

THE DEAF MENTOR EXPERIMENTAL PROJECT FOR YOUNG CHILDREN WHO ARE DEAF AND THEIR FAMILIES

The Deaf Mentor Experimental Project investigated the efficacy of deaf mentor services to young deaf children and their families. These services focused on deaf adults (mentors), who made regular home visits to the children and their families; shared their language (American Sign Language), culture, and personal knowledge of deafness with the families; and served as role models for the children. The children also received regular home visits from a hearing parent adviser who helped the family promote the child's early listening, English, and literacy skills. The result was a bilingual-bicultural home environment for these children. The children who received deaf mentor services were compared to matched children who did not receive these services but who received parent adviser services. Children receiving this early bilingual-bicultural programming made greater language gains during treatment time, had considerably larger vocabularies, and scored higher on measures of communication, language, and English syntax than the matched children.

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The Deaf Mentor Experimental Project was conducted over a 3-year period at the SKI•HI Institute, Utah State University, to investigate the effectiveness of deaf mentor services to young children who are deaf, ages 0-5 years, and their families.

With the expanded and deepened implementation of services to children with disabilities ages birth to 5 years brought about by Part H and the extension of Part B of the Individuals with Disabilities Education Act (IDEA), providers of early intervention services are being called upon to appropriately serve infants, toddlers, and preschoolers who are deaf and their families (National Early Childhood Technical Assistance System, 1995). An early intervention service option that could be of great importance to many young children who are deaf and their families is *deaf mentor home program-*

ming. This early intervention service focuses on deaf adult mentors who make regular visits to young children who are deaf and their families and who share their language—American Sign Language (ASL)—culture, and personal knowledge of deafness with the child and family.

Many argue that if young children who are deaf received early ASL programming combined with early programming that focused on the child's development of English, such children would develop early bilingual skills which would enable them to communicate comfortably with both deaf and hearing persons (Dolnick, 1993; Garretson, 1994; Hatfield & Humes, 1994; Moores, 1992; Ritter-Brinton & Stewart, 1992; Seal, 1991; Walworth, 1992). Others maintain that hearing parents of young deaf children could benefit greatly from early contact with deaf adults who would help

the parents understand and appreciate deaf persons and Deaf culture and accept deafness on its own terms. This would enable the parents to *really* appreciate their child who is deaf, and not only allow but encourage their child to be a *person who is deaf* (Barry, 1995; Bragg & Tranchin, 1994; Brown & Gustafson, 1995; Busch & Halpin, 1994; Carty, 1994; Ladd, 1994; Okwara, 1994). Thomas (1994) has said, "Deafness is a difference, not a deficit. Once parents understand this, they can make the imaginative leap of understanding that will make it possible for them to let their child be deaf" (p. 553).

There is growing interest in the use of bilingual-bicultural (bi-bi) programming with children who are deaf. Although no consensus exists on what type of bi-bi programming should be established, several models have been described for school-aged children (Johnson, Liddell, & Erting, 1989; Paul & Quigley, 1994; Strong, 1988). Many proponents of bi-bi programming believe that relevant relationships exist between ASL and English and that the early development of ASL as a first language will support the later learning of English as a second language (Johnson et al., 1989; Strong & Prinz, 1997). Some researchers question the correlation between the child's ability to understand and use ASL and the subsequent learning of English, especially written English (Mayer & Wells, 1996; Paul, 1996). Paul maintains that it is debatable whether one can achieve high-level literacy skills in English without learning and using the conversational form of English.

Studies of the *early* use of ASL and the subsequent development of English focus primarily on comparisons between deaf children with hearing parents and deaf children with deaf parents. A consistent finding is that deaf children of deaf parents perform significantly better on measures of academic achievement, vocabulary, speechreading, signing and fingerspelling, and written language and reading than deaf children of hearing parents (Balow & Brill, 1975;

Brasel & Quigley, 1977; Meadow, 1968; Quigley & Frisina, 1961; Stuckless & Birch, 1966). Differences are attributed primarily to parental acceptance of deafness and of the child who is deaf, and early and consistent use of ASL (Paul & Quigley, 1994).

