INFORMATION TO USERS

This material was produced from a microfilm copy of the original document. While the most advanced technological means to photograph and reproduce this document have been used, the quality is heavily dependent upon the quality of the original submitted.

The following explanation of techniques is provided to help you understand markings or patterns which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting thru an image and duplicating adjacent pages to insure you complete continuity.

2. When an image on the film is obliterated with a large round black mark, it is an indication that the photographer suspected that the copy may have moved during exposure and thus cause a blurred image. You will find a good image of the page in the adjacent frame.

3. When a map, drawing or chart, etc., was part of the material being photographed the photographer followed a definite method in "sectioning" the material. It is customary to begin photoing at the upper left hand corner of a large sheet and to continue photoing from left to right in equal sections with a small overlap. If necessary, sectioning is continued again — beginning below the first row and continuing on until complete.

4. The majority of users indicate that the textual content is of greatest value, however, a somewhat higher quality reproduction could be made from "photographs" if essential to the understanding of the dissertation. Silver prints of "photographs" may be ordered at additional charge by writing the Order Department, giving the catalog number, title, author and specific pages you wish reproduced.

5. PLEASE NOTE: Some pages may have indistinct print. Filmed as received.

University Microfilms International
300 North Zeeb Road
Ann Arbor, Michigan 48106 USA
St. John's Road, Tyler's Green
High Wycombe, Bucks, England HP10 8HR

A SURVEY OF COMMUNICATION METHODS AND TRENDS IN PROGRAMS FOR HEARING IMPAIRED STUDENTS IN MICHIGAN

By

Heather Lynne Sellick

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Elementary and Special Education

1978

ABSTRACT

A SURVEY OF COMMUNICATION METHODS AND TRENDS IN PROGRAMS FOR HEARING IMPAIRED STUDENTS IN MICHIGAN

By

Heather Lynne Sellick

This study focused on the use of oral and total communication approaches in public school special education classrooms for hearing impaired students in Michigan. The six major objectives of the study were to: (1) survey the public school programs serving hearing impaired learners in order to determine which communication approaches are currently used; (2) determine the relationship between approaches used, education level, degree of hearing loss, and functional deafness; (3) determine changes in the communication approaches used in educational programs since 1971; (4) determine the degree of teacher and teacher-perceived parent satisfaction with the communication approaches used; (5) determine the nature of methods of total communication used, including the sign systems used, whether attempts at standardization of signs within school districts have been made, and whether formal classes in sign language are offered to hearing impaired students and other groups within a district; and (6) determine if systematic measures of pupil academic progress are utilized.

The data were gathered by means of a mailed questionnaire developed in cooperation with the Special Education Service Area of the Michigan Department of Education. This questionnaire consisted of two parts. The second part of the questionnaire, Part B, completed by the classroom teachers of programs for the hearing impaired, provided the data for this study.

The information obtained was tabulated and resulted in the following conclusions.

1. There is a large and continuing trend in Michigan toward use of the total communication approach in public school special education classrooms at all educational levels for hearing impaired students. Currently, there is approximately equal utilization of oral and total communication in classes for hearing impaired. Since 1971 the number of oral classes has slightly decreased, while the number of total communication classes has increased dramatically.

2. The oral approach is used more frequently at the earlier educational levels (preschool through middle school) and total communication is used more frequently at the high school educational level.

3. Total communication is used more frequently with students who have severe/profound hearing losses and with students who are functionally deaf.

4. The degree of teacher satisfaction and teacher-perceived parent satisfaction with the communication approach used did not differ appreciably between the oral and total communication approach. Some of the oral teachers expressed a desire to change to

total communication. None of the total communication teachers indicated a desire to change communication approaches.

5. The newer sign systems--Signing Exact English and Signed English--are most frequently used at the preschool through middle school levels. A combination of American Sign Language and Signing Exact English is most frequently used at the high school level.

6. Fewer than half of the teachers using total communication offer formal classes in fingerspelling and sign to hearing impaired students. There is a need to offer instruction in sign and fingerspelling to hearing impaired and hearing students, teachers, support personnel, and parents to provide necessary communication support to the hearing impaired students in total communication classrooms.

7. There has been minimal standardization of signs or minimal plans to standardize sign systems used in classrooms and programs for the hearing impaired within intermediate school districts. This situation reflects a lack of continuity and coordination of programs between educational levels and classrooms.

8. In a majority of the classrooms, teachers use a formal system for measuring pupil academic progress. A need, however, for increased systematic evaluation of hearing impaired students' academic achievement is evident. The most frequently used systems of measurement were individual achievement tests and performance objectives.

ACKNOWLEDGMENTS

A study of this nature requires the assistance and cooperation of many individuals. This opportunity is taken to express sincere appreciation to the following persons for their encouragement and meaningful contributions which helped make this study possible.

To Dr. Charles E. Henley, chairperson of the guidance committee and major advisor, for his thoughtful assistance, caring, counsel, humor, and encouragement throughout this study and the entire doctoral program.

To Dr. Edwin J. Keller, committee member, for his invaluable knowledge, sensitivity, and many hours spent in guidance during this study.

To Mrs. Vivian Stevenson, committee member, whose dedication to the field of hearing impaired and knowledge make her an outstanding contributor to deaf education and this study.

To Dr. Stanley E. Bryan, Dr. Richard L. Featherstone, and Dr. Howard W. Hickey, committee members, for their helpful suggestions and general interest with this study.

To the Special Education Service Area of the Michigan Department of Education and Dr. Richard Baldwin, State Consultant for Speech and Hearing Impaired, whose support of this study is gratefully acknowledged.

To those special friends and family, particularly, T.D.S., who have been an endless source of faith, support, and encouragement; especially to my parents, Florence Smith Sellick and Jack Sellick, for their love, faith, support, guidance, and encouragement throughout my life and educational career.

Finally,

Duodecim pedidus . . . paulo diutius!

TABLE OF CONTENTS

LIST OF TABLES

Table | Page

LIST OF FIGURES

CHAPTER I

INTRODUCTION

One of the most controversial and emotional issues in the area of special education is that of determining the proper communication method to use with hearing impaired individuals. The controversy exists between two specific philosophies of communication: oral/aural and total communication. This issue has been debated for over a hundred years with the involvement of hearing impaired individuals, their parents, and education professionals. It has been an exceptionally emotional issue based primarily on rhetoric rather than empirical evidence. During the past decade, however, proponents of total communication have conducted research which supports the thesis that the educational achievement of the deaf learner is increased with the early use of total communication. Because of this research there has been a reported increase in the number of total communication programs, with some dedicated oralists changing to support the total communication approach. There is, however, minimal data regarding the present extent of the use of the two methods in public school programs in Michigan.

Background

Proponents or the oral and total communication philosophies perceive the primary needs of persons (especially children) with

hearing impairments very differently. The oralists strongly believe that a hearing impaired child must learn to live in the world of the hearing and that the ability to communicate orally is essential for effective participation in that world.

> The fundamental position of the oralist is that training in speech and speechreading provides an easier adjustment to the world in which speech is the chief medium of communication (Davis & Silverman, 1960, p. 240).

> The strong oralist believes that: (1) deaf children should be taught lipreading from the beginning, (2) deaf children must be in an exclusively oral environment, and (3) systematic signing must be eliminated during the critical period of speech and language development (DiCarlo, 1974, p. 115).

Hearing parents of hearing impaired children are generally supporters of oral communication because of the desire to have their children use speech. Speech is the only means of communication these parents have known, and it is the method most accepted in their world.

Total communication is a philosophy which stresses the use of all forms of communication in order to help the hearing impaired child develop a usable language system. Proponents of total communication believe that the most effective way for a child to gain receptive and expressive language is through the combined utilization of: child-devised gestures, amplification, speech, lipreading, fingerspelling, formal signs, reading, and writing. The highly individual needs of the child are stressed in total communication. Total communication proponents refer to "fitting the method to the child" rather than "fitting the child to the method." Of primary importance is the early development of communication and language. Deaf parents of deaf children have been firm supporters of total communication

because they understand the essential need for the development of communication and language in infancy and early childhood.

The use of oral and total communication methods in educational programs has been further complicated by a lack of established criteria for determining the effectiveness of each system with individual hearing impaired persons. The lack of a legal definition of deafness or hearing impairment further complicates educational programming. One dimension of a hearing impairment may be determined through an audiometric evaluation which indicates the physiological quality of the hearing loss. Another important factor is the age of onset. For example, a prelingually deaf child (the loss occurring before language has been acquired) has a much more difficult time acquiring language than a postlingually deaf child (one who has lost hearing after the development of speech). Jack Birch (1975) speaks to this issue in Hearing Impaired Children in the Mainstream: ". . . It is not feasible to use only the audiometric classification to predict how an individual hearing impaired child might achieve in school." Determination of the appropriate type of communication to help the individual child develop language and achieve academically as well as socially should be based on a combination of criteria. These should include: audiometric threshold, usable residual hearing, speech discrimination, environmental effects, the individual child's behavior, age of onset, etiology, psychosocial development, and perhaps additional impairing conditions.

Need for the Study

In Michigan there has been much discussion during the past few years regarding these two communication philosophies in the state's public school programs for the hearing impaired. Little, if any, factual data has been available concerning: (1) the specific communication methods being used, (2) the populations (educational level, degree of hearing loss) with whom each method is used, (3) specific sign systems used when the communication method is total communication, and (4) the factors influencing choice and the use of a specific educational approach. This information is needed by educators, parents, and others who are concerned with the hearing impaired and with the provision of the best possible programming for this population. Such information would be relevant to college and university teacher training programs, as well as to the Michigan Department of Education Special Education Service Area consultants in carrying out their role of educational leadership and information dissemination. This basic data is needed to provide a foundation for additional research and to make intelligent programming decisions for developing an evaluation of method effectiveness.

Purpose of the Study

The purposes of this study are to: (1) survey the public school programs serving hearing impaired learners in order to determine which communication approaches are currently used; (2) determine the relationship between approaches used, education level, and the degree of loss of the students served; (3) determine changes in the

communication approaches in educational programs since 1971; (4) determine the degree of teacher and parent satisfaction with the communication approach employed; (5) determine the nature of methods of total communication used, including the sign systems currently used, whether attempts at standardization within districts have been made, whether formal classes in sign language are offered to hearing students and other groups within a district; and (6) determine if systematic measures of pupil academic progress are utilized.

Limitations of the Study

1. The study was limited to the state of Michigan.
2. The study was limited to classroom programs and did not sample other instructional approaches for serving hearing impaired students.
3. The reliability of the data collected depended upon teacher accuracy in responding to a mailed questionnaire.
4. The study was limited to the perceptions and judgments of the teachers who responded.

Definition of Terms

Definitions are vital to a common understanding of the meaning of terms used in this study. The following definitions will be used:

Hearing Impairment--"A generic term indicating a hearing disability which may range from mild to profound: it includes the subsets of deaf and hard of hearing. A deaf person is one whose hearing disability precludes successful processing of linguistic information

through audition, with or without a hearing aid. A hard of hearing person is one who, with the use of a hearing aid, has residual hearing sufficient to enable successful processing of linguistic information through audition" (Report of the Conference of Executives of American Schools for the Deaf [CEASD] Ad Hoc Committee to Define Deaf and Hard of Hearing, 1975, p. 509).

Hearing Impaired--"Means a person identified by an educational planning and placement committee, based upon evaluation by an audiologist and otolaryngologist, and other pertinent information as having a hearing impairment which interferes with learning" (Rule 340.1707 of the Michigan Special Education Code, p. 3).

Hearing Threshold Levels--"The decibel scores obtained by a qualified audiologist using an average of scores within the frequency range commonly considered necessary to process linguistic information" (Report of the CEASD Ad Hoc Committee, 1975, p. 510).

Hearing Loss--A reduced level of auditory acuity, determined by audiometric assessment.

Educational Planning and Placement Committee--"Educational Planning and Placement Committee (E.P.P.C.) means a committee of an operating district or agency whose members shall include, as a minimum, a representative of the administrative personnel, instructional personnel, diagnostic personnel and parents invited to participate when their children are involved" (Michigan Special Education Code as Amended January 14, 1977, p. 1).

The Oral Approach--(The oral/aural method) "In this method, as practiced in its pure form, the deaf child is instructed through

speech and writing. . . . He, in turn, communicates through speech, speechreading, writing and reading" (Quigley, 1967, p. 3).

Oralism--"Oralism is a point of view which requires that all communications . . . be done exclusively by means of speech and speechreading" (Katz, Mathis, & Merrill, 1974, p. 16).

Oral Classroom--This refers to an educational setting in which all communication is exclusively the oral/aural method.

Total Communication--Refers to ". . . the right of every deaf child to learn to use all forms of communication in order that he may have the full opportunity to develop language competence at the earliest possible age. This implies the introduction of a reliable receptive-expressive symbol system in the preschool years between the ages of one and five. Total Communication includes the full spectrum of language modes: formal sign language; speech; speechreading; fingerspelling; reading; writing; and, child-devised signs" (Maryland School for Deaf, Dr. David Denton, 1970).

