Early Manual Communication in Relation to the Deaf Child’s Intellectual, Social, and Communicative Functioning

Kathryn P. Meadow
University of California, Berkeley

The basic impoverishment of deafness is not lack of hearing but lack of language. To illustrate this, we have only to compare a 4-year-old hearing child, with a working vocabulary of between 2,000 and 3,000 words, to a child of the same age, profoundly deaf since infancy, who may have only a few words at his command. Even more important than vocabulary level, however, is the child’s ability to use his language for expressing ideas, needs, and feelings. By the age of 4 years, the hearing child in all cultures has already grasped the rules of grammar syntax that enable him or her to combine words in meaningful ways.

There are those who feel that existing research points to the inability of the individual ever to recapture those phases of linguistic development that are bypassed (McNeill, 1965; Sigel, 1964). Data on the linguistic achievement of deaf adolescents and adults tend to confirm this notion. It is estimated that the average deaf adult reads at about the fifth grade level or even below (Furth, 1966, p. 205). An investigation of language comprehension of deaf students in 73 schools in Canada and the United States showed that only 12% of the 16-year-olds scored above the fifth grade level on the Metropolitan Achievement Tests—Elementary Battery (Wrightstone, Aronow, & Moskowitz, 1962, pp. 13–14).

It has been suggested that the experiential deficiency resulting from communicative inadequacy influences the personality characteristics that have been noted among the deaf. One of the most consistent findings is that deaf persons are less “mature” than hearing individuals with whom they are compared. Levine (1956), on the basis of a Rorschach study of normal deaf adolescent girls, described the complex that she summarized as “emotional immaturity” in terms of egocentricity, easy irritability, impulsiveness, and suggestibility (p. 143). Neyhus (1964, p. 325) characterized the deaf adults whom he studied (also using the Rorschach) as “restricted in breadth of experience, rigid and confused in thought processes, and characterized by an inability to integrate experiences meaningfully.” He found that the “distorted perception” noted in younger persons was apparent in adulthood as well. However, this characteristic was diminished at the older age levels, “suggesting a delayed period of maturation in the deaf” (Neyhus, 1964, p. 325). Altshuler (1964) described deaf persons as lacking in empathy, egocentric, and dependent, handling tensions with “considerable impulsivity” and without much thoughtful introspection (pp. 63–64).
On one hand, deaf persons have been found to be noticeably deficient in their educational and intellectual functioning, compared to hearing persons, in spite of apparently normal capacities. On the other hand, findings that indicate many deaf persons to be less mature and more dependent than comparable groups of hearing persons have been presented. Because not all deaf persons exhibit these responses, we may assume that there is nothing inherent in early profound deafness, which makes these deficiencies inevitable. Rather, we must look to environmental factors for explanations of developmental differences.

Because of the occasional genetic transmission of deafness, there are families in which both parents and children are deaf. “Nearly ten percent of all children born to deaf subjects” in the survey of the deaf population in New York State are also deaf (Rainer, Altshuler, & Kallmann, 1963, p. 27). The socialization experiences of these deaf children can be expected to differ markedly from those of deaf children with hearing parents. First, the emotional reaction of deaf parents to the birth of a deaf child is predicted to be less traumatic. Parental acceptance of and adjustment to the deaf child should be comparatively easier and more rapid. Second, most deaf children with deaf parents have a means of communication from earliest childhood because most deaf adults utilize the manual language of signs as a matter of course. These two basic differences in the family environments of deaf children with deaf parents and those with hearing parents provide the basis for a research design approximating a “natural experiment” for testing some hypotheses about the basis of differences in levels of social and intellectual functioning in deaf persons.

One reason for the presence of manual communication in deaf families and the absence of manual communication in hearing families with deaf children is related to a bitter controversy regarding the use of the language of signs with young deaf children. Most hearing parents are warned against the use of manual communication by the professionals with whom they come in contact. The reason for this prescription is the belief that if deaf children are not forced to rely exclusively on oral methods of communication, they will not be motivated to learn speech and speech reading: “the evidence is . . . . impressive that speech seldom develops if signs come first” (DiCarlo, 1964, p. 115). Some social scientists, however, are not convinced that this statement is true. Furth (1966), for instance, said that the insistence that the early use of signs is detrimental to the acquisition of speech because they are easier for the deaf to learn relies on “a mysterious doctrine of least effort . . . . Carried to its logical conclusion, this would mean that infants who are allowed to crawl would forever lack the motivation to learn to walk.” Altshuler and Sarlin (1963) and Kohl (1966) also believed that insistence on the exclusive use of oral communication with young deaf children has been carried to extremes. A comparison of the communicative functioning of deaf children who were exposed to manual communication early in life and those who had no exposure to it in the early years should provide parents and educators with additional evidence in this sensitive area.

