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ABSTRACT

The author reviews studies and programs in consideration of problems and issues professionals face in the early education of aurally handicapped children. Language handicaps as an obstacle to development of the child's academic, intellectual, and social potential are examined; as is parental need for supportive guidance. Discussed are studies which show effectiveness of oral and neo-oral (Rochester) communications methods in preschool programs in the U.S. and the Soviet Union. Investigations are reviewed which show that deaf children of deaf parents achieve greater academic success than deaf children of hearing parents, although the point is made that use of manual communication in preschool programs might not produce similar success. Discussed in relation to the issue of early intervention are preschool programs emphasing either socialization or cognitive development. Unimodal and bimodal stimulation are considered, and questioned is the optimum stimulation to be prescribed for a newly diagnosed hearing handicapped child. Cited are medical advances (such as near elimination of children's post-lingual hearing loss), and technological advances (improved hearing aids and audiovisual materials); and education's failure to produce new contributions. It is thought that the oral/manual controversy might be eliminated by applying the concept of individualized needs and instruction. (MC)

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EARLY CHILDHOOD SPECIAL EDUCATION FOR THE HEARING HANDICAPPED

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3. J. Rynders. Two basic considerations in utilizing mothers as tutors of their very young retarded or potentially retarded children. Occasional Paper #12. January 1973.

4. R. Bruininks, J. Rynders, & J. Gross. Social acceptance of mildly retarded pupils in resource rooms and regular classes. Research Report #45. January 1973.

5. J. Turnure & M. Thurlow. The effects of interrogative elaborations in the learning of normal and EMR children. Research Report #44. January 1973.

6. J. Turnure & S. Samuels. Attention and reading achievement in first grade boys and girls. Research Report #43. November 1972.

7. R. Riegel, A. Taylor, S. Clarren, & F. Danner. Training educationally handicapped children to use associative grouping strategies for the organization and recall of categorizable material. Research Report #42. November 1972.

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9. A. Taylor, J. Turnure, & M. Thurlow. From research to development: The Math Vocabulary Program. Development Report #1. October 1972.

10. J. Turnure & M. Thurlow. The effects of structural variations in elaboration on learning by normal and EMR children. Research Report #41. September 1972.

11. A. Taylor & N. Bender. Variations of strategy training and the recognition memory of EMR children. Research Report #40. September 1972.

12. D. Moores, C. McIntyre, & K. Weiss. Evaluation of programs for hearing impaired children: Report of 1971-1972. Research Report #39. September 1972.

13. R. Rubin. Follow-up of applicants for admission to graduate programs in special education. Occasional Paper #11. July 1972.

14. D. Moores. Communication - Some unanswered questions and some unquestioned answers. Occasional Paper #10. July 1972.

15. A. Taylor & S. Whitely. Overt verbalization and the continued production of effective elaborations by EMR children. Research Report #38. June 1972.

16. R. Riegel. Measuring educationally handicapped children's organizational strategies by sampling overt groupings. Research Report #37. May 1972.

17. E. Gallistel, M. Boyle, L. Curran, & M. Hawthorne. The relation of visual and auditory aptitudes to first grade low readers' achievement under sight-word and systematic phonic instruction. Research Report #36. May 1972.

18. E. Gallistel & P. Fischer. Decoding skills acquired by low readers taught in regular classrooms using clinical techniques. Research Report #35. May 1972.

19. J. Turnure & M. Thurlow. Verbal elaboration in children: Variations in procedures and design. Research Report #34. March 1972.

20. D. Krus & W. Bart. An ordering-theoretic method of multidimensional scaling of items. Research Report #33. March 1972.

21. J. Turnure & S. Larsen. Effects of various instruction and reinforcement conditions on the learning of a three-position oddity problem by nursery school children. Research Report #32. March 1972.

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23. J. Rynders & J. Horrobin. A mobile unit for delivering educational services to Down's Syndrome (Mongoloid) infants. Research Report #30. January 1972. (Presented at Council for Exceptional Children, Special National Conference, Memphis, December, 1971).

24. F. Danner & A. Taylor. Pictures and relational imagery training in children's learning. Research Report #29. December 1971.

25. J. Turnure & M. Thurlow. Verbal elaboration phenomena in nursery school children. Research Report #28. December 1971.

