their functions, the establishment and maintenance of special interest sections, the role of the executive director, and disbursements.

The recommendations of this study are being carried out in the ongoing research and demonstration project described below.

### **Council of Organizations Serving the Deaf**

Garretson (RD-2917) is implementing the recommendations made by the previous project in his role as executive director of the *Council of Organizations Serving the Deaf* which was officially incorporated under the laws of New York State. Following the establishment of headquarters in Washington, D.C., and the appointment of an executive staff, the organization identified its basic objectives, which center in the promotion of the interests of deaf persons through the cooperative efforts of its autonomous organizations. The specific objectives of the COSD as stated in an informational brochure are as follows:

1. Striving to eliminate social and economic barriers which handicap deaf persons.
2. Supporting activity directed to the prevention of deafness.
3. Coordinating and strengthening the services of its member organizations.
4. Providing liaison between organizations for the deaf and other organizations interested in the deaf and their problems.
5. Facilitating the sharing of information about deafness and the welfare of the deaf, and providing general information about deafness.
6. Enlisting the support of organizations and of the general public in developing economic, social, cultural, and other opportunities for deaf persons.
7. Seeking funds for the accomplishment of these purposes.

A central clearing house function, the sponsoring of an annual Forum which focuses on topics of current and long range interest in the area of deafness, and the activation of special sections for study and remediation.

tion of various problems in the field of deafness, comprise the essential working structure of the COSD.

A permanent organization is being sought, maintained with private funds, to continue and expand the important functions that this project has made possible.

#### **Implementing the Successful Professionalization of the Registry of Interpreters for the Deaf**

Schrieber (RD-2573), acting for the National Association of the Deaf, proposed that this organization assume joint responsibility with the *Registry of Interpreters for the Deaf*, established in 1964, to complete the preliminary steps necessary to the formal establishment of a registry of interpreters for the deaf. In addition to providing a roster of persons who purport to be qualified to perform the valuable function of interpreting, the Registry has the following purposes:

1. To prepare and administer examinations to determine competency of prospective members of the Registry.
2. To publicize the existence of the Registry and its services.
3. To recruit interpreters for service as indicated by the needs of deaf people and those who wish to serve them.
4. To encourage research that will contribute to the improvement and expansion of interpreting services for deaf people.
5. To prepare standards of performance and guidelines for interpreters, examiners, and training personnel.
6. To develop training programs and procedures to ensure a constant and expanding supply of qualified interpreters.

The basic aim of the *Registry of Interpreters for the Deaf* is to make viable that part of Section II (a) of the Vocational Rehabilitation Act of 1965 calling for . . . "provision . . . of interpreter services in the case of such individuals who are deaf." The implementation of this aim embracing that of the main handicap of deafness, communication, requires that this project shall be concerned with those communication needs of deaf persons that can be resolved through professional interpreting services.

A current activity of this project, which has for its long-range goal, the professionalization of interpreters for the deaf, is participation in the development of curriculum for interpreter training programs in the areas of vocational rehabilitation, adult education and higher education, medicine, mental health, legal action, and religion. An additional consuming responsibility of the project director (Pimentel) is the promotion of State registries that enable deaf people to secure such interpreting services as are needed.

The progressive implementation of the objectives of this project may

be expected to reinforce substantially the framework of the *Registry of Interpreters for the Deaf* for fruitful operation of this needed communication service for deaf people.

Test development is illustrated in three examples, a test of learning aptitudes, a picture interest inventory, and vocational guidance instruments.

#### **Revision and Restandardization of the Hiskey-Nebraska Test of Learning Aptitudes**

Hiskey (RD-1173) revised and restandardized the "Nebraska Test of Learning Aptitude for Young Deaf Children," one of the first major individual tests of mental ability in the United States to be designed specifically for hearing handicapped children.

Particular purposes of the project were to extend the limits of the scale especially at the upper end, and to provide up-to-date norms on deaf subjects and hearing subjects which were based on larger and more representative samples. A total of 1,107 deaf subjects and 1,101 hearing subjects from 2-6 years to 17-25 years of age were used to standardize the new scale.

Although the original scale was not correlated with other instruments, research has indicated that it has been a valid instrument. The revised and restandardized test should continue this record of satisfactory service.

#### **Report of Construction of a Picture Interest Inventory for the Deaf**

A test construction effort reported on by Quigley and Geist (RD-464), involving a picture interest inventory for deaf males, was concluded by the authors to be insufficiently developed and tested to warrant its use in a clinical situation. They have suggested several steps to be taken by further research to make the test ready for operational use.

#### **Effective Vocational Guidance of Adult Deaf**

A research study in progress at the Oregon State Board of Control, (Berger (RD-2018), was instituted to develop effective vocational guidance instruments and information for employable deaf adults and for employable deaf high school students.

The research subjects are deaf adults and deaf high school students residing in Oregon and in the State of Washington.

In addition to the development of a number of new test instruments and the standardization of commonly used testing tools on a deaf popu-

lation, the project goal includes examination of the following questions:

1. Can relationships be uncovered between the adult deaf individual's background attributes and his performance on a group of test instruments on the one hand, and his capacity to find and retain work on the other hand, and can these relationships be described in meaningful terms.
2. Can relationships be uncovered between the adult deaf individual's background attributes and his test performance and the kind of work he does, and can these relationships be described in meaningful terms for the counseling process.

Commonly used testing instruments which are being standardized for use with deaf people include:

1. Vocational Interest—Weingarten Picture Interest Inventory
2. The Culture Fair form of the General Aptitude Test Battery. This form was developed specifically for those whose reading level is so poor as to prejudice their response on tests involving written language components. The GATB culture fair form provides a singularly appropriate instrument for evaluating the deaf individual's aptitudes (and intelligence.)
3. The Bender Gestalt Test

New test instruments which are being developed for better assessment of those factors which are considered to be relevant to the vocational adjustment of deaf people include:

1. Berger Block Test. This test is designed to assess the receptive communication ability of deaf persons.
2. Speech Intelligibility Test
3. Manual Communication Proficiency Test

The continuing aim of this project is to secure data and information which will provide a sound basis for the development of programs and methods to improve the vocational status and the vocational adjustment of deaf persons.

