

1-1-1970

Survey of methods and materials for teaching remedial reading to the hard-of-hearing

Beverly Ann Nelson

Follow this and additional works at: <https://digitalcommons.stritch.edu/etd>

 Part of the [Education Commons](#)

Recommended Citation

Nelson, Beverly Ann, "Survey of methods and materials for teaching remedial reading to the hard-of-hearing" (1970). *Master's Theses, Capstones, and Projects*. 862.

<https://digitalcommons.stritch.edu/etd/862>

This Research Paper is brought to you for free and open access by Stritch Shares. It has been accepted for inclusion in Master's Theses, Capstones, and Projects by an authorized administrator of Stritch Shares. For more information, please contact smbagley@stritch.edu.

A SURVEY OF METHODS AND MATERIALS
FOR TEACHING REMEDIAL READING TO
THE HARD-OF-HEARING

by

Beverly Ann Nelson

A RESEARCH PAPER
SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS IN EDUCATION (READING SPECIALIST)
AT THE CARDINAL STRITCH COLLEGE

Milwaukee, Wisconsin

May, 1970

This research paper has been
approved for the Graduate Committee
of the Cardinal Stritch College by

Sister Marie Colette O.S.F.
Director

Date: May 7, 1970

ACKNOWLEDGMENTS

The writer wishes to thank her parents for the opportunity to pursue graduate studies. She also expresses deep gratitude to "Mamacita" and to Sister M. José, OSF, for their patient encouragement and prayers.

A sincere thank you is extended to Sister Marie Colette, OSF, the director of this paper, to Sister Mary Walter, OSF, for her gracious permission to observe her class, and to Mary Schubilske, the typist.

TABLE OF CONTENTS

| | Page |
|--|------|
| ACKNOWLEDGMENTS | iii |
| CHAPTER | |
| I. THE PROBLEM. | 1 |
| Introduction | |
| Statement of the Problem | |
| Significance | |
| Scope and Limitation | |
| II. SURVEY OF RELATED LITERATURE | 6 |
| Educational Characteristics | |
| Cognitive Development | |
| Speech and Communication | |
| Reading | |
| Methods | |
| Natural or Developmental Language | |
| Approach | |
| Eclectic Approach | |
| Stimulus-Response Approach | |
| Materials | |
| Tests | |
| Reading Instruction | |
| Summary | |
| III. METHODS AND MATERIALS. | 62 |
| Definition of Terms | |
| Hard-of-Hearing | |
| Acoustic Deficiency and Auditory | |
| Perception | |
| Methods | |
| Natural or Developmental Language | |
| Eclectic Approach | |
| Stimulus-Response Approach | |
| Materials | |
| Tests | |
| Reading Instruction | |
| Audio-Visual Materials | |
| Library Materials | |
| Summary | |

IV. SUMMARY 82

The Problem
Findings
Conclusions

BIBLIOGRAPHY 87

CHAPTER I

THE PROBLEM

Introduction

Reading, as a process of deriving meaning from a set of graphic symbols representing aural and oral language, depends much upon language and speech development as well as the ability to make fine auditory discriminations between sounds and words.¹ Children with auditory deficiencies, then, will have difficulty in learning to read. Despite malfunction of the acoustic channel some comprehension of the sound-language-symbol relationship is generally essential to the reading act.

Teachers of the deaf and hard-of-hearing are fully aware of the difficulties inherent in reading instruction for the acoustically handicapped, and there is much discussion on the subject, particularly in relation to the experiments, discoveries, and developments during the last ten years of reading research. These discussions, the resultant research, and subsequent development of and experimentation with new methods and materials for teaching reading are relevant not

¹Bond, Guy L., and Tinker, Miles A., Reading Difficulties: Their Diagnosis and Correction, (New York: Appleton-Century-Crofts, Inc., 1967), p. 111.

only to reading instruction in schools for the deaf, but also to remedial instruction in reading clinics and programs.

Statement of the Problem

The purpose of this paper was to survey the recent literature, methods, and materials in reading instruction for the deaf and the hard-of-hearing, and to suggest their applicability to remedial instruction for the hard-of-hearing.

The specific objectives were:

1. Since the hard-of-hearing are often linguistically as well as acoustically deficient, what intelligence, general achievement, and reading tests are recommended as appropriate measures of their capabilities?
2. What methods are recommended and useful in teaching reading to the deaf and hard-of-hearing?
3. How are the above methods applicable to remedial reading instruction for the hard-of-hearing?
4. What materials are recommended and useful in teaching reading to the deaf and hard-of-hearing?
5. How are the above materials applicable to remedial instruction for the hard-of-hearing?

Significance

It has been estimated that about 5% of the school children in the population,² or well over 500,000 children

²Ibid.

have a hearing loss.³ Because these children lack an adequate auditory response to their environment, they may be deficient, not simply in language or speech, but in the concepts that make language possible. If language is conceived, as Frizna states, as "a system of conventional symbols having the purpose of communicating thought",⁴ the application to speech, a system of acoustic symbols intended to communicate thought, and to reading, a system of graphic symbols intended to communicate thought, should be clear. The auditorily handicapped child, lacking certain concepts, may have difficulty with either or both symbolic systems.

However, conceptual deficiencies do not account for all the problems of the hard-of-hearing in communication. Speech sounds encompass frequencies from 500 to 2000 cps.⁵ Depending upon its severity, a loss in this range may adversely affect a child's oral and aural communication. Loss in the higher frequencies blurs consonant discrimination; loss in the lower frequencies affects vowel discrimination. Both affect the reading process,⁶ and since inflectional

³Force, Dewey G., and Garrison, Karl C., The Psychology of Exceptional Children, (New York: Ronald Press Co., 1965), p. 215.

⁴Frizna, R., "Auditory Channels in the Education of Deaf Children", The American Annals of the Deaf, III p. 640.

⁵O'Neill, John, The Hard of Hearing, (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1964), p. 3.

⁶Bond and Tinker, Reading Difficulties, p. 110.

endings and grammatical structure are often conveyed aurally, the structure of their language may be affected as well.

Because his auditory sense is inadequate, the hearing handicapped child must learn to compensate for it visually through speechreading or other visual cues while learning to use his residual hearing to its fullest extent. This means that any tests, methods, and materials used in remedial instruction must be visually oriented while offering the opportunity for training of the residual hearing. During the last ten years, much discussion of methods and materials for reading instruction has taken place, but, although some research has been done in reading instruction for the deaf and the hard-of-hearing, little has been said about its application to remedial instruction.

Scope and Limitation

Since most experimentation in reading instruction for the deaf and hard-of-hearing has taken place during the last decade, this paper surveyed research of the 1960's in methods and materials for teaching reading to the acoustically handicapped, applying it to remedial instruction for the hard-of-hearing.

The latest journals, proceedings, monographs, and books were used to obtain information and opinions on the applicability and usefulness of the recent innovations and research in reading to reading and remedial reading instruction for the acoustically handicapped.

It was hoped that this survey will be a partial guide to sources, methods, and materials for teaching remedial reading to the hard-of-hearing. An attempt has already been made to productively compile the results of reading research for the deaf.⁷ Future research, particularly in reading and remedial instruction for the hard-of-hearing, is foreseeable.

⁷Wooden, H. Z., "An Audiovisual Approach to Language Instruction of Children With Severe Hearing Impairments: Project LIFE", Audio-Visual Instruction, II (November, 1966), 742.

CHAPTER II

SURVEY OF RELATED LITERATURE

In locating guides for and evaluations of methods and materials useful for teaching remedial reading to the hard-of-hearing, the author examined research in and discussions of education of the deaf as well as of the hard-of-hearing. Three general topics were considered relevant: educational characteristics, methods and programs in reading and language development, and materials for diagnosis of reading disabilities and instruction in reading. Since language development and reading are often considered simultaneously in instruction of the deaf, it was thought necessary to consider methods and materials in both areas.

Educational Characteristics

The educational characteristics which have been researched as most relevant to reading and the hard-of-hearing are those aspects of cognitive development related to reading; speech, including language development, auditory training, and communication, and reading.

Cognitive Development.--In a study of dimensional preferences, discrimination, and learning in deaf and hearing children, Suchman studied the relationship between

discriminative accuracy and dimension preference with the hypothesis that, given a choice between stimuli in color, form, or size dimensions, most hearing elementary school children prefer form, while most deaf elementary school children prefer color. He matched 72 children, 36 deaf and 36 hearing, for sex, age, and IQ, using as a criterion for deafness the bilaterally, congenitally deaf, with an absence of other physical anomalies, and checking his hearing subjects with the Wepman Auditory Discrimination Test. These pairs were compared on their ability to discriminate accurately in the color and the form dimension and on a successive discriminative-training task. Suchman concluded that there is a relationship between discriminative accuracy and dimension preference. His hypothesis that the hearing school children would prefer form while the deaf children would prefer color, was proved correct, with the adjunct proof that the deaf discriminate color variations better than the hearing, while the hearing discriminate form better than the deaf. Suchman also concluded that children's discrimination learning is facilitated when the relevant cue from the preferred dimension is not clearly supported.¹

Espeseth investigated visual-sequential memory in deaf children to determine if it would be significantly

¹Rossllyn Gaines Suchman, "Color-Form Preference, Discriminating Accuracy, and Learning of Deaf and Hearing Children", Child Development, 33 (June, 1966), 439-451.

increased by an intensive treatment program. He selected 36 deaf pupils grade 6-12, from a state school for the deaf, assigning them at random to an experimental or a control group. The instruments used for the experiment were four subtests of the ITPA; Visual-Motor Association, Visual-Motor Sequencing, Visual Decoding, and Motor Encoding; as well as the Knox Cube Test, Heally Picture Completion Test (II), Picture Span Test, and Digit Span Test. The experimental group had half-hour remedial sessions four days a week for ten weeks, while the control group met twice weekly for exercises not related to memory span. The results showed that the experimental group made significant gains beyond the .05 level of confidence on two of the three primary measures: visual-motor sequence and picture span. Espeseth drew two implications from this: that a longitudinal study is needed, and that the visual-memory span of the deaf can be improved.²

The verbal conceptualization of deaf as compared to hearing children was investigated by Hughes, who compared 56 deaf subjects with 33 hearing subjects of comparable mental ages on a selected list of words and word concepts arranged in a percept-testing, concept-sorting task. He hypothesized no significant difference in performance. Hughes investigated five related points: the performance of

²Vernon K. Espeseth, "Investigation of Visual-Sequential Memory in Deaf Children", The American Annals of the Deaf, 114 (September, 1969), 786-789.

the hearing impaired subjects on the task with respect to the type of training or instruction they had received; an analysis of the length of time spent in the residential school compared to task performance; the relationship between sex and performance on the verbal task; the relative difficulty of the words employed in the task in terms of performance by the deaf and hearing; and a comparison of the relationship of mental age and chronological age to verbal-concept behavior as measured by a discriminating instrument. The subjects were checked on each word and its pictured equivalent to be sure the word was known, then were asked to sort known percept words under the known concept words. Seven measures were taken: the number of concepts known; the number of percepts known; the number of words correctly sorted; the number of words incorrectly sorted; the number of sortable words known; the efficiency ratio; and the inefficiency ratio. The null hypothesis was rejected: the hearing subjects knew more percept and concept words, and were able to sort a higher proportion of known percepts to known concepts than the deaf. However, the deaf performance was better on two variables, making fewer wrong sorts than the hearing, and having a smaller inefficiency ratio. The deaf performed better on the percept as compared to the concept level. There was no relationship between the length of institutionalization and performance for the deaf or the hearing, and the hypothesized sex difference was

not supported. The words were more difficult for the deaf than the hearing. Mental age was more closely related to verbal conceptualization than was chronological age. Hughes suggests that the deaf need more emphasis on concept refinement and an earlier introduction to more low-order abstract concepts.³

Kates et al also did a study involving categorization and related verbalization in deaf and hearing adolescents, with three purposes: to investigate categorization; to distinguish between the process of categorization and the process of verbalization and judge the accuracy of categorization independently of verbalization; and to attempt to separate the effects of deafness from the cognitive effects of age and achievement level. There were three groups of subjects. Group I consisted of 5 girls and 3 boys with a mean IQ of 02, mean age of 18.09, and mean rank on the Stanford Achievement Test of 17.79, who comprised the graduating senior class from Clarke School for the Deaf. They had very profound losses, and had oral training. Group II consisted of 8 junior high school students, 5 girls and 3 boys, with a mean IQ of 04.63, a mean age of 14.2, and a mean rank on the Stanford Achievement Test of 7.68. The third group consisted of 8 high school seniors, 5 girls and

3

Robert B. Hughes, "Verbal Conceptualization in Deaf and Hearing Children", Exceptional Children, 27 (May, 1961), 517-522.