26. D. Moores & C. McIntyre. Evaluation of programs for hearing impaired children: Progress report 1970-1971. Research Report #27. December 1971.

27. S. Samuels. Success and failure in learning to read: A critique of the research. Occasional Paper #9. November 1971. (In M. Kling, the Literature of Research in Reading with Emphasis on Modes, Rutgers University, 1971).

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Department of Health, Education and Welfare
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Bureau of Education for the Handicapped

RESEARCH AND DEVELOPMENT CENTER
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The University of Minnesota Research, Development and Demonstration Center in Education of Handicapped Children has been established to concentrate on intervention strategies and materials which develop and improve language and communication skills in young handicapped children.

The long term objective of the Center is to improve the language and communication abilities of handicapped children by means of identification of linguistically and potentially linguistically handicapped children, development and evaluation of intervention strategies with young handicapped children and dissemination of findings and products of benefit to young handicapped children.

Early Childhood Special Education for the Hearing Handicapped

The problems and issues currently facing professionals involved in early childhood education are magnified by the fact that the deaf child is unique in that he alone does not acquire language primarily through the auditory-vocal channel. Other things being equal, the ease with which a child acquires language varies inversely with the severity of his hearing loss. While other children are able to utilize an intact auditory modality to build up automatic integrative mechanisms leading to early mastery of the sound, shape and sense of their language, the child with a severe hearing handicap is unique in that his language acquisition must depend primarily on vision.

The hearing child employs his early knowledge of the phonological structure, or sound system, of his language as a vehicle to choose from a wealth of language forms pervading his environment leading to a mastery of grammatical patterns. The hearing handicapped child must bypass the sound system in his quest for grammatical competency. Language, perceived by this child through visual means, must be received through speechreading, signs, informal gestures, dactylic (fingerspelling) and graphemic presentation as well as through the auditory channel.

The child with normal hearing can be considered linguistically proficient in every sense of the word. He has a basic knowledge of the rules of his language and can produce a potentially infinite number

of novel yet appropriate utterances. Because of his mastery over the structure of his language, he can combine and recombine its elements indefinitely. He can produce and understand sentences to which he has never been exposed. He enters the formal situation in elementary school at age six with an already fully developed instrument for learning--language and communication ability--an ability he has acquired with little or no conscious effect on the part of his parents or himself.

A child with no functional response to speech presents an extremely different picture. He does not acquire language naturally and automatically. Without intensive compensatory training he may be totally nonverbal; he might even be unaware that such things as words exist. For this child language is not a facilitating device for the acquisition of knowledge. Rather, it is a formidable obstacle standing between the child and full development of his academic, intellectual and social potential. Although of potentially normal intelligence, the deaf child finds his range of experience constrained by communication limitations. He suffers from a lack of opportunity to fully interact with and manipulate his environment in meaningful ways. Although impaired hearing itself may have no effects on intellectual development, if the child is not provided compensatory tools, the impairment will lead to impoverished communication skills which in themselves set limits on all aspects of development.

Much of the curricula in programs for the hearing hardicapped has been designed to teach or develop the linguistic proficiency

which hearing children bring to the educational process. The means by which most hearing handicapped children learn a language is a different, more laborious procedure. The result is far below that of hearing children both qualitatively and quantitatively. Intellectually normal deaf adolescents in North America or Europe, whether or not they have had preschool training, are unable to read at the fifth grade level (Norden, 1970; Wrightstone, Aranow and Moskowitz, 1963), lack basic linguistic skills (Moores, 1970; Simmons, 1967 ; Tervoort, 1967) and are incapable of expressing and receiving oral communication on anything but a primitive level (Montgomery, 1966; Report of the Chief Medical Officer of the British Department of Educational Services, 1964).

In addition to the generic problem of language and communication, early childhood investigators must remain sensitive to the implications of restricted parent-child interaction and the need for realistic parent guidance. Parents exhibit the customary signs of guilt, frustration, anger and insecurity that may be observed in parents of any handicapped child. Most parents of deaf children have normal hearing and usually have had minimal exposure to deaf individuals. They are in great need of support as they work through the trauma of adjusting to the realization that the deafness is an irreversible loss and that the child's major handicap is not an inability to speak, but an inability to hear.