Only a few studies, primarily case studies, have been done of deaf children who are exposed to both ASL and English in infancy and early childhood (Collins-Ahlgren, 1974; Philip, 1992; Schlesinger & Meadow, 1972). These studies are characterized by the deaf child's vocabulary and language development being equivalent to or greater than that of the child's hearing peers, and the emergence of standard English through various stages of sign use including invented signs, standard and inflected signs, and sign combinations.

The Deaf Mentor Experimental Project investigated the use of a model (i.e., the deaf mentor model) with young children who are deaf and their families. It was basic, exploratory research to obtain introductory data on the efficacy of that model, not research to investigate *per se* the relationship of bi-bi programming to the language development of young children who are deaf, or the relationship between early ASL use and the early development of English literacy, although these issues were of great interest. Basic research focuses on fundamental structures and processes with the goal of better understanding of these structures and processes. Exploratory research is guided by research questions and objectives rather than specific hypotheses. This kind of introductory research serves an important purpose in obtaining preliminary information about new programs and processes (Borg & Gall, 1989).

To obtain data on the efficacy of deaf mentor programming for young children who are deaf and their families, two groups were studied. Children in one group received deaf mentor programming in the form of regular home visits from a deaf mentor. These children were in the Utah Parent-In-

fant Program under the auspices of the Utah School for the Deaf. The mentor focused primarily on three areas during the home visit: (a) teaching the family ASL, (b) interacting with the child using ASL, and (c) teaching the family about Deaf culture and introducing the family to the local Deaf community. The deaf mentor was also a role model for the child and helped the child develop a positive identity, self-esteem, and pride in being a person who is deaf. Family members learned the difference between signed English and ASL and used both in ways that were appropriate for the child and family.

In addition to the deaf mentor visits, the children and their parents received regular home visits from a trained parent adviser who helped the parents learn about and manage the child's hearing aids, promote the child's early listening skills, establish early communication with the child, and learn and use signed English with the child. With valuable communication input, information, and guidance from both the deaf mentor and the parent adviser, a bi-bi atmosphere was established in the home.

The members of the second group were children in the Tennessee Infant Parent Services (TIPS) program who received SKI•HI parent adviser home visits only. The parent advisers used English (spoken or signed) with these children.

Children in the Utah Deaf Mentor Program were matched to children in the Tennessee program. The children were matched on hearing loss, age at the start of the project, amount of SKI•HI programming prior to the Deaf Mentor Project, and pretest developmental rates as measured by the SKI•HI Language Development Scale (see Table 1). There were 18 children in each of the experimental and control groups. Half of the 18 children in Tennessee used an aural-oral approach (spoken English) and the other half used a signed English approach. The children in the Utah experimental group received an average of 17.6 months of deaf mentor treatment. The

average amount of mentor home visiting time per month was 6.5 hours and the average number of mentor visits per month was four. Parent advisers in both Utah and Tennessee made weekly home visits, each visit lasting about 1 hour.

Parent advisers in both Utah and Tennessee were trained by national SKI•HI trainers who had received intensive training to prepare parent advisers for direct services to families and who were experienced users of the SKI•HI Model. The parent advisers in both states who used signed English with families used the SKI•HI Total Communication (manually coded English) Program (see Watkins & Clark, 1993). Thus, their signs and approaches were similar. The parent advisers in Tennessee who used spoken English with families used the SKI•HI Aural-Oral Language Program (see Watkins & Clark, 1993).

Mentors in the Utah program were widely recruited throughout the state and carefully screened and interviewed by a team that included leaders in the Utah Deaf community, Deaf Mentor Project staff, and hearing parents. Applicants were rated on ASL fluency, involvement in Deaf culture and the Deaf community, educational background, job experience, general communication skills with hearing persons, and experience working with young children.