The above discussion was designed to provide background for the rational behind the selection of three crucial dependent variables examined in the research to be reported here: (a) the intellectual or academic functioning, (b) the social functioning, and (c) the communicative functioning of the deaf child. The major independent variable was defined as the parents’ hearing status because this factor was believed to affect (a) the socialization climate and (b) the existence of a system of early family communication. Four studies have been reported, which have direct bearing on the present research. These are summarized briefly later.

Previous Research With Specific Relevance for This Investigation

Stuckless and Birch (1966) used a matched-pair design very similar to the present one for comparing deaf children of deaf parents with deaf children of hearing parents. Of 71 deaf children with deaf parents in five different schools for the deaf, 38 who had been exposed to early manual communication as well as meeting other criteria were selected. These were matched with deaf children of hearing parents on the basis of sex, age, age of admittance to present school, severity of hearing impairment, and intelligence test scores. The authors found no significant differences between their two groups on scores for speech intelligibility or for “psychosocial adjustment” as measured by rating scales completed by teachers. Significant differences were
found on reading scores, speech reading scores, and on written language scores. In all cases, were achieved higher scores by children with “early manual communication.”

Stevenson (1964) compared the educational achievement of deaf children with deaf parents to the achievement of deaf children with hearing parents, using all children of deaf parents enrolled at the California School for the Deaf (Berkeley) between 1914 and 1961.

Of the 134 (children of deaf parents) only fourteen were found to be weaker, educationally, than the children of hearing parents with whom they were compared. . . . This would mean that 90 percent were better students and attained a higher educational level than the children of hearing parents (thus) invariably possessed a very strong command of language.

He found that only 9% of the hearing parents “succeeded in going to college,” compared to 38% of deaf parents’ children. In spite of some methodological questions that might be raised, we can agree with Stevenson that “the study is strong . . . enough to justify further study by other schools.”

Brill (1960) compared the adjustment of 45 deaf children of deaf parents to that of the same number in two other categories: (a) deaf children with deaf siblings and hearing parents and (b) deaf children with no deaf relatives. The two comparison groups were equated with the children of deaf parents on the basis of sex, age, and IQ scores. No significant differences were found for the group as a whole. However, when boys were compared separately, differences were significant with the children of deaf parents showing “better adjustment.” “Children with deaf parents and with deaf sibs have more ratings at both extremes, while those children who are the single deaf person in a family do not have as many extreme ratings” (Brill, 1960, p. 466). A subjective analysis of the 28 deaf families revealed “at least fifteen (who had 26 of the 45 children) were families that had given very definite evidence of social and/or psychological maladjustment.” Brill suggested that the maladjustment in the homes of such a large number of deaf children of deaf parents might more than offset the advantage of communication between parent and child.

Quigley and Frisina (1961) compared day pupils to boarding pupils in residential schools. Although they did not set out to study children of deaf parents specifically, they did a separate analysis of this subgroup. Among the 120 day students studied, there were 16 who had deaf parents.

Although the group with deaf parents had much poorer speech than the group with hearing parents, they had significantly higher scores in finger spelling and vocabulary . . . This group also had higher scores in educational achievement although not significantly so. The higher scores in finger spelling would be expected since this group with deaf parents would likely be exposed to much manual communication at home. Apparently, however, this use of manual communication also aided them in vocabulary development, although it hindered them in speech development. There was no significant difference between the two groups in speechreading (Quigley & Frisina, 1961, p. 33).

Two other studies have touched peripherally on the influence of the presence of deaf relatives, in the deaf child’s family, but the focus is somewhat removed from the central concerns of this paper (Pintner & Reamer, 1920; Titus, 1965).

Research Hypotheses for This Article

On the basis of the theoretical considerations and results from previous research outlined above, the following hypotheses were formulated prior to the initiation of research procedures:

Hypothesis 1. Deaf children of deaf parents compared to deaf children of hearing parents are more likely to show a higher level of intellectual functioning.

Hypothesis 2. Deaf children of deaf parents compared to deaf children of hearing parents are more likely to show a higher level of social functioning, especially apparent in situations requiring “maturity” and “independence.”