### **Prediction of Trend in Research in Psycho-Social Aspects of Deafness**

It is expected that future research will probe deeper into the areas that were explored by the research in this section. The mental health studies have suggested numerous directions research may take to assure that more deaf people may benefit from the growing body of knowledge on specialized mental health services. It is also essential that research

continue study of the handicap of deafness and the adjustment to this disability so that guidelines may be available to agencies interested in serving deaf clients. The pioneer research on community counseling service programs for deaf people needs to be demonstrated further to emphasize the vital role these programs play in the rehabilitation of deaf individuals.

Interest displayed in the development of adequate test instruments for use with deaf populations assures that work in this area will expand.

In pursuing these matters further, questions such as the following are likely to occur to research workers;

1. *Mental Health Service Studies*

- a. How can young emotionally disturbed deaf children be identified as such and be treated?
- b. How can preventive psychiatry be made a part of school programs?
- c. What is the role of communication in schools for the deaf in detecting symptoms of disturbed personality?
- d. How can parents be enlisted in helping to ameliorate the manifestations of incipient disorder?
- e. What community service programs can provide deaf parents of hearing children with needed counseling service?
- f. What can mental hygiene do to help school age deaf children develop better attitudes towards others?
- g. Can a scale be developed to measure the maturity of deaf persons?
- h. How can preventive psychiatry be made available to deaf adults?
- i. What is the role of mental health in providing deaf persons with needed knowledge on genetics and marriage?
- j. How can sufficient numbers of psychiatrists, psychologists, nurses, ward attendants, vocational counselors, and social workers be trained to work with mentally ill or emotionally disturbed deaf people?
- k. How can deaf leadership be helpful to the deaf community in imparting knowledge concerning resources for the mentally ill and emotionally disturbed?
- l. How can the restoration of deaf ex-hospital patients to the community be implemented, using a wide range of community services?

2. *Adjustment to Hearing Loss*

- a. Is the handicap of deafness definable and measurable?
- b. Can predictive tests be developed to assess economic and social handicap due to deafness?

- c. Can an index be developed to determine public attitudes about deafness and deaf people?
  - d. How can measurements of handicap help deaf and hearing impaired persons?
  - e. What is the pattern of deafness handicap as revealed by critical incidence techniques?
  - f. What other techniques would be helpful in measuring adjustment to the handicap of deafness?
3. *Community Service*
- a. What service programs needed by deaf people have not been explored or have not been adequately explored?
  - b. How can the service needs of deaf residents of communities be estimated?
  - c. What community resources would be helpful in stimulating interaction between deaf persons and hearing persons?
  - d. What is the role of organizations of the deaf in promoting a correct image of deaf people?
  - e. Could the intelligence of deaf children be measured more accurately using other systems?
4. *Psychosocial Adjustment*
- a. How can the behavior and adjustive deviations that frequently accompany deafness be minimized?
  - b. What factors contribute to the lack of responsiveness encountered in deaf persons and how may they be dealt with?
  - c. Is the behavior and adjustment of deaf persons affected by the measure of their linguistic skills?
  - d. Is the communication barrier between deaf and hearing individuals responsible for the formation of a separate social system of the deaf?
  - e. What is the role of the community in implementing better communication between deaf and hearing persons through a medium such as manual communication?
  - f. Do emotional processes, specifically sympathy and empathy, develop differently in deaf individuals than in hearing persons?
  - g. How can deaf people be more involved in their total environment to enable them to identify with and be more emotionally responsive to others?
  - h. How critical to their adjustment is effective communication among deaf children or deaf adults?
  - i. How critical to the school experience and adult adjustment is early manual communication and family climate?
  - j. Does motivation develop differently in deaf people?

The status of research in the psychosocial aspects of deafness may be summarized thus:

1. Group psychotherapy has been indicated to be a principal factor in stimulating behavior changes and personality growth in deaf persons, with manual communication being the implementing instrument. So that this technique may be more widely used, future research should provide guidelines in the principles of group psychotherapy with deaf people.
2. Investigations on the emotional maturity and responsiveness of deaf individuals have yielded both negative and positive observations. Inappropriate testing procedures may account for some of the observations of maladjustment among deaf people.
3. Research tends to indicate that the more modes of communication a deaf person is familiar with, the greater his response to therapy. This suggests there should be more research on the development of communication skills in deaf persons, with particular attention given to reading and creative writing.
4. Encouraging headway has been made in identifying personality types among deaf persons such as the impulsive personality, the primitive personality, the paranoid and the schizophrenic. Hopefully, this work may continue in order that guidelines may be available on the developmental patterns of these categories.
5. Research has made preliminary investigations of the following areas that merit further study:
  - a. The family interaction patterns in differential family groups which include one or more deaf persons.
  - b. The personal and social adjustment of deaf adolescents and deaf adults.
  - c. The influence of communication skills on the personality development and emotional responsiveness of deaf persons.

The growing sophistication of research in the psychosocial aspects of deafness, reflected in recently acquired insights, should be stimulating to further activity that promises continuing significant gain.

*research on  
communication patterns  
of the deaf*

**Overview of Research**

Studies of the communication patterns of deaf persons have generally taken two approaches. Some have been concerned with basic research on the modes of communication \* used by deaf people in order to gain knowledge about the characteristics of these communication systems. Other studies have been involved with the development and demonstration of techniques and aids to promote communication skills in deaf individuals.

The pervasiveness of the communication problem of deaf persons, affecting alike their occupational aspirations and their psychosocial adjustment, is reflected in the numerous references to the sections on "Occupational Conditions and Psychosocial Aspects of Deafness." However, the main direction of the research reviewed in this section is study of the elements of communication as they pertain to deaf persons and specialized modes of instruction in communication skills.

Investigators have taken various routes in their treatment of communication. However, inspection of their studies reveals a general interest in analyzing factors that bear upon communication processes leading to the development of hypotheses and a research construct for experimentation or demonstration of pertinent schema. The areas of speech and hearing disability, linguistics, sociology, and engineering have provided the embodiments for scientific communication breakdown.

Research persons interested in techniques to effectuate competency in communication have been concerned with the design of methods of instruction. Experiments have been carried out using fingerspelling, lipreading, and speech as well as newly devised instructional media. Specialists such as engineers, electronic technicians, motion picture producers, telephone equipment designers, and others, have played an important part in research studies featuring specialized equipment, hardware, and software.