Evaluation of Preschool Programs

Although preschool programs for the deaf have been in existence

for generations, individuals interested in the development of new programs or the modification of ongoing ones quickly discover that almost no educational guidelines exist for effective preschool programs for the hearing impaired. In view of the strong opinions prevelant in the field it is somewhat surprising to find a lack of comparative data. Most of the literature cited as research involves description, defense and praise of a program by a person who has developed it or is in some way closely related to it. With the exception of a possible tape or audiogram, no data are presented.

The relatively few studies for which data exist present results consistent with research activities in other fields. In many respects, investigations of preschool programs for the deaf parallel the research into early intervention programs for the disadvantaged. In spite of all the enthusiasm and subjective reports of success, there is little to suggest that the programs have had much lasting effect on children. Table 1 presents the studies of effectiveness of such preschool programs. Phillips (1963) compared children receiving preschool training with others receiving no preschool training at six schools for the deaf. By nine years of age there were no differences between experimental and control groups on language arts, arithmetic and socialization. Craig (1964) matched children who had preschool training to those with no preschool training at two schools for the deaf and reported no differences in lipreading and reading skills.

McCroskey (1968) compared children who participated in a home-centered program with auditory emphasis to children who received no training and found few differences between groups. What differences existed tended to

Table 1. Studies of the Effectiveness of Preschool Programs

Investigator	Comparison	Preschool Programs	Results
Morozova (1954)	Oral-only Preschool versus Neo-Oralism (Rochester Method)	Schools in Soviet Union	Children with fingerspelling plus oral instruction master in two years material requiring three years under oral-only method
Phillips (1963)	Oral Preschool versus No Preschool	Lexington School for Deaf White Plains School for Deaf Illinois School for Deaf Pennsylvania School for Deaf American School for Deaf New Jersey School for Deaf	No differences in language, arithmetic and socialization.
Craig (1964)	Oral Preschool versus No Preschool	Western Pennsylvania School for Deaf American School for Deaf	No differences in reading and speechreading.
McCroskey (1968)	Oral Preschool versus No Preschool	Atlanta Speech School	No differences.
Quigley (1969)	Oral-only Preschool versus Rochester Method Preschool	American School for the Deaf Indiana School for the Deaf	Rochester Method Students superior in: a) fingerspelling b) speechreading c) 5 of 7 measures of reading d) 3 of 5 measures of written language Oral-only students superior in: a) 1 of 5 measures of written language
Vernon & Koh (in press)	Oral Preschool versus No Preschool	Tracy Clinic	No differences in speech, speechreading, general achievement and reading.

Table 1 continued. Studies of the Effectiveness of Preschool Programs

Investigator	Comparison	Preschool Programs	Results
Vernon & Koh (in press)	Oral Preschool versus Deaf Children of Deaf Parents with No Preschool	Tracy Clinic	Students with deaf parents and no preschool superior in reading and general achievement. No differences in speech and speechreading.

favor the control group, those with no preschool training. McCroskey postulated that the experimental group consisted of a "basically inferior product" which had been brought to a position of equality with the control group. This must remain conjecture because no pre-experimental data were gathered on the children.

Shortly following World War II, educators of the deaf in the Soviet Union concluded that education of the deaf was a complete failure which could be traced to two basic misperceptions. The first was an inability to recognize that speech and language are distinct entities. Equating the two led educators to emphasize articulation skills at the expense of linguistic and cognitive development. The second mistake was an unfortunate tendency to consider the child a relatively passive organism. As a result classrooms were structured in such a way that almost all conversation and activities were teacher-initiated. A new system, labeled Neo-Oralism, was developed which had three basic goals:

1. To give the child tools of communication, especially expressive communication, at an early age.
2. To change a passive youngster to an active one with initiative in learning.
3. To free the child and his language from the immediate situation.

From the beginning instruction concentrates on practical activities to encourage independence. There is extensive use of toys such as paper, plastic, textiles, paper mache' and plexiglas. Emphasis is

placed on arts and crafts to develop concepts of position and color as well as creativity. Activities with practical application include work with illustrations and figures. There are numerous measuring and counting experiences. A large portion of the child's early education is devoted to organized observation of the environment. Morkovin (1960) and Moores (1971a) have described the system in detail.