Hypothesis 3. Deaf children of deaf parents, compared to deaf children of hearing parents, are more
likely to demonstrate a higher level of communicative competence, including competence in written and spoken, expressive and receptive language.

Research Population and Setting

All the children included in this study were enrolled at the California School for the Deaf in Berkeley between January and September 1966. This is one of the two residential schools for the deaf operated by the State. Minimum age for admission is five-and-a-half. Pupils either graduate or must leave the school by the age of 21 years. School population is approximately 500. In January 1966, 60 children (12%) who had both a deaf father and a deaf mother were enrolled. One was excluded because the parents did not wish to participate. Thus, 59 deaf children with deaf parents formed the base of the study population. Each of these children was matched individually with a child of hearing parents. Matching was done on the basis of sex, age, IQ test score, degree of residual hearing, and family size. Some attempt was made to equate family socioeconomic status family using the father’s occupation as a measure.

Before the matching procedure was begun, children of hearing parents were eliminated from consideration if they had any of the following characteristics:

1. deaf siblings
2. racial or ethnic minority group membership
3. secondary handicap (e.g., physical condition in addition to deafness, which interfered with functioning)
4. deafened after the age of 2 years
5. deafness resulted from maternal rubella, Rh incompatibility, or anoxia

After the children with these characteristics had been excluded, to the extent possible with the available records, there remained approximately 225 children with hearing parents who formed the pool from which matched pairs were formed.

The task of matching is an extremely laborious one, particularly when an attempt is made to control many variables simultaneously. Age and sex are the two variables on which most emphasis is placed in matching. The sex of the two members of the pair is the same in all cases: 34 pairs of boys and 25 pairs of girls. Fifty of the 59 pairs are matched within 1 year of age.

Equating intellectual potential in the two groups is most difficult. The results of any intelligence test administered to a young child are of questionable reliability and validity; when the young child is also deaf, these difficulties are multiplied (Levine, 1960; Vernon & Brown, 1964). Every child who applies for admission to the school is given an intelligence test. The one used most often, and uniformly at the present time, is the performance scale of the Wechsler Intelligence Scale for Children. Forty-five pairs are matched within 10 points on IQ test score; 12 pairs show a discrepancy of between 11 and 15 IQ points; 1 pair has a 17-point discrepancy; and another pair has a 20-point discrepancy. The mean IQ score for children of deaf parents is 111.5, whereas the mean IQ score for children of hearing parents is 108.9. Eighty percent of the children with deaf parents have a “profound” hearing impair-ment (>80 dB in the speech range of the better ear) as do 71% of those with hearing parents (Flower, 1964).

The importance of family size to the socialization process has been summarized by Clausen (1966). An attempt was made to match children for this variable with the following success: 44 pairs were judged as having a “satisfactory” match, with a discrepancy of not more than one child; 11 pairs were “intermediate” in their match, with a discrepancy of two children; and 4 pairs have an “unsatisfactory” match, with a discrepancy of more than two children.

Because of the skewed occupational distribution of deaf adults (Lunde & Bigman, 1959; L. Meadow, in press), it is difficult to compare the deaf and hearing fathers. It was decided to equate deaf fathers who were skilled craftsmen with hearing fathers who were classified as professional, managerial, clerical, and sales workers. On this basis, 40 pairs were judged to have a satisfactory match, 10 pairs have an unsatisfactory match, and 9 pairs cannot be evaluated because father’s occupation was unknown for one pair member.

Research Instruments and Procedures

A rating scale was devised, which included items dealing with intellectual, social, and communicative functioning (K. P. Meadow, 1967, pp. 336–340). Each student was rated independently by three separate raters. Of these, the first was the classroom teacher.
and the second a dormitory counselor. Children in the fifth grade or above, who participated in the vocational training program, were rated by their vocational arts teacher. For the younger children, the third rating was completed by a different counselor. The three ratings were summed, scores ranked from highest to lowest and trichotomized for most of the analyses (referred to as “high,” “medium,” and “low” scores). To encourage raters to avoid the “halo effect” (Selltiz, Jahoda, Deutsch, & Cook, 1963), the positive and negative ends of the scale were shifted at random for different items.

In addition to teacher–counselor ratings for intellectual functioning, Stanford Achievement Test scores, administered by the school in May 1966, were utilized for evaluating students in this area. The Craig Lipreading Inventory (Craig, 1964) was administered to evaluate this area of communicative functioning.