\**Modes of communication* is used in this report to refer to language as spoken, written, heard, lipread, read, signed, or fingerspelled.

## The Question of Relevancy in Research

It may be appropriate to discuss some difficulties of research in the general area of communication before entering the specialized area of research in the communication patterns of deaf people. A review of research problems due to the complexities of communicative forms, modes, functions, and structures can serve as preparation for understanding of the difficulties of research in the special area of deafness.

The problems of the researcher are seen to be twofold. Not only does he have the difficult task of measuring human communicative expressions but he must also determine what aspects of this behavior are relevant to his particular study. The problem of relevancy is made more significant when one considers that the individual, in his communication, indicates other behavior patterns, also. Other hazards contribute to the research problem. There is the possibility that the researcher may ask inappropriate questions. As a consequence, insignificant data may be produced or opportunity to gain valuable data lost, resulting in an incomplete or skewed observation.

The training and professional experience of a researcher may affect a study unduly. A particular professional background may confine an inquiry to such a narrow area that the substance of functional communication is never touched. Stating the matter more explicitly, there is the danger in research that communication may become so highly refined that it no longer appears to be a mode of human interaction.

Another peril may be an unfortunate selection of research design and construct which may affect adversely the treatment of relevant data. An investigator may, for example, apply too early, a set pattern of lipreading instruction and be unable to accommodate opposing findings as they develop. Relying on a possibly errant framework of reference rather than proceeding from empirical evidence may cause a researcher to pursue a less productive course.

A researcher must also attend to relevant cues and clues. Otherwise, a well-constructed study may not prosper. The problem here may be elucidated as one of "disjunctive relevancy." To illustrate, part of a sign utterance may be relevant in one situation while another part is relevant under some other condition. Although a number of the signals in a sign utterance may be significant to the "listener," the researcher must discover which signals are being received and which are not.

In concluding this discussion, it may be affirmed that relevancy is a major consideration in research on communication and that it poses special problems for the researcher in the area of communication patterns of the deaf. This researcher, then, in surveying his study goals, will need to give thought to the following questions:

1. What are the relevant questions contained in the anticipated research?

2. What professional postures would be relevant to the separate components of the study?
3. What are the relevancy requirements of the study as they pertain to designs and constructs? What guides will indicate need for shift or changes in the research formats?
4. Using the sign concept of "disjunctive relevance," what investigative processes are required to isolate the functioning aspects of communication?

Human communication systems and the language complexities they represent are profound. Particular attention to questions of relevancy in construct and processes are immediate concerns of productive research. They are especially critical factors in research on the communication patterns of deaf persons which are developed without acoustic assistance.

### **Analysis of Communication**

Individual investigators have analyzed communication as it extends to communicative structure patterns, esoteric symbolism, visual communication (fingerspelling, signs, and lipreading), and communication situations. In addition, a dictionary of idioms and a dictionary of manual signs have been prepared. Though these dictionaries might more properly belong in the following section, they are presented here since their development required an analysis of communication.

The researcher interested in analyzing communication techniques, situations, meanings, and structures, is confronted with the problems of knowing what behavior to select and knowing how to evaluate and organize this behavior. It does not necessarily follow that this knowledge is transformed into instructional systems and procedures. Analysis does serve a critical purpose, nonetheless, in providing a frame of reference for understanding of the communication process. The development of new methods of language instruction and effective techniques of measurement of adeptness in communication proceed from knowledge gleaned through analysis. The core of the deaf person's handicap, an imperfect communication system, is brought to light in this area of research.

#### **A Study of Factors Associated With Success in Lipreading**

The analysis of factors important to lipreading ability has been the investigative point in several studies. Lowell et al (RD-29) employed analysis to investigate these factors systematically in a series of studies at the John Tracy Clinic.

A bibliography of psychological characteristics of the hearing impaired and of analytical studies in communication was compiled by Lowell, Wong, Dickens, and Taafe in the course of this work. These references which have implications for visual communication were presented in one of the Tracy Clinic Research Papers in 1957.

The development and evaluation of a test of lipreading ability was the topic of the second study. The test, which has two forms, contains 60 unrelated sentences filmed in color.

A group of 408 normally hearing college students were used to standardize the tests.

The next study examined variables in lipreading stimulus materials. The film, *Film Test of Lipreading*, standardized in the second test, was used as the stimulus material with the same subjects performing. A factor associated with success in lipreading was found to be high vowel to consonant ratio. Difficulty in lipreading was related to the following factors: sentence length; the number of vowels per sentence; the number of consonants per sentence; and word length. Visibility indices, sentence order, and the number of pronouns per sentence did not influence success or difficulty in lipreading.

In the fourth study of the series, Lowell and Woodward explored the relationship of linguistic principles to lipreading. The investigation involved the isolation and processing of articulatory features (linguistic forms), determination of levels of analysis (constructions), and the establishment of still larger constructions (meaningful categories).

A pilot study was organized to examine the visibility of phonation of English consonantal phonemes in order to establish a rank order of visual perceptibility and a hierarchy of visual contrastiveness of differences assumed to be crucial in hearing speech. The findings of this study were presented in charts of observed visibility of phonation for consonants. A significant conclusion was that labial articulations are the only ones that can be discriminated consistently in lipreading.

The fifth study analyzed facial cues in context in lipreading. Lowell and Stone wished to test three hypotheses:

1. Success in lipreading is positively related to the amount of face exposed.
2. A speaker with a pleasant expression will be lipread more successfully than a speaker with an unpleasant expression.
3. A speaker whose lips are normally mobile will be more successfully lipread than a speaker whose lips are less than normally mobile.

In order to test these hypotheses, the investigators prepared sixteen 16 mm. color films of a professional actor reading a set of 20 sentences pre-

sented in 16 experimental conditions. The investigation substantiated the hypothesis concerning the advantage of normally mobile lips but raised questions about the others. The investigators conclude that their analyses do support the notion that facial context is important in lipreading.

Attention was then turned from the stimuli material to the individual doing the lipreading. Lowell, Wong, and Taafe investigated possible relationships between certain measures of aptitude and personality and the individual's lipreading ability. The *Film Test of Lipreading* was employed as the criterion measure of lipreading and the *Guilford-Zimmerman Temperament Survey* provided the measure for personality variables. Aptitude was assessed with a scale of lipreading factors.