Methods

Research was guided by several basic questions, including the following:

1. Do children who receive early bi-bi home intervention (ASL/Deaf culture and English/hearing culture) perform better on measures of communication and language than matched children who get SKI•HI programming only?
2. How does communication between children and family members who receive deaf mentor treatment differ from the communication between children and families who do not receive deaf mentor treatment?

3. How do perceptions and attitudes concerning deafness and the child who is deaf differ between parents who receive deaf mentor treatment and those who do not?

Methods used to answer these questions included the selection of measures and the testing of children in the project. The following measures were selected:

1. *Grammatical Analysis of Elicited Language: Pre-Sentence Level* (GAEL-P; Moog, Kozak, & Geers, 1983). This test measures early language comprehension and production in the areas of readiness, single words, and word combinations.
2. *Patterned Elicitation Syntax Test* (PEST; Young & Perachio, 1993). This test assesses the child's ability to use 44 basic grammatical structures of English.
3. *SKI•HI Language Development Scale* (LDS; Watkins & Tonelson, 1979). This scale was developed specifically for deaf children from birth to age 6 years; it measures general receptive and expressive language.
4. *Communication Data Sheet*. This measure was developed specifically for the Deaf Mentor Experimental Project. It is a parent report that focuses on family communication with the young child who is deaf.
5. *The Deafness Perception Survey*. This measure was also developed specifically for the project with as-

Table 1
Matching Factors for Experimental and Control Groups

	Utah group (SKI•HI & deaf mentor)	Tennessee group (SKI•HI only)
Average hearing loss	97.4 dB (85-120)	84.9 dB (70-120)
Average age at project start (months)	27.2	28.6
Average amount of SKI•HI programming prior to Deaf Mentor Project (months)	14	12
Average pretest development rates (PDRs)	0.75	0.75

sistance from deaf persons in Utah who were active in the local and national Deaf community and who identified with Deaf culture. The survey addressed parent attitudes toward deafness, Deaf culture, and the child who is deaf.

Four diagnosticians regularly tested the children in Utah and Tennessee. The diagnosticians were carefully trained to administer and score the tests. Children were tested every 6 months. Diagnosticians administered the GAEL-P and the PEST to the children. One deaf and one hearing diagnostician tested the children in Utah and two hearing diagnosticians tested the children in Tennessee. Interrater agreement among the diagnosticians was determined to be 81% for the GAEL-P and 91% for the PEST.

Parent advisers in Utah and Tennessee tested the children on the LDS. Administration of this test was a routine part of the parent adviser's delivery of SKI•HI parent-infant program services to families in Utah and Tennessee. All parent advisers received careful training in the administration and scoring of the LDS. The parent advisers also obtained information from parents in both the control and experimental groups on the Communication Data Sheet and the Deafness Perception Survey. Parents completed the Communication Data Sheet at the beginning and end of the project and

the Deafness Perception Survey at the end of the project.

In addition to undergoing testing, all children in the Utah Deaf Mentor Program were videotaped every 3 months. One purpose of the videotaping was for parents to interact with the child in the way most comfortable for them. These videotaped interactions were transcribed, coded, and scored.

Results

The SKI•HI Language Development Scale (LDS)

Results from administration of the LDS showed that children in the Utah Deaf Mentor Program made greater gains in both receptive and expressive language during treatment time than the matched children in Tennessee. (Differences were statistically significant at the .05 level.) For the children in the Utah Deaf Mentor Program, language growth in months was greater than treatment time in months. During treatment, average language gains for Utah children were 6 months greater than those for the matched children in Tennessee.

Using the children's LDS scores, Intervention Efficiency Indexes (IEIs; Bagnato & Neisworth, 1980), Proportional Change Indexes (PCIs; Wolery, 1983), and predicted-versus-actual posttest scores were calculated and compared for the children in the two groups. The IEI gives an indication of the child's rate of language development during intervention. The PCI is a ratio of the child's average language development during intervention and the child's average language development before intervention. Predicted-versus-actual posttest scores provide information on the child's language progress during intervention compared to the progress the child would have made as a result of maturation alone.