3 boys, with a mean IQ of 106.38, a mean age of 17.97, and average scholastic achievement. The test used was the Goldstein-Scherrer Object Sorting Test. It was given in three parts, free, active, and constrained situations administered in order in one session. The written instructions to the deaf were the same as the oral instructions to the hearing. Kates concluded that (1) the deaf categorize as adequately as the hearing; (2) the deaf have more inadequate verbalization, but more adequate categorization accompanied by inadequate verbalizations than the hearing; (3) the deaf do not differ in the type or the developmental level of verbalization, or in their spontaneous changes of categorization in the test; (4) the deaf have narrower categories than hearing adolescents of their own age and IQ, but do not differ from those of the same achievement level and IQ; and (5) no difference was found indicating a definite shift in categorization ability distinct from the effects of age and achievement.⁴

A second investigation of concept attainment by deaf and hearing adolescents was done a year later by Kates, Yudin and Tiffany. They investigated concept attainment in problem solving situations, with a relevant problem, which was to determine how deafness affects the ability to attain

⁴Solis L. Kates, William W. Kates, James Michael, and Terrance M. Walsh, "Verbalizations in Deaf and Hearing Adolescents", The Journal of Educational Psychology, 52 (August, 1961), 188-194.

conjunctive concepts and how it affects the processes manifested in concept attainment. Kates hypothesized first no difference in concept attainment between the deaf and hearing subjects matched for age and IQ in (1) the total number of choices before solution, (2) the latency of the first choice in each conceptual problem, (3) the total time taken to solve the problem, (4) the number of guesses about the correct concept, (5) the number and type of changes made in attribute values on the first choice and the percent of focusing changes in the first four card choices, and (6) a comparison of their respective performances on orderly and random presentations of the stimulus material. A second hypothesis held that the deaf adolescent subjects would be superior in concept attainment to younger hearing control subjects matched on school achievement level and IQ in all of the above subheadings.⁵

There were three groups of subjects. The experimental group consisted of 30 deaf students, 17 male and 13 female from the Clarke School for the Deaf, who had been profoundly deaf from birth or infancy, and whose mean IQ was 98.87, mean age was 16.4, and mean grade was 8.51. Correlated with these were two control groups, each consisting of 30 hearing subjects, 17 male and 13 female. Control group I was drawn

⁵Solis L. Kates, Lee Yudin, Ronald K. Tiffany, "Concept Attainment by Deaf and Hearing Adolescents", Journal of Educational Psychology, 53 (June, 1962), 119-120.

from senior high school students and had a mean IQ of 97.63, a mean age of 16.4, and average achievement in their studies; control group II was drawn from junior high school students and had a mean IQ of 97.50, a mean age of 13.6, and average achievement on the Stanford Achievement Test. The conceptual attainment materials were Bruner's cards, 81 three-by-fives which combined four attributes: colors, figures, number of figures, and borders. They were displayed under two conditions: grouped systematically with similar attributes and values placed in juxtaposition; and grouped randomly by random numbers.

All subjects were tested individually on the same problems presented in the same order. Each group was divided into two groups of 15 subjects matched for IQ and scholastic achievement in the experimental group, for age and IQ in control group I, and for scholastic achievement and IQ in control group II. One subgroup from each solved both sets of two to three problems in the orderly sequence; the other solved the problems first in the orderly sequence, then in the random sequence. The nature of the task was fully explained to each subject.⁶

The results on part one of Kate's hypothesis were varied. There was no significant difference between the deaf and older hearing subjects for the number of choices necessary to attain the concept, for the length of time needed

⁶Ibid., p. 120-121.

to attain it, or for the number of changes made in attribute values. On the orderly-orderly and orderly-random sequences, there was no significant difference on the six variables or on the full or half tests for the deaf and older hearing subjects. For the deaf and younger hearing groups, there was no significant difference on five of the six variables. There was a trend for the deaf to make fewer choices before attaining the concept than the younger hearing subjects, and there was a significant difference favoring the younger hearing subjects in the latency of the first choices. There was no significant difference between these two groups on the full or half test sequences. Kates concluded that the deaf and hearing subjects were equally capable of using discriminating attributes to distinguish the exemplars of a concept from the non-exemplars. He inferred that language achievement doesn't have important significance for efficiency in attaining sensory concepts, although the deaf appear reluctant to communicate orally.⁷

Youniss, Neil, and Furth attempted to replicate a previous experiment which reported that deaf adolescents were superior to hearing adolescents in acquiring discrimination of visually presented word pairs, attempting to clarify the problem of inconsistent performance deficiency on tasks involving verbal material. The study involved

⁷Ibid., p. 121-126.

two experiments. In experiment I, 30 deaf subjects from a state school for the deaf and 30 hearing subjects from a parochial school were correlated for age, with the deaf subjects' mean at 14.3 years and the hearing subjects' mean at 14.4 years. The range for both was 12-15 years. Five lists of word pairs, homonyms with high meaning, high form similarity; high meaning, low form similarity; low meaning, high form similarity; and low meaning, low form similarity, were presented to each subject, who had to choose the correct word from each pair. The deaf subjects discriminated with fewer errors than the hearing subjects, discriminated better when the similarity in form was low than when it was high, and made as many errors when the similarity in meaning was high as when it was low. The hearing subjects made more errors with pairs high in meaning similarity than with pairs low in meaning similarity.⁸

Experiment II was set up to investigate the possibility that a selected group of deaf subjects might be more responsive to lexical meaning than the adolescents of Experiment I. In this experiment, 20 subjects, 10 female, 10 male, deaf since 6.2 years, with a mean age of 22.6, were selected from Gallaudet College for the Deaf, and 20 subjects, 10 female, 10 male, with a mean age of 19.8, were selected from Catholic

⁸James Youniss, Richard N. Feil, and Hans G. Furth, "Discrimination of Verbal Material as a Function of Intra-pair Similarity in Deaf and Hearing Subjects", Journal of Educational Psychology, 56 (August, 1965), 184-190.

University. They were subjected to the same test used in Experiment I. The deaf and hearing college students were equally affected by meaningful stimuli. Youniss also notes that the hearing as well as the deaf subjects attempted a strategy based on visual perception, but the hearing reached to the meaning, treating words as language units, while the deaf were affected only by the formal attributes.⁹

Finally, Pugh, in "Developing the Deaf Child's Power of Reasoning", discusses the problems of reasoning in the education of the deaf. He defines reason as the manipulation of ideas and memories, and points out that research suggests that the deaf reason well in pictures, but fail to make a satisfactory transition to verbal reasoning not because of difficulty with concepts, but because the symbols are misunderstood. As possible remediation, Pugh suggests practice in drawing previously learned information into new situations; help with different types of definitions in context and in the dictionary; practice with simple analogies and reciprocal relations, the use of time concepts, and directions; as well as the use of the process of elimination and of deductive and inductive reasoning.¹⁰

Speech and Communication.--Before a hearing child learns to read, he learns the oral-aural aspect of language,

⁹Ibid.

¹⁰Besses L. Pugh, "Developing the Deaf Child's Power of Reasoning", Volta Review, 62 (September, 1960), 334-340.

speech, in which he relates aural-oral symbols to parts of his environment about which he wishes to communicate. This procedure is usual for most hard-of-hearing who acquire language prior to their hearing loss.

However, the hard-of-hearing still differ significantly from the hearing in speech-sound discrimination, according to a study by Lichtenburg. He investigated the speech-sound discrimination on consonants and vowels of three groups of elementary school children, normal hearing, normal hearing with speech problems, and hard-of-hearing, totalling 60 from schools in Prince County, Maryland, in order to determine if there would be a difference in the discrimination scores if there were a time separation between the two trials, and to compare the speech sound discrimination of two groups of hard-of-hearing subjects, one with auditory training, and one without auditory training. The test material consisted of 20 taped sentences for vowels and 50 taped sentences for consonants, each containing paired words which were nearly homophonics. The auditory training consisted of 30 fifteen minute sessions for the control group and 80 fifteen minute sessions for the experimental group. The results showed a significant difference at the 2.5 level in vowel discrimination and a significant difference at the .01 level for consonant discrimination between the normally hearing subjects and the hard-of-hearing subjects. The group of hard-of-hearing subjects which received 80 auditory training sessions showed change which was significant at the .01 level,

while no change appeared in the control group. Lichtenburg suggested that these results were significant for appropriate school placement and for planning speech therapy.¹¹

In a discussion of language and perception related to the deaf and hard-of-hearing, Harrington points out the difficulty inherent in speech sound discrimination for the acoustically handicapped. According to him, the first sounds to be acquired are those which are easily seen, and easily formed. Vowels are particularly easy, and plosives such as b, p, q, k, t, or d require only the simple muscular opening and closing of the speech mechanism to release air. However, fricatives such as f, v, th, s or sh are not only difficult to see, but are often inaudible to the hard-of-hearing. This presents a problem not only in acquisition, but in auditory perception.¹²

Speech and sound discrimination and perception is related definitely to reading instruction, but Frizna points out that the auditory channel is not necessary for reading. He discusses the role of auditory channels in the education of deaf children in full. Since the auditory system transmits information about both the immediate and remote environment to the brain for interpretation, impairment

¹¹F. S. Lichtenburg, "Comparison of Children's Ability to Make Speech Sound Discriminations", Volta Review, 68 (June, 1966), 426-434.

¹²D. A. Harrington, "Language and Perception", Volta Review, 67 (March, 1965), 191-196.

of the system limits the size and quality of the environment as perceived by the person. Not all hearing problems are the same, but they are similar in that they produce two major problems, reduced auditory sensitivity, and difficulty in the discrimination of complex sounds.¹³

Frizna goes on to discuss the application of this auditory channel for the education of the deaf. He points out that language is a system of conventionalized symbols, acoustic or visual, intended to communicate thought. Neither speech reading nor hearing alone transmit the full message for the hearing handicapped. Frizna suggests that constant use of an electronic device realizes less than the optimum potential of the residual hearing. One reason for this is the limited application of knowledge of the auditory system; others are limited familiarity with aids, limited knowledge of advanced technology, and a resultant lack of experimentation, financial limitations, and difficulty with dealing effectively with varietal levels of interest and abilities of significant people in a given child's life inside and outside that academic day. The large role of auditory perception in education makes early detection and remediation of losses important as well as periodic reassessment of the auditory system, since auditory needs change with development. The

¹³Robert Frizna, "Auditory Channels in the Education of Deaf Children", American Annals of the Deaf, III (November, 1966), 633-636.

auditory channel is in use full time during the academic day, and, while it may not be necessary in reading, it is extremely important in the development of certain language skills, particularly those related to communication.¹⁴

Communication skills and situations are also of concern to the reading clinician or teacher who is involved with the hard-of-hearing. Jones points out four guides for teaching communication skills to the acoustically handicapped: the development of language structure and of vocabulary based on the child's personal and group experience and the creation of situations for language not met in daily experience; the expansion of understanding of language principles and grammatical forms throughout the school years as the class is ready for them, not leaving experience to chance; use of devices such as the Fitzgerald Key for linguistic construction; and continuing stress on the mastery of new vocabulary, on verb forms, and idiomatic expressions.¹⁵

Giolas and Wark studied communication problems associated with unilateral hearing losses to determine what causes the difficulty and what might be done to alleviate problem situations. They interviewed 20 subjects with a unilateral loss of 20dB or greater and one normal ear. They concluded that such people are at a disadvantage in many communication situations and that they feel that they lack

¹⁴Ibid., pp. 636-647.

¹⁵Kate-Helen Jones, "Communication Skills", Volta Review, (February, 1961), 73.

normal hearing for all practical purposes. Difficulty in understanding speech and localizing auditory stimuli in both quiet and noisy situations was noted. In the quiet settings, distance was the most common factor, and in the noisy situations, the noise itself was a problem. A personal factor was the general negative feeling many acoustically handicapped persons have in a difficult listening situation. However, it was also found that by moving to a more favorable position, by asking for repetitions, or by making optimal use of visual cues by watching facial expressions, lip movements, and gestures, the communication situation could be improved.¹⁶

Reading.--There is little research bearing directly upon the hearing handicapped retarded reader. Much of what has been written pertains to methods and materials for reading instruction for the deaf. However, Jones, in his discussion of communication skills, devotes much of his paper to reading and the problems of the acoustically handicapped in reading, interpretive skills in particular. He suggests that the literal mindedness of most deaf children creates difficulty in learning to read and that informative reading is easier for them than reading for pleasure, concluding that "Teaching deaf children that reading is an enjoyable experience is a goal that is sometimes lost sight of because of the great amount of time needed to teach them how to read."¹⁷

¹⁶G. Giolas and D. J. Wark, "Communication Problems Associated with Unilateral Hearing Loss", Journal of Speech and Hearing Disability, 32 (November, 1967), 336-342.

¹⁷Kate-Helen Jones, "Communication Skills", Volta Review, (February, 1961), 76. (72-77)

Hart discusses reading in relation to the acoustically handicapped extensively in her book Teaching Reading to Deaf Children. She states

The printed form represents the only medium of communication in which the deaf person meets intact language patterns in exactly the same form as anyone else. Therefore reading would seem to be a lifeline of communication for the deaf.¹⁸

However, such is not the case, and the reasons discussed by Hart are relevant to the hard-of-hearing as well. First, reading is derived from the spoken language, and a deficiency in the comprehension of aural symbols will be a disadvantage in learning to read. Limited concepts, limited vocabulary, and lack of facility in oral language¹⁹ are three other problems which would be of concern to a remedial teacher or clinician. Finally, in regard to remedial reading for the deaf, Hart states

A deaf child needs to master specific reading techniques at the same time that he is acquiring language forms. . . . The deaf child, lacking the normal oral repetition the hearing child gets so casually, may need more deliberate, planned practice in vocabulary or language forms.²⁰

In view of the previously discussed findings of Youniss et al, the above statement seems relevant to the problem of visual versus conceptual recognition of words.

¹⁸ Beatrice Ostern Hart, "Teaching Reading to the Hard of Hearing", Alexander Graham Bell Association for the Deaf, Washington, D.C., 1963, p. 1.

¹⁹ Ibid., p. 5.

²⁰ Ibid., p. 12.

Rudloff also discusses the hearing handicapped retarded reader. He cautions that

. . . it is not uncommon to think of the hearing loss as the principal and perhaps only reason for the lack of progress. Most certainly it cannot be denied that deafness and the resulting limited experiences of the deaf child are major factors which contribute to reading difficulty. However, we must also conclude other possible causes of reading retardation.²¹

Rudloff does not deny the bearing a hearing loss may have upon difficulty in reading, but he does refer to the various other possible causes as he makes suggestions for teachers.²²

Methods

During the 1960's, interest in new methods and renovations of old methods brought about new emphases in literature on the natural or developmental language approach, the eclectic approach, special orthographies, and the stimulus-response approach. Since, for the deaf, language development and reading instruction are combined, language development must be considered concomittantly with reading.