The test group was composed of 326 normally hearing college students. The females were indicated to have higher lipreading ability than the males. Significant relationships to lipreading were found in the *General Activity*, *Emotional Stability*, and *Personal Relations* scales in the *Guilford-Zimmerman Temperament Survey*. Lipreading was also related importantly to the *Primary Mental Abilities* measure. *Reasoning*, *Ideational Fluency*, *Spontaneous Flexibility*, and *Associational Fluency* were abilities determined important to lipreading. It is concluded, however, that these results with hearing subjects would possibly not be as evident in a study using deaf subjects. Surprising discoveries of the study were the apparent nonrelationship of verbal comprehension scores and perceptual speed to lipreading. The investigators suggest that these factors should be examined further.

In the seventh sequence of this study in visual communication, Lowell with Eisman and Levy, and McEachern, and Rushford gave their attention to three separate aspects of lipreading performance. The first of three related studies explored relationships between communication characteristics and lipreading success. Aggressiveness, passiveness, and likeableness were the characteristics employed. The hypotheses in this study were not confirmed. It was indicated, however, that the complexity of communication variables has an influence on lipreading success.

The second related study regarded lipreading performance as a function of characteristics of unknown communicators. Three films having different speakers reading an identical list of sentences was the testing device. In the inconclusiveness of the results, further study was suggested.

The final investigation in this group of related studies compared auditory and visual speech perception. *The Film Test of Lip Reading* was used as the visual component. An auditory equivalent of the film test, recorded in a background of masking noise, made accurate perception

difficult for normal listeners. The results suggest that the best and worst lipreaders are the poorer listeners, with those in the middle range being better. The conclusion drawn is that a relationship exists between lipreading and listening but that it is not linear.

In a study titled *Phoenic Perception in Lipreading*, Lowell (RD-29) with Woodward and Barber had, among other objectives, the development of a theoretical model of the perceptive structure of lipreading and establishing the relationship of visually perceived symbols to the linguistic system. The rank order of visual difference for pairs of initial consonants indicating contrastive, similar, and equivalent pairs was developed. Methodology included the presentation of a silent film to 185 experimental subjects, the sound track alone to smaller control groups (65) and the complete film plus sound to the final group (55). Only four visually-contrastive units are available consistently to the lip-reader.

In addition to systematic evaluation of lipreading, the individual's estimate of his hearing ability has been emphasized in research study. Schein (RD-734), as indicated in the occupational conditions area, was interested in a study of the deaf community in Washington, D.C. One line of inquiry concerned extent of hearing loss of respondents, which in this type of study could not be feasibly met through audiometric testing. Accordingly, Schein developed a self-report scale that would enable the hearing handicapped individual to evaluate his own hearing. This scale of functional hearing has 5 items which will yield 6 categories of impairment. The scale corresponds to audiometric measures which were established by the investigator. The use of the scale in this study indicates that, while not perfect, it does provide an adequate tool to distinguish among various hearing losses.

Two researchers confined communication analysis to the compilation of idioms and description of signs used in manual communication. These studies resulted in the development of dictionaries.

#### **The Peet Dictionary of the Language of Signs**

Levine (RD-1298) saw the need for a dictionary of signs that are normally used in manual communication. The publication, which was edited by Sternberg, is now in the process of being printed. Over five thousand entries, two and one-half times the number in any existing compilation, are listed in this dictionary. Information provided includes the entry title, pronunciation, part of speech, rationale for the

sign, description of the formation of the sign, illustration, and cross-referencing with similar signs. Signs used in other countries are included.

### **A Dictionary of Idioms for the Deaf**

Boatner (RD-1007) perceived the need of deaf students for a supplement to existing school dictionaries in understanding English phrases which cannot be understood from the definitions of the separate words given by these dictionaries. Her efforts resulted in the production of a dictionary of idioms which is now being widely used by teachers and students in the upper grades and by adults who need this kind of reference resource. The considerable care taken in the compilation and testing of the idioms and the efficient organization have produced a valuable document that is aiding the communication functioning of deaf people.

Communication functioning as it is affected by early manual communication and family climate was investigated in a research effort. This study is now being replicated using a different population of deaf school age children.

### **The Effect of Early Manual Communication and Family Climate on the Deaf Child's Development**

Meadow (RF-265) describes in her dissertation the research procedures and findings of an investigation designed to increase knowledge and understanding of the process, meaning, and outcome of the deaf child's development during his school years. The research had two focal points: deaf children—their self-image, intellectual functioning, social or interpersonal functioning, and communicative skills; and families of these children—their definitions of the condition of deafness, their attempts to cope with social and physical difficulties posed by the child's condition, and their expectations of him.

An interesting feature of this research is a "natural experiment" involving families where both the children and parents are deaf and families where the children are deaf but the parents have normal hearing. The difference in composition of the 68 families that participated in this study, half of whom were in the first group and half in the second, has a two-pronged significance for the posed research questions. Only the significance related to the presence or absence of a ready mode of communication for the deaf child will be discussed here in the interest of this section on communication patterns. The other area is concerned with definition of the condition of deafness.

The theoretical goal of the section of the research study reviewed here was to increase knowledge about the linkage between family interaction and communication and the effects of this relationship on the communication skills and educational achievement of deaf children. The study proceeded from these known facts: 1) deaf children with deaf parents begin to communicate very early by means of manual signs, which their parents use as one or more means of communication; 2) speech and lipreading skills are acquired laboriously by the deaf child; 3) these skills are not available to the very young child for communication purposes; in most cases, the communication of deaf children with hearing parents is constricted both within the family and outside of it.

The study population was drawn from all children attending the California School for the Deaf in Berkeley from January to September, 1966. Children eliminated from the study were those with hearing parents who also had deaf siblings; children belonging to racial or ethnic minority groups; the multiple handicapped; those who became deaf after the age of 2, or as a result of maternal rubella, Rh incompatibility, or anoxia. Children with deaf parents and children with hearing parents were matched in pairs on the basis of age, sex, IQ, degree of residual hearing, and family size. The group ranged in age from 6 to 18 years.