According to the position of Soviet educators, the Russian language can be expressed in three separate modes; Oral Speech, Written Speech, and Dactyl Speech (Fingerspelling). Each one is considered a separate form of the Russian language and is used as soon as possible.

Because oral and written speech are so difficult for the very young child, fingerspelling is introduced and used from the beginning because even children who cannot speak or write can fingerspell. Both parents and teachers are expected to spell complete sentences at all times. For many children, as they develop mastery over spoken and written forms of Russian, the use of fingerspelling is phased out.

Morozova (1954) reported that three and four year old children could acquire in two years that which previously required three years under the Pure Oral Method (POM). Moreva (1964) replicated Morozova's study and reported that three year olds could master fingerspelling in from two to eight weeks and that two year olds required five to six months. Martsinovskaya (1961) and Titova (1960) found that fingerspelling facilitated the separation of words into their phonetic composition and accelerated vocabulary growth. Karsunskaya (1969) reported that if everyone around the child fingerpsells, the language mastery process becomes like that of a hearing child. However children do not rely on

fingerspelling even though it is easier. She reported it aids in the development of speechreading and appears to affect speech neither positively nor negatively.

Zukov (1962) claimed that under traditional methods a child entering sch t ge seven would learn 200 words and eight sentence patterns. Now 550 to 600 words and 80 patterns are learned the first year. Zukov reported that a child who has gone through preschool now has as many as 2000 words in his vocabulary upon entering the elementary program. More important, his language has achieved control over his behavior. He has words to control and direct his own actions.

Research on Neo-Oralism has been conducted on over 70 programs in the Soviet Union. By the early 1960's its superiority over the traditional Pure Oral Method had been established to the satisfaction of researchers at the Moscow Institute of Defectology, and Neo-Oralism was established officially through the Soviet Union.

In an attempt to test the generalizability of the findings of the Russians, Quigley compared preschool children taught under the traditional oral-only method to a group taught simultaneously by speech and fingerspelling, a system known as the Rochester Method in the United States (1969). Although it has been used in the United States for almost 100 years it had never been tried, with one exception, with preschool children for fear that fingerspelling would inhibit the very young child's development. Quigley reported that children taught by the Rochester Method were superior in fingerspelling, speechreading, written language and reading, thus supporting the results reported by the Russians.

Vernon and Koh (in press) reported the Tracy Clinic graduated 123 students from its three year preschool program from 1944 to 1968, of whom 56 percent had attended the California School for the Deaf at Riverside. Children from the Tracy program at the Riverside School were matched with children receiving no preschool training on the basis of age, IQ and sex. There were no differences between the Tracy Clinic trained children and those with no preschool in speech, speechreading, academic achievement or reading. A third group, consisting of deaf children of deaf parents, was superior in academic achievement and reading. There were no differences in speech and speechreading between the children of deaf parents and either of the other two groups. This aspect of the study will be discussed more fully in another section.

Studies of Deaf Children of Deaf Parents Receiving Early Manual Communication

Because there have been no educational programs involving the use of manual communication with young children until recently, many investigators have turned to the study of deaf children with deaf parents who use manual communication in the home. If the use of manual communication is harmful then deaf children of deaf parents would be expected to be inferior in academic achievement, psycho-social adjustment and all aspects of communication, including speech, speechreading, reading and writing. Table 2 summarizes completed studies of deaf children of deaf parents compared to deaf children of hearing