Total Communication Approach--This is the use of all forms of communication including formal sign language, speech, speechreading, fingerspelling, reading, writing, and child-devised signs.

Total Communication Classroom--This refers to an educational setting in which the Total Communication approach is used.

Residual Hearing--". . . refers to any amount of hearing that remains functional after hearing loss has been sustained" (Katz, Mathis, & Merrill, 1974, p. 6).

Prelingual Deafness--"Deafness present at birth or occurring early in life at an age prior to the development of speech or language" (Report of the CEASD Ad Hoc Committee, 1975, p. 510).

Postlingual Deafness--"Deafness occurring at an age following the development of speech and language" (Report of the CEASD Ad Hoc Committee, 1975, p. 510).

Rochester Method--This method also uses speech, speechreading, writing, and reading as a means of communication between students and instructors but adds fingerspelling as an additional communication avenue (Quigley, 1967, p. 3).

Simultaneous Method--"In the Simultaneous Method, communication and instruction are conducted in the same manner as in the Rochester Method with the addition of manual signs. This method also is known as the French Method due to its original use in France through the work of the Abbe Charles Michel de l'Epee in the eighteenth century" (Quigley, 1967, p. 3).

American Sign Language--"Sign Language is a language in which what are commonly called gestures do the usual work of words, or more precisely, in which cheremes are found instead of phonemes. But, most important, it is also a language that has its own morphology, syntax, and semantics" (Stokoe, 1970, p. 5).

Signed English--"This--Signed English--is a rapid succession of glossing the content words of an English utterance more or less approximately and glossing some function-words, but not all. It usually includes fingerspelled words as well as signs. Both the signer and the addressee in this mode must know English well because

the signs are put together as if they were English words and not by the rules of Sign Language syntax" (Stokoe, 1970, p. 5).

Seeing Essential English--A system of manually representing English spearheaded by David Anthony (SEE I).

Signing Exact English--A system of manually representing English developed by Gerilee Gustason (SEE II).

Functional Deafness--For the purpose of this study, a hearing impairment in which there is no usable hearing for educational purposes. This is based on the CEASD definition of "those in whom the sense of hearing is nonfunctional for the ordinary purposes of life" (Brill, 1971, p. 2).

Overview of the Study

The remainder of this study is organized in the following manner:

In Chapter II the pertinent literature is reviewed. The review has three parts: (1) a review of research supporting oral and total communication, (2) a review of a National Survey, and (3) a review of the Michigan Studies regarding the role of the Michigan School for the Deaf.

In Chapter III the population is defined, the instrumentation used and the procedures for collection of the data are discussed, and the research questions are presented.

Chapter IV presents the results and major findings of the study in the form of tables and discussion.

Chapter V contains a summary, discussion, and recommendations for further study.

CHAPTER II

REVIEW OF THE LITERATURE

In order to gain historical perspective regarding the controversy between proponents of the oral and proponents of the total communication philosophy with hearing impaired learners, research supporting both of these approaches will be reviewed.

Communication Trends

Jordan, Gustason, and Rosen (1975) conducted a sample survey of communication methods used in schools and classes for hearing impaired learners to determine the frequency of use of the various methods. Programs listed with the Gallaudet Office of Demographic Studies were surveyed. The results of this study indicated an increase in and continuing trend toward total communication with more than 64 percent of the reporting classes using that method. A significant number of programs were offering formal sign classes to parents as well as to hearing impaired students. In order to determine the specific systems of manual communication employed, the sign books used were surveyed. Newer systems of manual communication were found to be used at the preschool and elementary level. Of the 565 programs which were using total communication, over half were found to have made an attempt to standardize the signs used.

Oral and Total Communication Research

The development of language and speech are generally the major objectives of educational programs for hearing impaired students, and are, therefore, the issues addressed in research supporting both oral and total communication. Since academic achievement is dependent on the acquisition of language, the research usually examines the academic achievement and speech proficiency of the hearing impaired as indicators of language and speech development. Because proponents of the oral method are primarily concerned with speech development and articulation, this tends to be the major emphasis of their studies and literature. Total communication proponents emphasize language development and academic achievement. The studies cited are ex post facto studies, except for White and Stevenson's (1975) experimental study, and are criticized by the opponents of each method for several reasons: (1) ex post facto designs inherently disallow for the control of independent variables and thus extraneous dependent or independent variables may account for the results obtained; (2) the studies seldom employ matching techniques or the drawing of random samples from reference populations, and as a result the comparability of groups is open to question; and (3) the studies have generally been conducted at schools in which a truly oral population may not exist, thus vitiating conclusions comparing this population with a total communication population.

The studies to be cited equate deaf children of hearing parents and day students as oral groups and deaf children of deaf

parents and residential students as total communication groups. Generally, students of hearing parents only have exposure to oral communication and attend school on a day basis, while deaf children of deaf parents and residential students have early exposure to total communication.

Research Supporting Oral Communication

Proponents of the oral method stress the importance of speech development and articulation, and claim that by reducing the oralness of a program the achievement of intelligible speech is also reduced. Quigley and Frisina (1961) compared the speech of day students (the oral group) and residential students (the total communication group). They also compared day students of hearing parents (oral group) and day students of deaf parents (total communication group). The results of this study indicated that day students had significantly better speech than residential students and that day students of hearing parents had significantly better speech than day students of deaf parents. The conclusion was made that "oralness of the environment" significantly affects speech development.

Additional research conducted by Quigley (1967) and Stuckless and Birch (1966) supports the hypothesis that students from a more oral environment have slightly superior speech.

White (1969) expanded on Quigley and Frisina's study by comparing the speech of students in a day program with a matched group from a residential school. Students were matched on age, sex, intelligence, hearing loss, and age of onset. It was found that deaf

students in the day program made significantly fewer errors in articulation than the residential school students, with the conclusion that the oralness of the environment increases speech intelligibility.

The same argument which the oralists use against the research which supports the use of total communication can be applied to a review of the research which supports the thesis that an oral environment for hearing impaired students enhances speech articulation. That is, these ex post facto studies do not control for the independent variables and, therefore, do not establish a causal relationship. These studies provide support that increased speech intelligibility can occur in a more oral environment.

Research Supporting Total Communication

The research in support of total communication is also of an ex post facto nature, except for White and Stevenson's study. That study will be reviewed in depth later because of its significance as an experimental design.

Quigley and Frisina (1961), in the study cited earlier, stressed the correlation between language development and academic achievement. It was found that students of deaf parents had significantly larger vocabularies than students of hearing parents. It was further found that a high correlation existed between vocabulary and academic achievement.

Stuckless and Birch (1966) looked at the effects of early exposure to manual communication by matching deaf children of deaf

parents who used combined communication methods and deaf children of hearing parents who used only the oral method. These groups were matched according to sex, schools, hearing loss, and age of onset of deafness. It was found that early exposure to manual communication had no major effect on the intelligibility of speech; had a significantly better effect on reading, speechreading, and writing achievement; and did not negatively influence psychological development.

Meadows (1968) conducted a study which matched deaf children of deaf parents and deaf children of hearing parents according to age, sex, and intelligence. Results indicated a superiority of deaf children of deaf parents in arithmetic, reading, and overall academic achievement. This study noted no differences in speech and lipreading skills. Meadows, however, did not account for factors other than early exposure to manual communication which might have influenced academic achievement.

Vernon and Koh (1970), in an attempt to control for the independent variable of the etiology of deafness (nongenetic versus genetic), matched 32 deaf children of deaf parents with 32 recessively deaf children of hearing parents. The groups were compared on academic achievement, communication skills, and psychological adjustment. It was found that deaf children of deaf parents exposed to fingerspelling and signs were significantly superior in academic achievement. No differences, however, were found between the groups in the areas of speech, speechreading, or psychological adjustment.

Vernon and Koh (1971) matched deaf children of deaf parents with deaf children of hearing parents who had graduated from the John

Tracy Clinic, according to age, sex, and intelligence. Significant superiority of deaf children of deaf parents existed in academic achievement, speech, speechreading, and reading. A unique finding in this study was the better speech intelligibility of the deaf children of deaf parents, which directly conflicts with results of studies previously cited.

Important variables for which these ex post facto studies do not control are: degree of parent acceptance, deaf parents' usual choice of residential schools, and hearing parents' usual choice of day schools. It is believed that deaf children of hearing parents in a residential school are more likely to be less capable academically than deaf children of hearing parents in day schools. Such a difference would influence research results, particularly if the intelligence of the children has not been controlled by matching. Since a greater number of deaf children of deaf parents are genetically deaf, there is less chance in this group of additional handicaps because of neurological complications. A greater number of deaf children of hearing parents are of a nongenetic etiology and, therefore, the chance of neurological dysfunction and the possibility of other factors influencing capabilities to learn are increased.

Some attempts at experimental studies have been made. Johnson (1948) studied the ability of deaf children at a residential school to assimilate sentences presented by different modes of communication (manual, oral, accoustic, speech, and fingerspelling). Fingerspelling and signs with fingerspelling were found to be more

effective than oral communication, and fingerspelling was the most effective means of communication for all students tested.

White and Stevenson (1975) conducted an experimental study of hearing impaired children at residential schools in two states in order to determine the method of communication under which students assimilated the most factual information. A stratified random sample of 45 students was drawn from the Maryland School for the Deaf. They were presented factual information through four modes of communication: oral, total, manual communication, and reading. The independent variables were: method of communication, age, and intelligence. The dependent variable was the amount of information assimilated. An experimental design was used to eliminate the problem inherent in ex post facto studies. The subjects were presented four passages of factual information through each of the four modes of communication and each subject was compared to himself across the four modes of communication. The results of the study suggested the following conclusions: (1) hearing impaired children assimilate more information through reading than they do through oral or total communication, (2) all categorical sub-groups of hearing impaired children assimilate more information through total communication and manual communication than they do through oral communication, (3) the speech component in total communication does not increase the amount of information assimilated over that which is assimilated through pure manual communication, and (4) bright, average, and low functioning hearing impaired children do not differ in their ability to assimilate information through oral communication; however, average and bright

children do significantly better than low functioning children through total communication, manual communication, and reading. The last is perhaps the most significant finding and presents important educational implications. Similar findings were reported in a replication of this study done at the Michigan School for the Deaf.

National Survey

"The Annual Survey of Hearing Impaired Children and Youth," begun in 1968, was established at Gallaudet College as a permanent research effort to "collect, process, and disseminate data on hearing impaired individuals through college age in the United States." The major purpose of this program is to improve and expand on the educational opportunities available to hearing impaired children. The Annual Survey is initiated by the Division of Research, Bureau of Education for the Handicapped, U.S. Office of Education, and since its beginning has concentrated its efforts on data collection on hearing impaired individuals who are receiving special education services related to their hearing loss. The Annual Survey, although directed toward the description of services available to hearing impaired children and youth, has not included the extent of usage of oral and total communication procedures in classrooms for hearing impaired students.

Michigan Studies

In the state of Michigan three major studies have been conducted regarding the role of the Michigan School for the Deaf and its relationship to local and intermediate school district programs

for hearing impaired and deaf and blind students. Although none of these studies addressed the specific issue of communication method, the findings constitute important information regarding programming for the hearing impaired in Michigan.

The first study, initiated by the Michigan State Legislature in 1973, was conducted by the Special Education Research Development Corporation (S.E.R.D.) based in Washington, D.C. The recommendations of this study were for the development of regional networks throughout the state which would have the responsibility for providing programs for multiply and severely impaired students. This report also recommended that the Michigan School for the Deaf continue as a coordinating and monitoring agent, and as a diagnostic, prescriptive, and experimental resource and training center. The recommendations were submitted by the State Board of Education to the legislature without recommendations for approval or disapproval.

The second study was conducted by a Governor's Efficiency Task Force in 1976. This Task Force examined the Michigan School for the Deaf and the Michigan School for the Blind from a cost-effective perspective. The major recommendation was for a merger of the two schools on the Flint campus, with separate educational programs but shared noninstructional programs and facilities. The State Board of Education recommended disapproval of this proposal to the legislature.

A third study was conducted in 1976-1977 by Educational Management Services (E.M.S.), a firm based in Minneapolis, Minnesota. One recommendation of this study was to have the Michigan School for

the Deaf phase out all academic programs for the "normal" deaf population and serve only the multiply handicapped. Other recommendations were for the Michigan School for the Deaf to: (1) conduct short-term summer programs for "normal" deaf; (2) develop vocational assessment services; (3) conduct extensive outreach, training, and consultative services; and (4) develop vocational training techniques. The recommendations of this study were also submitted to the legislature by the State Board of Education without recommendation for approval.

The controversy regarding the role of the Michigan School for the Deaf has continued without resolution. All of the studies have been conducted by out-of-state agencies with the exception of the Governor's Task Force, which was comprised of business managers, not educators. In August of 1977, the State Board of Education charged the Superintendent of the Michigan School for the Deaf to conduct an administrative review to aid in the establishment of policies regarding future programs and services of the school. The Superintendent recommended that the Michigan School for the Deaf should be: (1) a comprehensive educational and vocational training center to meet the needs of students defined as needing a center program by an Educational Planning and Placement Committee; and (2) a diagnostic assessment, resource, orientation-training, community, and continuing education center. The administrative review stressed that the program of the Michigan School for the Deaf should be directed toward those severely/profoundly impaired students who need a total communication approach to develop language and

communication. These recommendations were not accepted by the State Board of Education.