The communicative functioning of the sample was analyzed in the areas of intelligible speech, speechreading ability and performance, facility in written language, facility in fingerspelling, facility in the use of signs, and degree of frustration resulting from inability to communicate. Criteria used for index ratings made by teachers and counselors included parents' hearing status, subjects' age, sex, degree of early speech training, parents' early involvement in child's training, word recognition, sentence recognition, and intelligence test scores.

In this review, the findings on communicative functioning have been isolated, insofar as possible, from the sociological implications with which, in many instances, they were enmeshed for the overall purpose of the research. The results of the study as they concern communication function, outlined on pages 225-227 of the study, are as follows:

1. Children with deaf parents and children with hearing parents do not differ in ability to speak intelligibly or to lipread.
2. Children with deaf parents are significantly superior to children with hearing parents in
  - a. facility in written language;
  - b. receptive and expressive fingerspelling;
  - c. use of signs;
  - d. absence of communication frustration; and,
  - e. willingness to communicate with strangers.

3. Children who have had early training (preschool, tutoring, or speech clinic) are likely to rate higher on communicative functioning and children with deaf parents rated higher than children with hearing parents at each level of early training.
4. A positive relationship exists between intelligence test scores and lipreading performance.
5. Significant positive relationships are evident between lipreading for word recognition and facility in language, speech, particular ratings for lipreading, receptive and expressive fingerspelling and use of signs. Additionally, sentence recognition is significantly related to particular ratings for lipreading, speech, fingerspelling (expressive only), sign usage, and word recognition.

The findings of this research appear to indicate that early manual communication does not tend to discourage the acquisition of oral skills. Rather, the study points to the more facile communicative functioning of deaf children who have opportunity to develop both oral and manual skills. The practical implications of this research that tend to question long-accepted educational viewpoints should encourage researchers to reevaluate methods currently in practice and to explore other techniques.

### **Summary**

The communication studies in this section may be summarized as evaluation efforts concerning stimulus material, the communicator, the reception and expression of communication, and the development and organization of verbal symbols. Lipreading, manual communication (fingerspelling and signs), and selected written language were research interests. A considerable number of the projects in this section are being replicated in whole or in part in projected research programs. It is expected that there will be a great deal of activity in the next few years in the analysis of functioning communication including language development as it is affected by deafness.

### **Instruction in Communication Skills**

The development and demonstration of new equipment and techniques have been principal factors in research concerning instruction in communication skills. Researchers have been interested in new methods to teach speech and lipreading, the use of fingerspelling to develop language competency, and new systems to develop academic ability and communication skills to increase vocational and school success. A certain methodology or an electronic device are the research focus of the studies in this section.

### **Visible Speech for the Deaf**

The visible speech cathode ray tube translator as a useful supplement to an oral method of teaching speech to the deaf has been investigated. Kopp, G.A. and Kopp, H.G. (RD-526) (RD-1483), using a cathode ray translator developed by the Bell Telephone Laboratories, experimented with the use of visible speech in the instruction of the deaf. A teachers' manual was developed and teachers were trained in the use of equipment. Improvement in intelligibility and articulation of an experimental group over controls was reported by these investigators. The successful use of the translator by four teachers with different educational and experiential backgrounds was advanced as further evidence of its effectiveness.

In a current project, the extent of the deaf person's ability to learn and to use visible patterns for the acquisition and control of speech habits through the visio-kinesthetic system is being studied. This research involves an evaluation of a deaf subject's ability to differentiate, recognize and produce: 1) patterns of sounds in isolation or with a neutral vowel; 2) patterns of sounds having similar kinesthetic perceptual characteristics, and 4) patterns of syllables, words, phrases, and sentences in continuous speech. The findings of the ongoing study should provide much more information on the use of the cathode ray tube translator in speech instruction.

### **Eyeglass Display for Aid in Lipreading**

Elam (RD-1575) wished to investigate the feasibility of an eyeglass projector system as an aid to deaf people in reading speech. It was felt that a system of electronic analysis, reencodement, and visual display of homophonous phonemes on one eyeglass could provide sufficient additional information for effective lipreading. Training would prepare the deaf or hearing impaired person to interpret the eyeglass display to supplement normal speech reading.

Two systems, the Bridge's circuit and PFV (plosive, fricative, and voiced characteristics of speech), were experimented with to provide this visual display. This preliminary study was not able to make any final conclusions and is awaiting possible further investigations.

### **Animated Cinefluorographic Film for Speech Rehabilitation in the Aurally Handicapped**

Lowell (RD-1008) wished to demonstrate the use of animated cinefluorographic films in speech rehabilitation in the aurally handicapped. This experiment involved the use of x-ray films of articulation and supplemental animated illustrations to aid the viewer in understanding

how a speech sound is produced. The films used described the (d), (n), and (a) sounds.

Three sets of film were produced. The first film contained normal and slow-motion photography, anatomical animation, and cartooning. The second film had no cartooning and the third had only anatomical animation. Although much interest was shown by the viewers, the results of the study tend to be obscure.

It was thought by the investigator that the experiment may not have been appropriate for the dual clinician and subject purposes owing to the complexity of a filmed speech presentation. Further research in clinical use of this procedure is indicated.

### **Teaching Speechreading by Television**

Stovall (RD-150) developed and demonstrated a television program for teaching speech reading to hearing handicapped individuals. A series of 21 one-half hour programs was developed. Besides speechreading lessons for the aurally handicapped, general and specific information on the problems associated with a hearing loss was provided for television viewers. A lipreading test consisting of sentences presented in differential sequences and normal conversation was used to evaluate the feasibility of this instructional approach.

The effectiveness of the programs was tested in both the studio situation and in the field using experimental and control groups.

Although it was not possible to interpret the practical importance of this demonstration because of technical problems, the results did suggest that speechreading skills can be improved by television teaching techniques. It is believed by the investigators that better techniques can be developed in further research.

### **Verbal Facilitation for the Deaf**

Jones (RD-1526) explored the use of the *Electro-writer*, a device which permits the operator to use telephone equipment to transmit written messages. Deaf adolescents and deaf adults were the subjects for this study in distance communication for the hearing handicapped.

