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ABSTRACT

The effects of an early intervention program for 24 profoundly deaf children under 3 years of age were compared to outcomes for 12 deaf children who did not receive special intervention. The Counselling and Home Training Program, which serves families in the Lower Mainland of British Columbia, is based on the philosophy of total communication with an emphasis on early language input. Other program components include the following: initial counseling concerning deafness and family reactions; home instruction by a trained teacher of the deaf; home instruction and group sign language instruction; various parent group activities; and consultation with a child psychiatrist. Assessment conducted when the children were 3 to 5.6 years old indicated the following outcomes: children receiving intervention showed more advanced social, communicative, and pre-academic skills than did the comparison group, as well as more advanced comprehension and expression of the abstract concept of time; and mothers in the intervention group reported significantly lower overall stress on the "Questionnaire on Resources and Stress" than did the comparison mothers. The positive effects for the intervention group were found on the basis of parent reports, interviewer rating, and behavioral observations. Future program needs include a greater emphasis on oral and aural skills, parent counseling, and special assistance to fathers. (SEW)

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Families with Deaf Children:
The Effects of Early Intervention

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Abstract

This report presents findings on an independent evaluation of an early intervention program for profoundly deaf children. Located in Vancouver, B.C., this comprehensive program served families with children under age 3. The evaluation included comparison to a matched sample of children without intervention. Included were a developmental assessment and assessment of family stress, knowledge and functions. Results indicated more developmentally mature communication, lower stress, and higher quality interaction in families who had received intervention.

The diagnosis of deafness has profound effects on parents and the family system. The process of denial, mourning, and anger that follow the diagnosis of deafness has been well documented. In addition, there is wide consensus that the desired outcome of this phase is the development of meaningful, mutual satisfying communication between the deaf infant/toddler and his/her parents (Schlesinger & Meadow, 1972). Conversely, it is believed that a number of negative social outcomes such as disturbed and fragmented communication, the deaf child's isolation from the family, high parent stress, and higher rates of psychiatric disturbance may result from early communicative deprivation (Meadow, 1980; Mindel & Vernon, 1971; Quigley & Kretschmer, 1982).

During the 1970's the use of sign language in combination with oral techniques (Total Communication) has rapidly become the major educational method for the majority of prelingually deaf children in the United States (Jordan, Gustafson, & Rosen, 1977). The use of Total Communication has been slower in developing in Canada and Great Britain (Freeman, Carbin, Boese, 1981). Early intervention programs using Total Communication have grown rapidly in North America through the support of Federal and State Education Grants as well as local school districts and Speech and Hearing Centers. Yet, at present there have been no published reports of the effects of early infant intervention using Total Communication. The purpose of this report is to do so by comparing family and child outcomes in families who have received comprehensive and systematic early intervention vs. those who have not.

While little is known regarding infant intervention, two studies have examined the effect of intervention during the later preschool years.

Quigley (1969), in an unpublished report, experimentally compared the effects of fingerspelling (Rochester Method) vs. Oral education in matched samples of 3½ to 4½ year-olds. At four-year follow-up, the experimental group (fingerspelling) scored significantly better on reading, writing, and speechreading skills. Moores, Weiss, and Goodwin (1978) in a study of seven preschool programs, reported significantly higher linguistic competence in children who were taught by Total Communication vs. Oral techniques. Greenberg (1980) also reported that for both Oral and Total Communication children, earlier diagnosis and intervention were related to more advanced communicative competence at age 5.

While no program evaluations on younger children have been reported, there have been a number of in-depth longitudinal case studies of children who began in Total Communication. Schlesinger and Meadow (1972) and Schlesinger (1978) report (1) the rapid growth of language in these children, and (2) that similar to the results of Moores et al. (1978), early introduction of sign language did not appear to inhibit the use of voice.

Components of Service Delivery in the C.H.T.P.