The State Board of Education appointed an Ad Hoc Committee in January of 1978 to study further the proposal submitted by the Superintendent of the Michigan School for the Deaf. The Ad Hoc Committee is utilizing descriptive data from this study in their review of the status of programs for hearing impaired students in Michigan in order to help determine what the future role of the School for the Deaf should be. The final recommendations of the Ad Hoc Committee should be submitted to the State Board of Education by June, 1978.

Summary

The studies of speech and articulation skills of hearing impaired children are inconclusive in relation to the oral and total communication controversy. Quigley and Frisina (1961), Stuckless and Birch (1966), Quigley (1967), and White (1969) have conducted research which concludes that students from a more oral environment have slightly better to superior speech. Meadows (1968), Quigley (1969), and Vernon and Koh (1970, 1971) conclude from studies that there is no difference in speech and articulation between learners exposed to an oral-only environment and those having early exposure to total communication. All the total communication learners had superior academic achievement. Philips (1963), Craig (1974), McCroskey (1968), and others have studied the effectiveness of oral-only preschool programs, and conclude that there is no significant

difference in speech and articulation skills in hearing impaired learners who have had an oral preschool experience and those learners with no preschool experience and/or deaf parents indicating early exposure to total communication. The research regarding educational achievement and language development is conclusively in favor of the total communication approach.

CHAPTER III

METHODOLOGY AND PROCEDURES

Introduction

In this chapter the population for the study is defined, the instrumentation and the procedures for collection of the data are discussed, and the research questions are presented. The treatment of the data will be reported by describing the crosstabulations and frequency distributions included with the discussion of each research question.

Population

In order to obtain the desired information regarding the public school classroom programs for hearing impaired students, all Michigan public school special education classrooms for hearing impaired students were surveyed, including home training programs for infant and preschool children. Since only the special education teachers and teacher consultants serving hearing impaired students were surveyed, information was collected on only those hearing impaired students identified as such by an Educational Planning and Placement Committee and receiving the services of those professional educators.

The total number of classrooms for hearing impaired students reported by the intermediate school district special education

directors in this survey was 344. The total number of teachers was 344 and the number of teacher consultants was 73. Of the 344 teachers, 338 (98.2 percent) returned the questionnaire by the requested time, and were included in the tabulation of the results. The remaining six teachers returned the questionnaire after the return date and were not included in the tabulation of responses.

The number of children served in classrooms for hearing impaired was 2,159. However, two of the teachers did not indicate the number of students which they serve. Duplication of the number of students in classrooms for hearing impaired was possible, although teachers were instructed to count students only once.

Development of the Questionnaire

The questionnaire was developed in conjunction with the Special Education Service Area of the Michigan Department of Education. The survey information was of particular interest to the State Department in light of the need to determine the future role of the Michigan School for the Deaf and the lack of descriptive information regarding Michigan's school-age hearing impaired population to aid in that decision. The State Consultant for Speech and Hearing Impaired requested assistance in the collection of demographic data. The State Department of Education needed this type of information in order to: (1) identify the available programs for Michigan's hearing impaired children, (2) compile the numbers of children served and unserved, (3) predict future service needs, (4) assist in

regionalization planning, and (5) identify gaps in the delivery system for the state plan.

A number of meetings were held with the State Consultant to determine the specific information needed regarding the education services for school-age hearing impaired students (0 to 25 years of age). The decision was made to request the following: (1) demographic information, including the total number of hearing impaired students identified and receiving special education classroom program or teacher consultant services, and their audiometric losses and functional level; (2) specific program information including the type of service offered, curricula used, communication approaches used, and resources available within districts for diagnostic and supportive services; (3) staffing information, the total number of classroom teachers and teacher consultants for hearing impaired; (4) formal classes in sign and/or fingerspelling offered within districts; (5) information about the specific problems and needs of the intermediate school districts in programming for hearing impaired students; and (6) the current and future role of the Michigan School for the Deaf as perceived by intermediate school districts.

The amount of data to be collected raised several major issues. Is it better to collect comprehensive information and risk inaccurate responses or a minimal return from persons who lack adequate time to answer thoroughly, or to collect easier-to-gather minimal information which may not provide a total picture of the educational services? The decision was made to collect comprehensive information regarding programs and to collect the information on a

classroom basis rather than for each individual child. The decision was a compromise to obtain sufficient data to answer the pertinent questions, and to limit the questions so that they could be readily answered by the teachers, teacher consultants, and intermediate directors. The support of the Special Education Service Area in urging the cooperation of teachers, teacher consultants, and directors is gratefully acknowledged.

The questionnaire consisted of two parts. Part A was completed for each of the 58 intermediate school districts by the 57 intermediate directors of special education serving those districts (Appendix C). Part B (Appendix B) was completed by each teacher and teacher consultant of programs for hearing impaired in Michigan. The responses of the classroom teachers to Part B of the questionnaire provided the data for the current study. Part A, not reported in this study, was of interest to the State Department of Education.

Procedures for Distribution and Collection of the Questionnaire

The Director of Special Education and the Consultant for Hearing Impaired of the Special Education Service Area of the Michigan Department of Education were supportive in the preparation, distribution, and collection of the survey instrument. Each questionnaire was accompanied by a cover letter from the State Director of Special Education Services requesting the cooperation of the person who would be completing the questionnaire. The cover letter (Appendix A) also provided instructions for the completion and return of the questionnaire to the Special Education Service Area office by a specified date.

Since both intermediate and local school districts provide service to hearing impaired students, there was a need to avoid duplication of counts. The information which applied to an entire intermediate district was completed by the intermediate special education director, who is familiar with all the programs and special needs of that district. The intermediate director was requested to complete the part of the questionnaire containing general questions regarding the entire intermediate district and to distribute the questionnaires to teachers and teacher consultants in the local districts. The directors were also requested to be responsible for the collection and return of the questionnaires to the Michigan Department of Education.

Meetings with the Michigan Association of Intermediate Special Education Directors and the Supervisors of the Hearing Impaired were scheduled prior to the distribution of the questionnaire for the purpose of explaining the format of the questionnaire and clarifying questions and concerns regarding the study. The questionnaires were distributed to the 57 intermediate special education directors at their monthly meeting and were mailed to those directors not present at the meeting.

Follow-up telephone calls were made from the Michigan Special Education Service Area Department to the intermediate school district directors who had not returned the questionnaire by the specified date. The purpose of the telephone calls was to inquire as to whether the questionnaires had been received and if there were any questions regarding the distribution and return of the questionnaires.

Research Questions

Research Question 1: To what extent does the use of oral and total communication vary with (a) educational level, (b) level of hearing loss, and (c) the presence of functional deafness?

Three subquestions were asked in relation to functional deafness:

1. How many students at each level of hearing loss are functionally deaf?
2. How many functionally deaf students are in oral communication and total communication classes?
3. Do districts have a definition of "functional deafness"?

The degree of hearing loss, functional deafness, and the educational level have all been cited as variables in determining the method of communication which should be used (Furth, 1973; Brill, 1971). Recent literature has indicated that the more severe the hearing loss and the earlier the age of onset, the greater the need for total communication and the development of a communication and language system. In practice, however, the opposite approach is more frequent. Initially, oral communication is used. If that fails, total communication is tried. One would, therefore, expect to find a larger number of middle school and high school classrooms using the total communication approach, while preschool and elementary classrooms would be primarily employing the oral communication approach.

Much discussion has also occurred regarding the importance of looking at functional deafness in relation to the hearing loss level. It has been suggested that students should receive educational programming according to the level of hearing loss indicated

by an audiometric assessment, since criteria have not been established for determining functional deafness.

Therefore, this study looked at the hearing (audiometric) loss in relation to the type of communication approach used. The Ad Hoc Committee to Define Deaf and Hard of Hearing of the Conference of Executives of American Schools for the Deaf (CEASD) in 1975 noted that the severity of the hearing disability and the age at which it occurs contribute to the degree of comprehensiveness of the services that the child and family need. The CEASD Committee also noted that the functioning level can change as well as the educational needs of the child with physical, social, personal, or psychological problems and/or development. Therefore, the Committee recommended that the levels given in Figure 1 on the following page be adopted for use in studying educational programs and methodologies and for research purposes.

The hearing threshold levels cited by the CEASD Ad Hoc Committee and their probable impact on communication and language were used for determination of the hearing loss for this study. To determine functional deafness, the definition of "no usable hearing for educational purposes" was used. Considering level of hearing loss in relation to functional deafness and the type of communication method used, it was expected that subjects at a more severe level of hearing loss would have a greater incidence of functional deafness and would be served by total communication programs.

Therefore, this study looked at the use of the oral and total communication approaches in relation to the educational levels,

Hearing Threshold Level (ISO)	Probable Impact on Communication and Language	Implications for Educational Settings	
Level I[a] 26-54 dB	Mild	Full Integration	Most Frequent
		Partial Integration	Frequent
		Self-Contained	Infrequent
Level II 55-69 dB	Moderate	Full Integration	Frequent
		Partial Integration	Most Frequent
		Self-Contained	Infrequent
Level III 70-89 dB	Severe	Full Integration	Infrequent
		Partial Integration	Most Frequent
		Self-Contained	Frequent
Level IV	Profound	Full Integration	Infrequent
		Partial Integration	Frequent
		Self-Contained	Most Frequent

[a]It is assumed that these decibel scores are obtained by a qualified audiologist using an average of scores within the frequency range commonly considered necessary to process linguistic information.

Figure 1.--CEASD hearing threshold chart.

the levels of hearing loss, and the frequency of reported functional deafness.

Data to answer these questions are provided by:

1. A frequency count of functionally deaf students at each level of hearing loss.
2. A frequency count of districts that have developed a definition of functional deafness and the frequency of the specific definitions.
3. A crosstabulation of the number of classes at each educational level by communication approach.
4. A crosstabulation of the number and percentage of oral and total communication classrooms by educational level and range of hearing loss.

Research Question 2: What changes have occurred between 1971 and 1978 in the number of classrooms using the oral and the total communication approaches?

The following subquestions were asked:

1. To what extent is each approach currently used?
2. How has the proportion of total communication and oral communication classrooms changed?
3. How many oral and total communication classrooms have been added since 1971?

This second question concerning communication approaches attempts to measure changes in educational methodology by educational level of classes since 1971. The year 1971 was chosen for several reasons: (1) it was the year that Public Act 198 (Mandatory Special Education) was passed in Michigan, (2) the accuracy of information

prior to this year would have been questionable, and (3) research findings regarding the effectiveness of the different communication approaches became available in the early 1970's and may have influenced the extent to which the different methods have been used.

Data to answer these questions are provided by:

1. A crosstabulation of change in the communication approach by educational level.
2. A frequency count of classroom change in communication approach for each year since 1971 by educational level.

Research Question 3: How many intermediate school districts provide oral and total communication options at each educational level for hearing impaired students?

This question explores the extent to which districts are providing a full continuum of options for hearing impaired students. Data to answer the question are provided by:

1. A crosstabulation of the number of intermediate school districts which provide both oral and total communication classroom programs for each educational level.

Research Question 4: To what extent does teacher satisfaction vary with (a) educational level and (b) communication approach used?

Research Question 5: Are there differences in the desire to change communication approaches between teachers in oral and teachers in total communication classrooms?

Two subquestions to Question 5 were asked:

1. To which approach would teachers like to change?
2. What are the obstacles to making the desired change?

Research Question 6: What is the degree of parent satisfaction as perceived by the teachers at each educational level as a function of (a) communication approach and (b) the hearing impaired program in general?

Research Questions 4, 5, and 6 address the degree of satisfaction of the teacher and parents with the communication approach used and the program in general for hearing impaired in a district. In addition to a direct question eliciting perceived level of satisfaction, this factor was approached indirectly by determining the respondent's desire to change communication approaches. Further perspective on the issue of change was obtained by securing opinions as to the obstacles to changing the method of communication. Finally, if a teacher does wish to change the method of communication used, which method of communication would the teacher like to put into effect?

Data to answer these questions are provided by:

1. A crosstabulation of the number of teachers at various levels of satisfaction with the communication approach used in their classroom by educational level and type of communication approach used.
2. A crosstabulation of the teacher's desire to change communication approach by educational level and the communication approach currently used.
3. A crosstabulation of the number of teachers who would like to change approaches by the desired approach and educational level.

4. A frequency count of the major obstacles to change in the communication approach used.
5. A crosstabulation of the percentage of parents viewed by the teachers who are satisfied/dissatisfied with the communication approach used by educational level and communication approach.
6. A crosstabulation of the percentage of parents who are satisfied/dissatisfied with the program for the hearing impaired by educational level and communication approach used.

Research Question 7: In total communication programs, what methods are being used?

Four subquestions are:

1. What specific sign systems are used as a function of education level?
2. What reference books are used as primary and supplementary resources as a function of educational level?
3. What formal classes in fingerspelling and sign are offered to hearing impaired learners, school personnel, and parents?
4. Has standardization of signs occurred in intermediate school districts or do districts have plans to standardize signs?