Table 2. Studies of Deaf Children of Deaf Parents Receiving Manual Communication

Investigator	Comparison	Programs	Results
Stevenson (1964)	134 deaf students of deaf parents to 134 deaf students of hearing parents	California School for Deaf, Berkeley	Those with deaf parents were educationally superior in 90% of pair matchings. 38% of students with deaf parents went to college, 9% of those with hearing parents.
Stuckless & Birch (1966)	38 deaf students of deaf parents matched to 38 deaf students of hearing parents	American School for Deaf Pennsylvania School for Deaf West. Pa. School for Deaf Martin School for Deaf Indiana School for Deaf	Children with deaf parents superior in reading, speechreading and written language. No differences in speech or psychosocial development.
Meadow (1966)	59 deaf students of deaf parents matched to 59 deaf students of hearing parents	California School for Deaf, Berkeley	Children with deaf parents ahead 1.25 years in arithmetic, 2.1 years in reading, 1.28 years in achievement. Superior in written language, fingerspelling, signs, willingness to communicate with strangers. More mature, responsible, sociable. No differences in speech or speechreading.
Quigley & Frisina (1961)	16 deaf students with deaf parents out of a population of 120 deaf students	Kansas School for Deaf Michigan School for Deaf Pennsylvania School for Deaf Texas School for Deaf Rochester School for Deaf California School for Deaf, Riverside	Children with deaf parents superior in fingerspelling and vocabulary. No differences in speechreading and achievement. Children with hearing parents superior in speech.
Vernon & Koh (1970)	32 deaf students with deaf parents matched with 32 recessively deaf students with hearing parents	California School for Deaf, Riverside	Chil.. w/ deaf parents-an average of 1.44 years superior on academic achievemnt and superior in reading, vocabulary & written language. No differences in speech and speechreading.

parents. Stevenson (1964) examined the protocols of pupils of deaf parents enrolled at the California School for the Deaf at Berkeley from 1914 to 1961 and matched them to deaf children of hearing parents. He reported that 38 percent of those with deaf parents went to college as compared to nine percent of those with hearing parents and that of the 134 paired comparisons students with deaf parents had attained a higher educational level in 90 percent of the cases.

Stuckless and Birch (1966) matched 38 deaf students of deaf parents to 38 deaf students of hearing parents at five residential schools for the deaf on the basis of age, sex, age of school entrance, extent of hearing loss, and intelligence test scores. Children with deaf parents were superior in reading, speechreading and written language. No differences were found in speech or psycho-social development.

Meadow (1966) compared 59 children of deaf parents to a carefully matched-paired group of children with hearing parents. She reported that children with deaf parents ranked higher in self-image tests and in academic achievement showed an average superiority to their matched pairs of 1.25 years in arithmetic, 2.1 years in reading, and 1.28 years in overall achievement. The gap in overall achievement increased with age, reaching 2.2. years in senior high school. Ratings by teachers and counselors favored children with deaf parents on (a) maturity, responsibility, independence; (b) socialibility and popularity; (c) appropriate sex-role behavior; (d) responds to situations with appropriate reactions. In communicative functioning the group with deaf parents was rated superior in written language, use of fingerspelling, use of signs, absence of communicative frustration, and willingness to communicate

with strangers. No differences were reported for speech or lipreading ability.

Commenting on the child's reaction to deafness, Meadow claimed (p. 306) that children with hearing parents viewed their deprivation in terms of inability to speak rather than an inability to hear. Children of hearing parents tend to ask questions regarding their deafness at a later age than children of deaf parents.

Vernon and Koh (1970) matched 32 pairs of genetically deaf children for sex, age, and intelligence. One group, consisting of recessively deaf children, had hearing parents and had no early exposure to manual communication. On a standardized achievement test the early manual group's general achievement was higher on the average by 1.44 years. They were also superior in reading, vocabulary and written language. No differences were found in speech, speechreading or psycho-social adjustment.

In an unplanned ramification of an investigation of the effects of institutionalization, Quigley and Frisina (1961) studied 16 deaf students of deaf parents from a population of 120 deaf day students. They reported that the group with deaf parents was higher in finger-spelling and vocabulary with no differences in educational achievement and speech reading. The group with hearing parents had better speech.

In the only study directly comparing children with deaf parents to children of hearing children who had completed an intensive oral preschool program, Vernon and Koh (in press) reported that the children with deaf parents exhibited a superiority of approximately one full grade in all areas over the Tracy Clinic oral preschoolers. Children

with deaf parents were rated superior in reading with no differences in speech and speechreading.

The results reported by Stevenson, Quigley and Frisina, Stuckless and Birch, Meadow, and Vernon and Koh, interesting in themselves, must be evaluated in relation to the richer environment to which children of hearing parents theoretically should be exposed. The socio-economic status of children with hearing parents is superior. The language and speech limitations of deaf adults have been substantiated extensively. In addition deaf children of hearing parents are far more likely to receive preschool training and individual tutoring. Meadow reported that 60 percent of the children with deaf parents received no preschool training as compared with only 18 percent of those with hearing parents. Half of the group with hearing parents not only attended preschool but had additional experience either at home or at a speech clinic. Almost 90 percent of the hearing families interviewed had had some involvement with the Tracy Clinic correspondence course, but none of the deaf families had sent for it.

