DOCUMENT RESUME

ED 206 148 EC 140 002

| | |
|---|---|
| TITLE | Handicapped Children's Early Education Program, Division of Innovation and Development. Final Report, June 1977-August 1980. |
| INSTITUTION | Oregon Univ., Eugene. Center on Human Development. |
| SPONS AGENCY | Office of Special Education (ED), Washington, D.C. |
| PUB DATE | Jan 81 |
| GRANT | G007701817 |
| NOTE | 88p. |
| EDRS PRICE | MF01/PC04 Plus Postage. |
| DESCRIPTORS | *Disabilities; Infants; *Intervention; Mainstreaming; Parent Participation; *Preschool Education; Program Descriptions; *Program Effectiveness; Program Evaluation; Young Children |
| IDENTIFIERS | Handicapped Childrens Early Education Program |

ABSTRACT

The Preschool Program, Center on Human Development at the University of Oregon is described in terms of objectives, rationale, structure, staff, curriculum design, parent involvement, support services, training and dissemination, and research and evaluation. The project has accommodated five major shifts in generally held concepts about young handicapped children, including the general recognition of the need for early intervention, the increased role of the parents, and a greater realization of the infant's competence. Intervention in the behavioral-developmental orientation included classroom programs for infants/toddlers, an integrated toddler class, a toddler class strictly for handicapped children, a preschool class, an integrated kindergarten class, and a public school special education kindergarten class. A home component served underage children or families living too far from the center. Services to parents included educational, social, and advocacy assistance. Research efforts centered on examination of strategies to enhance early developmental processes and evaluation of program effect on the children. Consistent positive progress of enrolled children was demonstrated on standardized and specifically designed instruments. Further, the project provided training for university students and opportunities for onsite research. (CL)

# Final Report

## Grant No. G007701817

## Handicapped Children's Early Education Program

## Division of Innovation and Development

Project Director: Diane Bricker, Ph.D.
Date of Project: 6/77 to 8/80
Date Submitted: 1/81

Preschool Program
Center on Human Development
University of Oregon

## Acknowledgments

The success of this project is attributable to contributions made by staff, families and the children. The preparation of this report also benefitted from the care and concern of a variety of individuals. The data analyses were conducted by William White and Earletta Bailey. David Littman contributed to the interpretation of the results and assisted in the formulation of the discussion section. Laurel Carlson and Robert Schwarz offered cogent and helpful editing suggestions. Connie Nosbisch ably made her way through a number of "drafts." All assistances were willingly given and gratefully received.

## Introduction

The Bureau for the Education of the Handicapped initiated the Handicapped Children's Early Education Program in 1968 (DeWeerd & Cole, 1976) to meet a congressional mandate to develop a series of model intervention programs throughout the nation. The target population for these model programs was preschool handicapped children -- a population for whom in the late 1960's and early 1970's few educational intervention programs existed. During the ensuing decade, a dramatic growth in the number of preschool programs throughout the country has occurred. In addition, there have been significant changes in generally held concepts and perspectives about the young handicapped child. As a background for this final report of USOE Grant No. G007701817 from OSE to University of Oregon, a number of the more important changes will be discussed.

Perhaps the most significant shift is in the general recognition of the need for early intervention. The available data, as well as the writer's involvement in one of the initial attempts to design an early intervention program, provides a basis from which to view the shifts in attitudes and perspectives during the past 10 years. The first early intervention programs elicited much criticism from professional colleagues -- in fact, the major supporters of initial efforts were the parents of handicapped preschool children (see Bricker & Bricker, 1976). Nonetheless, a number of pioneers, largely supported by the HCEEP, persisted and began to effectively demonstrate the ability to organize and deliver educational services to the handicapped preschool child (Jordan, Hayden, Karnes, & Wood, 1977). As descriptions,

training materials and data have become available, the field's efforts have become increasingly sophisticated. So well has the need for early intervention been presented, that many states are incorporating programs for the handicapped preschooler into their mandated continuum of educational services (Cohen, Semmes, & Guralnick, 1979). Critics, or at least sceptics, continue to argue that little objective information exists suggesting the efficacy of early intervention efforts, or that such gains produced by these efforts maintain over time (Clarke & Clarke, 1976). Although one cannot disagree with their concerns, the nature of the debate appears to be evolving into a more useful inquiry: What type of early intervention is most effective with which populations?