The present program has adopted the philosophy of Total Communication with an emphasis on early language input by all possible modes. The Counselling and Home Training Program serves families in the Lower Mainland of British Columbia and all children suspected of being hearing-impaired received a comprehensive multidisciplinary diagnostic study by the Hearing Disorders Team at the Children's Hospital Diagnostic Centre in Vancouver. After diagnosis the families were provided with information on the available Oral (Vancouver Oral Centre) and Total Communication (C.H.T.P.) parent-

infant projects. After visiting the projects they arrived at their own placement decision.

In addition to offering the standard components of intervention, the C.H.T.P. is unique in attempting to integrate both deaf adults and aspects of deaf culture and experience into the intervention. This was accomplished in a number of ways. First, because the Director of the C.H.T.P. is a deaf professional, the parents were continually exposed to experiences with a positive role-model for their children. Secondly, parents were visited weekly by sign language instructors who are themselves deaf. The parents were assigned a number of different instructors during their duration in the program and as a result developed relationships with different deaf adults of varying educational backgrounds, life-styles and communication abilities. Third, deaf people were invited to speak at Parent's Night. Fourth, the parents were invited to participate in various events with members of the deaf community. Through these experiences, it was hoped that hearing parents would both confront their attitudes towards handicaps and develop realistic perceptions of deaf persons. Simultaneously, their children were exposed to deaf adult role models.

Those families who chose to participate in C.H.T.P. received six specific program components:

1. Initial counselling and guidance was provided by the Program Director (and possibly the consulting psychiatrist). This included both information concerning deafness and possible related disabilities as well as exploration of common reactions to diagnosis, i.e., guilt, anger, blame, grief, and confusion. Siblings and

other related family members were included when deemed appropriate/feasible.

2. A teacher of the deaf trained to work with young children visited the home on a weekly basis. The teacher worked with the child and mother on educational activities including play, relatively unstructured auditory and speech training and the development of signs and gestures.
3. A deaf adult visited the family once per week for the primary function of individual sign language instruction. These visits were arranged to include both parents, if possible. A secondary function of these visits was to give both parents and children personal experience with deaf persons and further information on deafness.
4. Each week the families also participated in group sign language sessions at the C.H.T.P. Centre.
5. On an occasional basis other parent group activities (lectures, counselling sessions) and family activities (picnics, holiday parties) were held to stimulate contact between the families themselves, the staff, and members of the deaf community.
6. On a consultation basis a child psychiatrist was available for families who required more extensive counselling or therapy.

Finally, C.H.T.P. assisted the family in planning for entrance into the appropriate preschool program.

Evaluation Design and Measurement of Outcomes

The objective of this study was to compare families who have participated in C.H.T.P. with a comparison sample of families who have received

less systematic and extensive assistance. The comparison group termed "minimal treatment" has received various interventions and accurately reflects the extent and types of assistance that would be available in the absence of a C.H.T.P. type of program. The evaluation was conducted by an outside evaluator who worked independently of the C.H.T.P. All evaluation staff members with the exception of Dr. Greenberg were blind to the treatment/group status of the families.

As the C.H.T.P. was already ongoing for over one year when the evaluation began, unfortunately it was not possible to conduct pre-post testing. Therefore, this evaluation employed a two-group post-test design (Bricker et al., 1981) with the experimental (C.H.T.P.) and comparison group matched as closely as possible (see Methods).

The evaluation was broad-based using a variety of measures to assess outcome in five domains of family and child functioning: parent and family stress, parental knowledge, child developmental level, and both mother and child communication skills. While the present report deals with the psychosocial domains, Greenberg, Calderon, and Kusché (1982) and Greenberg (1982) reported results of communication outcomes from analysis of mother-child videotapes. Briefly summarizing the findings, a number of significant group differences were found. First, mothers who had received the C.H.T.P. intervention gave fewer behavioral commands, and more declarative statements and reinforcements. Second, they communicated more often when they had their child's visual attention and their children were more likely to comply to their requests. Third, the intervention children themselves more often used questions in their communication than did the comparison children. Fourth, the intervention

children were rated as showing more gratification/enjoyment in interaction with their mothers, while their mothers were less directive. Fifth, during free play, intervention dyads showed longer and more elaborated conversations and interactions as well as a higher percentage of topics that include jointly shared fantasy themes. Sixth, the intervention children showed somewhat longer word/sign combinations.