Natural or Developmental Language Approach.--The natural language approach involves teaching language and reading according to the needs made evident by the child or the group through practice in sentence structure and variations. Krug attempted to develop a means of teaching language

²¹Joseph S. Rudloff, "The Hearing Handicapped Retarded Reader", Volta Review, 68 (October, 1966), 567.

²²Ibid..

and reading through a color coding, visual method created for preschoolers, but applicable to remedial reading. His purposes were to teach the syntactical meaning of words at a simple level, to teach the deaf preschooler to read, and to allow the child a means of expression without writing which would permit maximal communication. The language was to be structured in acceptable English related to the children's needs and interests without referring to complicated rules; the system was to be flexible, allowing the incorporation of spontaneous language, and corroborating the development of related language skills; it was to be useful with any mode of interpersonal communication, making no unrealistic demands upon the children; it should strengthen existing methodology; and the system should be useful to parents in the home.

Krug was guided by five specific concepts: that environment can be modified and controlled through the use of language; that pupils can be controlled by others through the use of language; that they should be able to read simple sentences about daily classroom activities; that the pupils should be able to construct simple sentences with language blocks relating to needs and activities; and that the pupils should be aware that use of the printed form is not limited to the classroom. He also wished to develop five sentence-structure concepts in the pupils: word relationships; word interchange; use of the negative verb form; use of the question form; and use of tenses. The

materials consisted of real objects, toys, pictures, or models for vocabulary development, and rectangular, plastic-coated blocks of wood, color-coded to represent units of language.²³ The result was an approach combining the better qualities of linguistics with natural language.

Caldwell discusses the use of the natural language approach during the readiness period, also suggesting principles which could be used in remedial reading instruction. He believes in an experiential approach, teaching organization and thought through an experience, listing the procedure and discussing the whys and hows before turning to sentence organization and the formulation of questions. Vocabulary is taught systematically as the need arises: nouns by naming objects or labeling them and giving synonyms; pronouns by hearing, seeing, and using personal pronouns; verbs as a means of naming the happening by a do-and-talk method; and modifiers and conjunctions as the occasion arises by various games such as "Where are you?". Idioms and common conversational phrases are also taught, as these create difficulties when literally interpreted. Reference materials are used as sources of word meanings and clarifications of concepts. One interesting aspect of Caldwell's approach is

²³Richard F. Krug, "Approach to Teaching Language to Young Deaf Children", American Annals of the Deaf 110 (November, 1965), 591-597.

a school-home notebook for recording events at both places for conversational and reading reference.²⁴

Schmitt, in another discussion of the natural language or language development approach, describes it as building language into the child. Vocabulary is built through words, unitary phrases, and meanings, and syntax is taught as language principles or generally accepted grammatical entities, moving from word order patterns, structural analysis, and functional words through partitives, direct-indirect discourse; and idiomatic expressions. The approach itself involved a dual procedure. One procedure as described above, is grammatical, focussing attention upon the structural aspects of language such as parts of speech, syntax rules, and general language inductively; the second, a natural language procedure, takes the grammatical and adds to it meaning through experience to develop a conceptual basis for language and reading.²⁵

Eclectic Approach.--Many authors such as Betts, Nila Banton Smith, or Durrell, consider an eclectic approach, founded on a good basal reading program, as one of the better methods for teaching reading. Among authorities in teaching reading to the deaf, this approach is questioned by Hart, who states, "To the deaf child, even the vocabulary and the

²⁴Elizabeth H. Caldwell, "Some Adventures in Language Development", Volta Review, 63 (February, 1961), 60-64.

²⁵Philip J. Schmitt, "Language Instruction for the Deaf", Volta Review, 68 (January, 1966), 85-105.

language of the basal reader are difficult. Therefore, there isn't any great advantage in using a basal reader unless it contains high interest value."²⁶

Stafford agrees with Hart about the basal reader, claiming that it involves drudgery for both teacher and pupil and builds frustration by progressing too slowly for some and being too difficult for others. He suggests the use of charts derived from the basal reader for instruction, and reserves the basal itself for individual work in reading, during which he encourages oral reading for the benefit of kinesthetically absorbing words, sentence patterns, and their meaning.²⁷

Kent discusses the value of using the eclectic approach with the deaf. He considers that the deaf need a firm base in phonetic analysis of words if the word is to have meaning, and that word recognition should be stressed with the first reader. However, he also suggests charting stories, making displays, and providing first-hand experience to aid the development of concepts and meanings. A second approach discussed by Kent is the individualized approach. He suggests that this is more suitable for the deaf since it provides more reading at a suitable level for the individual.

²⁶Beatrice O. Hart, Teaching Reading to Deaf Children, p. 10.

²⁷Charlotte Stafford, "Reading for Deaf Children," American Annals of the Deaf, III (March, 1966), 463-466.

This lessens frustration and emotional problems associated with reading and provides for individual effort, interest, and home participation. The use of cards to list the characters, adjectives to describe them, and a few facts about the story provides practice with language.²⁸

The use of the eclectic method with junior high school hearing handicapped students is discussed by Foy. Two principles which he stresses are detailed individual attention in word attack to help in the pronunciation and attack of strange words, and the continuation of phonetic analysis with the use of contextual clues, structural analysis, pictures, and dictionary skills. Foy also suggests the use of study questions and of lists of unfamiliar words and phrases to aid in pronunciation, the use of multiple meanings, and idiomatic expressions.²⁹

Finally, a linguistic approach is discussed by Sister Marie Suzanne Buckler, CSJ. Her approach is based on an analysis of the language involving seven verb phrases which are gradually combined into more complex language. As these patterns are taught, the pupils learn how language works and develop fluency and naturalness in the various

²⁸Alice Kent and others, "To Each His Own in Reading," in "Efficient Reading for the Deaf," Volta Review, 64, (September, 1962), pp. 379-393.

²⁹Robert Foy, "Teaching Reading to Hearing Impaired Junior High School Pupils", Volta Review, 68 (April, 1966), pp. 315-316.

aspects of the language arts.³⁰

Stimulus-Response Approach.--The stimulus-response approach has been of special interest to instructors of the hearing handicapped during the last decade. Its characteristics seem well suited to the needs of students who are visually oriented.

Streng discusses the applicability of stimulus-response to deaf education. She begins with the assumptions that verbal behavior is subject to the same principles as any other learned behavior; that more effective instructional techniques than are used at present can be employed in language instruction through the application of principles of learning; and that concepts and principles involved in any new methodology must be developed inductively from observation unless the possibility of generalizations permit a deductive approach. Streng points out the similarity between psycholinguistic theory and stimulus-response theory. Both, according to her, consider learning as a process which takes place through trial and error, and conditioning by reinforcement of responses. An important point made is that while the hearing child over-learns oral language before beginning to read, the deaf child must simultaneously learn oral and written language from the beginning of his formal education. The teacher, therefore is an essential factor

³⁰Sister Marie Suzanne Buckler, CSJ, "Expanding Language through Patterning", Volta Review, 70 (February, 1968), 89-96.

in stimulus-response instruction since he must extinguish inappropriate responses and strengthen appropriate ones.³¹

Another problem which arises is that, while some deaf children discover the function of language structures and transfer the knowledge to new situations, many never make this discovery because they have neither clear concepts of the operation of language nor the opportunity for enough practice to make their use of language automatic. Streng notes that the teacher attempts to establish a specific repertory of oral or written verbal responses through a highly specialized process of response which requires that the pupil know his response is correct. This combination of instant feedback and provision of overlearning is stressed in the stimulus-response approach. However, Streng cautions that language as a social behavior must be related to the child's experience, which provides a basis for language meaning and for the broader meaning of communication.³²

Birch and Stuckless made three studies of the use of programmed instruction in written language for deaf children. The first was a pilot study done at the University of Pittsburgh to determine whether written vocabulary could be established through stimulus-response methods, and to determine the most appropriate response mode. When positive results were

³¹ Alice Streng, "The Applicability of Individualized Programmed Instruction in the Education of Deaf Children", Exceptional Children, 30 (March, 1964), 365-367.

³² Ibid., pp. 367-371.

obtained from this, the authors proceeded to the second study, a comparison of programmed and conventional instruction involving 99 children from 13 classes in 6 schools. The program was linear in aspect, with vanishing cues intended to test the students' ability to write full descriptive sentences correctly, using language principles from the program content.

Each class was divided into two sections to compose an experimental group of 52 students and a control group of 47 students. The instruction was continued for 20 school days, and the pupils were tested at the end. It was found that the experimental group arrived at the same level of achievement as the control group in less than half the time. The difference between the two groups was significant at the .01 level. Full sentence responses were found to be excellent when the object was to teach grammatical construction, and the 10 year old deaf pupils were found to be capable of self-correction. The vocabulary was transferred to the vernacular, although some verbs were still used incorrectly.³³

The third study concerned programmed instruction and the correction of the written language of deaf adolescents, and was to determine if stimulus-response methods of teaching

³³Jack W. Birch and E. Ross Stuckless, "Programmed Instruction in Written Language for Deaf Children", Exceptional Children, 30 (March, 1964), 296-303.

grammar to pupils would avoid errors resulting from rote learning, and whether increased practice in inhibited skills and repeated presentations would reduce errors. The pupils involved were from seven residential and two day schools which employed the Fitzgerald system. The two experimental groups consisted of 57 students, 24 male and 23 female, with a mean age of 10.3 and a mean IQ of 95.8, and 52 students, 29 male and 23 female, with a mean age of 10-3 and a mean IQ of 95.4. The control group consisted of 105 students. Experimental group I received two different programs each week for five weeks, based upon composition errors, the principles of which had not previously been studied, with conventional language instruction.

Experimental group II received two programs a week for six months based on the first two errors in their weekly compositions with conventional language instruction, and the control group received conventional language instruction only. It was found that between experimental group I and the control group, there was no significant difference. Experimental group I was superior to experimental group II on composite scores. However, between experimental group II and the control group, there was a significant difference favoring the control group. Birch and Stuckless concluded that programmed instruction is a feasible, efficient approach and that the grammar of deaf adolescents is amenable with a repeated program, although language was taught more efficiently to the younger deaf than to the adolescents, whose errors

resisted extinction. The authors also found that programmed instruction is most useful as a supplement to conventional instruction and that teachers were receptive to it as a beneficial adjunct to instruction.³⁴

Sister James Lorene, CSJ, also discusses the use of the stimulus-response approach in language development. She uses the approach to teach categorization and the association of parts with slides which list categories horizontally and their components vertically. In summary, the principles she uses are that new learning is vertical and its associations horizontal; that receptive expressive language should be used; that all vocabulary be useful; that the teacher be aware of the difficulty of phonating certain words; that rote learning is of little value; and that tests should ascertain the degree of language competency. Sister also points out that this is only one out of many methods.³⁵

Materials

Research involving materials has been closely integrated with methodology. However, there has been concern with appropriate testing instruments and with the development of special instructional materials for the deaf. Also, recent innovations in audio-visual aids have provided materials

³⁴Ibid., pp. 299-303.

³⁵Sister James Lorene, CSJ, "Developing Language Through Vertical Learning and Horizontal Association, Volta Review, 67 (March, 1965), 201-207.

for classroom use, and there has been concern with the role of the library in deaf education.

Tests.--There has been concern with appropriate psychological tests for the hearing handicapped, intelligence tests, and with reading test norms during the last decade.

Vernon and Brown composed a guide to psychological tests and testing procedures for use with deaf and hard-of-hearing children, making suggestions for choosing proper tests, and comparing commonly used instruments and their validity for use with the hearing handicapped.³⁶

They put forth seven considerations for intelligence testing: (1) an intelligence test for the hearing handicapped must be non-verbal to adequately indicate their potential; (2) scores on preschool and early school deaf and the hard-of-hearing tend to be extremely unreliable; (3) there is far more danger that a low score is wrong than that a high one is inaccurate; (4) intelligence tests given to the deaf or the hard-of-hearing are subject to greater error when given by those not experienced with the hearing handicapped than when they are given by someone who is familiar with the problems of the deaf; (5) the performance scale is only half or less of the tests, and to approach the validity of a full test, two should be given; (6) timed tests used with the deaf or the hard-of-hearing are not as valid

³⁶McCoy Vernon and Donald W. Brown, "Guide to Psychological Test and Testing Procedures in the Evaluation of Deaf and Hard-of-Hearing Children", Journal of Speech and Hearing Disorders, 29 (November, 1964), 415, 418.

as those which do not stress time; and (7) group testing of the deaf or the hard-of-hearing is highly questionable and of use only as a gross screening procedure. Suggested tests are the Wechsler Performance Scale for Children, the Wechsler Performance Scale for Adults, the Leiter International Performance Scale, the Randalls Island Performance Test, and Raven's Progressive Matrices. The Wechsler scales are considered the best tests for use with the hearing handicapped. However, Raven's Progressive Matrices provide good substantiation of another, more comprehensive test, and the Randall's Island Performance Test is excellent with pre-schoolers. The Leiter International Performance Scale presents a problem in interpretation of scores since the absolute normal score is 95 instead of 100, as on other tests, but it is considered good for evaluation of disturbed deaf children. Other tests considered by Vernon and Brown are the Chicago Non-Verbal Examination, the Goodenough Draw-a-Man Test, the Grace Arthur Performance Scale, the Merrill Palmer Scale of Mental Tests, the Nebraska Test of Learning Aptitude, and the Ontario School Ability Examination.³⁷