### Research Findings

#### Intellectual Functioning

There were 32 pairs of children for whom Stanford Achievement Test scores were available for both members. (These tests are administered only to children who are beyond the second grade in school.) The scores are expressed in terms of standardized “grade level” achievement for “reading,” “arithmetic,” and “grade average.” Table 1 shows the results of a pair-by-pair comparison, evaluated by means of a t test of differences. The table shows that differences in grade level achievement, reading, and arithmetic, favoring children with deaf parents in each instance, were significant at the 1% level of confidence or beyond. The average discrepancy in scores was >1 year for grade level and arithmetic and >2 years for reading.

Three items included in the teacher–counselor rating scale are relevant to the assessment of intellectual functioning: apparent intellectual functioning, apparent intellectual ability, use of intellectual ability, and apparent “achievement motivation.” The results of the matched-pair comparisons on these three items are shown in Table 2. (Scores used in this comparison represent a summation of the ratings given by three raters, referred to as “index ratings.”) Teachers’ and counselors’ judgments of the relative intellectual ability and use of ability show the same pattern as the Stanford Achievement Test comparisons: the children of deaf parents are judged to be of superior ability and performance (differences were significant beyond the 1% level for both of these items). Fewer discrepancies were found in the predicted direction for the item describing the child’s effort to achieve. Although the comparisons favor children with deaf parents in 34 of 56 observations, this proportion could have been due to chance variation in 7 of 100 samples.

In addition to the support that these findings give to the initial research hypothesis, they are of interest because of their relationship to previous comparisons of deaf and hearing subjects. As was stated earlier, a number of investigators have found deaf subjects to be “immature” compared to hearing subjects (Levine, 1956; Neyhus, 1964; Rainer et al., 1963). Several researchers have evaluated the “social maturity” of deaf children using the Vineland Social

| Table 1 Matched-pair comparisons of Stanford Achievement Test scores: 1966 grade average, reading, and arithmetic |
|----------------------------------|-----------------|--------------------|
| **Mean difference** (years) | **No. pairs** | **t** |
| Grade average                  | +1.28           | 31*                | 2.84** |
| Reading                        | +2.20           | 31                 | 2.56** |
| Arithmetic                     | +1.25           | 32                 |       |

*One tied observation dropped from the analysis. **p ≤ .01.

| Table 2 Index ratings of intellectual functioning for matched pairs of children with deaf or hearing parents |
|-------------------------------------------------|-----------------|--------------------|
| **Rating scale item**                          | **No. pairs** | **No. children with deaf parents who rated higher** | **Wilcoxon T value** | **z** |
| Intellectual ability                            | 55             | 44 (80%)           | 255.5            | 4.31** |
| Use of intellectual ability                     | 54             | 36 (67%)           | 326.0            | 3.58** |
| Works hard—strives to achieve                   | 56             | 34 (61%)           | 619.0            | 1.46*  |

*p = .07. **p ≤ .01.
Maturity Scale
designed to measure the “degree of independence or self-sufficiency.” Avery (1948), Myklebust (1960), Myklebust and Burchard (1945), and Streng and Kirk (1938) all found that deaf children received lower scores on this scale than did hearing children. Myklebust (p. 215) reported that the discrepancy between the two groups increased with age. It has been suggested that the immaturity that seemingly characterizes deaf children and adults may result from the high proportion who attend residential schools, where the development of independence and responsibility may be attenuated (Barker, 1953).

The results of this study suggest that there is nothing inherent in the condition of deafness itself—that is, in the lack of auditory contact with the environment—which produces characteristics of immaturity that so many have noted. Because all subjects in this study are students of a residential school for the deaf, and there are significant differences among them, the fact of residential living by itself would not seem to lead necessarily to immaturity. Rather, we should look to other conditions in the deaf child’s environment to discover those that produce differences within the deaf population, which may be as great as those between the deaf and hearing groups. (Of course, the hypothesized differences upon which this study was designed relate to the presence or absence of early communication and the quality of family relationships.)

Another similarly suggestive area is that represented by the item “appropriate sex role behavior,” shown in Table 3 to be significantly more frequently rated higher among the children with deaf parents. Here, differences are attributable almost entirely to higher ratings given to boys with deaf parents (K. P. Meadow, 1967, p. 193). The New York group found indications of a higher incidence of sexual maladjustment among their clinic patients than would be expected (Rainer et al., 1963, pp. 148, 245).

The significance of differences found in these critical areas of “social adjustment” (maturity, sociability, and sex role behavior) is underscored by the absence of significant findings for a number of traits for which there is no evidence of deaf–hearing differences. These areas included traits summarized as “happy, calm, generous, obedient, kind, neat, mannerly, empathic” (K. P. Meadow, 1967, p. 191). The absence of significant differences in these areas also provides support for the belief that the raters were not responding merely to a “halo effect” in scoring children with deaf and hearing parents.