Method

Sample

Between December 15, 1978 and February 1, 1981 the Evaluation has assessed 24 families. Twelve of the families are "experimental" or intervention families and 12 are "comparisons." To be included in the intervention group a family must have entered the C.H.T.P. before the child was two years old and participated in the project for at least twelve months. All children who completed the program between December 1978 and February 1, 1981 were assessed excluding those with significant multi-handicapping conditions (e.g., blind, severe cerebral palsy). Children in the minimal treatment group (comparison group) have not experienced any systematic and comprehensive treatment program comparable to the intervention group. Because all children/families who are diagnosed as deaf receive some services, it would be incorrect to call this a "no treatment" control. While an attempt was made to match the groups on urban vs. rural residence this has been only partially successful because by the very nature of the present services the intervention group is clustered in the Greater Vancouver area, while the majority of the comparison group reside in small cities or towns in other sections of British Columbia.

All children in both groups met the following requirements: hearing

loss of greater than 70 db in the better ear across the speech range; no significant developmental delay defined as greater than one year delay (except in communication); 3 to 5½ years of age at time of assessment. Three of the children had multiple handicaps (partial blindness, mild cerebral palsy) but were included in the sample because of their normal developmental progress. Two of the families have deaf parents (both in the intervention group).

Demographic Analysis. A greater number of comparison families (16) were assessed in order to gather an adequate sample to closely match the intervention group. Families from the comparison group were then case-matched with the intervention families on the following variables; child's age, hearing loss, and age of diagnosis, and maternal education. Analyses were subsequently conducted on these matched groups of 12 families each. Table 1 presents data on child characteristics. A series of one way analysis of variance tests revealed no significant differences in the children's age at this evaluation, age suspected to be deaf, age of diagnosis, age received hearing aids, etiology of hearing loss, presence of additional handicaps, or parity. Additionally, no differences were found on age of first intervention. However, the age at which manual communication was introduced was very different, $t(22) = 2.96, p < .01$, with the intervention children beginning sign language approximately one year earlier than comparisons. The beginning intervention for the comparison group usually consisted of infrequent speech and aural rehabilitation. However, by the time of the Evaluation, the average child in the comparison group had been using manual communication for approximately 14 months. Therefore, while both groups "began" intervention at the same time, both

the quantity (amount of time) and diversity (complete Total Communication program vs. infrequent speech therapy) of their early experiences differed substantially.

Examining parental characteristics, a series of one-way ANOVA's indicated no significant differences on maternal or parental age or education. While parent hearing status, did not significantly differ, two intervention families had deaf parents. Because previous research (Meadow, 1980) has indicated this may be a very advantageous situation, all variables in this report were analyzed both with all the parents included (12 families per group) and with the deaf families and their matched controls excluded (10 families per group). However, there were no differences between these analyses.

Procedure

Each family was visited in their home on two separate occasions by the outside evaluation team. During the first visit, lasting approximately 2½ hours, the assessment procedure was described to the family, and the parent(s) were given an extensive interview regarding their child and family.

The second visit, lasting approximately 3½ hours, was held on a weekend day. There were three different types of assessment during this visit. First, parents were questioned on their child's developmental level/abilities utilizing a revised version of the Alpern-Boll Developmental Profile (Alpern and Boll, 1972). Second, the deaf child was assessed for non-verbal intelligence. Third, the deaf child was video-taped in a naturalistic play setting (living room) with his/her mother (Greenberg, Calderon, & Kusché, 1982). Additionally, each parent was asked to complete

three questionnaires (Questionnaire on Resources and Stress, Parent Knowledge of Audiological Matters, and Parent Knowledge of Deafness) and return them by mail.