A second change in the way the field's professionals view the handicapped infant/child has been the need to include the parent in the intervention effort (Turnbull, 1978; Bricker & Casuso, 1979). Indeed, there is increasing recognition of the importance of evaluating the target child's entire ecology, and including all relevant aspects, if the established targets are to be met successfully (Hobbs, 1978). This shift has evolved from a previous position in which parents were encouraged to consider the professional to be "the expert" who could intervene most effectively with their child. Often, the parent's primary role was to transport the child and to be grateful. The move toward a more ecologically-based perspective should have intuitive appeal to both parents and professionals. By including parents and others in the intervention effort, generalization should be enhanced. In addition, the parent's competence in terms of their ability to manage and teach their own child should be an important boost to their self-esteem, mental health,

and their willingness to maintain their handicapped child in the home.

Another important change during the past decade has been our perception of the infant. A significant amount of research has focused on demonstrating the "competence" of the infant which is in stark contrast to the earlier prevailing view of the infant as having limited perceptual, memory, and discrimination abilities (Kagan, Kearsley, & Zelazo, 1978). In fact, data reported over the past decade have emphasized the competencies of the young human organisms. Piaget has exerted a great impact in suggesting the active nature of the infant in terms of acquiring information and acting on the environment. This model of organismic-environmental interaction has had a profound influence on the prevailing view of the infant as an active participant in the developmental process rather than a passive recipient. This view of the infant has had, in turn, a substantial effect on the form of intervention efforts. The essence of this impact is the moving away from programs emphasizing infant stimulation (which seems to suggest the infant is a passive vessel in need of energizing) to approaches that emphasize the significance of the interactive nature of the learning process (Bricker, Seibert, & Casuso, 1980).

In terms of the prevailing views of infants, other data have suggested that young children need not be traumatized by being away from their primary caregiver for substantial time periods (Caldwell & Richmond, 1968; Bronfenbrenner, 1976; Kagan, Kearsley, & Zelazo, 1978). Given appropriate handling, most young children seem quite capable of satisfactorily adjusting to other caregiving adults and functioning effectively within groups of children (Rubenstein & Howes, 1979). As more information is acquired about early

development, our view of the capabilities and competencies of young children may evolve further.

A fourth change to be noted is the growing concern for those infants deemed to be at-risk for developmental delays for both physiological and environmental reasons (Field, Sostek, Goldberg, & Shuman, 1979). Follow-up data collected on this population have consistently reported that approximately 30% of the infants labeled as at-risk require some form of special service by elementary school (Scott & Masi, 1979). Although currently there is little predictive validity for subsequent child progress associated with tests and procedures used with this population, the substantial number of infants in this group that will require special services argues for continuing investigation into determining more effective selection procedures. Underlying the increasing concern for populations of at-risk infants is the tacit assumption that early intervention is effective in eliminating or attenuating the development of subsequent problems.

A final change to be discussed in this introductory section reflects the move from a behavioral format that precisely employed the principles of shaping and reinforcement in sterile, relatively artificial adult controlled environments to more child oriented, developmental approaches. The rigor of the approach has not been diluted, but rather the antecedent, response and consequent activities have been more broadly and relevantly defined. This shift in no way undermines the importance of behavioral principles of intervention, but rather reflects a more generalized, integrated use of these principles in tandem with developmental theory (see Brinker & Bricker, 1980; Bricker, Seibert, & Casuso, 1980 for more in-depth discussion of this issue).

Much of the initial intervention work in the 1960's and early 1970's was conducted with deviant subjects (Baer, Peterson, & Sherman, 1967; Metz, 1965) or institutionalized populations (Bricker & Bricker, 1969; Guess, Sailor, Rutherford, & Baer, 1968) in which interventionist and investigators were faced with enormously difficult behavioral control problems. The behavioral technology that evolved was, at least in part, influenced by the need to establish rigorous procedures in order to obtain and maintain the subject's attention and cooperation. In addition, the subjects of these investigations often resided in sterile environments, thereby necessitating the development of an artificial consequence system. Young handicapped children who reside at home confront the interventionist with, if not different problems, at least variations on the theme. That is, these youngsters' environments are often richly stimulating and consequently, their target repertoires should be significantly different from institutionalized individuals. These differences require not less rigor, structure, or careful application of behavioral principles, but a more broadly based application of these principles. The antecedent events, or more appropriately the curriculum, should reflect the sequential development of critical behaviors for a young child, rather than selected specific targets that may or may not be related. The response should be broadly defined to be adaptable across a variety of conditions (e.g., stimuli, location, people) rather than a one-to-one correspondence between a stimulus and a response. The consequence, whenever possible, should be inherent in the task or activity and/or socially relevant rather than an artificially imposed event that has little relevance for the activity.