Communicative Functioning

If the deaf child is to communicate effectively with the hearing world, he must acquire facility in speech, speech reading, and writing. If he is to communicate effectively within the Deaf community, he must acquire both receptive and expressive facility in finger spelling and the language of signs. In addition, he should feel comfortable about his own communicative

<table>
<thead>
<tr>
<th>Rating scale item</th>
<th>No. pairs</th>
<th>No. children with deaf parents who rated higher</th>
<th>Wilcoxon T value</th>
<th>z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mature</td>
<td>56</td>
<td>39 (70%)</td>
<td>430.0</td>
<td>2.99**</td>
</tr>
<tr>
<td>Responsible</td>
<td>55</td>
<td>38 (69%)</td>
<td>432.5</td>
<td>2.83**</td>
</tr>
<tr>
<td>Independent</td>
<td>53</td>
<td>40 (75%)</td>
<td>281.0</td>
<td>3.85**</td>
</tr>
<tr>
<td>Enjoys new experiences</td>
<td>55</td>
<td>36 (65%)</td>
<td>501.0</td>
<td>2.25*</td>
</tr>
<tr>
<td>Friendly, sociable</td>
<td>55</td>
<td>42 (65%)</td>
<td>405.0</td>
<td>3.06**</td>
</tr>
<tr>
<td>Popular with classmates</td>
<td>55</td>
<td>40 (73%)</td>
<td>434.0</td>
<td>2.82**</td>
</tr>
<tr>
<td>Popular with adults</td>
<td>52</td>
<td>34 (65%)</td>
<td>427.0</td>
<td>2.38**</td>
</tr>
<tr>
<td>Responds to situations with appropriate emotion</td>
<td>55</td>
<td>34 (65%)</td>
<td>535.5</td>
<td>1.97*</td>
</tr>
<tr>
<td>Shows appropriate sex role behavior</td>
<td>54</td>
<td>33 (61%)</td>
<td>509.5</td>
<td>2.01*</td>
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</table>

*p = .05. **p ≤ .01.
skills, and be willing to use these skills to communicate with strangers, both deaf and hearing. All these items were included in the rating scale that teachers and counselors completed for this study. Table 4 shows the results of the matched-pair comparisons of children with deaf parents and with hearing parents on these items.

The critical communicative areas, for most parents and educators of deaf children, are represented by speech reading and speech. Table 4 shows that the differences between children with deaf parents and those with hearing parents on these two variables are not significant. Twenty-two of 46 available score comparisons favor children with deaf parents in ratings of speech reading ability; 21 of 51 comparisons favor children with deaf parents in ratings of speech aptitude and performance. The analysis of the additional six items dealing with communicative skills shows that children with deaf parents are given higher ratings in a significant proportion of the comparisons.

The results of the Craig Lipreading Inventory were essentially the same as those of the teacher–counselor ratings: no significant differences appeared in the scores of children with deaf parents and those with hearing parents. Of 35 pairs for whom a “word score” was available, differences favored children with deaf parents in 18 instances. Of 22 pairs for whom a “sentence score” was available, differences were in the predicted direction in 18 instances (not statistically significant).

Because of the great interest in the relationship between proficiency in oral and in manual communicative skills, scores on the Lipreading Inventory were compared to index ratings for other aspects of communicative functioning. A significant positive relationship emerged between speech reading scores and ratings for speech, expressive finger spelling, and language of signs usage. (Relationships with written language facility and receptive finger spelling were in the same direction but were not statistically significant at the 5% level of confidence.) These findings fail to provide support for the notion that the knowledge and use of manual communication prevent the acquisition of speech reading skills. This contention is the heart of the oralist argument that forbids the use of manual communication with young deaf children. The findings of the present research agree substantially with those reported by Montgomery (1966), who studied 59 prelinguistically deaf Scottish students and concluded that “There are no negative correlations at all. Positive significant correlations are recorded between the manual communication rating and the Donaldson Lipreading Test” (p. 562). Like the present author, Montgomery concluded that “There ... appears to be no statistical support for the currently popular opinion that manual communication is detrimental to or incompatible with the development of speech and lipreading” (p. 562).