In addition to proving the social value of the *Electro-writer* for deaf adults, the demonstration with deaf adolescents determined that the device had considerable merit as an approach to language development. Liberal exposure to the equipment for purposes of informal communication with hearing persons was credited with increasing motivation for language improvement. Vocabulary expansion and greater use of idiom were direct results of *Electro-writer* communication for these deaf adolescents.

Few investigations of the effects of fingerspelling on the achievement of deaf children have been carried out. The research reviewed below was an attempt to gain more information on the results produced by the use of fingerspelling with children in schools for the deaf.

### **The influence of Fingerspelling on the Development of Language, Communication, and Educational Achievement in Deaf Children**

Quigley (RD-1299) wished to investigate the effects of the *Rochester Method*, which is the combined use of fingerspelling and speech, on the development of language and communication in deaf children. In this method, the words are both spoken and fingerspelled by the teacher, and the student receives them in simultaneous reception through speech-reading and reading the fingerspelled correlation.

In this project, the researcher conducted two separate studies as investigations of different aspects of the same matter. One is identified as a survey study and the other as an experimental study. The survey study was the less constructed of the two. It involved only the administration of a battery of tests to approximately 200 subjects from 6 residential schools for deaf children, 3 of which were designated as experimental schools and 3 as comparison schools. The experimental schools are described as those in which a combination of speech and fingerspelling was systematically used within the classroom with the subjects selected for the study. The comparison schools employed various combinations of oral and manual communication methods known as the *Combined System*. A comparison between the performance of the subjects in these schools comprised the results of the survey study.

The other project was designated as an experimental study because the entire structure was under the control of the investigator. It included the selection of subjects, the selection of the teachers to use the *Rochester Method*, and the establishment of an out-of-class environment. The experiment involved utilization of the *Rochester Method* with 16 selected deaf children in a residential school, use of the *Oral Method* with 16 matched deaf children in a similar residential school, and control of the classroom and out-of-class environment of both groups of subjects for a period of 4 school years. In the final year of the project, a comparison was made on certain measures of language and communication to determine the comparative effects of the two methods.

The variables selected for measurement and for comparing the experimental and comparison groups were speechreading, speech intelligibility, the reading of fingerspelling, written language, and educational achievement including reading. It was hypothesized that the use of fingerspelling would have a generally beneficial effect on the development of these variables. This hypothesis was applied to both the survey study and the experimental study. The only exception was the speech in-

telligibility variable which was eliminated from the latter study, since the very young age of the children made this assessment impossible.

As much as possible, standard measuring techniques and devices were used to test the subjects in speech intelligibility, speechreading, receptive fingerspelling, educational achievement, and written language. All testing was conducted by use of speech, fingerspelling, signs, and writing to ensure that the test instructions were understood by the children.

In the survey study, comparisons were made between the performances of the subjects in the three experimental schools combined and the performances of the subjects in the three comparison schools combined. Additional comparisons were made of the performance of the subjects in each of the three experimental schools and the performance of the subjects in matched comparison schools. These comparisons determined, in general, that the experimental group was significantly superior to the comparison group on measures involving meaningful language. No significant differences were found between the two groups in speechreading and speech intelligibility.

The results of the experimental study showed that the experimental group was consistently and significantly superior on almost all of the measures used in the study. The subjects in this group exceeded the subjects in the comparison group not only in reading and writing ability but also in the measures of speechreading ability. The conclusion is that better results were achieved by the *Rochester Method* than by the *Oral Method* for the subject children and schools involved in the investigation.

A number of implications were drawn from the findings of the studies by the investigator. They are the following:

1. Fingerspelling used in combination with speech as practiced in the *Rochester Method* can lead to improved achievement in deaf children with particular improvement in meaningful language.
2. The acquisition of oral skills need not be affected adversely by fingerspelling when effective oral techniques are employed.
3. Younger rather than older children achieve greater gains from the use of fingerspelling; in the experimental study, children as young as three and a half years of age were benefited.
4. Though it is not a panacea, fingerspelling is a useful tool in helping deaf children to develop language and communication.
5. The findings on the effects of fingerspelling suggest that persons working directly with deaf children or adults should have well-developed manual communication skills.

## **Directions of Research: Communication Patterns**

Research on the communication patterns of deaf people is seen to be developing along two lines of inquiry, one being means of evaluating the communication of deaf individuals, and the other, procedures and techniques for teaching communication skills to deaf persons. It is expected that utilization of research and continued research involving communication development, technical equipment, and instructional techniques will increase vastly the prospect of changing trends in the treatment of the communication needs of deaf individuals.

Researchers may be asking questions such as the following:

1. *Analysis of Communication*
  - a. Can lipreading be supplemented by tactile stimulation?
  - b. In addition to those studied, are there other variables that are significant to lipreading?
  - c. In the study on the communication handicaps of deaf people, what lines of linguistic inquiry may be helpful?
  - d. How can predictive tests be developed to determine aptitude for speech and speechreading skills?
  - e. Do individuals with various hearing impairments have access to auditory patterns?
  - f. How can the auditory pattern needs of such persons be determined?
  - g. In combination with various hearing losses, what factors contribute to success or failure in vocational and social adjustment?
  - h. Which communication skills are most important to successful deaf people?
  - i. Is there a social and economic community pattern of reaction to various means of communicating with the deaf population?
  - j. Is more efficient organization of language possible to produce greater benefits in classroom instruction?
  - k. How can manual communication be made more useful as a language development tool?
  - l. What language training media need to be developed for deaf people?
  - m. How can language training techniques appropriate for individual deaf persons be determined?
2. *Instruction in Communication Skills*
  - a. What further improvements in visible speech equipment and procedure will increase the quality of speech instruction?
  - b. Does visible speech equipment have a place in the classroom?
  - c. Is portable visual display equipment feasible as an aid to lipreading?

- d. What personal and environmental factors influence the effective use of visual displays?
- e. What is the role of programmed learning in speech and speech-reading training using machines?
- f. What would be the most effective way to present this programmed learning?
- g. How can deaf people be enabled to make more use of telephone equipment for social and occupational purposes through writing devices and other facilities?
- h. How can preschool-age deaf children be provided with early language training through fingerspelling, signs, or other means?
- i. How can parents be trained to communicate with their preschool-age deaf children using fingerspelling, signs or other means?
- j. What new insights into the communication requirements of deaf people are needed so that they may have greater benefits from existing educational, vocational, and rehabilitation facilities?