The sensitive use of behavioral technology is a necessary but not

sufficient condition for effective intervention because there is no content inherent in this technology. As we have argued elsewhere, findings from research on early cognitive, affective, and linguistic development provide the most useful source of content currently available to the interventionist (Bricker & Carlson, 1980a). The literature reflects that many early interventionists are adopting developmental data as their content for intervention (Sheehan, 1979). We believe a balanced synthesis of developmental theory with behavioral technology will result in increasingly effective early intervention programming.

## Summary

The five major shifts above have all been incorporated in the Preschool Program, Center on Human Development. The remainder of this report describes this program and the results from the second and third years of operation.

## Project Objectives

The need for and expansion of educational services for the handicapped preschool child is predicated on three basic assumptions:

The early experiences of infants and young children are of critical importance for subsequent development.

Assisting parents in learning how to respond to their young handicapped child increases the likelihood of developing a mutually satisfying child/family relationship.

Early intervention programs can offer the necessary mechanism for the delivery of educational and support services to the young handicapped child and his/her family.

The need for the development of educational programs for young handicapped children is strikingly acute in states like Oregon which have not even statewide provisions for kindergartens. The need for demonstrations of the impact of early intervention is critical if more state resources are to be allocated for the implementation of appropriate educational and support services to the preschool handicapped child. Therefore, the goal of this project was to create an early intervention program for handicapped preschool children to meet the following objectives:

1) To develop a comprehensive program that produced verifiable changes in children over time.
2) To develop a program to support and to educate the families of participating children.

3) To develop an evaluation system for monitoring child change over time.

4) To assist local public schools in developing programs for the preschool handicapped child/

5) To develop a model early intervention program that could offer an exemplary site for training, research, and dissemination.

Project Overview

This project was a joint effort between the Center on Human Development, University of Oregon, Lane County Mental Health Department, Lane County Educational Service District (the intermediate county unit legislated to provide educational services to all TMR and preschool handicapped children), and the Eugene Public Schools. This program was initiated in July, 1977 with funding provided in part by the Handicapped Children's Early Education Program. During the first year of this project, 1977-1978, approximately 40 children were served, ranging in age primarily from 3-5 years. In the second year, 1978-1979, approximately 65 children were served, and more of these children ranged in age between birth and 2 years. In the final year of OSE funding, 1979-1980, this project served approximately 80 handicapped and 20 at-risk or non-handicapped children ranging in age from birth to 5 years. Etiologies of enrolled children include Down's syndrome, cerebral palsy, behavior disorders, sensory impairments, and general developmental delays of both known and unknown origins. Selected children developing within normal limits were served as well. This program was non-categorical, and any infant or child for whom the program was deemed appropriate was

enrolled if space was available. It is of interest to note that although OSE support of this project terminated August, 1980, this program has continue with support from the Lane County Educational Service District, Lane County Mental Health; and the Eugene Public School District will be supporting the kindergarten program for handicapped 5 year olds completely. The continuation of this project will be discussed in more depth in the results section of this report.

This multi-faceted project was composed of five separate but integrated components including: intervention, parent involvement, support services, training/dissemination, and evaluation/research. Each of these units is described below:

## EDUCATIONAL INTERVENTION COMPONENT

### Rationale

This program adopted a position that:

> ... a sound and effective educational program needs to be governed or regulated by some broad underlying theoretical framework or orientation. An underlying theoretical framework should provide cohesiveness and consistency to the program by directing the decision-making process at a number of levels which include: 1) The determination of short-term and long-term objectives and priority areas for the child's educational program, 2) the selection of strategies for facilitating acquisition of the established objectives, 3) the selection of appropriate evaluation instruments to assess initial levels of development and monitor (subsequent) change, and 4) the constuction, adaptation, or modification of training materials and curricula (p. 233, Bricker, Seibert & Casuso, 1980).

The framework or approach adopted by this project can be termed "behavioral-developmental" in that developmental theory is the source of the content and sequence of that content for intervention, while behavioral technology is the methodology used to teach the selected content. This approach has been described in detail elsewhere (see Bricker, Seibert, & Casuso, 1980; Bricker & Dow, 1980; Bricker & Iacino, 1977; Bricker & Carlson, 1980), and therefore a brief description will suffice here.