Each of these questions addresses an important factor in the effective implementation of a total communication program.

Data to answer these questions are provided by:

1. A crosstabulation of the specific sign systems used by educational level.

2. A crosstabulation of primary and supplementary reference books used by educational level.
3. A frequency count of the formal classes offered for hearing impaired students, hearing students, teachers, support personnel, parents, and other groups in fingerspelling and sign.
4. A frequency count of the number of districts which have plans to standardize or have standardized signs within their program(s).

Research Question 8: To what extent are formal systems used to measure pupil academic progress?

The fourth area of concern is whether or not districts are using formal systems to measure pupil academic progress. This has great implications for effective program planning for hearing impaired learners. Data to answer these questions are provided by:

1. A frequency count of the teachers who employ a systematic method of academic assessment.
2. A determination as to specific instruments employed in these measures.

CHAPTER IV

ANALYSIS AND INTERPRETATION OF THE DATA

Introduction

The results of this study are presented in a format which answers the eight major research questions and their related sub-questions as listed in Chapter III. The questions are discussed sequentially, and the data pertaining to the research questions are presented in the form of tables and discussion.

Results

Research Question 1: To what extent does the use of oral and total communication vary with (a) educational level, (b) level of hearing loss, and (c) the presence of functional deafness?

The classrooms which report use of a combination of oral and total communication are designated as total communication classrooms in this study. The use of both approaches in the same classroom was reported by 59 of the teachers. Some teachers state that they use primarily total communication, stressing the sign component with some children and the oral-aural component with other children in the same classroom. These teachers are reporting use of total communication and are therefore tabulated in the study as total communication classrooms.

The first area investigated was that of the prevalence of the use of the oral and total communication approaches as a function

of educational level. As indicated in Table 1, 53 percent of the classrooms use oral communication and 47 percent use the total communication approach.

The change from 61.8 percent oral at the preschool level to 36.5 percent at the high school level provides support for the expectation that the oral approach is used more frequently at the earlier educational levels and that the total communication approach is used more frequently at the higher education levels.

The second area investigated was to determine the extent to which the use of the oral and the total communication approach varies with the level of hearing loss. The classrooms were divided into three major groups according to level of hearing loss: (1) those classrooms which serve children with losses ranging from 26-90+ dB (mild to profound loss), (2) classrooms which serve children with losses of 26-69 dB (mild/moderate loss), and (3) classrooms which serve children with losses in the 70-90+ dB range (severe/profound loss).

The distribution of classrooms by communication method, educational level, and level of hearing loss is represented in Table 2. As illustrated in Table 2, of the classrooms serving students having 26-90 dB hearing losses (62 percent of all programs), 62.2 percent use oral communication and 37.8 percent use total communication. Of the classrooms at the 26-69 dB level (3 percent of all programs), 60 percent used total communication and 40 percent used oral communication. Classrooms serving students with 70-90+ dB hearing losses (35 percent of all programs) tend to use the total communication

Table 1.--The number and percentage of classrooms currently using oral and total communication approaches according to educational level.

Communication Approach	Educational Level					
	Preschool	Elementary	Middle	High School	All Levels[a]	Totals
Oral						
Number	34	83	30	23	9	179
Percent	61.8	57.2	61.2	36.5	34.6	53.0
Total						
Number	21	62	19	40	17	159
Percent	38.2	42.8	38.8	63.5	63.4	47.0
Total classrooms	55	145	49	63	26	338

[a]All levels: classrooms serving students from three or more educational levels.

Table 2.--The number and percentage of classrooms serving three levels of hearing loss according to educational level and communication method used.

Educational Level	Level of Hearing Loss					
	26-90 dB		26-69 dB		70-90+ dB	
	Oral	Total	Oral	Total	Oral	Total
Preschool and Infant						
Number	26	13	0	0	5	7
Percent	66.6	33.3	0.0	0.0	41.7	58.3
Elementary						
Number	46	22	4	2	33	33
Percent	67.6	32.4	66.6	33.3	50.0	50.0
Middle School						
Number	20	7	0	0	5	7
Percent	74.1	25.9	0.0	0.0	41.7	58.3
High School						
Number	20	22	0	4	2	4
Percent	47.6	52.4	0.0	100.0	33.3	66.6
Across All Levels						
Number	7	6	0	0	1	9
Percent	53.8	46.2	0.0	0.0	10.0	90.0
Unknown						
Number	1	3	0	0	1	1
Percent	25.0	75.0	0.0	0.0	50.0	50.0
Total						
Number	120	73	4	6	47	61
Percent	62.2	37.8	40.0	60.0	43.5	56.5

approach with 56.5 percent using total communication and 43.5 percent using oral communication.

As indicated in the 26-90 dB column, the breakdown of the percentage of classrooms using oral communication and total communication serving mild to severe losses is similar to that of all classrooms for hearing impaired (Table 1). The oral communication approach is used more frequently with the preschool to middle school and classrooms serving three or more educational levels, while the total communication approach is more frequently used at the high school level.

The same relationship holds for the 26-69 dB column in Table 2: Twice as many elementary classrooms use the oral approach as use the total communication approach, while all of the secondary classrooms use the total communication approach.

Classrooms which serve students with only severe to profound hearing losses (70-90+ dB) favor use of the total communication approach at all educational levels, except the elementary level which has 50 percent oral and 50 percent total classrooms as indicated in the 70-90+ dB column.

The third area investigated was the extent to which the use of oral communication and total communication varies with functional deafness, defined by this study as "no usable hearing for educational purposes." The number and percentage of students classified as functionally deaf in each of the hearing loss levels was tabulated. As indicated in Table 3, 2.6 percent of the students in the 26-69 dB level were classified as functionally deaf; 14.1 percent in the

70-90 dB level were classified as functionally deaf; and of the students with unknown hearing losses, 26.9 percent were reported as functionally deaf. Of the 1,623 students for whom this information was reported, 188 or 11.6 percent were classified by their teachers as functionally deaf. Some teachers were hesitant to classify a child as functionally deaf. This was particularly true of teachers reporting from oral programs. A frequent response of these teachers was that "every child has some hearing which can be used for educational purposes."

Table 3.--Distribution of functionally deaf students at each hearing loss level.

Threshold Level (ISO Measurement)	Total	Functionally Deaf	
	N	N	%[a]
26-69 dB	427	11	2.6
70-90+ dB	1,129	159	14.1
Unknown audiometric level	67	18	26.9
Totals	1,623	188	11.6

[a]Percentage of all those at a hearing loss level who are functionally deaf.

Of the 188 functionally deaf students, 5.8 percent had mild/moderate hearing losses, 84.6 percent had severe/profound hearing losses, and 9.6 percent had unknown hearing losses.

The second question relating to functional deafness asked: "How many functionally deaf students are programmed for in oral

communication and in total communication classrooms? It was found that of the 81 classrooms which reported at least one functionally deaf child, 71.6 percent of the classrooms used total communication, while 28.4 percent used oral communication. As indicated previously, some teachers using the oral communication approach failed to classify any children as functionally deaf. Therefore, the accuracy of the responses is questionable. However, the majority of students reported as having a severe hearing loss and/or functional deafness were found to be served in total communication classes.

The third question raised in relation to functional deafness was: Have districts developed a definition of functional deafness? The terminology of functional deafness and teachers' unwillingness to identify students as having no usable hearing was addressed through this question. Of the 338 teachers surveyed, 35 indicated that their program has a definition for functional deafness. Thirty-two of those teachers stated that the definition was the same as the state and federal definition in Public Law 94-142 and Public Act 198. It is interesting to note that neither of these laws defines functional deafness. The 32 teachers did not agree with other teachers in their district who indicated that their district did not have a definition for functional deafness. In only one intermediate school district did all the teachers agree that their district had a definition for functional deafness. These three teachers identified a definition which stressed the "consistent lack of response to speech, and loud environmental or audiometric tones in a given quiet environment." The major point illustrated is that

there is confusion among teachers as to the meaning of functional deafness, and that some teachers supporting the oral approach do not recognize the concept that some hearing impaired children have no hearing for educational purposes. It may be concluded that there is a probable lack of criteria used in these districts for determination of special education classroom placement and the communication approach which would be most effective with the individual child.

Research Question 2: What changes have occurred between 1971 and 1978 in the number of classrooms using the total communication and oral communication approaches?

The percentages of classrooms using the oral communication and total communication approaches at each educational level in 1971-72 are presented in Table 4. The extent of use of the oral communication and total communication approaches within classrooms in 1971-72 (Table 4) and the extent of use in 1977-78 (Table 1) were compared in Table 5. As illustrated in these tables, the extent of use of the oral and total communication approaches has changed significantly since 1971-72. Oral communication in 1971-72 was used more frequently than total communication at each educational level. The use of total communication, however, increased as the educational level increased. A change in the use of oral and total communication is illustrated at the different education levels, with a significant increase in the use of total communication at all levels, particularly at the preschool and elementary levels.

Table 4.--The number and percentage of classrooms in 1971-72 using oral and total communication approaches according to educational level.

Communication Approach	Educational Level					
	Preschool	Elementary	Middle	High School	All Levels	Totals
Oral						
Number	38	89	26	31	18	202
Percent	90.5	82.4	68.4	56.4	85.0	76.5
Total						
Number	4	19	12	24	3	62
Percent	9.5	17.6	31.6	43.6	14.3	23.5
Total Classrooms	42	108	38	55	21	264

Table 5.--Summary of the percentages of classrooms using oral and total communication approaches at each educational level in 1971 and 1978.

Educational Level	Communication Approach			
	Oral		Total	
	71-72	77-78	71-72	77-78
Preschool	90.5	61.8	9.5	38.2
Elementary	82.4	57.2	17.6	42.8
Middle School	68.4	61.2	31.6	38.8
High School	56.4	36.5	43.6	63.5
All Levels	85.7	34.6	14.3	63.4
Total	76.5	53.0	23.5	47.0

Year-to-year changes in the total number of classrooms using each approach are presented in Table 6. Since 1971 there has been an increase in the number of classrooms for hearing impaired from 259 to 344. A steady decline in the number of classrooms using the oral communication approach has occurred. In 1971-72, 76.8 percent (199) of those 259 classrooms used the oral approach, as indicated in Table 6. Currently, 53.0 percent (179) of the 338 classrooms reported use the oral approach, as illustrated in Table 6. The number of classroom programs using the total communication approach has increased from 23.2 percent (60) of all programs in 1971 to 47.0 percent (159) of all reported classroom programs in 1977-78. This is a decline of 10.1 percent in the number of oral classrooms and an increase of 265 percent in the number of total communication

classrooms. These figures are presented in Figure 2 to further illustrate the change which has occurred in the frequency of oral and total communication classrooms from 1971 to 1978.

Table 6.--The number and percentage of programs for each year from 1971 to 1978 using the oral communication and total communication approaches.

Communication Approach	Year						
	71-72	72-73	73-74	74-75	75-76	76-77	77-78
Oral							
Number	199	195	193	184	185	171	179
Percent	76.8	74.4	70.4	64.1	61.7	54.5	53.0
Total							
Number	60	67	81	103	115	143	159
Percent	23.2	25.6	29.6	35.9	38.3	45.6	47.0
Totals	259	262	274	287	300	314	338[a]

[a]Data missing for six classrooms.