An overview of research accomplishments in the area of communication patterns of deaf people indicates certain situations.

1. It is now possible to analyze certain aspects of communication including language development, the physical and physiological production of speech, the acoustical and visual components of audition, and the properties of manual communication. The utilization of some of this research has already improved instructional procedures.
2. A multidisciplinary approach has been applied to the problems surrounding deafness and deaf people. The unique contributions of engineers, scientists, and linguists have deepened the attack on the communication problems of deaf persons.
3. A systematic evaluation of instructional procedures concerning instructional devices and methods is being carried out.
4. Communication, occupational success, and psychosocial development are now viewed as an interrelated whole.

The deaf individual is assessed in this perspective and in his interactions with the world around him.

The continuing unsatisfactory situation of educational achievement in deaf people has given new impetus to research in communication training for deaf persons. Researchers are being stimulated by this distressing state of affairs to examine current practices. Additionally, new concepts on communication and innovative equipment are suggesting new instructional approaches. An abundance of new lines of inquiry are open to future research.

*summary  
and  
implications*

It may be appropriate in a final discussion of the implications of the studies reviewed in this report to use as a reference point the determination of research aims outlined at a conference on "Research Needs in the Vocational Rehabilitation of the Deaf," held in Washington, D.C., June 19-22, 1960.

At this conference particular emphasis was placed on the need for definitive criteria for vocational success and satisfaction. It was suggested that studies should be undertaken to attempt to relate the degree of success and satisfaction to such variables as degree of hearing loss, age of onset of hearing loss, method or methods of communication employed, the deaf person's attitude toward his deafness, and his educational, vocational, and social experience backgrounds. The findings of the research reviewed in this report appear to indicate that deaf persons who are competent in the use of a number of modes of communication tend to reach higher levels of vocational attainment with corresponding higher income and to achieve greater satisfaction from their jobs. Where essential skills in reading and writing were evident, proficiency in speech and lipreading skills were seen to be factors that contribute to the vocational success of deaf persons, with lipreading being the less important of the two. Professional deaf persons, the majority of whom had good speech skills, reported that the unreliability of lipreading where important issues were concerned precluded its extensive use. The success of these professional persons in their chosen fields tends to indicate that employers and coworkers are willing to modify communication when that is necessary. This viewpoint stresses the need of deaf persons for reading and writing skills which they may use effectively as a mode of communication.

The success of deaf persons in a wide variety of occupations regardless of degree of hearing loss indicates that other factors than deafness determine success or failure in vocational pursuits. A later age of onset of deafness was indicated in one study to be related to vocational achievement. It was pointed out that the normal early language development of persons who do not incur hearing loss until after the age of 5 or 6 enables their education to proceed more along the lines observed

in normally hearing persons. In other words, persons afflicted by late onset deafness do not have the language handicap that characterizes many early deafened individuals.

Although a number of studies investigated the effects of the variables of hearing loss on occupational attainment as part of their research, the area has not been studied from that viewpoint alone. It would seem important that future research be concerned with this aspect of the handicap of deafness to determine what factors are related to vocational success.

A conclusion made by several investigators was that there are virtually no occupational areas that cannot be entered by qualified deaf persons. Personal qualities that were stressed as essential for inordinate vocational achievement were drive and ability to meet the requirements of a job. Problems that were met by professional deaf persons who were respondents in one study centered around inability to make use of the telephone, unsatisfactory participation in group conferences, and deprivation of beneficial information that hearing persons can attain through the company "grapevine."

It should be pointed out that this study antedated the development of a number of telephone devices that are enabling professional deaf persons trained in their use to carry on independent telephone conversations. Also, it is a growing practice for many professional deaf persons to hire secretaries who are well versed in manual communication and capable of assisting them in use of the telephone, interpreting at conferences, and keeping them abreast of current company developments.

It was observed in one of the studies that although deaf persons may be found in almost all of the occupations listed by the Department of Labor, the heaviest concentration was in two occupational levels, that of the skilled and the semiskilled worker. Although this 10-year-old study reflects a situation that prevailed a decade ago, it may be presumed that it continues into the present day. Skilled occupations such as the printing trades, tool and die work, and machinists' jobs, which command high hourly wages, are attractive areas to deaf persons who have the necessary skills. Among noncollege-educated deaf people, skilled workers are the elite members of the deaf community. An exceptional person may be motivated to seek further training, occasionally leading to supervisory position. Although a great many are stimulated to upgrade their job levels through inservice training or vocational training, opportunity to do so is too frequently not available to them. Others, who are threatened by unemployment due to technical advances, seek, when possible, vocational training which normally permits them to continue in their chosen occupational fields.

The need for vocational training programs for deaf people has long been recognized. A recently initiated program in vocational training for

deaf persons at a junior college is demonstrating the integration of deaf students with hearing students in regular academic and vocational classes. The results of this experiment in special supportive services for deaf students such as tutors, counselors, and interpreters will determine whether the use of existing facilities is a feasible method for providing deaf persons with needed vocational training.

Unfortunately, a great many capable college-educated persons also make their livelihood from skilled work, mainly in the printing trades. The question may arise as to why persons with college training should select occupations that can promise no other satisfaction than a possible better than average level of income. Research seems to be needed to determine the reasons for the failure of deaf college graduates to use advantageously their higher education experience.

Several of the studies indicated that deaf persons possess finger dexterity and manual dexterity exceeding that of normally hearing persons. Although many other factors enter the picture, dexterity may, at least partially, explain why great numbers of deaf persons are employed in operative semiskilled work. Operative occupations such as machine shop and assembly line work normally are ladders for hearing workers who are sufficiently motivated to upgrade their employment status. Deaf workers in similar positions, on the other hand, seldom go far beyond their entry level jobs in spite of inherent ability and desire for more challenging work. An important area of investigation for future research may be the status of opportunity for employed semiskilled deaf workers to upgrade their employment situations.

An attempt is being made in this direction in a current research project entitled, "Assessing the Attitudes of Industry Hiring Personnel Toward Employment of Deaf Applicants." Fellendorf (RD-2606).