Another variable that may well contribute to the deaf student’s communicative functioning is the extent

<table>
<thead>
<tr>
<th>Rating scale item</th>
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<th>No. children with deaf parents who rated higher</th>
<th>Wilcoxon T value</th>
<th>z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speech reading ability</td>
<td>46</td>
<td>22 (48%)</td>
<td>623.5</td>
<td>0.10</td>
</tr>
<tr>
<td>Speech aptitude and performance</td>
<td>51</td>
<td>21 (41%)</td>
<td>758.0</td>
<td>0.89</td>
</tr>
<tr>
<td>Faculty in written language</td>
<td>49</td>
<td>35 (71%)</td>
<td>263.5</td>
<td>3.47**</td>
</tr>
<tr>
<td>Ability to finger spell</td>
<td>54</td>
<td>50 (93%)</td>
<td>18.5</td>
<td>6.23**</td>
</tr>
<tr>
<td>Ability to read others’ finger spelling</td>
<td>52</td>
<td>49 (94%)</td>
<td>25.0</td>
<td>6.09**</td>
</tr>
<tr>
<td>Ability to use the language of signs</td>
<td>55</td>
<td>46 (87%)</td>
<td>117.0</td>
<td>5.47**</td>
</tr>
<tr>
<td>No apparent frustration from inability to communicate</td>
<td>56</td>
<td>39 (70%)</td>
<td>319.0</td>
<td>3.89**</td>
</tr>
<tr>
<td>Willingness to attempt communication with strangers</td>
<td>45</td>
<td>30 (67%)</td>
<td>335.5</td>
<td>2.06*</td>
</tr>
</tbody>
</table>

*p = .05. **p ≤ .01.
of the early oral training that he receives. From interviews with 34 deaf and 34 hearing families, it appears that the parents’ hearing status is related to preschool training. About 40% of the children with deaf parents had attended preschool classes for deaf children compared to 80% of those with hearing parents. Both children with deaf parents and those with hearing parents are more likely to score above the median on the lipreading inventory if they received some early oral training. (Approximately two thirds of the groups with some early training scored above the median compared to about one third without early training. Because of the small numerical base, however, these differences were not statistically significant.)

Summary and Conclusions

The findings confirm the initial research hypotheses regarding the superior intellectual and social functioning of deaf children with deaf parents, compared to deaf children with hearing parents. Data from Stanford Achievement Tests (reading, arithmetic, and overall grade level), as well as teacher–counselor ratings for intellectual functioning, disclosed significant differences between the sets of matched pairs in the predicted direction. In the area of social functioning, differences favoring children with deaf parents were particularly impressive in areas of behavior that have often been cited as “characteristic” of deaf individuals. These include traits such as maturity, responsibility, independence, sociability, and appropriate sex role behavior.

The results of ratings and speech reading test, measuring communicative functioning, were less clear. No differences were found among children with deaf parents, and those with hearing parents received significantly higher ratings for facility with written language, receptive and expressive finger spelling, and use of the language of signs. On the other hand, various measures of manual communication were positively related to facility in speech reading, as measured by the Craig Inventory. Early oral training seems to be related to later communicative functioning and is less likely to have been experienced by children with deaf parents.

None of the evidence from the research reported above would seem to justify the strong injunctions placed by professional educators on the use of manual communication by parents of young deaf children. Children in this study who had been exposed to early manual communication performed at a higher level by almost every measure employed. This conclusion is not meant to discourage early oral training for deaf children. On the contrary, some evidence was reported to the effect that children who are most likely to be judged as having good communicative skills are those who were exposed to both oral and manual training at an early age.

Notes

1. In the New York State study, almost half of the 493 deaf respondents stated that they used “mainly signs” for communicating, whereas another 18% reported the “equal use of speech and signs.” This compares to 29% who use “mainly speech” (Rainer et al., 1963, computed from Table 6, p. 119). Of 71 deaf parents of deaf children responding to the Stuckless and Birch survey, only 5 stated that they did not use the language of signs with their deaf child. Sixty-four percent stated that they had used the language of signs with the child when he was a baby (Stuckless & Birch, 1966, p. 458).

2. The aim of matching is to control or “hold constant” as many variables as possible other than the experimental variables. An attempt is made to make the two groups (i.e., those with deaf parents and those with hearing parents) as nearly alike as possible. A random group of deaf children of hearing parents would, in all probability, not have the functional potential equal to that of the children with deaf parents because of the higher probability of additional neurological complications. In order to test the effect of parents’ hearing status on the child’s performance, we must start with groups that are “equivalent” in important ways. The most precise method of achieving this goal is by means of the matched-pair design.

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