Vernon and Brown also make suggestions of test batteries to screen for brain injury and to determine the potential of school-age deaf and hard-of-hearing subjects. The Bender-Gestalt test and the Wechsler performance scales

³⁷Ibid., 419.

are considered good as are Graham and Kendall's Memory for Designs Test, the Ellis Visual Designs Test, and the Strauss-Werner Marble Board Test. The Rorschach Test has dubious value. Batteries on four levels are suggested for determining potential. For preschoolers, the Leiter International Performance Scales, the Merrill-Palmer Scale of Mental Tests, and the Randall Island Performance Tests are suggested. The Leiter Scale, the Wechsler Performance Scale for Children, the Nebraska Test of Learning Aptitude, the Ontario Test of School Ability, the Goodenough Draw-a-Man Test, Raven's Progressive Matrices, and the Bender-Gestalt Human Figure Test are suggested for those from beginning school age through nine years. For ages nine through fifteen, five tests are suggested: the Wechsler Performance Scale for Children, the Progressive Matrices, the Chicago Non-Verbal Test, the Leiter Scale, and the Bender-Gestalt Human Figure Test. The Wechsler Adult Performance Scale, the Progressive Matrices, the Bender-Gestalt Human Figure Test, and the Stanford-Binet Memory for Designs test are suggested.³⁸

Doehring criticized Vernon and Brown, questioning the validity of a non-verbal scale. He emphasizes the point that a non-verbal IQ must not be interpreted uncritically and suggests the need to develop new procedures to assess the verbal aptitudes of deaf children. However, Vernon and Brown point out in a simultaneous note that empirical data confirms the predictive value of performance scales and that

³⁸Ibid., pp. 420-421.

a single IQ score is never used as the sole criterion of a child's aptitude.³⁹

The choice of an adequate intelligence test to be used with hearing handicapped children presents a problem because of their lowered verbal efficiency. Goetzinger et al set up a study to explore the test-retest value with the deaf of three intelligence tests: the Chicago Non-Verbal Examination, Raven's Standard Progressive Matrices, and the Non-Language Multi-Mental Test. The authors note that with the few norms established for the deaf, there are four tests, the Pintner Non-Language Test, the Digit-Symbol, Symbol-Digit Test, the Porteus Maze, and Raven's Progressive Matrices on which there is two to three years retardation dependent upon the test; and there are three, the Chicago Non-Verbal Test, the Grace Arthur Test, and the Wechsler Scales, on which there is no retardation. This raised a question about test-retest values. The subjects in the study consisted of 96 children in the intermediate department of a state school for the deaf, each of whom was administered three non-language tests in question. The subjects were retested three and a half months later. The results showed a significantly greater increase in the IQ for the Chicago and Multi-Mental tests than for the Progressive Matrices, although they showed a significant

³⁹ Donald G. Doehring, "Guide to Psychological Tests and Testing Procedures in the Evaluation of Deaf and Hard-of-Hearing Children", Reply with Rejoinder, Journal of Speech and Hearing Disorders, 30, (August, 1965), 299-301.

increase on the raw scores for the Progressive Matrices. The test-retest reliability coefficients were similar in magnitude to those reported by test makers for the normally hearing standardization subjects, mean age $18\frac{1}{2}$ months, on the Progressive Matrices and on the Multi-Mental tests. The authors postulated that lack of experience was the reason for the difference, with the assumption that reading achievement for the deaf is an index of language abilities.⁴⁰

A second study done within the last decade concerns WISC psychometric patterns among deaf children. Lavros points out that there has been much literature containing reports of quotients and related statistics from the WISC as given to different samples of deaf children, yet none show the results on the subtests or analyze the effectiveness of the scale in terms of the educational adjustments of the children. His purpose in the study was to examine subtest patterns among deaf children. The sample consisted of 59 twelve-year-old deaf pupils with a mean mental age of 12.4 and a loss of 65dB or more in the 500-2000 frequency range. The WISC was administered by one examiner who was familiar with the children, and the subtests used were picture completion, picture arrangement, block design, object assembly, coding, and mazes. The Stanford Achievement

⁴⁰Cornelius P. Goetzinger, Robert C. Wills, and Lynn C. Dekker, "Non-Language IQ Tests Used With Deaf Pupils", Volta Review, 69 (October, 1967), 500-506.

Test and Lorge-Thorndike Non-Verbal Intelligence Scale were also administered.⁴¹

Lavros reported ten major findings:

1. that the group means did not deviate from their theoretical expectations except for a statistically insignificant deviation in object assembly.
2. that individuals did not deviate from their own mean scaled score, producing a flat profile.
3. that all intratest coefficients except coding were lower than those obtained for the hearing standardization subjects closest in age.
4. that of all six WISC subtests, coding is most closely related to the sum of the remaining five.
5. that apart from coding, the intratest coefficients have nearly the same order from highest to lowest among the deaf as they do among the standardization subjects.
6. that as an aspect of general learning capacity the coefficient of correlation between the WISC quotient and that of an abstract non-verbal intelligence test was approximately the same as that obtained when pairs of performance tests were correlated.
7. that block design among the WISC subtests correlates as well with the Lorge-Thorndike as it

⁴¹ George Lavros, "WISC Psychometric Patterns Among Deaf Children", Volta Review, (November, 1962), 547-552.

- does with the WISC quotient.
8. that when the WISC was studied for specific classroom subjects, all the mean quotients and subtest scores in the thirteen differentials between those below and above the mean in paragraph meaning, and arithmetic comprehension were statistically significant in favor of those above the mean.
 9. that in both arithmetic comprehension and paragraph meaning, coding and block design were strongest in differentiation.
 10. that since quotients are sometimes prorated and prognoses are outlined on the basis of some of the subtest of the WISC, the position of coding and block design as sensitive indicators of the total WISC outcome and of its relationship to general abstract intelligence and specific achievement should be noted.⁴²

Little has been done with reading test per se during the last decade. However, two studies concerned with reading test norms have been made.

Wrightstone et al attempted to develop reading test norms for deaf children, on the Metropolitan Achievement Tests, Test 2, Reading. The norming population consisted of 5, 307 pupils in 73 special schools or classes in the United States

⁴²Ibid., p. 550.

and Canada who took the test in 1959. Their chronological ages ranged from $10\frac{1}{2}$ years to $16\frac{1}{2}$ years, 47.7% were female, and 52.5% were male. The mean hearing loss in the better ear was 84dB. The percentile ranks were differentiated with respect to age in order to maintain the relative status, and to obtain standard reading ratings, the raw scores were converted to a nine point standard score system with a median of five and a standard deviation of two. The authors recommend the use of both. In using the tests results, the authors made their evaluations in terms of individual characteristics and of the characteristics of the measures obtained. The standard deviation on the Kudeer-Richardson reliability coefficient and related data was found to be three standard deviation points. There were differences found in the study for children grouped by age according to the degree of hearing loss.⁴³

The second study was done by Furth with the purpose of comparing the scores obtained by the deaf subjects in the Wrightstone et al study discussed above with scores of hearing subjects. He took the silent reading achievement scores of the deaf subjects and compared them to the grade equivalent of the hearing norms, using grade 4.9 as the cut-off point between those with functional ability and those who cannot be said to know written language. The results showed that when hearing norms are used, the percentage of those

⁴³J. Wayne Wrightstone, Miriam S. Aronow, and Sue Moscovitz, "Developing Reading Test Norms for Deaf Children", American Annals of the Deaf, 108 (May, 1963), 311-316.

attaining a functional score is considerably lowered. In the six one year age levels ranging from 10½ years to 16½ years, the percentage scoring at 4.9 or better were respectively 1, 2, 6, 7, 10, and 12. Furth concluded that this provides as valid an estimate as one could want as to the present proportion of deaf pupils who reach a functional level of linguistic competence, and that reading instruments presuppose linguistic competence which the deaf do not possess, so that their low reading level does not indicate reading deficiency, but linguistic incompetence.⁴⁴

Reading Instruction.--Reading and language arts are mingled in instructional materials for the deaf, but since the reading and linguistic problems of the deaf and those of the hard-of-hearing are often similar, the materials may be considered applicable to the hard-of-hearing.

The natural or developmental language approach is most commonly used among instructors of the deaf. Wooden discusses the Thompson technique of instruction. He notes first that normally hearing children learn both concrete and abstract concepts from concrete situations and that the deaf may learn likewise, but have problems with language in the area of irregular constructions, non-phonetic spelling, idiomatic expressions, metaphors, and multiple meanings as well as types of words. The Thompson materials consist of

⁴⁴Hans G. Furth, "Comparison of Reading Test Norms for Deaf and Hearing Children," American Annals of the Deaf, III. (March, 1966), 461-462.

profusely illustrated mimeographed booklets in which concrete situations illustrate not only concrete concepts but the meaning of words with abstract or subtle meanings. A meaningful activity is connected with each lesson, and opportunity for individual work or for repetition is provided. Wooden makes five suggestions regarding this material: that a better vocabulary in which each word is introduced in one concept at a time is necessary; that there be greater emphasis on the development of structure words; that there be dramatization or illustration of the language at the time of presentation; that captioned sound films, slides, and teaching machines be developed to facilitate the learning task, and that the significance, development and use of the child's inner language be determined in all aspects.⁴⁵

Elliott has developed a set of color coded blocks for instruction in language patterns and sentence structure. These are very definitive in aspect. All the parts of speech are represented with their various functions. Nouns are divided into common (dark blue), proper (light blue), and objective case (dark orange); verbs are divided into intransitive (dark red), transitive (red-orange), and copulative (coral); and adjectives are divided into descriptive (yellow), color (chartreuse), and number (green). Other categories include articles and punctuation, nominative pronouns,

⁴⁵Harley Z. Wooden, "Dramatized Language for the Deaf", Exceptional Children, 29 (December, 1962), 155-163.

conjunctions, possessive pronouns, objective pronouns, adverbs, and prepositions. Words which are similar in function are represented by similar colors. Linguistic patterns may be emphasized and sentence patterns repeated without loss of interest.⁴⁶

Similar materials have been developed for verbs by Sister Mary Therese, SSND. These consist of a pack of fifty cards, each picturing a verb and its action. First, the verb is introduced in an informal situation, then one picture is selected, and the printed form of the chosen verb is presented with it for discussion. The verb is dramatized, and other pictures, some with common elements, other with "jokers", are presented. Finally, the pupil reads directions using the verb.⁴⁷

Reid discussed verb materials which are slightly different in aspect. The Rocky Mountain Special Education Instructional Materials Center, situated at the Colorado State College, campus in Greeley, responded to teachers' requests for large, stimuli-free, proportionately sound materials depicting action verbs for instruction. The center developed a Deaf Education Package consisting of flip books, a 16mm film loop and individual projector, a picture wheel, and a tag board test. The flip books are three-by-three

⁴⁶ Shirley S. Elliott, "Structural Language Blocks", Volta Review, 66 (September, 1964), 526-531.

⁴⁷ Sister Mary Therese, SSND, "Illustrated Verbs", Volta Review, 66 (May, 1964), 272-274.

inch sheets showing a figure in developmental action and stapled together so that as they are flipped, the pupil sees a particular action occur. The 16mm film loop illustrates a single printed phrase in which the action verb pictured is underlined while the action is carried out, and the picture wheel presents variations of the action. The tagboard test presents four pictures showing various verbs from which the pupil is to choose the correct one. Further research is being done with this material.⁴⁸

Miller has discussed current practices in language instruction which might be considered as material for the eclectic approach. The Wing symbols are used for teaching grammatical construction, and are placed over a word, phrase, or clause to demonstrate the form, function, or part of speech used, as in this sentence: Mary's mother gave John a piece of birthday cake. They may be used to indicate a possessive (1), subject (2), verb (\sim), adjective (adj), indirect object (--o), object (o), or prepositional phrase (----4). A second means of demonstrating structure is the Barry Five Slate, used with lower grades. It consists of five columns into which subject, verb, object, preposition, and when may be inserted. This, however, tends to produce rigid sentence structure. The Fitzgerald Key has columns similar to the Barry Five Slate, presenting the categories

⁴⁸William R. Reid, "Action Verb Materials Developed for Deaf Children", Exceptional Children, 34 (November, 1967), 203-205.

who, what, how many, where, what was or is done, and combining them with symbols similar to the Wing symbols. Diagramming is also mentioned, with the natural method.⁴⁹

Northcott discussed the implications of Head Start for the deaf. He points out that the children involved in Head Start often function as hearing-impaired children, characterized by immature linguistic patterns, poor auditory and visual discrimination, lack of motivation, a poor self-image, and lowered scholastic achievement. He points out the need for parent involvement in order to motivate the child to relate to and respond to his environment and to use his residual hearing in order to stimulate linguistic growth, social and emotional stability and general intellectual attainment. Head Start also involves those ages most critical to language development. It provides exploratory and creative experiences; richness of variety in child-directed adult language; use of abstract concepts, syntax above the child's level of expression, and colloquial expressions; and provides training in seeing relationships and processing information in a logical sequence. Instruction which shares the varied and exciting aspects of daily life, uses supplementary materials, expects the class not only to read for information but to form opinions, express attitudes, and make judgments, and attends to the logic of

⁴⁹June Miller, "Practices in Language Instruction", Exceptional Children, 30 (April, 1964), 355-358.

thought as well as semantics is provided. All of this is essential in language instruction for the deaf.⁵⁰

There has been little if any work done with basal readers for the deaf, although various workbooks and similar materials are mentioned as useful for teaching reading to deaf children by Hart. Newspapers and magazines suggested by Hart are My Weekly Reader--Surprise, editions one, three, and six, Scholastic Magazine's News Pilot, News Ranger, News Trails, News Explorer, and News Time, and Reader's Digest, Reading Skills Builder. For source of exercise work, she suggests Practice Exercises in Reading--Books III, IV, V, VI, Types A, B, C, and D, and three workbooks published by Webster Publishing Company, Primer Seatwork, First Reader Seatwork, and New Practice Readers, Books A, B, C. Workbooks suggested by Hart are Mother Hubbard, # 1, # 2, published by E. M. Hale and Co., Learning Letter Sounds, published by Houghton, Mifflin, and Co., Phonics We Use, books A through F, published by Lyons and Carnahan, and the Diagnostic Reading Workbook Series published by Charles E. Merrill, Co..⁵¹ These are materials common to remedial reading classes.