Measures

Stress and Knowledge Inventories

Questionnaire on Resources and Stress. The QRS (Holroyd, 1973), is a 285 true-false item inventory designed to measure fifteen different factors pertinent to families with chronically ill or handicapped family members. A shortened version of the QRS (128 items) was developed for use in families with a young deaf child. The following dimensions were assessed: poor health/mood; excess time demands; negative attitude toward index member; overprotection/dependency; lack of social support; overcommitment/martyrdom; lack of family integration; limits on family opportunity; and difficult personality characteristics.

Parents Knowledge/Attitudes Toward Deafness. These dimensions will be assessed with a modified version of Parental Information and Attitudes Scale for Parents of Hearing-Impaired Children (Brown, 1972). This measure assesses parents attitudes/knowledge regarding the education and status of deaf people.

Parent Knowledge of Audiological Matters. The PKAM (Schlesinger and Meadow, 1976) is a questionnaire developed to assess parent's knowledge of audiology, hearing aids, and their management. A subset of fifteen questions from this questionnaire titled the "Index of Parental Sophistication" was used to assess this dimension.

Assessment of Developmental Level

Intelligence. Each child was given the Leiter International Perform-

ance Scale, a non-verbal intelligence test which has been normed for young deaf children.

Developmental Level. The parents were given the Alpern-Boll Developmental Profile (Alpern & Boll, 1972) which gauges parental estimates of the child's social, self-help, academic, communication and physical levels of development. The child receives a separate age-level score for each of these five domains. Because this measure is not standardized for, nor totally appropriate for deaf children, a non-standard scoring procedure was developed.¹

Family Interview and Home Rating

Family Interview. On the first evening the parents received an interview that was approximately two hours in duration. The interview included questions on demographic information, medical and educational history of the child, social support, parent disciplinary practices, parental decision-making regarding their child's education, social and behavioral strengths and weaknesses in the child, and a needs assessment of the family regarding educational concerns.² In addition, at the close of the second visit, the Interviewer filled out four scales rating the family adjustment in different domains. These 3-point scales rated the quality of the home atmosphere, degree of parental overprotectiveness, the child's general adjustment, and the child's attachment to the family. Twenty-five percent of the interviews were attended by two interviewers and on these visits both interviewers completed the ratings in order to obtain a measure of observer reliability/agreement. Pearson reliability coefficients ranged from .84 to .93 on the four scales.

Results

Estimates of Developmental Level. Table 2 presents data on intellectual assessment and parental estimates of their child's developmental level. Using the Leiter International Performance Scale, no significant group differences were found on IQ. Such a finding is important to the Evaluation because other significant findings cannot be confounded by, or accounted for by group differences in basic non-verbal cognitive ability.

Results of the parental estimates on the Alpern-Boll Developmental Profile indicated no group differences on physical or self-help quotients. This indicates that the handicap of deafness has not seriously impaired the motoric function or self-care abilities of either group. However, significant group differences on measures of Social, $t(22) = 2.37, p < .05$, Academic, $t(22) = 2.92, p < .01$, and Communication abilities, $t(22) = 3.01, p < .005$, indicate that by parent estimate, children in the intervention group were significantly more advanced in social and communicative competence. While these findings are striking, it is important to remember that these are parental estimates and not direct measures of the child's ability. However, in terms of the group differences, parents from either group are just as likely to under- or over-estimate and thus such a criticism should not invalidate these group differences. Additionally, because a non-standard scoring procedure was necessary to adapt the Alpern-Boll to use with deaf children, the scores cannot be directly compared to those of hearing children. The scoring, because it omits certain items places differential weight on remaining items and thus

may tend to inflate scores especially on the communication subscale.

Stress and Knowledge Questionnaires. To examine differences in family stress and coping, a revised version of the Questionnaire on Resources and Stress (QRS) was completed separately by both mother and fathers (when present). As Table 3 shows, mothers in the intervention group reported significantly lower overall levels of stress than did the comparison mothers, $t(17) = 2.76, p < .01$. Additionally, a subscale analysis indicates differences between mothers on both the scales of Poor Health/Mood and Negative Attitudes. No group differences were found for fathers on the QRS.