The next area examined in relation to communication approaches used in classrooms for hearing impaired was the changes that have occurred since 1971; that is, the number of classes using the oral communication and total communication approach that have changed from one method to the other. This was tabulated by counting the number of classrooms using each method previously and the present number for each educational level. Table 7 presents this information. Since 1971, 179 of the oral programs made no change in the communication

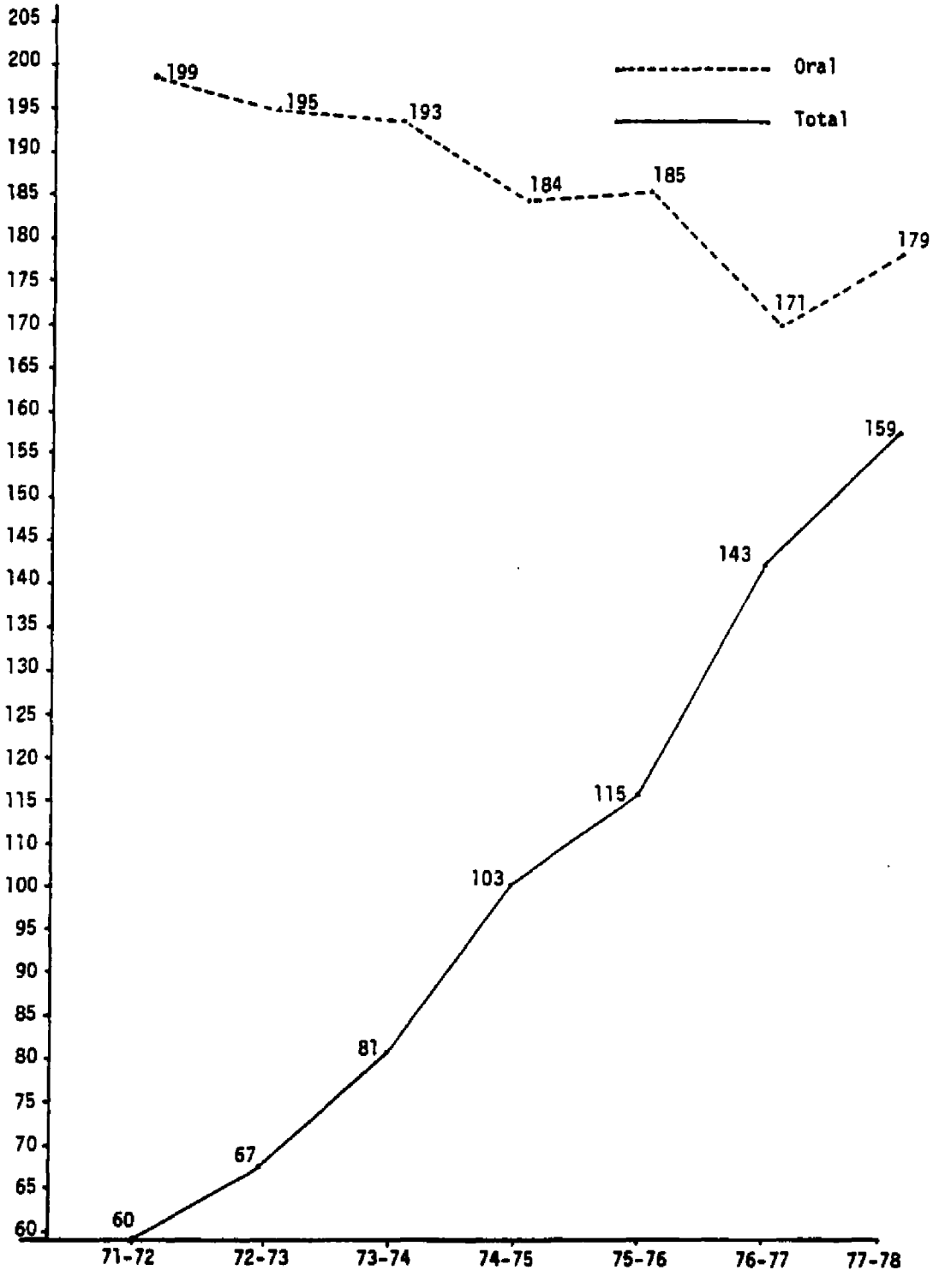

Figure 2.--Graph of classrooms using oral communication and total communication approaches yearly since 1971 to 1978.

Table 7.--Previous and present uses of communication approaches at various educational levels.

Communication Approach	Educational Level					
	Preschool	Elementary	Middle	High School	All Levels	Totals
Oral						
Previous	46	108	33	31	17	235
Present	34	83	30	23	9	179
Total						
Previous	9	37	16	32	9	103
Present	21	62	19	40	17	159
Totals						
Previous	56	145	49	63	26	338
Present	56	145	49	63	26	338

approach used. Of the 235 oral classrooms, 56 or 23.8 percent changed to the total communication approach. Of the 159 total communication classrooms, none changed the communication approach used. Of the total number of classrooms reported (338), 16.6 percent changed communication approach. All of these changed from oral to total communication. The changes at each educational level are presented in Table 8. The greatest changes were at the preschool, elementary, and classrooms serving all educational levels.

Table 8.--The number and percentage of oral classes since 1971 which have changed to total communication at each educational level.

Educational Level	Number	Percent
Preschool	12	21.4
Elementary	25	17.2
Middle School	3	6.1
High School	8	12.7
All Levels and Unknown	8	30.8

The changes as they occurred each year since 1971 did not present a consistent pattern. The percentage of change from the oral to the total communication approach as it occurred each year for each educational level is presented in Table 9.

Table 9.--The percentage of the total number of classrooms that changed from oral to total communication approach at each educational level from 1971 to 1978.

Educational Level	Year						
	71-72	72-73	73-74	74-75	75-76	76-77	77-78
Preschool	0	16.7	16.7	8.3	16.7	41.6	0.0
Elementary	0	0.0	20.0	32.0	8.0	24.0	16.0
Middle School	0	0.0	0.0	66.7	0.0	0.0	33.3
High School	0	12.5	0.0	12.5	25.0	37.0	12.5
All Levels (and Unknown)	0	0.0	0.0	37.5	0.0	37.5	25.0
Totals	0	5.3	12.5	26.8	10.7	30.4	14.3

In Table 10 the classrooms added since 1971 are tabulated as to whether the oral or total communication approach was used. Of the 15 classes added at the preschool level and the 34 classrooms added at the elementary level, approximately half used oral and half used total communication. Of the 12 classes added at the middle school level, 75 percent used oral communication and 25 percent used total communication. Of the 12 classes added at the high school level, 33.3 percent used oral communication and 66.7 percent used total communication. Classrooms serving all educational levels and unknown service levels totaled 11, of which 36.4 percent used oral communication and 63.6 percent used total communication.

Table 10.--The number and percentage of oral and total communication classrooms added since 1971.

Educational Level	Classrooms Added		
	Oral	Total Communication	Totals
Preschool			
Number	8	7	15
Percent	53.3	46.7	
Elementary			
Number	16	18	34
Percent	47.1	52.9	34
Middle School			
Number	9	3	12
Percent	75.0	25.0	
High School			
Number	4	8	12
Percent	33.3	66.7	
All Levels and Unknown			
Number	4	7	11
Percent	36.4	63.6	
Totals			
Number	41	43	84
Percent	48.8	51.2	100

Research Question 3: How many intermediate school districts provide oral and total communication classroom options at each educational level?

The number of districts which offer both oral and total communication classrooms at each educational level was tabulated. It

was found that six intermediate districts have both oral and total communication classrooms available at the preschool level, eight districts have oral and total communication classes available at the elementary level, three have oral and total communication available at the middle school level, and five have high school classes for both oral and total communication. Only three intermediate school districts have both oral and total communication classroom programs available at all educational levels.

Research Question 4: To what extent does teacher satisfaction vary with (a) educational level and (b) communication approach?

The degree of teacher satisfaction with the communication approach used by educational level was surveyed. The number of teachers expressing various degrees of satisfaction is shown in Table 11. As indicated in the Totals column, 74.0 percent of the 144 teachers using oral communication who responded to the question were "very satisfied," while 51.4 percent of the 140 teachers using total communication who responded to this question were "very satisfied." Of the teachers using oral, 20.0 percent were "satisfied," while 42.1 percent of the teachers using total communication were "satisfied." Of the teachers using oral, 6.0 percent were "dissatisfied," while 5.7 percent of the teachers using total communication were "dissatisfied." None of the teachers using oral communication were "very dissatisfied," while .7 percent of the teachers using total communication were "very dissatisfied."

Table 11.--Distribution of teachers according to degree of satisfaction by educational level and communication approach.

Degree of Teacher Satisfaction With Communication Approach	Educational Level											
	Preschool		Elementary		Middle		High School		All Levels		Totals	
	Oral	Total	Oral	Total	Oral	Total	Oral	Total	Oral	Total	Oral	Total
Very Satisfied												
Number	16	6	55	39	18	3	15	22	3	2	107	72
Percent	72.7	54.5	73.3	59.1	78.3	18.8	83.4	57.9	50.0	22.2	74.0	51.4
Satisfied												
Number	6	4	13	23	5	12	2	15	3	5	29	59
Percent	27.3	36.4	17.3	34.8	21.7	75.0	11.1	39.5	50.0	55.6	20.0	42.1
Dissatisfied												
Number	0	0	7	4	0	1	1	1	0	2	8	8
Percent	0.0	0.0	9.3	6.1	0.0	6.2	5.5	2.6	0.0	22.2	6.0	5.7
Very Dissatisfied												
Number	0	1	0	0	0	0	0	0	0	0	0	1
Percent	0.0	9.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7

The teachers of the oral approach tended to express greater satisfaction by selecting more "very satisfied" responses. There appears, however, to be no appreciable difference in the degree of teacher satisfaction at the various educational levels.

It is imperative to note that the nine teachers using total communication who were "dissatisfied" and "very dissatisfied" with the method they were using were not dissatisfied with the total communication approach. These nine teachers were trying to use oral communication with some students without exposing those children to the total communication used with other children in the same classroom. These teachers stated that they were dissatisfied with trying to separate the use of both communication approaches in the same classroom. As indicated in Table 13, all of these teachers wanted to change approaches. Seven of the teachers wanted to change to total communication, while the remaining two did not express a preference.

Research Question 5: Are there differences in the desire to change communication approaches between teachers in oral and teachers in total communication classrooms?

The results for this question are presented in Tables 12 and 13. None of the 129 teachers using total communication who responded to this question wanted to change communication approaches except for the nine teachers using both oral and total communication separately in the same classroom, seven of whom wanted to change to total communication, as indicated in the Totals comumn of Table 13. Of the 130 teachers using oral communication who responded to the question,

Table 12.--The distribution of teachers according to desire to change, by educational level and communication approach.

Like to Change	Educational Level											
	Preschool		Elementary		Middle		High School		All Levels		Totals	
	Oral	Total	Oral	Total	Oral	Total	Oral	Total	Oral	Total	Oral	Total
Yes												
Number	1	0	9	0	1	0	3	0	0	0	14	0
Percent	4.5	0.0	12.0	0.0	4.4	0.0	16.7	0.0	0.0	0.0	9.7	0.0
No												
Number	21	10	66	62	22	15	15	36	6	6	130	129
Percent	95.5	100.0	88.0	100.0	95.6	100.0	83.3	100.0	100.0	100.0	90.3	100.0

Table 13.--The distribution of teachers according to change in communication approach desired, by educational level and communication approach.

Change in Methods Desired	Educational Level					
	Preschool	Elementary	Middle	High School	All Levels	Totals
Oral to Total Communication	1	9	1	3	0	14
Total to Oral Communication	0	0	0	0	0	0
Oral and Total Separately to Total	1	2	1	1	2	7
Oral and Total Separately to Either Oral or Total	0	2	0	0	0	0

9.7 percent wanted to change the communication approach used, as indicated in the Totals column of Table 12.

The communication approach to which the teachers wanted to change is shown in Table 13. All of the 14 teachers who wanted to change communication approaches wanted to change to total communication. Of the teachers who wanted to change to total communication, there were 4.5 percent at the preschool level, 12 percent at the elementary level, 4.4 percent at the middle school level, and 16.7 percent at the high school level. Seven of the teachers using oral and total communication separately wanted to change to total communication, while the other two teachers did not express a preference.

A second subquestion examined the major obstacles to making a change in the communication method currently used if a change is desired. The obstacles listed were:

1. teacher not acequately trained in total communication (24 percent)
2. administrative pressure (12 percent)
3. parent pressure (8 percent)
4. professional pressure (8 percent)
5. no response (40 percent)

The major obstacle to change is lack of teacher training in total communication. It is interesting to note that only one institution of higher learning in Michigan has a teacher training program in hearing impaired which emphasizes the total communication approach.

Research Question 6: What is the degree of parent satisfaction as perceived by the teacher with (a) the communication approach used and (b) the hearing impaired program in general?

The degree of parent satisfaction with the communication approach used at each education level, as perceived by the teachers, is indicated in Table 14. It should be noted that the degree of parent satisfaction did not vary greatly between oral and total communication programs. The parents of students in oral communication programs tended to be rated slightly more satisfied by the 137 teachers who responded to this question than those parents rated by the 124 total communication teachers who responded. This similarity in satisfaction may be explained in several ways. Parents who desire a specific communication approach may have influenced the use of that approach within a system. Another possibility is that parents who desire a specific communication approach may move to a district which offers that approach. Further, it is probable that a certain number of parents in both groups are ambivalent regarding the approach used.

Parent satisfaction with the program in general, as perceived by the teacher, is presented in Table 15. The proportion of parents satisfied with the program for the hearing impaired at each educational level was very similar to the proportion of parents satisfied with the communication approach, as indicated in Table 15. The parents of students in oral programs tended to be rated slightly more satisfied by the 134 oral teachers who responded than those parents with children in total communication programs by the 113 total communication teachers who responded to the question.

Table 14.--The number and percentage of teachers reporting levels of parent satisfaction with the communication method used at each educational level.

Percentage of Parents Reported as Satisfied	Educational Level											
	Preschool		Elementary		Middle		High School		All Levels		Totals	
	Oral	Total	Oral	Total	Oral	Total	Oral	Total	Oral	Total	Oral	Total
100 percent												
Number	19	8	56	38	22	12	14	24	4	1	115	83
Percent	90.5	80.0	78.9	63.3	95.6	80.0	82.4	75.0	80.0	14.3	83.9	66.9
90-99 percent												
Number	2	2	11	9	0	2	1	5	1	6	15	24
Percent	9.5	20.0	15.5	15.0	0.0	13.3	5.9	15.6	20.0	85.7	11.0	19.4
80-89 percent												
Number	0	0	3	12	1	0	1	1	0	0	5	13
Percent	0.0	0.0	4.2	20.0	4.4	0.0	5.9	3.1	0.0	0.0	3.6	10.5
70-79 percent												
Number	0	0	0	1	0	1	1	1	0	0	1	3
Percent	0.0	0.0	0.0	1.7	0.0	6.7	5.9	3.1	0.0	0.0	0.7	2.4
60-69 percent												
Number	0	0	0	0	0	0	0	1	0	0	0	1
Percent	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.8
50-59 percent												
Number	0	0	1	0	0	0	0	0	0	0	1	0
Percent	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0
Totals	21	10	71	60	23	15	17	32	5	7	137	124

Table 15.--The number and percentage of teachers reporting levels of parent satisfaction with the program for the hearing impaired.