⁵⁰Winifred Nies Northcott, "Head Start Programs, Implications for Deaf Children", Volta Review, 70 (February, 1968), 106-113.

⁵¹Beatrice Ostern Hart, Teaching Reading to the Deaf, p. 131-132.

Little concern with special orthographies has been expressed among teachers and researchers involved with the acoustically handicapped. Because no research is available on it, writers must content themselves with discussions of the possible advantages and limitations.

Withrow compares the Augmented Roman Alphabet with the Northhampton charts, a phonetic scale commonly used with the deaf. He notes that between the everyday orthography and phonetic scale of the Northhampton charts and the International Phonetic Alphabet, the chief advantages are consistency, few symbols, and the similarity to conventional orthography. Another advantage is that the pupil would be able to read and write anything he already knows. However, he also points out that the success of the phonetic alphabet is dependent upon a wide vocabulary, and since the vocabulary of a deaf child is limited, this would be a drawback. Also, the acoustically handicapped tend to be visualists, and since a phonetic alphabet is based on sound, this would be yet another difficulty. Withrow concludes that there is not enough material available to determine the usefulness of the Augmented Roman Alphabet.⁵²

Duffy discusses the use of the initial teaching alphabet which is in use at the Oldham School for the Deaf in Oldham, England for reading instruction. He discusses Sir James

⁵²Margaret S. Withrow, "Augmented Roman Alphabet: Can It Be Used for Teaching the Deaf?", Volta Review, 66 (September, 1964), 540-543.

Peltham's views extensively, pointing out that the linguistically deprived should benefit from a linguistic exercise which confirms and teaches simultaneously. Duffy points out that with one sound per symbol, the pupil can write, say, and articulate individual sounds so that reading, writing, and speaking develop simultaneously with language concepts.⁵³

Programmed instruction and computer education roused much interest and discussion during the last ten years. Rush experimented with programmed material for written language skills by attempting to train short-term memory through visually presented programmed materials. She hypothesized that (1) misuse or omission of function words might be due to the deaf pupil's inability to sustain memory traces for meaningless words; (2) systematic control of visual stimuli should result in more immediate recall; (3) systematic practice in the recall of functional words in context with words which have lexical meanings should produce correct syntactical language, and (4) a self-administered program which controlled the visual stimuli and assured correct recall of small units of visual symbols should terminate in the production of complete meaningful sentences with all the functional words intact and in proper syntax.

The sample consisted of 38 deaf children, age 11 to 17 years, with a mean IQ of 82, from a state school for the

⁵³John K. Duffy, "ITA and the Hearing Impaired Child", Volta Review, 68 (February, 1966), 150-153.

deaf. The materials were 29 frames with 66 pictures divided into five sections, worksheets, and cards to match. The written task increased until the subjects were writing complete sentences in proper syntax. A pretest and a post-test were given, with the mean scores at 49.5 and 60.5 respectively. The subjects were checked for retention two and four weeks later, with mean retention scores of 59.6 and 59.2 respectively. Rush concluded that visual memory training for small units of meaningful language was helpful to the deaf child in remembering language patterns, that programmed instruction is one medium through which meaningful units can be visually presented, controlled and extended, and that through reinforcement, the learner can be trained to recall longer and longer units of sentence patterns. She also suggested that there were implications for the wider application of programmed techniques in teaching written language skills to the deaf and to other handicapped people.⁵⁴

Another experiment done by Rush concerned programmed instruction and directions. Rush comments that the deaf child must acquire the language involved in directions with special effort. Since such language is not familiar to him, he had difficulty distinguishing directions from content. She therefore surveyed current texts, workbooks, and standardized

⁵⁴Mary Lou Rush, "Use of Visual Memory in Teaching Written Language Skills to Deaf Children", Journal of Speech and Hearing Disability, 31 (August, 1966), 219-226.

tests on all grade levels for needed concepts, devising a test from them, and using the results to develop a program of instruction. Rush's sample consisted of 57 deaf children in seven classes, grades four through seven, five of which were in residential schools, and two of which were in day school. Their ages ranged from 10-10 to 18-9, and their reading achievement ranged from 2.1 to 5.1.

The entire sample was administered a pretest, on which the mean was 46.5, and a post-test on which the mean was 65.0, and a gain of 18.5 was made. To determine the practice effect, a sub-group of 24 pupils took a retest before the administration of the program. The mean for the pretest was 53, for the retest was 58, and for the post-test was 73, with a gain from retest to post-test of 15. The control group of 33 pupils took no retest, and had a mean of 42 on the pretest, a mean of 57 on the post-test, and a gain of 15. The results showed the practice effect to be significant at the .01 level, with a mean gain three times that of the practice gains. Seventy-nine percent of the subjects scored higher than the practice effect differential. Younger children with lower reading score made more errors, but the comparison was not statistically significant. Rush concluded that programmed instruction in the language of directions might be an effective and economical procedure with elementary deaf students in need of it.⁵⁵

⁵⁵Mary Lou Rush, "Programmed Instruction for the Language of Directions", American Annals of the Deaf, 109 (September, 1964), 356-358.

Sister James Lorene, CSJ, discusses the use of slides to develop language skills through vertical and horizontal associations. These are used to develop vocabulary and categorization with horizontal categories and vertical parts, or to develop structural concepts, for instance, presenting a verb and its object. She bases the material on eight principles: (1) that new learning is vertical; (2) that horizontal learning associates vertical learning in new areas of vertical development; (3) that the language should be receptive and expressive; (4) that vocabulary should be useful; (5) that the teacher should be aware of the difficulty of phonating particular words; (6) that rote learning is of little value; (7) that tests should determine the degree of language competence achieved; and (8) that this is only one of many methods.⁵⁶

A slightly different aspect of programmed instruction, computer-assisted instruction, has been discussed by Rathe, who considers it promising material. There are three approaches to CAI: drill and practice to augment class learning; tutorial, in which the computer takes over instruction; and dialogue, in which it is used for stimulation and gaming exercises. The programs make the computer work, and it is up to the coursewriter to establish a vocabulary close

⁵⁶Sister James Lorene, CSJ, "Developing Language through Vertical Learning and Horizontal Associations", Volta Review, 67 (March, 1965), 201-207.

to the teacher's working idiom. Rathe notes that the program's efficiency depends upon that of the educator. Specific problems in deaf education involved are that the drill and practice is not effective unless the pupils already have a background for it, and that the tutorial and dialogue aspects of CAI present visual instruction, dealing effectively with the problem of hearing. Rathe suggests that CAI has potential for use with the deaf because it does not discriminate between the deaf and hearing and it individualizes in response to the student's individual progress rather than presenting an inflexible programmed sequence.⁵⁷

Beckmeyer experimented with programmed instruction and remedial reading for the deaf. His objectives were to determine whether programmed teaching materials not originally intended for the deaf might be used to teach reading to a group of deaf children retarded one or more years in reading and to determine the validity of the stated grade level achievement prerequisite for the use of the materials. The subjects were ten pupils from Mill Neck Manor Lutheran School for the Deaf, Long Island, and were divided into high and low ability groups equated for chronological age and IQ. They were administered the California Achievement Test. The materials were three units of a linear type remedial reading program, Phonetic Analysis I and II, and Structural Analysis,

⁵⁷G. H. Rathe, Jr., "Computer-Assisted Instruction: Promising New Tool for Teaching Deaf Students", Volta Review, 70 (September, 1968), 447-452.

published by the Center for Programmed Instruction, New York. The program was administered in the classroom by teachers previously acquainted with the nature of the program materials for thirty minutes a day. Pre- and post-tests were given. Group A, the high reading ability group, was found to be superior to group B, the low reading ability group. Group A also found the material easier and learned more from it. Beckmeyer concluded that the success of group A indicates the possibility of use of programmed teaching materials with deaf pupils as long as ability and achievement level is considered.⁵⁸ However, nothing was done with the data from group B, and it would be interesting to know what the pre-test and post-test results showed for each group.

A special program, Project LIFE, was set up under the directorship of Wooden to produce programmed material for remedial reading instruction for hearing impaired children. Wooden and Willard introduced the program in the American Annals of the Deaf as being set up by a committee of representatives from various organizations involved with the hearing impaired, AGBND, CEASD, CAID, and CED, to investigate the need for special materials, compile a list of those materials already available, and to produce materials for and

⁵⁸Theodore Beckmeyer, "Application of Programmed Instruction to Remedial Reading for the Deaf", Volta Review, 65 (October, 1963), 415-417.

an audio-visual approach to language instruction for hearing impaired children.⁵⁹

Wooden discusses the program in full in a later article. A six point rationale has been developed for the program in which recognition is made of the deaf child's retardation in communication skills, of his need for language based on experience, of the need for categorization of experience on the basis of concept development rather than subject, of the sequential nature of development; of the dependency of vocabulary and language upon concept formation, and of the fundamental nature of thinking skills. Past problems with which these materials are intended to deal are dependency of vision for communication while studying illustrations, and difficulties with linguistic structure. The actual teaching materials consist of a book presenting a series of pictures illustrating sentences with specific concepts. The teaching machine presents programmed language via print, speech-reading, and aural presentations. Other materials include filmstrip and movie projectors, a headphone equipped tape player, and a notebook to record responses and progress. The movies are intended to present a single concept such as proper verbal labels for time or verb tenses, spatial relationships, and various kinds of movement as well as to furnish background for

⁵⁹Harley Z. Wooden and Lorna L. Willard, "Project LIFE, Language Improvement to Facilitate Education of Hearing Impaired Children", American Annals of the Deaf 110, (November, 1965), 541-552.

the next lesson, language reinforcement, and reinforcement of speechreading. The project itself has four objectives: to catalog available audio-visual materials rich in potential for primary language instruction, to make the list available to those in the profession, to recommend to commercial producers additional items needed and finally, to provide a program for language centered around concepts of self, the physical environment, and social relationships.⁶⁰

Audio-visual materials are essential in any up-to-date program, and are particularly important in the instruction of the acoustically handicapped. Stepp suggests the use of motion pictures, filmstrips, and overhead projectors not only as a focal point for visual study, but for study materials for captioning, identification, and classification as well. He points out that the filmstrip has become an essential resource in most classrooms, but like the opaque projector, requires a dark room. The overhead projector, on the other hand, has a variety of uses, may be used in a lighted room, and allowing the instructor to face the pupils. This is essential for those who speech-read. It has the added advantage of allowing the addition of comments, labeling, development of sequential overlays, and progressive disclosure.

⁶⁰Harley Z. Wooden, "Audio-Visual Approach to Language Instruction of Children with Severe Hearing Impairments: Project LIFE", Audio-Visual Instruction 11. (November, 1969), 712-746.

An important innovation in audio-visual aids is cartridge-loaded equipment, which puts the experience into the students' hands and provides mechanical media for individual study. Stepp points out that while programmed material provides specificity of purpose, logical structure and sequence, and freedom for the pupil to proceed at his own rate, they require active interaction from the learner for maximum effort. Finally, Stepp suggests that in providing optimal classroom environments for the acoustically handicapped, attention should be given to non-glare lighting, acoustical specifications, the elimination of extraneous noise, and an amplification system.⁶¹

Dixon, Chapman, and Welch discuss the use of audio-visual aids with hard-of-hearing children in the Robert L. Mueller School special class in Chula Vista. A floor microphone is used to allow the children to hear the teacher, themselves, others, and environmental noises; and a dual track tape recorder is provided for imitation of the teacher's speech and comparison of the pupil's speech with it. For word and rhythm patterns, the Language Master is used, which consists of flash cards with a strip of tape across the bottom which present words and their usage. This gives the child inflection and practice with context clues. The primary difficulty with this is that there is a shortage of vocabulary

⁶¹Robert E. Stepp, "Educational Media and Deaf Education: The Emerging Literature", Volta Review, 70 (November, 1968), 465-471.

materials at the various levels of learning and that materials are not coordinated with the curriculum. Filmstrips are presented on a daylight screen. These are used as preview materials and are coordinated with the Weekly Reader. The short strip viewer, an individual slide viewer type of teaching machine, allows the pupil to preview or review subject matter. On field trips, a portable transistor tape recorder and a polaroid camera are used to record sounds and pictures for auditory training later. A phonograph and records are also used with simultaneous presentations of pictures for auditory training. Some records mentioned are Learning to Listen (John Tracy Brown), Songs for Children with Special Needs (Boroman Records), Estamae's Toy Shop Album (Pueblo, Colorado), Sounds Around Us, (Scott Foresman), and What's Its Name (Jean Utley). Other audio-visual aids used are the tachitron, or personal tachistoscope, maps and globes, an auditory training unit, a portable amplifier, and individual hearing aids.⁶²

The use of the overhead with the deaf is discussed by Meier. Since interruption in eye contact with the deaf interrupts the learning process, and problems of attention span and discipline are even more crucial with deaf pupils than with hearing pupils, he considers the overhead a good

⁶²Carmen Dixon et al, "A-V Aids for Hard-of-Hearing Children", Educational Screen and Audio-Visual Guide, 43 (November, 1964), 642-643.

unifying device. Meier suggests the revelation technique and also teaming the overhead with flash cards, chalkboards, and realia for maximum learning.⁶³ Thomure also discusses the use of the overhead specifically in reading instruction in the second grade. He makes nine suggestions for its use: (1) use of the bouncing ball effect to develop correct eye movement and rhythm; (2) elimination of the possibility of getting the story from pictures alone; (3) drawing lines and arrows on the page as it is read to show time sequences; (4) addition of Wing symbols; (5) writing the pronunciation above a difficult word; (6) leaving new vocabulary and its meanings projected on the screen for reference, (7) projection of discussion questions; (8) introduction of poetry; and (9) the projection of quick quizzes.⁶⁴

Finally, Cross discusses uses of television with the deaf. It provides practice in speechreacing, but without subtitles, is difficult to follow for entertainment. Mention is made of a BBC series, For Deaf Children, which provides captioned entertainment. Psychologically, it makes the child feel more a part of his family, a part of his world, and helps him become a more interested and interesting person. As a teaching medium, it allows vicarious experience of various life situations, showing gesture, facial expressions, and

⁶³Harold R. Meier, "Using the Overhead with the Deaf", The Instructor, 77 (March, 1968), 40-41.