There were no group differences on either the measure of Parent Attitudes/Knowledge of Deafness or Parent Knowledge of Audiological Matters. In both groups, the majority of parents were quite knowledgeable and there was very little heterogeneity within the groups.

Family Environment and Adjustment. Table 4 presents the findings for the four rating scales used by the interviewer to assess family and child functioning. No significant differences were found on the dimensions of the quality of the home environment or the degree of parental over-protectiveness. However, children in the intervention group were rated as significantly more secure in their attachments and as showing better overall behavioral adjustment than the comparison children ($p < .05$ and $p < .001$, respectively).

Parent Evaluation and Needs Assessment

Intervention families. During the parent interview these families were asked to (1) rate the effectiveness of various components of the program, (2) suggest how these components might be improved, and (3)

raise concerns about their present situation and needs. In general, the parents were extremely complimentary about, and grateful to the C.H.T.P. All parents voiced strong confidence that they had made the "right decision" enrolling in the C.H.T.P. Two of the parents had initially enrolled in the alternative available services (the Vancouver Oral Centre) and their dissatisfaction with those services led them to the C.H.T.P. Almost without exception, the parents felt both types of sign language training (group and home visits by deaf adults) were very valuable in spite of the time commitments. Additionally, while initially quite anxious, the visits by a deaf adult were seen as a very important component in their understanding as well as adjustment to deafness. A number of mothers (40%) said these visits were especially beneficial to the fathers and siblings, who were not at home during the teachers visits.

The mothers were very enthusiastic (without exception) about the teacher's home visits. The teachers were perceived as effective in modelling communication and play techniques as well as emphasizing auditory training. The teachers were obviously successful in forming positive affective ties with the mothers and were not perceived as intrusive. When asked if one home visit/week was sufficient, the mothers were about equally divided; some suggesting that two to three visits/week would have been more helpful or that each visit be extended in length, while others felt that once per week was sufficient.

In addition to this generally positive evaluation, there were a number of consistent criticisms. First, while their initial counselling and information sessions were quite good, more than half of the mothers

(but few fathers) felt that regularly scheduled parent counseling group sessions would be especially helpful to their husbands. A second criticism stated by 1/3 of the parents was a need for greater emphasis on speech and auditory training. These parents felt that while their children were communicating adequately in sign language, their child had potential for better speech and that neither the teachers or the program in general place sufficient emphasis on the use of voice.

At the time of interview, the families no longer were receiving services from C.H.T.P. While their children were now in preschool programs, the parents felt a significant loss since "graduating" from the program. In response to questions about their interest/need of family services, more than one-half felt in need of continued sign language training and said they would continue to be interested in such classes if they were offered. Additionally, 1/3 of the mothers spontaneously commented on their wish for more interaction with parents of other deaf children and hoped that C.H.T.P. might expand to meet the needs (sign language and parent counselling) of parents with preschool children.

Comparison families. Because the comparison families had received a wider variety of interventions, they were asked to both reflect on the value of their experiences and also to consider what services or supports would have enabled them to better adapt to their child's deafness, as well as improve parent-child communication. Approximately 80% of the parents felt that the lack of counselling and information soon after the diagnosis had significantly affected their adjustment. After receiving the diagnosis (usually in Vancouver), they returned home to a situation with no competent counselling services. Typically, they

were either referred to a Developmental Center where their child received speech therapy or they were visited by a teacher of the deaf. In either case there was little provision of support for the family and no initial encouragement to use Total Communication. Most of the families had no contact with either deaf adults or other families with young deaf children. However, within approximately one year, both the parents attitudes and the nature of the services they received had changed considerably. As a result of such experiences as talking to parents of older deaf children, becoming acquainted with deaf adults, having visited a school for the deaf, or having visited either the C.H.T.P. or attending its Summer Family Learning Vacation, the families began to utilize Total Communication. In two areas, the families had formed organizations and negotiated with Provincial authorities to begin Total Communication programs. In other areas the parents either educated themselves or solicited help from their local school district. Because there were no qualified teachers of the deaf in most areas, the parents were assisted by school speech pathologists who made weekly home visits. Most parents took sign language courses from local community colleges or asked deaf adults in their community for assistance. A number of parents were radicalized by their experiences and felt a strong need to gain political advocates in order to assist them in receiving services.