Percentage of Parents Reported Satisfied	Educational Level											
	Preschool		Elementary		Middle		High School		All Levels		Totals	
	Oral	Total	Oral	Total	Oral	Total	Oral	Total	Oral	Total	Oral	Total
100 percent												
Number	18	8	44	31	18	5	14	14	3	2	97	60
Percent	90.0	80.0	62.0	52.5	81.8	31.2	87.5	60.9	60.0	40.0	72.4	53.1
90-99 percent												
Number	1	1	15	11	1	9	2	5	1	2	20	28
Percent	5.0	10.0	21.1	18.6	4.5	52.6	12.5	21.7	20.0	40.0	14.9	24.8
80-89 percent												
Number	0	0	6	9	2	0	0	1	1	0	9	10
Percent	0.0	0.0	8.4	15.2	9.1	0.0	0.0	4.3	20.0	0.0	6.7	8.8
70-79 percent												
Number	1	0	4	3	0	1	0	2	0	0	5	6
Percent	5.0	0.0	5.6	5.1	0.0	6.2	0.0	8.7	0.0	0.0	3.7	5.3
60-69 percent												
Number	0	0	0	2	0	1	0	0	0	0	0	3
Percent	0.0	0.0	0.0	3.4	0.0	6.2	0.0	0.0	0.0	0.0	0.0	2.6
50-59 percent												
Number	0	1	2	3	1	0	0	1	0	1	3	6
Percent	0.0	10.0	2.8	3.4	4.5	0.0	0.0	4.3	0.0	20.0	2.2	5.3
Totals	20	10	71	59	22	16	16	23	5	5	134	113

Research Question 7: What methods are being used in total communication programs?

The four specific questions in relation to the above question are:

1. What specific sign systems are used as a function of educational level?

The sign systems used in total communication classrooms were surveyed and the results are presented in Table 16. At the primary and elementary levels, Signing Exact English (45.4 and 49.2 percent) and Signed English (27.3 and 41.0 percent) were most frequently used. At the middle school level, Signing Exact English (55.0 percent) and other combinations of methods (45.0 percent) were used most frequently. At the high school level, a combination of methods was most frequently used (42.1 percent), with Signing Exact English (18.4 percent) and a combination of American Sign Language and Signing Exact English (18.4 percent) used with the second highest frequency. In programs serving three or more educational levels, Signing Exact English was used twice as frequently as Signed English.

2. What reference books are used as primary and supplementary resources at each educational level?

The specific resource books used as primary and secondary references were surveyed, with the results listed in Table 17. It was found that a wide variety of books is used at all educational levels. The most frequently listed primary reference books were: Gustason, Signing Exact English; Borstein, Signed English Series; and O'Rourke, A Basic Course in Manual Communication. The most frequently

Table 16.--Percentage of sign systems used at each educational level.

Sign System	Educational Level					
	Primary	Elementary	Middle	High School	All Levels	Totals
Signing Exact English	45.4	49.2	55.0	18.4	61.5	42.9
American Sign Language	0.0	1.6	0.0	10.5	0.0	3.2
Signed English	27.3	41.0	0.0	10.5	23.1	24.7
American Sign Language and Signed English or Signing Exact English	4.5	3.3	0.0	18.4	0.0	6.5
Combinations	22.7	4.9	45.0	42.1	15.4	22.7

Table 17.--The frequency of the following reference books at each educational level cited as either a primary (P) or supplementary (S) reference source for sign.

Reference Books	Educational Level														
	Pre-school		Elementary		Middle		High School		All and Unknown		Totals				Totals
	P	S	P	S	P	S	P	S	P	S	P	%	S	%	P&S	%
Anthony: Seeing Essential English	0	1	6	3	1	0	0	3	0	1	7	(4.7)	8	(2.6)	15	(3.2)
Bornstein: Signed English Series	2	0	21	11	0	1	4	10	1	2	28	(18.8)	24	(7.7)	52	(11.2)
Fant: Ameslan	1	0	3	4	1	4	0	19	0	1	5	(3.4)	28	(8.9)	33	(7.1)
Fant: Say It With Hands	0	4	0	6	0	10	1	8	0	2	1	(0.7)	30	(9.6)	31	(6.7)
Gustason et al.: Signing Exact English	7	2	33	20	5	3	7	17	5	1	57	(38.2)	48	(13.7)	100	(21.6)
Madsen: Conversational Sign Language II	0	2	2	5	2	1	0	15	0	0	4	(2.7)	23	(7.3)	27	(5.8)
O'Rourke: A Basic Course in Manual Communication	1	3	5	19	5	1	6	15	3	2	20	(13.4)	40	(12.8)	60	(13.0)
Riekehof: Talk to the Deaf	0	3	2	14	0	7	6	6	0	4	8	(5.4)	34	(10.9)	42	(9.1)
Stokoe, Casterline, & Croneberg: A Dictionary of American Sign Language	0	1	1	0	0	3	1	10	0	0	2	(1.3)	14	(4.5)	16	(3.5)
Watson: Talk With Your Hands	0	0	1	9	1	5	0	6	1	4	3	(2.0)	24	(7.7)	27	(5.8)
Gallaudet College: Signs for Instructional Purposes	0	1	3	5	1	3	0	15	0	0	4	(2.7)	24	(7.7)	28	(6.1)
Bornstein, Hamilton, Saulnier, & Ray: Signed English Dictionary	0	0	2	0	0	0	0	1	1	0	3	(2.0)	1	(0.3)	4	(0.9)
Babbini: Basic Course in Manual Communication	1	2	2	4	1	0	0	3	0	0	4	(2.7)	9	(2.9)	13	(2.8)
Others:	0	2	2	4	0	0	0	3	1	2	3	(2.0)	11	(3.5)	14	(3.0)
Totals	12	21	83	104	17	38	25	131	12	19	149		313		462	

used supplementary reference books were: Gustason, Signing Exact English; O'Rourke, A Basic Course in Manual Communication; Riekehof, Talk to the Deaf; Fant, Say It With Hands; and Fant, Ameslan. When the numbers of primary and supplementary reference books were combined, the reference books used most frequently, as indicated in the Totals column in Table 17, were: Gustason, Signing Exact English; O'Rourke, A Basic Course in Manual Communication; Bornstein, Signed English Series; Riekehof, Talk to the Deaf; and Fant, Ameslan.

At the preschool and elementary level, Gustason's Signing Exact English and Bornstein's Signed English Series are the most frequently used primary reference books. At the middle school level the most frequently used primary reference books were Gustason's Signing Exact English and O'Rourke's A Basic Course in Manual Communication. At the high school level the most frequently used primary books were: Gustason's Signing Exact English, O'Rourke's A Basic Course in Manual Communication, Riekehof's Talk to the Deaf, and Bornstein's Signed English Series. Classrooms serving students at three or more educational levels most frequently used Gustason's Signing Exact English and O'Rourke's A Basic Course in Manual Communication.

3. What formal classes in fingerspelling and sign are offered to hearing impaired learners, school personnel, and parents?

A widely held belief has been that classes may use sign but not formally teach it (Jordan, Gustason, & Rosen, 1975). Teachers of total communication were asked if formal classes in sign are

offered to hearing impaired students, hearing students, teachers, support personnel, and parents. Knowledge of signs and fingerspelling by these groups is an important aspect of a total communication program. As indicated in Table 18, of the 159 classrooms using the total communication method, 102 (64.2 percent) offer classes in fingerspelling and 111 (69.8 percent) offer classes in sign to hearing impaired students. Of the programs reported, 19.5 percent had formal classes available in fingerspelling for hearing students. Thirty and eight-tenths percent had classes available for teachers, 27.7 percent for support personnel, and 32.7 percent for parents. Formal classes in sign were offered in 28.9 percent of the programs to hearing students, in 56.6 percent of the programs for teachers, in 58.5 percent of the programs for support personnel, and in 40.2 percent of the programs for parents. This situation is a potential problem area for hearing impaired students who use total communication and their ability to communicate with hearing students, teachers, support personnel, and parents.

4. Has standardization of signs occurred in intermediate school districts or do districts have plans to standardize signs?

Of the 209 teachers (not all of whom use total communication) who answered this question, 49 responded that signs had been standardized within their districts and the other 160 indicated that signs had not been standardized. Of the 49 who indicated that signs had been standardized, 15 were from the same intermediate district representing seven districts. The others were from districts in

which teachers indicated both yes and no to the question of signs having been standardized. Seven districts have partial standardization of signs. Teachers from four of the districts indicating that signs had been standardized have only one classroom for hearing impaired in the district, but also have teacher consultant services.

Table 18.--The number and percentages of classrooms using total communication providing or participating in formal classes for sign and fingerspelling for the indicated groups.

Groups Receiving Sign and Fingerspelling Training	Fingerspelling	Sign
Hearing Impaired Students		
Number	102	111
Percent	64.2	69.8
Hearing Students		
Number	31	46
Percent	19.5	28.9
Teachers		
Number	49	90
Percent	30.8	56.6
Support Personnel		
Number	44	93
Percent	27.7	58.5
Parents		
Number	52	64
Percent	32.7	40.2
Others		
Number	13	21
Percent	8.2	13.2

Three of the intermediate districts have plans to standardize signs in the future and seven of the districts had teachers who plan to standardize to some extent within programs. Six of the districts have no intention of standardizing in the future, according to the teachers. Eight of the districts which have partial plans to standardize, orare partially standardized, have portions of the program for which there is no intention of standardizing. In total, 55 teachers stated that their district had plans to standardize and 85 stated that their district had no plans to standardize. The lack of standardization of signs and plans to standardize signs indicates a difficulty within districts in providing a continuity of programming between educational levels and classrooms. This lack of standardization probably causes difficulties in communication within schools, and across educational levels, as indicated by teachers who answered this question.

Research Question 8: To what extent were formal systems used to measure pupil academic progress?

Teachers were asked if they employ a formal systematic measure of pupil academic progress. As indicated in Table 19, 61.5 percent of the teachers indicated "yes," 21.3 percent indicated "no," and 17.2 percent of the responding teachers did not answer the question. There is an obvious problem related to the number of programs which have no formal measurement of academic progress. As indicated in Table 20, 13.9 percent of the teachers were using group achievement tests to measure pupil progress. These tests were typically listed as the same ones offered to hearing students. The measures most

frequently used (Table 20) were: (1) individual achievement (28.8 percent), (2) performance objectives (26.0 percent), (3) a combination of methods (15.4 percent), and (4) group achievement tests (13.9 percent).

Table 19.--Number and percentage of teachers employing a formal systematic measure of academic pupil progress.

	Frequency	Percentage
Yes	208	61.5
No	72	21.3
No Response	58	17.2

Table 20.--Number and percentage of measures of pupil academic progress.

Systematic Measure	Frequency	Percentage
Group Achievement Measures	29	13.9
Individual Achievement	60	28.8
Language Achievement	5	2.4
Diagnostic Tests	14	6.7
Developmental Profiles	8	3.8
Performance Objectives	54	26.0
Not specified	6	2.9
Combination of above (Michigan Assessment Test)	32	15.4

Major Findings

1. The oral communication approach was used by 53 percent of classrooms for the hearing impaired, with 47 percent using the total communication approach.

2. The change from 61.8 percent oral at the preschool level to 36.5 percent oral at the secondary level provides support for the assumption that the oral approach diminishes at higher educational levels.

3. Classrooms which serve students with mild and moderate hearing losses and classrooms which serve students with mild to profound hearing losses use oral communication more at the elementary levels and total communication more at the secondary levels.

4. Classrooms which serve students with severe and profound hearing losses favor the use of total communication at all educational levels except the elementary level, which has 50 percent oral and 50 percent total classrooms.

5. Classrooms that serve students with mild to profound hearing losses and only moderate losses use oral communication at the elementary level and total communication at the secondary level.

6. Of the hearing impaired students in the survey, 11.6 percent were reported as functionally deaf or "having no usable hearing for educational purposes." Of those students, 84.6 percent had severe/profound hearing losses. Of the 81 classrooms which had at least one functionally deaf child, 71.6 percent used total communication. Therefore, the majority of students who are functionally deaf are in total communication classrooms.

7. Only one intermediate school district has defined functional deafness.

8. Since 1971, the number of classrooms using total communication has increased by 265 percent. Since 1971, the percentage of classrooms using oral communication has decreased by 10.1 percent. In 1971-72 oral communication was used more frequently than total communication at each educational level, with the use of total communication increasing as the educational level increased.