The data indicate that the Utah children, who received deaf mentor treatment, performed better than the Tennessee children in the following ways: (a) Rates of language growth for the Utah children (IEIs) were higher during treatment time than the language

growth rates of the Tennessee children; (b) the PCIs of the Utah children were higher than the PCIs of the Tennessee children from pretest to posttest; (c) actual-versus-predicted posttest scores were better for the Utah children than for the Tennessee children. For the Utah children, the actual mean posttest language score exceeded the predicted mean score by 4.2 months for receptive language and 6.0 months for expressive language. For the Tennessee children, the actual mean posttest score exceeded the predicted mean score by only 1.1 months for expressive language. For receptive language, the Tennessee children's actual mean posttest score was *less* than the predicted mean posttest score by 0.2 months.

Grammatical Analysis of Elicited Language: Pre-Sentence Level (GAEL-P)

Data derived from administration of the GAEL-P indicate that the mean gain scores and mean final scores of the children in the Utah Deaf Mentor Program were higher on all four subtests of the GAEL-P than the mean gain scores and mean final scores of the Tennessee children. (The GAEL-P subtests are *Single Word Comprehension*, *Single Word Production*, *Word Combination Comprehension*, and *Word Combination Production*.) Except for the Word Combination Production subtest, the two groups' scores were fairly close. However, this likely can be attributed to a ceiling effect. Eight of the Utah children reached the ceiling on the GAEL-P prior to posttest. None of the Tennessee children reached the ceiling prior to posttest.

Patterned Elicited Syntax Test (PEST)

All but one of the children in both groups were unable to respond correctly to any item on the PEST at pretest time. At posttest, the Utah children scored higher on this test of English grammar than the Tennessee children. This is interesting in light of the fact

that the Utah children received ASL and (signed) English input, while the Tennessee children received (spoken or signed) English input only.

One of the most interesting findings of the present study resulted from the administration of an ASL equivalency test of the PEST to the Utah children at posttest time. The children in the Utah program scored more than 2.5 times higher on this ASL-administered posttest than they did on the signed English-administered posttest.

Communication Data Sheet

At the beginning of the present study, parents in Utah and Tennessee reported similar communication abilities for their children on the Communication Data Sheet. For example, when asked, "What stage best represents your child's highest level of language development?" Utah parents rated their children at an average 7.3 level and Tennessee parents rated their children at an average 7.1 level. (The child at the 7.0 level understands single words/signs). Average vocabulary for the Utah children at the beginning of the study was reported to range between 31 and 50 words. Average vocabulary for the Tennessee children was reported to range between 21 and 30 words.

At the end of the present study, differences between the two groups related to child and family communication became apparent. According to parent reports, children in the Utah Deaf Mentor Program communicated at a higher average language level and had larger vocabularies than the Tennessee children. Parents of the children in Utah reported that they understood what the child was communicating to them a greater percentage of the time than what was reported by the parents in Tennessee. The Utah parents also reported that their children understood them a greater percentage of the time than did the Tennessee parents in regard to their children.

Parents in the Utah Deaf Mentor Program reported less frustration when communicating with their child

than the Tennessee parents. Of particular interest was the reported number of signs used by parents in Tennessee, who used signed English with their children, and the number of signs used by parents in Utah who used both ASL and signed English (bilingualism). Parents in Utah reported using *more than six times as many signs* as the Tennessee parents.

Videotape Probes

Analysis of the videotape probes that were obtained every 3 months revealed that as the project progressed, parents in the Utah Deaf Mentor Program became more comfortable using both ASL and signed English "complete" (i.e., all that was said in English was signed). Parents used more ASL and signed English "complete" at posttest time than at pretest time. The length of their ASL and signed English expressions increased, as well as the percentage of the spoken English that they signed. The children responded much more frequently to their parents' expressions at the end of the project than at the beginning. At posttest time, children responded most frequently to their parents' use of ASL and signed English "complete." They responded next-most-frequently to signed English "incomplete."