The majority of parents had similar suggestions on how to improve services. First, they strongly encouraged the hiring of parent counsellors because of the difficult situations they had faced. Second, because of the lack of counselling and "true" information, they felt that they had lost valuable time in learning how to communicate with their child

and relieving frustrations in the family. Third, they emphasized that while they appreciated the help they had received, the majority of professionals who assisted them were not trained to work with, or experienced in working with young deaf children. Fourth, 84% of the parents felt that their sign language training was inadequate and stressed the need for classes tailored to the needs of parents with young children. Fifth, over 1/2 of the parents stated their feeling that they wanted to learn about the "deaf community" and get to know deaf people in their communities. Sixth, not only did they request counselling after the diagnosis, but 2/3 stated that they would now attend parent counselling groups if available. Most of the families were very concerned about their child's educational future and felt that within a few years their local district would have little to provide. As a result, most of the families were beginning to psychologically prepare themselves to send their child away to the Provincial School. To avoid such a possibility, three families (25%) had already made definite plans to move to the Vancouver area to keep their child at home while providing a quality education.

Discussion

The evaluation was successful in adequately matching program intervention and comparison families on all dimensions of interest. This is crucial to the validity of the study because this design is only quasi-experimental (no pre-test data and non-random group assignment). There were no group differences on age of diagnosis, hearing loss, age of intervention, or non-verbal intelligence. However, two factors did differentiate the intervention and comparison families; (1) intervention families

received manual communication training approximately one year earlier, and (2) while the intervention families received a systematic intervention of regular teacher visits, counselling, and both home and group sign language lessons, the comparison families initial assistance were often unsystematically delivered by less than fully-trained professional and focused primarily on the child's oral and aural skills. The results indicate that the C.H.T.P. parents and children differed from their matched controls on a number of important dimensions.

Developmental level. An important finding was that intervention children showed more advanced social, communicative, and pre-academic skills than did the comparison group. Additionally, they were more advanced in both the comprehension and expression of the abstract concept of time (Greenberg et. al., 1982). Since the groups did not differ in intelligence, this data is best interpreted as indicating both the advanced communicative ability of the program children as well as the effect of communicative skill on both social and pre-academic development.

Family environment, parent knowledge and stress. The findings in this domain illustrate both the positive effects of the C.H.T.P. as well as the need for program change. First, the mothers in the intervention group reported significantly lower overall stress on the Q.R.S., show a mean score of 25.8. In contrast, the comparison mothers received a mean score of 38.3, which is very similar to those scores reported by Freidrich and Freidrich (1980) in a sample of 140 families with a developmentally delayed child. While it is unclear what program components contribute to the lower stress, the finding fits the picture drawn from behavioral observations showing higher gratification and compliance

by the intervention children (Greenberg et. al., 1982) However, the finding of no differences between groups in the stress levels of the fathers is of some concern. While there are various reasons for this finding, it is common for interventions to be focused on and therefore show greater impact upon mothers. Finally, ratings of both the quality of the child's attachment and their overall behavioral adjustment were enhanced in the intervention group. These findings are congruent with those discussed earlier showing lower maternal stress and higher compliance and social age/maturity (greater social competence) in the intervention families.

In summary, data from a variety of sources which tapped different dimensions of the family context have indicated the beneficial effects of the C.H.T.P. compared to the standard alternative treatment for deaf children in British Columbia. Such positive effects were found not only by parent reports and interviewer ratings, but also from behavioral observations. The parents and children show a pattern of more positive adjustment to the deafness and lower rates of family and child problems.