9. Since 1971, 23.8 percent of the oral communication classrooms changed to total communication, while none of the total communication classrooms changed communication approach. The greatest number of classrooms changing to the total communication approach was at the preschool and elementary levels.

10. Only three of the intermediate school districts provide both oral and total communication options at all educational levels. Seven intermediate school districts provide communication options at at least one educational level.

11. There are no appreciable differences in the degree of teacher satisfaction with the communication approach used at the various educational levels.

12. Of the teachers using oral communication, 9.7 percent expressed a desire to change to total communication. None of the teachers using only total communication wanted to change methods.

13. Obstacles to changing the communication approach were: teacher not adequately trained in total communication (24 percent),

administrative pressure (12 percent), parent pressure (8 percent), and professional pressure (8 percent).

14. The degree of parent satisfaction (as reported by the teacher) with (a) the communication approach used and (b) the individual district's program for the hearing impaired was similar for oral and total communication classrooms.

15. At the primary, elementary, and middle school levels, the newer sign systems are most frequently used (Signing Exact English and Signed English). At the high school level, a combination of American Sign Language and Signing Exact English is most frequently used.

16. A wide variety of reference books are used as primary and supplementary references at all educational levels. The use of these books corresponds closely to the sign systems used. The most frequently used books were: Gustason, Signing Exact English; O'Rourke, A Basic Course in Manual Communication; Riekehof, Talk to the Deaf; Fant, Ameslan; and Bronstein, Signed English Series.

17. Of the classrooms using total communication, 64.2 percent offer formal classes in fingerspelling and 69.8 percent in sign to hearing impaired students. Formal classes in fingerspelling were available in 19.5 percent of the programs for hearing students, 30.8 percent for teachers, 27.7 percent for support personnel, and 32.7 percent for parents. Formal classes in sign were offered in 28.9 percent of the programs for hearing students, 56.6 percent for teachers, 58.5 percent for support personnel, and 40.2 percent for parents.

18. Seven of the 31 intermediate school districts which use total communication have standardized signs within the district. Three of the districts plan to standardize signs in the future.

19. A formal system of measuring pupil academic progress was used by 61.5 percent of the reporting teachers, while 21.3 percent do not use any formal system of measurement of pupil academic progress. The most frequently listed measures were: individual achievement tests (28.8 percent), performance objectives (26.0 percent), a combination of measurements (15.4 percent), and group achievement tests (13.9 percent).

CHAPTER V

SUMMARY, DISCUSSION, AND RECOMMENDATIONS

Summary

This study focused on the use of oral and total communication approaches in public school special education classrooms for hearing impaired students in Michigan. The six major objectives of the study were to: (1) survey the public school programs serving hearing impaired learners in order to determine which communication approaches are currently used; (2) determine the relationship between approaches used, education level, degree of hearing loss, and functional deafness; (3) determine changes in the communication approaches used in educational programs since 1971; (4) determine the degree of teacher and teacher-perceived parent satisfaction with the communication approaches used; (5) determine the nature of methods of total communication used, including the sign systems used, whether attempts at standardization of signs within school districts have been made, and whether formal classes in sign language are offered to hearing impaired students and other groups within a district; and (6) determine if systematic measures of pupil academic progress are utilized.

The data were gathered by means of a mailed questionnaire developed in cooperation with the Special Education Service Area of the Michigan Department of Education. This questionnaire consisted of two parts. The second part of the questionnaire, Part B,

completed by the classroom teachers of programs for the hearing impaired, provided the data for this study.

The information obtained was tabulated and resulted in the following conclusions.

Conclusions

1. There is a large and continuing trend in Michigan toward use of the total communication approach in public school special education classrooms at all educational levels for hearing impaired students. Currently, there is approximately equal utilization of oral and total communication in classes for hearing impaired. Since 1971 the number of oral classes has slightly decreased, while the number of total communication classes has increased dramatically.

2. The oral approach is used more frequently at the earlier educational levels (preschool through middle school) and total communication is used more frequently at the high school level and in classes serving students from three or more educational levels.

3. Total communication is used more frequently with students who have severe/profound hearing losses and with students who are functionally deaf or have "no usable hearing for educational purposes."

4. The degree of teacher satisfaction with the communication approach used did not differ appreciably. Some of the oral teachers expressed a desire to change to total communication. None of the total communication teachers indicated a desire to change communication approaches. Teachers of oral and total communication

classrooms did not differ appreciably in their ratings of the degree of parent satisfaction with the communication method used or with the total educational program for the hearing impaired.

5. The newer sign systems--Signing Exact English and Signed English--are most frequently used at the preschool through middle school levels. A combination of American Sign Language and Signing Exact English are most frequently used at the high school level. The most frequently used sign reference books are: Gustason's Signing Exact English; O'Rourke's A Basic Course in Manual Communication; Riekehof's Talk to the Deaf; Fant's Ameslan; and Bornstein's Signed English Series.

6. Fewer than half of the teachers using total communication offer formal classes in fingerspelling and sign to hearing impaired students. Because of the fact that many programs do not offer this instruction, there is a potential problem in providing necessary communication support to the students by those who interact with them. In addition, there is a need to offer instruction in sign and fingerspelling to hearing students, teachers, support personnel, and parents.

7. There has been minimal standardization of signs or minimal plans to standardize sign systems used in classrooms and programs for the hearing impaired within intermediate school districts. This situation reflects a lack of continuity and coordination of programs between educational levels and classrooms.

8. Only 61.5 percent of teachers report using a formal system for measuring pupil academic progress. A need for increased

systematic evaluation of hearing impaired students' academic achievement is evident. The most frequently used systems of measurement were individual achievement tests and performance objectives.

Discussion

This study illustrates the dynamic nature of special education programs for hearing impaired students in Michigan. Since 1971 the number of classrooms for hearing impaired has increased from 259 to 344. The number of classes using the oral approach has decreased from 199 to 179, a decline of 10.1 percent. Since 1971, 23.8 percent of the 235 oral classrooms have changed to total communication. In the same period the number of classes using total communication has increased from 60 to 159, or 265 percent. None of the classrooms using total communication have changed communication approach. There is clearly a significant change taking place in the direction of total communication in Michigan, with 53 percent of the classes using oral and 47 percent of the classes using total communication.

The ratio of oral to total communication classes has changed significantly at each education level. Although oral communication is used more than total communication at the preschool, elementary, and middle school levels, total communication made its greatest increases at the preschool, elementary, and in classes serving three or more educational levels. This would appear to indicate a growing recognition of the need for the early development of language and communication.

A look at the use of oral and total communication in relation to the degree of hearing loss and functional deafness indicates that oral communication is used with preschool through middle school level classes which serve mildly impaired students and classes with mild to profound losses. The greater the hearing loss, the greater the use of total communication. The classes serving students recognized as functionally deaf usually used total communication.

Only 3 of the 58 intermediate school districts provide both oral and total communication options at all educational levels. Because of the emotionalism of the issue among both professionals and parents, and the varying needs of hearing impaired students, one might expect that more districts would offer both oral and total communication options. Provision of both oral and total communication options within and among intermediate school districts may represent a means to provide more appropriate programming for the individual needs of hearing impaired students. It may also be the way to deal administratively with the strong opinions and preferences of both professionals and parents.

In relation to teacher satisfaction with the communication approach used, the oral teachers tended to rate themselves as slightly more satisfied. As mentioned earlier, 9.7 percent of the teachers using the oral approach wanted to change to total communication, the major obstacle to making the change being a lack of teacher skills in total communication. With the increase in the number of total communication classes, it appears necessary to develop total communication components in teacher training programs.

There is a trend toward the use of the newer sign systems (Signing Exact English and Signed English) at the preschool, elementary, and middle school levels. These systems are based on American Sign Language (ASL), the system used most frequently by deaf adults. Many of the signs, however, have been modified beyond recognition. Signing Exact English and Signed English stress the teaching of English through sign and, therefore, modify the ASL syntax (which is not related to English) so that the grammatical structure of English can be taught. Signing Exact English and Signed English stress consistent use of "meaning through context and consistent use of normal spoken English structure" (Cokely & Gawlik, 1973, p. 8). Because English and its characteristics dominate, the ASL vocabulary is borrowed and changed. According to Cokely and Gawlik (1973), deaf children who use Signing Exact English and Signed English have difficulty communicating with deaf adults who use Ameslan. Because manuals are available to teach Signing Exact English and Signed English and benefits are expected in dealing with the English language problems of deaf children, it is understandable that these systems are used at the preschool to middle school level. Since ASL is a sign system which is faster to sign and based on meaning, it is also understandable that its frequency is greater at the high school level. Because of the great variation in sign systems, and the difficulty in understanding different sign systems, the need for standardization is essential for effective communication. Only 7 of the 31 intermediate school districts using total communication have standardized signs.

Recommendations

The following are areas of concern arising from the information obtained in the study which the authors feels must be addressed by the local and intermediate school districts and the Michigan State Department of Education.

1. Criteria for determining the appropriate educational placement for hearing impaired students need to be developed, including the development of guidelines for the selection of the oral or total communication placement.

2. Also needed are criteria for the definition of functional deafness and the determination of the communication approach which is most effective for students found to be functionally deaf.

3. Provision of both oral and total communication options at each educational level among and within intermediate school districts may represent a means to provide more appropriate programming for the individual needs of hearing impaired students.

4. It is recommended that in-service and pre-service training in total communication be developed by university teacher training programs (only one of which currently emphasizes total communication).

5. The use of the newer sign systems (Signing Exact English and Signed English) and American Sign Language in educational programs and in the deaf community needs to be evaluated and a determination made as to the appropriate system(s) to use.

6. Local and intermediate school districts should standardize the sign systems used in total communication programs for hearing impaired.

7. It is recommended that all districts using total communication offer formal classes in sign and fingerspelling to hearing impaired students, hearing students, teachers, support personnel, and parents in order to provide them with the communication skills they need for interaction with students in a total communication program.

8. The range of hearing impairment for which adequate educational programming can be offered in one classroom needs to be explored. Of all the teachers reporting, 193 (57.1 percent) appear to be serving students with losses ranging from 26 dB to 90 dB in the same classroom. Rationale for this needs to be investigated and supported or refuted.

9. Increasing attention should be paid to the specific procedures used to measure academic progress for hearing impaired students.

10. Guidelines need to be developed and established for the integration of students in general education (mainstreaming). Measures of program effectiveness could then be based on measurement of individual student achievement.

11. Administrators at state, intermediate, and local levels are encouraged to examine the results of this survey, concurrent with the data compiled by the State Department of Education from the unreported Part A of the questionnaire. Such a procedure would identify areas of expressed need and concern in the delivery of effective educational services to hearing impaired students. A

careful analysis of responses from both questionnaires should help indicate appropriate directions for on-going efforts to develop and improve the continuum of services to this special population.

APPENDICES

APPENDIX A

PART B OF QUESTIONNAIRE TO BE COMPLETED BY CLASSROOM TEACHERS OF PROGRAMS FOR HEARING IMPAIRED

APPENDIX A

PART B: TO BE COMPLETED BY TEACHERS AND TEACHER CONSULTANTS OF HEARING IMPAIRED PROGRAMS

Name of District: _____

Address: _____

List the specific school districts which you serve (I.S.D. and local(s)):

_____

_____

1. **Type of Program (check):**

   _____ Special Education Classroom
   a. Total number of students in your class _____
   b. Number of students who spend a portion of school day in general education _____

   _____ Teacher Consultant Service

   _____ Other, specify: _____

2. **Level Program Serves (check):**

   _____ Infant (0-3 years of age)
   _____ Preschool (3-5 years of age)
   _____ Elementary (specify grades: _____)
   _____ Middle School (specify grades: _____)
   _____ Secondary (specify grades: _____)

3. Indicate the number of hearing impaired students you serve, whose puretone average in the speech frequency for the better ear (unaided) is in each of the listed ranges. Also indicate which of those students seem to have no usable hearing with or without amplification.