⁶⁴F. E. Thomure, "In South Dakota: New Potential for Teaching Deaf Children", Audio-Visual Instruction 7, (April, 1962), 210-211.

reactions. Syntax and vocabulary for specific situations is also developed. Closed circuit television is also good for presentation of speech-reading lessons.⁶⁵

Library materials are an integral part of a reading program for the deaf. McMahan discusses the new role of the library in deaf education. She envisions the library as an educational media center providing print materials, captioned motion pictures, filmstrips, slides, overhead and opaque projectors and materials, teaching machine programs, maps and globes, and demonstration materials. McMahon suggests that the library should be a means of conveying information in efficient and meaningful ways to the students. To further this purpose, she suggests that isolated carrels with movie, filmstrip, tape, or slide projectors be provided for individual study, and that packages of filmstrips, transparencies, film cartridges, tapes, or maps and question brochures on various subjects be provided for study.⁶⁶

Cory makes similar suggestions in "Report on Library Programs in Schools for the Deaf".⁶⁷ She has also discussed a library reading project for teenagers. This involves the use of library books for reading instruction. Classics in

⁶⁵B. G. Cross, "At Work and Play: Television in the Lives of the Deaf and Hard-of-Hearing", Volta Review, 69 (March, 1967), 203-207.

⁶⁶Marie McMahon, "Educational Media Center--The Library's New Look", American Annals of the Deaf, 112 (November, 1967), 708-709.

⁶⁷Patricia B. Cory, "Report on Library Programs in Schools for the Deaf", American Annals of the Deaf, 112 (November, 1967), 708-709.

adolescent literature are read and explanations written. Archaic words are deleted and complex sentence patterns are simplified to provide contemporary literature on a reading level consonant with the deaf adolescent's reading skills. Questions about setting, time, characters, style, and theme are prepared, and the comments are compiled. The books are chosen on the basis of appropriateness to the students' interests and reading ability. The program provides guided reading with the purpose of fostering self-sufficiency in leisure reading.⁶⁸

Summary

Educators of the deaf have been particularly concerned with updating methods and materials of language and reading instruction based upon empirical data about the development of acoustically handicapped students. Research and discussions have reached into many areas such as cognitive development, natural language or developmental instruction, eclectic approaches, stimulus-response approaches, tests, materials, and library facilities. However, there are many areas in which discussion is rampant and research is vague or non-existent.

⁶⁸Patricia B. Cory, "Special Library Reading Project for Teenagers", Volta Review, 66 (February, 1964), 63-66.

CHAPTER III

METHODS AND MATERIALS

Literature and research during the last decade has explored the usefulness of several methods and of many types of materials in teaching language arts and reading to the deaf. Since the hard-of-hearing have language problems similar to those of the deaf, such methods and materials would seem applicable to remedial reading instruction for the hard-of-hearing.

Definition of Terms

Hard-of-Hearing.--The hard-of-hearing may be distinguished from the deaf by the use of three criteria: age at which the loss occurred; the amount of rehabilitation possible; and a quantitative evaluation.¹ If the loss occurs after speech patterns have been established, no severe retardation in speech or language development occurs, and normal communication and educational development is possible.² If the impaired hearing can be raised to a functional level by the use of a hearing aid or by surgery, the child cannot

¹John O'Neill, The Hard of Hearing, (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1964), p. 2.

²Ibid..

be considered truly deaf.³ A quantitative evaluation through the use of an audiometer distinguished not only between the hard-of-hearing and the deaf, but also among the hard-of-hearing. This criterion uses the average loss of hearing for pure tones within the speech range of 500 - 2000 cps, designating a loss of 20-40dB as mild, of 40-60dB as moderate, and of 60dB or more as severe. A loss of 80dB or more places the subject in the category of deaf.⁴

Two other criteria for distinguishing among the classes of hard-of-hearing which may be important to the reading clinician in diagnosis and instruction are speech reception and speech discrimination. Speech reception is the ability to comprehend spoken words; speech discrimination is the ability to distinguish phonemes and use them to aid speech reception. For a slight hearing loss, the speech reception test results will be similar to the pure-tone test results, and will reflect the average loss for the better ear. Speech discrimination within the normal hearing range will be slightly lowered if noise is introduced.⁵ For a moderate loss, the speech reception test results will also agree with the pure-tone test results unless the audiometric curve drops sharply, in which case, the results may be poorer than the better ear. Speech discrimination will be slightly

³Ibid., p. 3.

⁴O'Neill, The Hard-of-Hearing, p. 3.

⁵Ibid., p. 74.

lowered, and the subject will be able to comprehend 80-90% of what is said.⁶ Finally, for a severe loss, speech reception test results may vary 10-15dB from the pure-tone test results and may reflect the average loss for the poorer ear, while speech discrimination is greatly lowered, and the subject can comprehend only 30-70% of what is said.⁷ Speech reception and speech discrimination, therefore, are of concern to the reading clinician, since the basic reading skills of auditory perception and auditory discrimination are involved.

Acoustic Deficiency and Auditory Perception.--A second distinction to be made is that between acoustic deficiency and poor auditory discrimination. The former may cause the latter, but although the symptoms are similar, they are two different problems. An acoustic deficiency is a functional disruption of the hearing apparatus, which results in the inability to discriminate among sounds. Poor auditory perception is a lack of knowledge of sounds which results in the inability to discriminate among them. The one may or may not be remedied by the use of an aid or by surgery and by auditory training; the other may be remedied by auditory training and instruction in the discrimination of sounds.⁸

⁶Neill, The Hard of Hearing, p. 75.

⁷Ibid.

⁸Karl G. Garrison and Dewey G. Force, jr., The Psychology of Exceptional Children, (New York: Ronald Press Co., 1965), p. 219.

Natural or Developmental Language.--Bond and Tinker note that impaired hearing may be either a cause of poor reading or an impediment which must be overcome by the reader.⁹ They also note that reading achievement is dependent upon language development and speech facility, since instruction in reading involves many oral and aural activities.¹⁰ Insufficient language development or speech facility, then, might indicate the need for the natural language or language development approach. The child whose language skills are so deficient that he cannot communicate well orally needs developmental instruction in those skills before he can experience success in reading. At the same time, it may be desirable to avoid delay in beginning reading instruction. Such a case may profit by exposure to language structured in appropriate English and presenting the syntactical meaning of words without a plethora of complicated rules while strengthening the skills already learned. In such a case, a method involving the manipulation of visual, coded representations of language units, such as Krug¹¹ discusses, may give the child the linguistic background needed while enabling him to begin reading instruction.

⁹Guy L. Bond and Miles A. Tinker, Reading Difficulties, Their Diagnosis and Correction, (New York: Appleton-Century-Crofts, 1967), p. 112.

¹⁰Ibid..

¹¹Robert F. Krug, "Approach to Teaching Language to Young Deaf Children", American Annals of the Deaf, 110 (November, 1965), 591-597.

An older child, better versed in language usage, yet lacking some language skills and some concepts, may respond to language development through experience, learning thought processes, sentence organization, vocabulary, and idiomatic language as the need arises in his daily experience and his reading instruction. Listening, speaking, reading, and writing would then be combined to provide for his more advanced needs, much as they are combined in Caldwell's methods.¹²

The approaches discussed by Krug and Caldwell, since they involve basic language instruction along with fundamentals of reading, might serve for a developmental primary case or a remedial intermediate case. However, with a developmental intermediate case or a remedial junior or senior high school case, Schmitt's language building method¹³ may be more feasible, building vocabulary and syntax inductively from word-order patterns through types of discourse, and developing a conceptual basis for language usage through experience.

All three approaches to language development, then, have value in remedial instruction. However, Krug's approach has the possibility of developing a rigid concept

¹² Elizabeth H. Caldwell, "Some Adventures in Language Development:", Volta Review, 63 (February, 1961), 64-66.

¹³ Philip J. Schmitt, "Language Instruction for the Deaf", Volta Review, 68 (January, 1966), 85-105.

of language structure as the pupil's comprehension and expressive needs mature. This means that while the approach may be useful with pupils who are in need of readiness or who are on the primary level, it would be either modified or discarded as their language skills improve. Caldwell's approach, on the other hand, need not be limited to older pupils, but is useful on all levels, provided some language skills are possessed by the pupil. Flexibility of thought and language structure is not only permitted, but encouraged, more closely approximating the usual reading or communication situation. That is also an advantage in Scmitt's approach, which extends language experience to the various levels of listening, speaking, reading, and writing skills, making it useful especially with the high school, college, or adult developmental or corrective case.

The language development or natural language approach in use may be an aid in eliminating the child's confusion over some linguistic aspects of reading which must commonly be taught by sight or rote. Sister Anna Rose mentions this regarding such aspects of vocabulary as synonyms and their shades of meaning, root words, the use of prepositions to change meaning, and idiomatic expressions.¹⁴ Scott discusses its use with five- and six-year olds for the development of who and action words as well as

¹⁴Sister Anna Rose, "Factors Which Influence Language Learning", National Catholic Education Association Bulletin, 57 (August, 1960), 443.

general language usage and reading instruction,¹⁵ and Sister James Lorene applies the method to primary instruction in pronouns.¹⁶ Finally, Sweeney uses letter writing in the natural language approach to develop written language skills.¹⁷

Eclectic Approach.--Although such authorities as Hart and Stafford question the applicability of a basal or eclectic approach for instruction of the deaf because of the conceptual difficulty, the advantage of sequential instruction in phonetic and structural analysis and in the use of contextual clues cannot be overlooked in remedial instruction. It is well to attend to individual differences and needs as they arise through the use of study questions and words or phrase lists.

Since vocabulary concepts may present difficulty when an eclectic method is used, Sister Ann Bernardine takes care to develop words conveying emotion. She lists the words and their meanings in different situations, then has one child begin a sentence in which a particular word must be used, and has another complete it. Synonyms and antonyms are pointed out, and quotations using the words are printed on scrolls and matched with the lists. Such an approach

¹⁵Elizabeth V. Scott, "Language and Reading", Volta Review, 64 (March, 1962) 128-132.

¹⁶Sister James Lorene, "Pronouns Puzzle Primary Pupils", Volta Review, 62 (January, 1960), 17-19.

¹⁷Mae M. Sweeney, "Project: Letter Writing", Volta Review, 70 (February, 1968), 120-121.

helps to eliminate some conceptual difficulties.¹⁸

Another problem with basal readers in the eclectic method is that the deaf and hard-of-hearing are prone to read the pictures, not the stories, particularly during the early stages of instruction. By covering the pictures and permitting the child to see only one picture, that for the page he is reading, Newton finds that the formation of mental pictures and the use of the picture as an aid to meaning rather than a substitute for reading is encouraged.¹⁹

Structural and phonetic analysis may be overstressed, yet not be completely helpful to a child who has difficulty in hearing phonemes. Sterne suggests placing more emphasis upon configuration and contextual clues for improved word recognition. She develops the use of contextual clues by having the pupil read the sentence containing the word first, then the preceding and following sentences, and finally the paragraph, looking for explanatory words, clauses, or phrases, noting mood and atmosphere, and attempting to capture a sensory impression.²⁰ This, too, is a means of overcoming conceptual difficulties.

¹⁸Sister Ann Bernardine, "Let's Increase Their Vocabularies", Volta Review, 66 (May, 1960), 218-219.

¹⁹M. G. Newton, "Readers, Not Leaf-Turners", Volta Review, 66 (February, 1964), 67-69.

²⁰Lillian Sterne, "Using Context Clues in a Reading Program for the Deaf", Volta Review, 67 (May, 1965), 371-375.

Finally, the use of dictionaries to define structural derivatives, to clarify multiple meanings by the substitution of words in sentences, and to develop semantic understandings is advocated by Pugh.²¹ This provides practice in an essential reference skill and helps to develop vocabulary concepts.

The above are representative of many ways in which the eclectic method may be adapted for use with the hard-of-hearing pupil who needs developmental, corrective, or remedial reading instruction and who has a good command of listening and speaking skills. The eclectic method can, properly used, help such a pupil to reading success.

Stimulus-Response Approach.--The stimulus-response approach, defined as programmed or computerized instruction on an individual basis, has several advantages for the hard-of-hearing retarded reader. It is visual, and therefore does not discriminate against his handicap. It also provides individual instruction paced according to the pupil's learning rate, extra practice in the concepts being taught, reinforcement, and immediate feedback. This approach is useful in the development of abstract language concepts and for instruction in difficult language structures.