Suggestions for Improvement in Services: The C.H.T.P. Project

Given the present findings, there are three areas of program content that could benefit from substantial revision. First, as previously discussed there is a need for increased emphasis on oral and aural skills. For both groups the percentage of child communications using intelligible speech (5.5%) or even unintelligible vocalizations (52%) is low. The lack of clearly understandable speech is not surprising. However, the lack of use of voice as indicated by the low percentage of bimodal communications indicates a "failure" of either group to utilize "simul-

taneous communication." This finding corroborates the criticisms of parents in both groups who felt that too little emphasis had been placed on oral skills.

While such a finding points to the need for program change, it is difficult to state an exact goal to be attained due to the individual nature of each case. Furthermore, this issue is believed to be the heart of a larger philosophic controversy regarding the goals of early education for the deaf. Should speech training be delayed until the child has learned how to use and enjoy communication/language? Are the first three or four years crucial for oral development? Presently, there is little longitudinal data by which to guide such decisions (Quigley & Kretschner, 1982). However, at least for some children it may be fruitful to emphasize the simultaneous development of both speech and signs (Schlesinger, 1978).

The second program change involves the need for substantial improvement in the availability of parent counselling. The absence of a trained counsellor (psychologist, psychiatrist, or social worker) on the C.H.T.P. staff has led to a diffusion of responsibility for these services. Moores (1978) has discussed the difficulty of teachers of the deaf who are given or accept "responsibilities of parent counsellors, social workers, child development specialists, educational audiologists, and psychologists--roles for which they are completely unqualified," (p. 195). Additionally, it is hypothesized that long-term effectiveness would be substantially enhanced by teaching parents generalized coping and problem-solving skills to better deal with future difficulties.

The third suggested program revision would be to place more emphasis

on assisting fathers. This need was reflected in both the father's self-reported stress as well as the mothers suggestions that their husbands would benefit from such attention. This might be accomplished by initiating separate father discussion groups, holding activity sessions for fathers and their children, arranging for occasional teacher visits to occur when the fathers are home, and use of a male staff member (possible the parent counsellor) as a father confidant and liason.

Suggestions for Improvements in Services: The Comparison Families

Due to the small concentrations of population outside the Lower Mainland, most of the families in the comparison group live in towns or cities that have no specialists in counselling or education of the very young deaf child. Indeed, because of the low rates of deafness and the deaf child's unpredictable presence, it would not be financially feasible nor are there sufficiently trained professionals to serve such communities. However, it is apparent that the lack of such systematic services definitely impedes both the child's development and family functioning. In order to serve such families in a cost-effective manner, the following approach is suggested.

First, coordinate service delivery province-wide through expansion of C.H.T.P. Second, C.H.T.P. supervised teachers would travel on a regular basis (possibly once per month) to each family for an extended (2 to 3 day stay). These teachers would be trained to: (a) provide similar services to that of the present C.H.T.P. teachers; (b) provide basic counselling skills (where significant problems exist, referral would be necessary); (c) help provide inservice training to the local Developmental Centers so that they could better provide some local services

to the families; (d) introduce the family to members of the local deaf community; and, (e) provide video-tape curriculum and sign language materials on each visit. Third, C.H.T.P. would provide regular phone consultation to both the families and their local agencies on an as-needed basis. While such a coordinated service delivery may appear expensive, we believe that it would be cost-effective and could provide a needed demonstration model for other Provinces as well as rural areas in the United States.

Issues in the assessment of long-term effects. From the results of this evaluation the C.H.T.P. has shown substantial success in achieving its program goals. However, this evaluation was conducted almost immediately (within 1 to 4 months) after the intervention terminated. As with other intervention programs (Bronfenbrenner, 1976; Gray & Wandersman, 1980) a major concern is whether these effects will be maintained across childhood and adolescence. In fact, some investigators have suggested that if long-term effects are not found, then the program is not effective. However, it appears that this is a somewhat simplistic viewpoint given our present knowledge of the transactional nature of development (Sameroff, 1980).