Number of students in each range (unaided score)		Number of students with no usable hearing for educational purposes
26-54 dB	_____	_____
55-69 dB	_____	_____
70-89 dB	_____	_____
90 dB and above	_____	_____
Unknown	_____	_____

4. Has your program developed a definition or specific criteria for functional deafness? Yes _____ No __ ____

5. If yes, would you please enclose a copy of that definition.

6. Indicate the number of hearing impaired students you serve who are diagnosed as having additional handicaps as follows:

   Visually Impaired _____ Mentally Impaired _____
   Learning Disabled _____ Emotionally Impaired _____
   POHI _____
   Combinations, specify: _____
   _____

7. List the type(s) of amplification systems used in your classroom or program (e.g. hearing aid, loop, wireless, etc.):

8. List the specific language curriculum(s) which you use:

9. List the specific speech curriculum(s) which you use:

10. List the specific auditory curriculum(s) which you use:

11. Who provides speech and language training for your students? (check)

_____ Speech and Language Therapist
_____ Classroom Teacher
_____ Teacher Consultant
_____ Other, specify:_____

12. List the specific sign system(s) which you use:

13. If you use signs in this program, check the specific book(s) used and whether they are a primary or supplementary resource:

BOOKS	RESOURCE	
	Primary	Supplementary
Anthony: Seeing Essential English		
Bornstein: Signed English Series		
Fant: Ameslan		
Fant: Say It with Hands		
Gustason et al: Signing exact English		
Madsen: Conversational Sign Language II		
O'Rourke: A Basic Course in Manual Communication		
Riekehof: Talk to the Deaf		
Stokoe, Casterline, Croneberg: A Dictionary of American Sign Language		
Watson: Talk with your Hands		
Gallaudet College: Signs for Instructional Purposes		
Other(s), specify:		

14. Check the formal classes which are available in your program for the groups designated in the left-hand column:

GROUP	CLASSES				
	Finger-spelling	Sign	Speech Development	Audition	Other, specify
Hearing impaired students					
Hearing students					
Teachers					
Support Personnel					
Parents					
Others, specify:					

15. Have signs been standardized within your district? Yes _____ No _____

16. If no, are there any plans to do so? Yes _____ No _____

Comments:

17. Indicate the primary communication method you use in your program:

_____ Oral/Aural
_____ Total Communication
_____ Manual
_____ Other, specify: _____

If more than one method is used, please explain: _____

18. Indicate for each year since 1971 or since your program started, which method of communication was used in your classroom or program. If you do not have knowledge of this information, consult with your supervisor.
INDICATE METHOD USED EACH YEAR:
("O" for oral; "T" for total; specify others)

1971-1972 _____
1972-1973 _____
1973-1974 _____
1974-1975 _____
1975-1976 _____
1976-1977 _____
1977-1978 _____

19. Circle the degree of satisfaction you have with the method of communication you use:

Very Satisfied 1 | Satisfied 2 | Dissatisfied 3 | Very Dissatisfied 4

Comments:

20. Would you like to change the communication method you use?
Yes _____ No _____

21. If yes, to what specific method: _____

22. If yes, indicate the major obstacle(s) to making such a change:

23. Approximately what percentage of parents of children in your program do you feel are satisfied/dissatisfied with the communication method you use?

Satisfied: _____% Dissatisfied: _____%

Comments:

24. Approximately what percentage of parents of children in your program do you feel are satisfied/dissatisfied with the hearing impaired program in general?

Satisfied: _____% Dissatisfied: _____%

Comments:

25. Do you employ a formal systematic measure of pupil academic progress?

Yes _____ No _____

26. If yes, specify:

APPENDIX B

COVER LETTER TO TEACHERS

APPENDIX B

STATE OF MICHIGAN

DEPARTMENT OF EDUCATION

Lansing, Michigan 48909

JOHN W. PORTER
Superintendent of Public Instruction

December 12, 1977

M E M O R A N D U M

TO: Classroom Teachers and Teacher Consultants of Hearing Impaired Programs

FROM: Murray O. Batten, Director, Special Education Services

SUBJECT: Questionnaire Regarding Hearing Impaired Programs

I am asking your help in collecting information regarding programs and services available to hearing impaired students within the State of Michigan. As you are aware, the State Board of Education and the Legislature have been reviewing the role and function of the Michigan School for the Deaf. The State Board of Education has already asked a number of questions about the types of programs and services available in the public schools which I am unable to answer because I do not have a sufficient data base. I am asking for your help in having the attached questionnaire completed. I will share this information with you as soon as I have it summarized and will plan to use the information in the State Plan to pinpoint any problems I might have in regard to the delivery system for the hearing impaired.

Would you please complete Part B of the questionnaire. Teacher consultants, please do not report students who are being served in special education classrooms for the hearing impaired. They will be reported by the teacher of the hearing impaired on his/her form.

Please return this information to your intermediate district as soon as possible as they are responsible for sending the questionnaires back to the State Department by January 9, 1978.

Thank you for your time and cooperation in the collection of this information.

APPENDIX C

LIST OF 58 MICHIGAN INTERMEDIATE SCHOOL DISTRICTS

APPENDIX C

LIST OF 58 MICHIGAN INTERMEDIATE SCHOOL DISTRICTS

Allegan
Alpena, Montmorency, Alcona
Barry
Bay, Arenac
Berrien
Branch
Calhoun
Cass
Charlevoix, Emmet
Cheboygan, Otsego, Presque Isle
Eastern Upper Peninsula
Chippewa, Luce, Mackinaw
Clare, Gladwin
Clinton
Delta, Schoolcraft
Dickinson, Iron
Eaton
Genesee
Gogebic, Ontonagon
Traverse Bay Area: Grand Traverse, Benzie, Kalkaska, Leelanau, Antrim
Gratiot, Isabella
Hillsdale
Cooper Country: Houghton, Baraga, Keweenaw
Huron
Ingham
Ionia
Iosco
Jackson
Kalamazoo Valley
Kent
Lake
Lapeer
Lenawee
Livingston
Macomb
Manistee
Marquette-Alger
Mason
Mecosta-Osceola
Menominee
Midland
Monroe
Montcalm
Muskegon
Newaygo
Oakland Schools
Oceana (also Newaygo)
Ottawa
COOR: Crawford, Oscoda, Ogemaw, Roscommon
Saginaw
St. Clair
St. Joseph
Sanilac
Shiawassee
Tuscola
Van Buren
Washtenaw
Wayne
Wexford-Missaukee

REFERENCES

REFERENCES

Babbie, E. R. Survey Research Methods. Belmont, Ca.: Wadsworth Publishing Co., 1973.

Bates, A. "Controversy in the Education of the Deaf." The Teacher of the Deaf 73 (September 1975): 272-81.

Bennett, C. "Speech Pathology and the Hearing Impaired Child." Volta Review 76 (1974): 550-57.

Birch, Jack. Hearing Impaired Children in the Mainstream. Reston, Va.: University of Pittsburg, Council for Exceptional Children, 1975.

Borg, W. R., and Gall, M. D. Educational Research. New York: David McKay Company, Inc., 1976.

Brill, Richard. Administrative and Professional Developments in the Education of the Deaf. Washington, D.C.: Gallaudet College Press, 1971.

_____. "The Superior I.Q.'s of Deaf Children of Deaf Parents." The California Palms 15 (December 1969) California School for the Deaf, Riverside, California.

Cokely, D. R., and Gawlik, R. A Position Paper on the Relationship Between Manual English and Sign. Washington, D.C.: Kendall Demonstration Elementary School for the Deaf, April 18, 1973.

Craig, W. N. "Effects of Preschool Training on the Development of Reading and Lipreading Skills of Deaf Children." American Annals of the Deaf 199 (1964): 280-96.

Davis, H., and Silverman, S. R., eds. Hearing and Deafness. New York: Holt, Rinehart, and Winston, Inc., 1960.

Denton, David M. Total Communication. Maryland School for the Deaf, October 16, 1970.

DiCarlo, Lois. The Deaf. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1964.

Furth, Hans G. Deafness and Learning: A Psychosocial Approach. Belmont, Ca.: Wadsworth Publishing Company, Inc., 1973.

Gates, Robert R. "Report of an Administrative Review of the Michigan School for the Deaf." A report presented to the Michigan State Board of Education by the Michigan School for the Deaf, Flint, Michigan, September 1977.

Goldberg, J. P., and Bordman, M. B. "The ESL (English as a Second Language) Approach to Teaching Hearing Impaired Students." American Annals of the Deaf (February 1975): 22-27.

Gustason, G. "Manual English--What We Know and What We'd Like to Know." Washington, D.C.: Kendall Demonstration Elementary School for the Deaf, April 18, 1973.

Johnson, E. H. "The Ability of Pupils in a School for the Deaf to Understand Various Methods of Communication, II." American Annals of the Deaf 93 (1948): 258-314.

Jordan, I. K., Gustason, G., and Rosen, R. "Communication Trends at Programs for the Deaf." American Annals of the Deaf (December 1976): 527.

Katz, L.; Mathis, S. L.; and Merrill, E. C. The Deaf Child in the Public Schools. Danville, Ill.: The Interstate Printers and Publishers, Inc., 1974.

Kent, Margaret S. "Language Growth and Development of the Deaf Child." In-Service Workship, Carver School for the Deaf, Annapolis, Maryland, March 19, 1972.

Letourneau, N., and Young, V. "Total Communication Shuffles Off to Buffalo." American Annals of the Deaf 120 (1975): 493-98.

Ling, Daniel. Speech and the Hearing-Impaired Child: Theory and Practice. Washington, D.C.: Alexander Graham Bell Association for the Deaf, Inc., 1976.

McClure, William J. "The Rochester Method and the Florida School." American Annals of the Deaf (June 1975): 331-40.

McCroskey, R. L. "Early Education of Infants with Severe Auditory Impairments." Proceedings of International Conference on Oral Education of the Deaf, The Volta Bureau, Washington, D.C., 1967, pp. 1891-1904.

Meadows, K. P. "Early Manual Communication in Relation to the Deaf Child's Intellectual, Social, and Communication Functioning." American Annals of the Deaf 113 (1968): 29-41.

Michigan, Special Education Code as Amended January 14, 1977. Under the provisions of Public Act 198 of 1971, p. 1.

Miller, June. "Oralism." Volta Review 72 (1970): 211-217.

Mindel, E. D., and Vernon, M. They Grow in Silence. Silver Spring, Maryland: National Association of the Deaf, 1971.

Moores, D. F. "Neo-oralism and the Education of the Deaf in the Soviet Union." Exceptional Children 38 (1972): 377-84.

Nie, N. H.; Hull, C. H.; Jenkins, J. G.; Steinbrenner, K.; and Bent, D. H. Statistical Package for the Social Sciences. New York: McGraw-Hill Book Co., 1975.

Office of Demographic Studies. Characteristics of Hearing Impaired Students by Hearing Status. Washington, D.C.: Gallaudet College, 1971.

_____. Characteristics of Hearing Impaired Students Under Six Years of Age. Washington, D.C.: Gallaudet College, 1970.

Phillips, W. D. "Influence of Preschool Training on Achievement in Language Arts, Arithmetic Concepts, and Socialization of Young Deaf Children." Ph.D. dissertation, Teachers College, Columbia, S.C., 1963.

Prickett, H. T., and Hunt, J. T. "Education of the Deaf--The Next Ten Years." American Annals of the Deaf (August 1977): 365-81.

Quigley, S. P. The Influence of Fingerspelling on the Development of Language Communication, and Educational Achievement in Deaf Children. Washington, D.C.: Department of Health, Education and Welfare, 1967.

_____, and Frisina, R. D. "Institutionalization and Psycho-Educational Development of Deaf Children." Council for Exceptional Children (CEC) Research Monograph, Series A 3 (1961).

Report of the Conference of Executives of American Schools for the Deaf Ad Hoc Committee to Define Deaf and Hard of Hearing. American Annals of the Deaf (October 1975): 509-12.

Schein, Jerome D. The Deaf Community, Studies in the Social Psychology of Deafness. Washington, D.C.: Gallaudet College Press, 1968.

_____. The National Census of the Deaf Population (Erwin Kugel Lecture Series). New York: New York Society of the Deaf, 1973.

_____, and Delk, M. T. The Deaf Population of the United States. Silver Spring, Md.: National Association of the Deaf, 1974.

Stevenson, E. "A Study of the Educational Achievement of Deaf Children of Deaf Parents." California News (1964): 143.

Stokoe, W. C., Jr. "CAL Conference on Sign Language." The Linguistic Reporter 12 (1970): 6-7.

_____. "The Use of Sign Language in Teaching English." American Annals of the Deaf (August 1975): 417-42.

Stuckless, E. R., and Birch, J. W. "The Influence of Early Manual Communication on the Linguistic Development of Deaf Children." American Annals of the Deaf 111 (1966): 452-62.

"A Study of the Michigan School for the Deaf and the Michigan School for the Blind." Educational Management Services, Inc., Minneapolis, Minn., March 1977.

"A Study to Determine the Feasibility of Implementing Multiply Handicapped Programs at the Michigan School for the Blind and the Michigan School for the Deaf." Educational Research and Development, Inc., Washington, D.C., October 1974.

Vernon, M., and Kohn, S. D. "Early Manual Communication and Deaf Children's Achievement." American Annals of the Deaf 115 (1970): 527-36.

_____. "Effects of Oral Preschool Compared to Early Manual Communication on Education and Communication in Deaf Children." American Annals of the Deaf 116 (1971): 569-74.

White, A. H. "A Comparative Study of the Articulation of Consonant Phonemes Between Day School and Residential School Deaf Students." M.A. thesis, University of Utah, 1969.

_____. "The Effects of Total Communication, Manual Communication, Oral Communication and Reading on the Learning of Factual Information in Residential School Deaf Children." Ph.D. dissertation, Michigan State University, 1972.

_____, and Stevenson, Vivian M. "The Effects of Total Communication, Manual Communication, Oral Communication and Reading on the Learning of Factual Information in Residential School Deaf Children." American Annals of the Deaf (February 1975): 48-57.

Williams, Clarence M., ed. "Language and Communication Research Problems." Proceedings of the Second Gallaudet Symposium on Research in Deafness, Office for Research, Gallaudet College. Washington, D.C.: Gallaudet Press, 1976.