All of those qualities make the stimulus-response approach a valuable supplement to other methods. However, it creates an artificial reading environment in which the skills are not fully integrated, and therefore should not be used as the only method of instruction.

²¹Bessie L. Pugh, "Teaching Children to Use the Dictionary", Volta Review, 63 (April, 1961), 178-185.

Materials

Tests.---Since the hard-of-hearing may lack certain language skills, and especially may find oral communication difficult in some situations, intelligence, achievement, and diagnostic instruments must be chosen with care. There are few tests made expressly for the deaf or the hard-of-hearing, and few standardized tests have norms for the deaf or hard-of-hearing. Indeed, since the acoustically handicapped must function in a hearing world, it is doubtful whether norms from a deaf population give a more valid indication of a hard-of-hearing person's potential than do norms from a typical population.

Some tests have been especially recommended for use with the deaf and hard-of-hearing, and have norms for the deaf.²² The Leiter International Scale requires no verbalization on the part of the examiner or examined, and is highly perceptual in nature. Raven's Progressive Matrices are good as a second test to substantiate another more comprehensive test, and the Ontario School Ability Examination, which is considered reasonably good for deaf children, age 4-through 10, is in use at some schools for the deaf.

However, there are some considerations to be made when selecting a test for the hard-of-hearing. A highly verbal intelligence test such as the Stanford-Binet Intelligence

²²McCoy, Vernon, and Donald W. Brown, "Guide to Psychological Tests and Testing Procedures in the Evaluation of Deaf and Hard-of-Hearing Children", Journal of Speech and Hearing Disabilities, 29 (November, 1964), 416-417.

scale may not give an accurate or complete indication of the subject's potential, and may present difficulties in administration, since the format is oral. Yet a performance scale alone gives no indication of verbal intelligence. The WISC or the WAIS, employing a dual scale, may yield a more accurate analysis for the hard-of-hearing, and are considered to be the best instruments for use with the hearing handicapped. For determining scholastic aptitude, a non-verbal test may, in the case of the severely handicapped hard-of-hearing subject, be advisable. In administering a reading achievement or diagnostic test, of necessity verbal, it is well to keep the possible effects of a hearing loss upon the results in mind. Some conceptual retardation, two to three, and sometimes five years, in the case of the severely handicapped, may be expected. Oral reading fluency may be affected by a concomitant speech defect, and is likely to lag behind silent reading achievement. In attempting an accurate diagnosis, a test employing norms for both normally-hearing and deaf populations, such as the Metropolitan Achievement Tests, Test 2, Reading, offers a comparison of performance on both sets of norms which could be helpful to the clinician.

The considerations proffered by Vernon and Brown²³ regarding the interpretation of tests given to the acoustically handicapped should be kept in mind and adapted to the

²³Ibid., pp. 414, 423.

particular case. The most important point is the questionable validity of verbal intelligence testing and of group testing with the hard-of-hearing. The hard-of-hearing subject may have the concept, but be unable to express it adequately verbally, limiting his response pattern. In a group, if care is not taken that he have optimal seating for visual and auditory contact with the examiner, the acoustically handicapped subject may miss pertinent instructions or, should the test involve listening skills, be unable to handle the material adequately. At all times, in any testing situation, the examiner should recognize and respond to the hard-of-hearing subject's intrinsic limitations.

Reading Instruction.--Natural or developmental language materials as discussed in various journals during the last decade, tend to be linguistically-oriented, presenting difficult aspects of language structure via simple, interesting, and meaningful media while allowing creative expression and growth in all aspects of language arts and reading. The Thompson materials discussed by Wooden²⁴ are to be used with the natural language approach, since the philosophy upon which they are based involves learning concrete and abstract concepts from concrete situations. Their visual presentation is an advantage for the hard-of-hearing pupils. This set of mimeographed booklets appears to be

²⁴Harley Z. Wooden, "Dramatized Language for the Deaf", Exceptional Children, 29 (December, 1962), 155-163.

good material for use with pupils who have limited language skills and concepts since it attempts to build language skills while developing abstract and concrete concepts. However, as Wooden suggests, this material should not be the sole basis of a remedial program, but other materials such as illustrations, audio-visual materials, or teaching machines should be used to extend the learning experience.

The materials compiled by the Rocky Mountain Special Education Materials Center are also good for remedial instruction in verbs.²⁵ The variety of material, audio-visual in aspect, presenting the verb, its action, and usage, make them useful supplements to remedial instruction. Elliott's color coded blocks²⁶ and Sister Mary Therese's verb cards²⁷ are also interesting and useful instructional supplements. Elliott's materials, presenting sentence structure in a visual mode without minimizing vocabulary and word recognition, are good supplementary materials for hard-of-hearing pupils experiencing difficulty with language structure and can be used to strengthen the use of context and structural clues to comprehension. The verb card might prove useful for vocabulary instruction on the primary or intermediate remedial levels in general.

²⁵William R. Reid, "Action Verb Material Developed for Deaf Children", Exceptional Children, 34 (November, 1967), 203-205.

²⁶Shirley S. Elliott, "Structural Language Blocks", Volta Review, 66 (September, 1964), 526-531.

²⁷Sister Mary Therese, SSND, "Illustrated Verbs", Volta Review, 66 (May, 1964), 272-274.

Although such devices as the Wing Symbols, Barry Five Slate, or Fitzgerald Key could be used in an eclectic approach, they are especially devised for teaching grammatical structure. For a pupil with poor sentence structure, these are useful, but not absolutely necessary materials. However, as Northcott²⁸ points out, such programs as Head Start use the eclectic approach, combining the qualities of both the natural language and formal, or basal approach. These are essentially readiness programs, and the variety of methods and materials used in them makes Head Start programs especially good for the hearing-handicapped retarded reader. The readiness principles involved, creative experiences, language development, and conceptual growth, are essential not only for the environmentally deprived, but for the linguistically deprived.

Insofar as basal materials in the eclectic method are concerned, most such materials used with the deaf for reading instruction are currently used in remedial reading instruction. For the hard-of-hearing, these should provide a well-rounded developmental program without the conceptual difficulties they present to the deaf. At the same time, care should be taken to see that concepts, grammatical structure, or idiomatic expressions which are difficult are understood by the pupil.

²⁸Winifred Nies Northcott, "Head Start Programs, Implications for Deaf Children," Volta Review, 70 (February, 1968), 106-113.

Supplementary work which is applicable to remedial instruction in the eclectic method is described by Sister Mary Walter. The pupils match sentences to pictures in one exercise for developing sequential comprehension. In another, action pictures accompanied by a sentence with the verb folded back are used. The child reads the sentence, inserts the verb and checks his answer. Sentence strips presenting eight pictures with elliptical sentences to which cards with past and present verbs are matched are also used.²⁹

Special orthographies are almost never used in remedial instruction. However, they do have the advantage of presenting reading as a linguistic exercise and presenting sounds through a visual key, and they allow the pupil to express himself in natural speech patterns. The primary disadvantage is the dependency upon a wide vocabulary and a working knowledge of sounds. This would make such materials extremely difficult for the hearing-impaired retarded reader.

During the last decade, programmed material has attracted much attention in research in both reading instruction for the deaf and in remedial reading. Research has shown that it is useful for teaching written language skills, the language of directions, and categorization. Its primary attribute is visual, sequential instruction proceeding according to the pupil's learning rate. Computer-assisted education, an advanced type of programmed instruction,

²⁹Sister Mary Walter, "Individual Instructional Seatwork", Volta Review, 62 (April, 1960), 162-165.

possesses similar qualities. Because of the visual attributes, both are useful materials for remedial instruction for the hard-of-hearing, although expense makes computer-assisted education unlikely material for a center. The materials developed by Project LIFE³⁰ for remedial instruction for the deaf appear excellent in the reasoned philosophy upon which they are based, and in the attempt to create materials for all aspects of reading. The multi-media material is especially good, since it reaches all aspects of language and reading development.

However useful programmed material may be in remedial instruction for the hard-of-hearing, it is well, as with most materials, to avoid overuse. While such materials are undoubtedly helpful in developing specific skills, they do not allow the integration of skills which is the key to good reading. For a remedial or corrective case, then, programmed materials may be useful, for the developmental case, their primary value is as supplementary material.

Audio-Visual Materials.--Audio-visual materials are excellent supplements to any type of instruction. Since the hard-of-hearing rely on vision as well as hearing to assimilate learning, the use of audio-visual aids is even more important to their instruction than to that of normally hearing pupils.

³⁰Harley Z. Wooden, "Audio-Visual Approach to Language Instruction of Children with Severe Hearing Impairments: Project LIFE", Audio-Visual Instruction, 11, (November, 1966), 712-746.

Films, filmstrips, television, pictures, overhead and opaque projectors, and tapes are especially useful in classroom instruction and may vitalize remedial skills and comprehension instruction. Their usefulness for study purposes should not be overlooked.

However, there are some limitations to be considered. Films, television, and tapes contain aural material which may not be grasped by the hard-of-hearing pupil who has little speech-reading skill or whose hearing loss covers much of the speech frequency range. Pre-familiarization with materials to be presented may alleviate this difficulty. Such materials should not necessarily be eliminated from the instructional program, as they do offer practice in auditory discrimination and listening skills which should be developed as much as possible. Many of the older models of opaque projectors are extremely noisy, which would lower the pupil's comprehension of an oral explanation. Again such difficulties may be overcome by explaining the material before-hand or by putting a written explanation on the projection or into the pupil's hands.

Library Materials.--Library materials are an intrinsic portion of any reading program. The suggestions for a multimedia resource library containing audio-visual aids to study as well as books for leisure reading or reference made by

McMahon³¹ and Cory³² are excellent not only for schools and special classes for the hearing handicapped, but for any educational institution.

However, while Cory's library reading program,³³ in which books are edited and simplified to bring classics to teenagers reading at intermediate levels, has good points, it has drawbacks as well. The use of library books for reading instruction builds interest and allows variety in materials. Discussions based upon these books, their settings, time characters, style, and themes, involve an integration of skills which would hopefully lead to reading growth. Also, for the retarded reader, the simplified classics are good means of gaining background material which he otherwise would lack. However, in the usual reading program, simplification of sentence structure and deletion of archaic words, or omission of long, supposedly irrelevant, and difficult passages may give the pupil a misconception of the author's style and cause him to miss details and descriptions that could add to his understanding of the setting or a character. Complexity of sentence structure is a characteristic of the English language, particularly in

³¹Marie McMahon, "Educational Media Center--The Library's New Look", American Annals of the Deaf, 112 (November, 1967), 665-675.

³²Patricia B. Cory, "Report on Library Programs in Schools for the Deaf", American Annals of the Deaf, 112 (November, 1967), 708-709.

³³Patricia B. Cory, "Special Library Reading Project for Teenagers", Volta Review, 66 (February, 1964), 63-66.

certain scholastic disciplines, and it adds variety to speech and writing. If the pupil is allowed an explanation of the difficult passage, complex sentence, or archaic word, and is helped to grasp its meaning, he is given a chance to grow conceptually.

Summary

Each of the methods, natural or developmental language, eclectic, and stimulus-response, used in reading instruction for the deaf, may be applied to remedial reading instruction for the hard-of-hearing with modifications considering both the advantages and disadvantages of the hard-of-hearing as contrasted with the deaf. Depending upon the type of case, developmental, remedial, or corrective, one or another, or a combination of these methods would be applicable.

Many of the materials used in diagnosis and reading instruction for the deaf may be used not only with the hard-of-hearing pupil, but with the normally-hearing pupil as well. The type and extent of hearing loss in the pupil may determine the choice of tests, although in most instances, an accurate diagnosis of the hard-of-hearing person, given consideration for limitation in the language skills, may be gained from individual tests.

Instructional reading materials for the deaf are highly language oriented, and many are useful more with the primary or low intermediate level than the junior or senior high school level. However, for remedial work with specific

skills, and as supplements to developmental instruction, they may prove useful. It is also well to note that reading instruction for the deaf often takes the form of remedial instruction, and therefore many materials used are common in clinical classes. Audio-visual aids, including films, filmstrips, pictures, opaque and overhead projectors, and tapes are interesting and useful materials for any reading program. However, they are especially pertinent as means of developing fluent oral-aural communication skills in a hard-of-hearing pupil.

Finally, library materials, while they may not take the form of multi-media resources, are an essential source of vicarious conceptual and linguistic development for the hard-of-hearing pupil as well as for the normally hearing pupil. Once care is taken to develop concepts and language which are unfamiliar to the pupil, the book may prove a valuable source of pleasure and instruction.

CHAPTER IV

SUMMARY

The Problem

This paper surveyed literature on methods and materials for language development and reading instruction for the deaf and the hard-of-hearing. Its purpose was to determine their applicability to diagnosis and remedial reading instruction for the hard-of-hearing. The scope was limited to the last decade, since most interest and experimentation in remedial reading has taken place during that time.

Findings

Literature from the last decade in cognitive development, methods of instructions, and diagnostic, instructional, and supplementary materials for use with the hearing-handicapped has been particularly concerned with the deaf and with language development.

Research in cognitive development has revealed that the deaf and hard-of-hearing are capable of attaining cognitive skills, but take longer than the normally-hearing. They possess fewer concepts and percepts, but are better able to relate the one to the other than normally-hearing persons.

The deaf and hard-of-hearing tend to be more dependent upon concrete attributes for reasoning and word perception. It is possible that linguistic symbols are not understood well enough for verbal reasoning. In the basic skills of speech and communication, reluctance to work with oral-aural symbols creates difficulty for both the deaf and hard-of-hearing. Difficulty in discriminating speech sounds, particularly fricatives and sibilants, makes speech discrimination difficult. Auditory training is helpful, but consideration to the communicative environment, allowing optimal aural and visual contact, must be given at all times.