The plight of severely handicapped deaf youth and adults was demonstrated in research efforts attempting to find ways to ameliorate the serious effects of personal, social, and vocational maladjustment on deaf persons. The dramatic results that were achieved by some of these research programs in rehabilitating into employment hard core cases including former penal inmates, mental hospital patients, and institutionalized mentally retarded deaf persons attests to the importance of the studies.

The need for further research to demonstrate effective adjustment training programs for school failures, the uneducated, and the socially and personally maladjusted deaf person is urgent. The need becomes even more pressing when one considers the changing deaf population, which has a disproportionate number of multiple-disabled members compared to what was true only a few years ago when deafness was normally the single disability. Moreover, it appears that there will be no early abatement in this tendency for disabilities and conditions such as mental retardation, neurological malfunction, emotional disturbance,

and vision impairment to accompany deafness. The complex task of meeting the training needs of severely handicapped deaf persons, most of whom have severe language deficiencies, so that they may achieve their vocational potential, poses an especially challenging area for research. An important beginning has been made. Much more needs to be done.

The results of studies on school-situated deaf youth determined that the school and home experience of many deaf children does not provide them with needed vocational knowledge. It appears that research should investigate the prevocational and vocational counseling needs of deaf children, whose development pattern differs from their hearing peers, so that they may be better prepared for the world of work. The development of unique vocational aptitude testing instruments or the adaptation of standard instruments is seen to be essential to improved vocational education for deaf youth. It is encouraging to note that research has already stimulated a number of residential schools for the deaf to establish evaluation and adjustment training programs that serve both school-based deaf youth and deaf adults. These facilities are improving the vocational adjustment of deaf persons using techniques that aim at better self-knowledge, preparation, and more appropriate vocational choice. Research appears to be needed to develop standards for school-situated diagnostic, evaluation, and adjustment training programs.

The 1960 Conference made pertinent recommendations for research concerning concept formation and learning. The results of the various nonverbal tests and related verbal tasks that were developed or adapted for use with deaf subjects in a number of studies were conclusive in indicating that concept formation is not affected appreciably by verbal deficiency and that, additionally, learning is a developmental process. Each of these conclusions is seen to impinge on the language development and educational achievement of deaf children. It is a well recognized fact that deaf people who are not sufficiently verbal to communicate effectively in speech, reading, or writing, are able, notwithstanding, to communicate proficiently in manual communication, which is essentially concept expression and reception. Moreover, the results of one study on the effects of early manual communication and family climate on the educational achievement of deaf children indicated that deaf children with deaf parents are superior in written language as well as in general educational achievement to deaf children with hearing parents. Apparently, the studies on concept formation and learning and the study on the effects of early manual communication are closely related in that the results of the latter tend to support the conclusions of the former. The superior language development and educational achievement of deaf children who have had early training in manual communication appears to prove further that learning is a de-

velopmental process. It would seem important, then, that research determine how hearing parents might learn to communicate better with their very young deaf children so that critically needed language training may begin earlier.

A study that dealt with the influence of fingerspelling on the language, communication, and educational achievement of deaf children tended to verify the results of the above study. Not only was it found that fingerspelling used in combination with speech leads to improved language and general educational achievement but that earlier rather than later training in fingerspelling produces the greatest gains in language development and overall educational achievement.

The importance of early communication training for deaf children, whatever the method, was further stressed in a study on esoteric symbolism. This study suggested that the esoteric symbol system used and developed by young children among themselves in all residential schools for the deaf tends to conflict with the exoteric symbol system used in classroom learning. It was suggested in this study that the mixed-up language that frequently results from this conflict of symbol systems may be avoided through very early and consistent use of exoteric symbols.

Research is producing important new thinking on the developmental needs of early profoundly deaf persons. The valuable knowledge that has been gathered is already being put to use in a number of experimental pre school and primary educational programs. A great deal more study is needed on parent education in early language training and on the development of community resources for this purpose.

Demographic data on the deaf population was identified as a major need at the 1960 Conference. Since then, a number of survey studies have been conducted that have been useful, for the most part, in indicating the social, educational, familial, and employment patterns of deaf individuals. Survey studies of young deaf adults have been particularly helpful in determining interests and needs in vocational training. These studies have served to stimulate the development of a regional high school, and the establishment of vocational and technical training programs. The continued need for reliable local and national data on deafness and deaf people has stimulated researchers to design a survey study that is scheduled to be carried out as part of the 1970 United States census.

The 1960 Conference specified that there should be research to investigate the area of genetics and parent-child relationships. Research in family and mental health problems in a deaf population has provided some important leads in the search for knowledge to prevent congenital deafness. Much further study is urgently needed, however, on modes of inheritance and the developmental dynamics of the genetic forms. The new research area of preventive psychiatry, which is demonstrating tech-

niques whereby parents of deaf children and others may be helped to detect incipient emotional disorder and assist with the problem, holds growing promise of reducing the incidence of mental illness among deaf people. Guidelines in the orientation of parents to the problems of deafness and to the adjustment needs of deaf children are already contributing to more wholesome family living in the promotion of better attitudes toward deafness. The demonstration of a pioneer State mental health program for a deaf population, including inpatient and outpatient services, which is providing patterns for other States, is a particularly significant contribution made by research.

Research demonstrating community counseling services for deaf people who are unable, because of communication barriers, to obtain community services that are normally available to hearing persons, promises to be the forerunner of numerous other programs in the indicated need of these services. This research has shown, also, that a community counseling services center can act as a catalyst in stimulating community awareness of the various types of service programs deaf individuals need.

The role of the deaf person in the community was suggested at the 1960 Conference as a special area of inquiry. Although no research has addressed itself specifically to community penetration, current research that is demonstrating a *Council of Organizations Serving Deaf People* will, in section studies, deal with the community integration problems of the deaf population.

It can be seen from this summary, which highlights some of the advances that have been made by research in reducing the handicapping aspects of deafness, that a great deal has been accomplished. The utilization of some of this research is already significantly improving the social, educational, and vocational situations of deaf people. Gratifying though these results are, there is no question but that the research to date has merely laid the groundwork for further study. The continued generous support of the Social and Rehabilitation Service assures that this important work will be completed.

In conclusion, it may be said that research has broadened considerably the horizons of all deaf persons, and even brighter vistas are envisioned for the future.

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