There are a number of issues to be examined in interpreting results of long-term follow-up. In the event that significant differences are found favoring the families who received early intervention, then the interpretation is quite clear. However, a finding of no difference may be quite difficult to interpret because there may be a number of potential reasons. First, the program may be provided effective services during its tenure, however such effects cannot effectively buffer families from

the adverse effects of deafness during other periods of developmental crisis. Second, due to the lack of programs for young school aged deaf children, those who received early intervention are grouped with the remaining children who are less advanced. Consequently, those children who were advanced are slowed down by the other children such that the delayed children catch up. Third, while no overall long-term effect is found, a detailed study of individual differences may indicate what later environments (school or family) either helped maintain or dissipated the early gains. Finally, the outcome measures may not be adequate to demonstrate differences that do exist. Ziegler and Trickett (1978) have discussed the difficulty in developing valid measures for evaluating long-term effects.

This discussion elucidates the dangers in solely relying on results of follow-up in determining program value. Nevertheless, there is the need to conduct such an evaluation. However, this need should in no way trivialize or negate the findings of the present report. As indicated by both parent report and behavioral analyses, this project has significantly increased the quality of communication and family life.

Footnotes

¹ A copy of this scoring procedure may be obtained from the author.

² A copy of the interview protocol may be obtained from the author.

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Table 1
Child Demographics by Program Status

	Intervention		Comparison	
	\bar{X}	SD	\bar{X}	SD
Age	43.8	9.2	47.1	10.9
Age Suspected	8.3	6.9	11.1	10.2
Age Diagnosed	12.4	6.9	15.7	11.3
Age Received Aid	17.2	5.4	21.5	9.8
Age at First Intervention	20.4	10.1	23.9	10.4
Age Began Sign Training	20.8*	10.0	33.2	10.4
Hearing Loss (unaided)	97.1	12.7	94.2	16.5
Hearing Loss (aided)	72.5	15.7	70.8	23.5
Etiology				
Genetic	4		1	
Rubella	0		2	
Menigitis	2		0	
Unknown	6		9	
Handicap				
None	9		8	
One Minor	1		1	
One Major	2		3	
Parity				
First Born	4		6	
Later Born	8		8	

* $p < .01$

Table 2
Developmental Estimates by Program Status

	Intervention		Comparison	
	\bar{X}	SD	\bar{X}	SD
Leiter IQ	125.4	16.2	117.3	21.8
Alpern-Boll Subscale Quotients				
Physical	110.0	17.5	101.3	21.0
Self-Help	129.8	19.1	117.6	18.3
Social	122.7*	20.1	105.2	15.1
Academic	103.9**	18.7	84.9	12.5
Communication	88.0***	21.1	64.4	12.2

* $p < .05$

** $p < .01$

*** $p < .005$

Table 3

Maternal Scores on the Questionnaire on Resources and
Stress (QRS) by Program Status

Scale	Intervention		Comparison	
	\bar{X}	SD	\bar{X}	SD
Total QRS ¹	25.8**	10.0	38.3	9.4
<u>QRS Subscales</u>				
Poor Health/Mood	2.6*	2.5	5.0	2.6
Excess Time Demands	4.7	2.2	5.2	1.8
Negative Attitudes towards the Child	2.6*	2.2	4.9	1.9
Overdependency	3.8	1.8	4.0	2.0
Lack of Social Support	4.3	1.5	4.7	1.6
Parental Martyrdom	3.0	0.5	2.9	0.5
Lack of Family Integration	2.6	1.7	3.2	1.0
Limits on Family Opportunity	0.8	1.3	1.0	1.2
Difficult Personality Characteristics of the Child	5.3	3.0	6.4	2.8

* $p < .05$

** $p < .01$

¹ Higher scores denote higher reported stress

Table 4
Interviewer Ratings of Adjustment¹

Variable	Program		Comparison	
	\bar{X}	SD	\bar{X}	SD
Home Atmosphere	1.9	.79	1.9	.67
Overprotectiveness	1.7	.78	1.83	.72
Child Attachment	1.3*	.41	1.8	.45
Child Adjustment	1.4**	.52	2.4	.67

I range = 1 (high) to 3 (low)

* $p < .05$

** $p < .001$