Deafness Perception Survey

Based on the information the parents provided on the Deafness Perception Survey, it was evident that there were some differences in how the parents in Utah and Tennessee perceived deafness and deaf persons, ASL, and their deaf children. Overall, Utah parents' perceptions were more consistent with the values of the Deaf culture and Deaf community than those of the Tennessee parents. The Utah parents' perceptions may be understandable in light of the fact that these parents had regular contact with Deaf adults (mentors) in the Utah Deaf Mentor Project, and that 100% of them participated in Deaf community activities, compared to 15% of the Tennessee parents.

The Deafness Perception Survey responses also showed that to the Utah parents it was most important that the family learn sign language, that their child learn to read and write, that their child have teachers who could sign well, and that their child have deaf friends. To Tennessee parents, it was most important that their child learn to read, write, and speak; attend public school; and learn to communicate without depending on sign language.

Utah parents wanted their deaf children to be self-confident, happy, loved, and proud of who they were and what they wanted for themselves. Tennessee parents wanted their deaf children to contribute to the world, attend college, get a good education, and have a successful career.

Discussion and Conclusions

The present study was a basic, introductory investigation of the use of a deaf mentor program model with young children who are deaf. Deaf adults (mentors) made regular home visits to young deaf children and their families in the Utah Parent-Infant Program. The mentors taught each family ASL, interacted with the child who was deaf using ASL, shared Deaf culture and their firsthand knowledge of deafness with the family, and introduced the family to the local Deaf community. Families that received regular visits from a deaf mentor also received regular visits from a hearing parent adviser who helped these families learn and use signed English. This created a bi-bi home environment. Average treatment time was 17.6 months. The Utah children who received early bi-bi programming were matched to children in the Tennessee Infant Program Services who received parent adviser home visits only. Half of these children received a signed English approach and half received a spoken English approach. Children in both Utah and Tennessee were tested every 6 months. For chil-

dren in the Utah Deaf Mentor Program, the number of months of both expressive and receptive language gain they achieved exceeded the total number of months they were in the program. The Utah children also scored higher at posttest on a measure of language development than what would be expected due to maturation alone. They made greater gains in both receptive and expressive language during treatment time than matched children in Tennessee, averaging more than 6 months more language growth than the Tennessee children.

Children in the Utah Deaf Mentor Program scored higher at posttest on a test of grammatical structures of English than children in Tennessee. When test items were signed to the Utah children in ASL, the Utah children scored more than 2.5 times higher on the measure than the children in Tennessee.

According to parent reports, deaf children in the Utah Deaf Mentor Program had vocabularies more than twice the size of the vocabularies of matched children in Tennessee, and parents in Utah knew and used more than six times as many signs as the parents in Tennessee, who were using signed English.

Parents in the Utah Deaf Mentor Program became more comfortable using both ASL and complete signed English as the project progressed. The Utah parents reported different attitudes toward deafness, ASL, and Deaf culture than the Tennessee parents. The Utah parents' attitudes and perceptions were consistent with a knowledge of Deaf culture and prevailing attitudes in the Deaf community.

The results point to the feasibility of considering deaf mentor programming as a program option for young deaf children and their families. Certainly these results represent just one study, and certainly parent choice is paramount in deciding which early home intervention approaches might best be used.

Many questions remain unanswered, and further research needs to be done related to the specific mechanisms that contributed to the results of the present study. For example, it is not known if and to what degree increases in sign use by Utah parents contributed directly to the children's performance on the English-based tests. Some other limitations of the present study include small sample sizes, an absence of reliability and validity measures on the instruments developed specifically for the study, the lack of videotaping in Tennessee (project constraints made this unfeasible), and the limited number of measures used.

Authors' Note

The research for the present study was funded by the U.S. Department of Education, Office of Special Education and Rehabilitative Services, Early Education Program for Children with Disabilities, Experimental Projects. Our special thanks go to Dr. Carol Strong, Dr. Don Barringer, Dr. Don Thompson, Linda Logan, Leila Thompson, Petra Rose, Mindy Bergeson, and all the families, mentors, and parent advisers who participated in this project.

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