Instructors of the deaf and hard-of-hearing have found that poor conceptual and language development leads to specific reading problems. Since reading is derived from the spoken language, a deficiency in aural comprehension results in limited concepts and a limited vocabulary. This leads to the tendency to reason in concrete rather than abstract terms, and to the problem of literal-mindedness.

Three particular methodologies, natural or developmental language, eclectic, and stimulus-response, have been discussed and researched during the last decade. The natural or developmental language approach is the most common in language arts or reading instruction for the deaf, because it allows development of language with reading skills. The eclectic approach, insofar as it is combined with natural language methods, is used, but educators of the deaf express reservations regarding methods using a basal reader, since the conceptual content is often beyond their pupil's

development. Stimulus-response methods have been extensively researched as visually-oriented, individualized, highly motivating programs. However, researchers, while impressed by the appropriateness of a visual methodology which does not discriminate against the deaf or hard-of-hearing pupil's handicap, recognize that such methods cannot develop all the language arts or reading skills needed.

Several tests of intelligence have been recommended especially for the deaf, including the Ontario School Ability Examination, the Leitner International Scale, and Raven's Progressive Matrices. For the hard-of-hearing, such tests may be less useful than verbal-performance scales such as the WISC or the WAIS. Although there are no specific aptitude or reading tests for the deaf, the norms which have been developed and the research on test performance of the deaf can be used to aid diagnosis with the hard-of-hearing.

Various types of materials for use with the natural or developmental language, eclectic, and stimulus-response methods have been developed and used for research during the last decade. Those used with the natural or developmental language method tend to be oriented toward structural linguistics, since the object is to teach correct grammatical patterns and communications techniques rather than reading per se. These include special keys such as the Fitzgerald Key, Barry Five Slate, and Wing Symbols which are in common usage, and color-coded blocks or picture cards for development of language and concepts. Combined with concept and language

building experiences, these materials have proved useful in the classroom, although research has not been concerned directly with them during the last decade. Basal series, workbook materials, and worksheets commonly used with the eclectic method have attracted little attention. Such materials, when used, are of the type often found in clinics: Phonetic or linguistic workbooks; comprehensive materials; or study skills materials.

Just as stimulus-response methods have attracted much attention in research, so have programmed and computerized materials for use with the deaf and hard-of-hearing. Research has shown these materials to be especially useful for instruction in the meaning and use of function words and in following written directions. Materials not prepared expressly for the deaf were also found to be useful in skills remediation for the deaf, although their usefulness with those reading below intermediate levels was doubtful. A major project during the last decade was Project LIFE, an attempt not only to develop materials for use with the hearing handicapped in language arts, with an emphasis on reading, but also to compile a bibliography of sources for material to be made available to members of the profession.

Finally, audio-visual and library materials have been receiving increased attention during the last decade, particularly the newer materials such as film loops, individual projectors, and overhead projectors. The usefulness of such materials with the hearing handicapped has led to the idea of libraries as multi-media resource centers in which audio-visual materials would be readily available for study.

Conclusions

The methods and materials in use for diagnosis and language arts instruction of the deaf during the last decade are for the most part useful for remedial reading instruction of the hard-of-hearing. Depending upon the extent of the pupil's handicap and his ability to cope with it, it may be feasible to use both verbal and performance criteria in diagnosis. Some instructional methods and materials used with the deaf may be useful only for development of specific skills, while others considered too difficult for the deaf may be useful in remedial instruction for the hard-of-hearing. However, with some modifications, current practices and materials in language arts instruction for the deaf may be useful to the reading clinician or teacher in helping a pupil with a hearing disability.

BIBLIOGRAPHY

BIBLIOGRAPHY

Books

- Bond, Guy L., and Tinker, Miles A. Reading Difficulties: Their Diagnosis and Correction. New York: Appleton-Century-Crofts, 1967.
- Garrison, Karl Claudius, and Force, jr., Dewey G. The Psychology of Exceptional Children. New York: Ronald Press Co., 1965.
- Hart, Beatrice Ostern. Teaching Reading to Deaf Children. Washington, D.C.: Alexander Graham Bell Association for the Deaf, 1963.
- O'Neill, John Joseph. The Hard of Hearing. Englewood Cliffs, N.J.: Prentice-Hall, 1964.

Articles and Periodicals

- Anna Rose, Sister. "Factors Which Influence Language Learning," National Catholic Education Association Bulletin, 57, (August, 1960), pp. 440-445.
- Anne Bernardine, Sister. "Let's Increase Their Vocabularies," Volta Review, 62, (May, 1960), pp. 218-219.
- Beckmeyer, Theodore. "Application of Programmed Instruction to Remedial Reading for the Deaf," Volta Review, 65, (October, 1963), pp. 415-417.
- Buckler, Sister Marie Suzanne. "Expanding Language Through Patterning," Volta Review, 70, (February, 1968), pp. 89-96.
- Caldwell, Elizabeth H. "Some Adventures in Language Development," Volta Review, 63, (February, 1961), pp. 60-64.
- Cory, Patricia B. "Report on Library Programs in Schools for the Deaf," American Annals of the Deaf, 112, (November, 1967), pp. 701-711.
- _____. "Special Library Reading Project for Teenagers," Volta Review, 66, (February, 1964), pp. 63-66.

- Cross, B. G. "At Work and Play: Television in the Lives of the Deaf and the Hard-of-Hearing," Volta Review, 69, (March, 1967), pp. 203-207.
- Dixon, Carmen, et al. "AV Aids for Hard of Hearing Children," Educational Screen and Audiovisual Guide, 43, (November, 1964), pp. 642-643.
- Doehring, D. G. "Guide to Psychological Tests and Testing Procedures in the Evaluation of Deaf and Hard-of-Hearing Children," Reply with Rejoinder: Journal of Speech and Hearing Disabilities, 30, (August, 1965), pp. 299-301.
- Duffy, John K. "ITA and the Hearing Impaired Child," Volta Review, 68, (February, 1966), pp. 150-153.
- Elliott, Shirley S. "Structural Language Blocks," Volta Review, 66, (September, 1964), pp. 526-631.
- Espeseth, V. K. "Investigation of Visual-Sequential Memory in Deaf Children," American Annals of the Deaf, 114, (September, 1969), pp. 786-789.
- Foy, Robert. "Teaching Reading to Hearing Impaired Junior High School Pupils," Volta Review, 68, (April, 1966), pp. 315-316.
- Frizna, R. "Auditory Channels in the Education of Deaf Children," American Annals of the Deaf, 111, (November, 1966), pp. 633-647.
- Furth, Hans G. "Comparison of Reading Test Norms of Deaf and Hearing Children," American Annals of the Deaf, 111, (March, 1966), pp. 461-462.
- Giolas, F. G., and Wark, D. J. "Communicative Problems Associated with Unilateral Hearing Loss," Journal of Speech and Hearing Disability, 32, (November, 1967), pp. 336-342.
- Goetzinger, Cornelius P., Dekker, Lyn Crouter, and Wills, Robert C. "Non-Language IQ Test Used with Deaf Pupils," Volta Review, 69, (October, 1967), pp. 500-506.
- Harrington, D. A. "Language and Perception," Volta Review, 67, (March, 1965), pp. 191-196.
- Hughes, Robert B. "Verbal Conceptualization in Deaf and Hearing Children," Exceptional Children, 27, (May, 1961), pp. 517-522.

- James Lorene, Sister. "Developing Language through Vertical Learning and Horizontal Association," Volta Review, 67, (March, 1965), pp. 201-207.
- _____. "Pronouns Puzzle Primary Pupils," Volta Review, 62, (January, 1960), pp. 17-19.
- Jones, Kate-Helen. "Communication Skills," Volta Review, 63, (February, 1961), pp. 72-77.
- Kates, Solis L., Kates, William W., Michael, James, and Walsh, Terrance M. "Categorization and Related Verbalizations in Deaf and Hearing Adolescents," Journal of Educational Psychology, 52, (August, 1961), pp. 188-194.
- Kates, Solis L., Tiffany, Robert K., and Yudin, Lee. "Concept Attainment by Deaf and Hearing Adolescents," Journal of Educational Psychology, 53, (June, 1962), pp. 119-126.
- Kent, Alice, and others. "To Each His Own in Reading, "Efficient Reading for the Deaf," Volta Review, 64, (September, 1962), pp. 379-393.
- Krug, Richard F. "Approach to Teaching Language to Young Deaf Children," American Annals of the Deaf, 110, (November, 1965), pp. 591-597.
- Lavós, G. "WISC Psychometric Patterns Among Deaf Children," Volta Review, 64, (November, 1962), pp. 547-552.
- Lichtenburg, F. S. "Comparison of Children's Ability to Make Speech Sound Discriminations," Volta Review, 68, (June, 1966), pp. 426-434.
- Louzensky, George. "Visual Aids for the Deaf," The Instructor, 77, (August, 1967), p. 103.
- Mc Mahon, Marie. "Educational Media Center: The Library's New Look," American Annals of the Deaf, 112, (November, 1967), pp. 708-709.
- Mary Therese, SSND, Sister. "Illustrated Verbs," Volta Review, 66, (May, 1964), pp. 272-274.
- Mary Walter, Sister. "Individual Instructional Seatwork," Volta Review, 62, (April, 1960), pp. 162-165.
- Meier, Harold R. "Using the Overhead with the Deaf," The Instructor, 77, (March, 1968), pp. 40-41.

- Miller, June. "Practices in Language Instruction," Exceptional Children, 30, (April, 1964), pp. 355-358.
- Newton, M. G. "Readers, Not Leaf-Turners," Volta Review, 66, (February, 1964), pp. 67-69.
- Northcott, Winifred Nies. "Head Start Programs: Implications for the Deaf," Volta Review, 70, (February, 1968), pp. 106-113.
- Pugh, Bessie L. "Developing the Deaf Child's Power of Reasoning," Volta Review, 62, (September, 1960), pp. 334-340.
- _____. "Teaching Children to Use the Dictionary," Volta Review, 63, (April, 1961), pp. 178-185.
- Rathe, jr., G. H. "Computer-Assisted Instruction: Promising New Tool for Teaching Deaf Students," Volta Review, 70, (September, 1968), pp. 447-452.
- Reid, William R. "Action Verb Materials Developed for Deaf Children," Exceptional Children, 34, (November, 1967), pp. 203-205.
- Rudloff, Joseph S. "The Hearing Handicapped Retarded Reader," Volta Review, 68, (October, 1966), pp. 567-571.
- Rush, Mary Lou. "Programmed Instruction for the Language of Directions," American Annals of the Deaf, 109, (September, 1964), pp. 356-358.
- _____. "Use of Visual Memory in Teaching Written Language Skills to Deaf Children," Journal of Speech and Hearing Disorders, 31, (August, 1966), pp. 219-226.
- Scmitt, Philip J. "Language Instruction for the Deaf," Volta Review, 68, (January, 1966), pp. 85-105.
- Scott, Elizabeth V. "Language and Reading," Volta Review, 64, (March, 1962), pp. 128-132.
- Stafford, Charlotte. "Reading for Deaf Children," American Annals of the Deaf, 111, (March, 1966), pp. 463-466.
- Stepp, Robert E. "Educational Media and Deaf Education: The Emerging Literature," Volta Review, 70, (September, 1968), pp. 465-471.
- Sterne, Lillian C. "Using Context Clues in a Reading Program for the Deaf," Volta Review, 67, (May, 1965), pp. 371-375.

- Streng, Alice. "The Applicability of Individualized Programmed Instruction in the Education of Deaf Children," Exceptional Children, 30, (April, 1964), pp. 365-371.
- Stuckless, E. Ross, and Birch, Jack W. "Programmed Instruction in Written Language for the Deaf," Exceptional Children, 30, (March, 1964), pp. 296-303.
- Suchman, Rosslyn Gaines. "Color-form Preference Discriminative Accuracy and Learning of Deaf and Hearing Children," Child Development, 37, (June, 1966), pp. 439-451.
- Sweeney, Mae E. "Project: Letter Writing," Volta Review, 70, (February, 1968), pp. 120-121.
- Thomure, F. E. "In South Dakota: New Potential for Teaching Deaf Children," Audiovisual Instruction, 7, (April, 1962), pp. 210-211.
- Vernon, McCoy, and Brown, Donald W. "A Guide to Psychological Tests and Testing Procedures in the Evaluation of Deaf and Hard of Hearing Children," Journal of Speech and Hearing Disorders, 29, (November, 1964), pp. 414-423.
- Withrow, Margaret S. "Augmented Roman Alphabet: Can It Be Used for Teaching the Deaf?" Volta Review, 66, (September, 1964), pp. 540-543.
- Wrightstone, J. Wayne, Aronow, Miriam S., and Moskowitz, Sue. "Developing Reading Test Norms for Deaf Children," American Annals of the Deaf, 108, (May, 1963), pp. 311-316.
- Wooden, Harley Z. "Audiovisual Approach to Language Instruction of Children With Severe Hearing Impairments: Project LIFE," Audiovisual Instruction, 11, (November, 1966), pp. 710-712.
- _____. "Dramatized Language for the Deaf," Exceptional Children, 29, (December, 1962), pp. 155-163.
- Wooden, Harley Z., and Willard, Lorna L. "Project LIFE: Language Improvement to Facilitate Education of Hearing Impaired Children," American Annals of the Deaf, 110, (November, 1965), pp. 541-552.
- Youniss, James, Feil, Richard N., and Furth, Hans G. "Discrimination of Verbal Material as a Function of Intrapair Similarity in Deaf and Hearing Subjects," Journal of Educational Psychology, 56, (August, 1965), pp. 184-190.