Vernon and Koh (in press) emphasize that their sample from the Tracy Clinic represents a select group: An IQ of 114 places a person in the upper 20 percent of the population; the children received intensive oral instruction and auditory training in a three year preschool program; and their parents received professional group counseling and, in some cases, private psychotherapy to help them adjust to deafness in their children.

Given the higher socio-economic levels, more adequate linguistic and speech skills and higher academic attainments to be found in the hearing families in addition to preschool educational and speech training for children with hearing parents, the educational, social and communicative superiority of deaf children with deaf parents takes on added significance. One can only speculate on the attainments of deaf children of hearing parents if, in addition to familial social, educational and economic advantages, they had benefitted from some fo: . of early systematic communication with their parents.

The benefits of the early introduction of the Language of Signs must remain speculation for the present. In view of the fact that deaf children of deaf parents were exposed to the Language of Signs from birth and because the preschool programs investigated which showed no results or temporary results have been oral-only programs, it has been argued that the failure of preschool programs lies in the fact that they have been restricted to oral only instruction (Vernon and Koh, in press) and that the addition of manual communication would improve results.

Such reasoning has led to the development of many recent preschool programs utilizing a system named Total Communication, which involves the use of signs, fingerspelling, and oral expression. Although the evidence for the superiority of deaf children of deaf parents is substantial, it does not necessarily follow that the use of manual communication in preschool programs will produce better results. At present, no data exist on the preschool level on the comparative

efficiency of the use of Total Communication as opposed to either an oral-only method or the Rochester Method. With older students, what little research there is available suggests that the Rochester Method is superior on a group level (Quigley, 1969; Moores, 1971a).

The lack of data may be traced to two primary factors. First is the fact that the extreme difficulty of evaluating effectiveness of preschool programs is confounded by the addition of the dimension of deafness. Second, and perhaps an even more inhibiting factor is the highly emotional nature of the question of methodology with deaf children, especially young deaf children. There are educators who firmly believe that the use of any kind of manual communication will prevent a child from developing speech and language and doom him to lifelong existence in a mute subculture. Others firmly believe that depriving the child of just such a system will cause him irreparable linguistic, educational and emotional damage. Given such a climate, most researchers prefer to investigate other questions. In the author's opinion neither concern should be sufficient to deter a search for objective analysis. Eucational decisions must be made daily. If no information exists, the decisions will be made on the basis of other, less desirable, factors.

Program Orientation

The Oral-Manual controversy has dichotomized the field to such an extent that other substantive issues have not received adequate attention. Probably the most important issue would be the content of early intervention programs. The majority of present programs have

been in the traditional nursery school mold with emphasis on socialization. Parent guidance may be the major aspect of such a program and placement contiguous to hearing peers is usually an essential component. Stress is placed on the spontaneous development of language and speech skills. Descriptions of such program may be found in the writings of Pollack (1964), Reed (1963) Griffith (1967) and Knox and McConnell (1968).

A second major development has recently been noted (Moores, 1971b) toward child-centered intervention programs with emphasis on the development of cognitive and academic skills. The impetus has grown out of the awareness of recent work with retarded and disadvantaged children which suggest that the more successful preschool programs contain some structured components with specific academic and/or cognitive training. Reports of investigators such as Bereiter and Englemann (1966), Di Lorenzo (1969), Karnes, et al. (1969), Weikert (1969) and Spicker (1971) are having the greatest impact.

Unimodal and Bimodal Stimulation

The three most common methods used with deaf children today provide simultaneous auditory-visual input. In the Oral-only method the child receives information through speechreading and residual hearing; in the Rochester Method he receives it through speechreading, residual hearing, and fingerspelling; in Total Communication he receives it through speechreading, residual hearing, fingerspelling and signs. In the latter two methods, attention is on the face of the speaker. Griffith (1967) and Pollack (1964) have criticized these approaches

for putting too much emphasis on the visual. They argue because visual input is easier for the deaf child he will become too dependent on it and never develop his potential residual hearing. Reasoning that the first year of life is critical for the development of auditory language, they advocate a completely auditory program for preschool children. Lenneberg (1967, 1970) on the other hand has taken the position that the channel by which language is learned is relatively unimportant and reasons that the early introduction of graphics would enhance the development of both language and speech skills. He includes manual communication within his definition of graphics. His theoretical position seems to be close to that of the Russians who first develop language in deaf children on the basis of a graphic (Dactyl) system and later transfer it to the auditory-vocal.

The work of Gaeth, who has been studying the effects of unimodal and bimodal stimulation, is of great relevance. The results of investigations (1963, 1966) with deaf, hard of hearing and normal students suggest that in bimodal presentation attention is directed to the modality which is more meaningful. The results appear to be consistent with other research in the area of unisensory and multisensory stimulation as reviewed by Travers (1970). The results contradict traditional research efforts in deafness, e.g. Numbers and Hudgins (1948), which indicated bimodal reception (look and listen) was superior to visual (look) or audition (listen) alone.

Gaeth (1966) reported that hard of hearing subjects, although somewhat inferior, function much as normal subjects in that they attended to the modality which was more meaningful. Deaf subjects consistently attended to the visual modality.

As opposed to possible interference between simultaneous bimodal presentation, Broadbent (1967) and Gaeth (1966) report no inhibition in the use of two stimuli presented simultaneously in the same modality. If so, this could lend support to the simultaneous use of speech and fingerspelling or speech, signs and fingerspelling with the young child.

At present, the relative efficacy of multisensory stimulation and applications to education of the deaf are unclear. However, a number of fascinating questions may be raised:

1. Can language be developed in the visual-motor channel?
2. If so, can it be transferred to the auditory-vocal?
3. Is visual information processing similar to auditory information processing?
4. Can there be a visual counterpart to short-term auditory memory?
5. What type of stimulation should be recommended for the newly diagnosed hearing handicapped child?

Number five presents the crux of the matter. The diagnosis for very young children is often confused and in many cases it is uncertain how much sound he receives and how it is processed. This is an especially important concern for children with etiologies such as rubella, meningitis and prematurity where other complicating factors may exist. For children for whom it is difficult to predict their potential for developing language auditorally, the educator has two alternatives. If he believes the base of language lies in the auditory mode and that visual presentation inhibits this, he will recommend a straight auditory emphasis. The auditory failures

would later be programmed into multisensory systems at a later age. If he believes the base of language lies deeper, he would consider modality to be relatively unimportant and, whenever in doubt, would provide simultaneous presentation.

As shown in the following diagrams, if the base of language really is auditory the first approach would save the auditory childen educationally and lose the others. The second approach would lose all children. If the base of language goes deeper, the first alternative again would save the auditory children and lose the others. The second alternative would save all the children.

Alternative I The Base of Language is Auditory

		Child Orientation	
		Auditory	Visual
Input	Unisensory	Succeed	Fail
	Bisensory	Fail	Fail

Alternative II The Base of Language is Deep

		Child Orientation	
		Auditory	Visual
Input	Unisensory	Succeed	Fail
	Bisensory	Succeed	Succeed

Given the present state of knowledge, an educator faces a Hobsen's choice. As he thinks through the problem he must be aware that if his orientation is wrong his decision can have lasting detrimental effects on the child.

Summary

In the field of education of the deaf, the most important recent advances have come in the field of medicine, primarily in the near elimination of post-lingual hearing loss in children, and in technology in the form of improved hearing aids and increasingly sophisticated audio-visual hardware. Education, the final component of the triad, alone has failed to make any substantial new contributions in the on-going struggle against severe hearing impairment. Educators of hearing handicapped children, long given to inbreeding, traditionally have been isolated from the main body of education and child development and therefore have not benefitted adequately from improvements in general education. The burden is now on educators to contribute their share.

Although the tiresome oral-manual controversy has taken on different dimensions, it still remains as one of the critical issues in dealing with young hearing impaired children. In addition, educators must exercise great care and judgment before solidifying positions on questions such as unimodal and bimodal presentation and on the relative efficacy of social, cognitive and academic emphasis in preschool programs. For years lip service has been paid to the concept of individual needs and individualization of instruction. If the ideal, or the pursuit of the ideal, becomes a reality in the near future, such either-or dichotomies and trichotomies will become meaningless and we will actually approach our goal: fitting the method to the child rather than vice versa.

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