Many early intervention programs have adopted the approach of including targets generally found in nursery school or kindergarten programs. That is, there is an emphasis upon a set of somewhat remotely integrated targets or skills such as color, size, and form discrimination. This approach seems to have been gleaned from strategies employed in elementary school, where the skills and information to be acquired during a specific year have been clearly delineated and agreed upon over the years (e.g., standardized achievement tests, reading, and math series). Unfortunately, such targets or skills become increasingly less well defined as one moves down the age scale, and when dealing with populations that have significant handicapping conditions. There has been substantial progress in the development of curricular materials for the preschool handicapped child, and we anticipate that within the next 5 years, additional definitions and clarity will be forthcoming that should lead to the systematic development of appropriate content (i.e., curricula) for the handicapped infant and young child. In the meantime, the most useful information is being generated by researchers and theorists concentrating on early developmental processes. Such content in tandem with behavioral procedures provides the basis for the educational intervention described in this report.

Operant conditioning, behavioral technology, and direct instruction are some of the labels used to describe an enormously effective set of intervention techniques and procedures. There seems to be little doubt that the experimental analysis of behavior and its applied efforts have significantly enhanced intervention approaches with children, especially in atypical populations. Yet, this set of learning principles as translated into intervention procedures does not inherently suggest what the likely content of the interventions should be. Rather, it is necessary when intervening with young children to examine the research and theoretical literature that focuses on early development. Such literature provides insight into the content of early development and the general sequence in which that content develops (e.g., sensorimotor behavior).

## Structure

The intervention component was divided into two units: A classroom program, and a home intervention program. Both of these units changed over the three year duration of this project, and therefore, only their composition during the final year will be described.

The classroom unit was composed of six distinct classes. Five of these classes were housed in the Center on Human Development, while the remaining class was operated in a local public school. Each of these classes is described below.

### Infant Classroom

The infant/toddler classroom provided services for children ranging

in age from 15 to 24 months. The majority of children had Down's syndrome or cerebral palsy, disabilities ranged from moderate to severe impairments. The classroom program operated from 8:30 to 11:30 a.m., Monday through Friday. Afternoons were spent providing individual or small group instruction to parents.

Four types of activities were conducted within the classroom program: large group, caregiving, instructional, and unstructured activities. Social interaction was the primary goal of large group activities. Examples included singing, water play, and outdoor games. In this classroom setting, diapering, and tasks associated with the arrival and departure of children from school were the major caregiving activities. Instructional activities were designed to teach new behaviors. Between 15 and 20 instructional activities designed to develop the child's skills in gross motor, fine motor, receptive language, expressive language, and self-help behaviors were conducted with each child daily. Most instructional activities were conducted on a one-to-one basis and lasted for approximately five minutes. Periods of exploratory play served to fill the time between periods of instructional activities for the children.

In addition to providing classroom instruction to handicapped infants and toddlers, the classroom program assisted parents in becoming effective change agents with their child. The approach to this objective was twofold. First, parents were encouraged to participate in small group meetings in which specific developmental areas (e.g., gross motor behavior) that were appropriate to their infants' needs were targeted. In addition, the teacher met on a regular basis individually with the parent/infant dyads. During

these sessions, the teacher assisted the parent in acquiring specific information and skills relevant to the developmental level of the infant and targeted educational objectives.

Integrated Toddler Classroom

The classroom program included handicapped and non-handicapped toddlers ranging in age from 15 to 36 months, of which 9 were handicapped and 6 non-handicapped. This classroom operated five days a week from 8:30 to 12:30. Children came on a daily basis.

Programming for these children covered the following areas: Gross motor, fine motor, self-help, social, and expressive and receptive language. Instructional activities focusing on these domains were conducted in small group and large group formats. The basic goal was to develop and implement the most effective educational program for each participating child.

Non-handicapped toddlers were included for several reasons. First, there was an attempt to provide the handicapped children with as normalized an environment as possible through the systematic exposure to and interaction with youngsters who were developing normally. Second, it was hoped that the population of non-handicapped toddlers would provide effective behavioral models for their handicapped counterparts. Third, the non-handicapped toddlers offered a perspective of normal skill acquisition that is often lacking in programs that serve only handicapped populations. Finally, the integration of handicapped and non-handicapped toddlers appeared to provide useful insights for parents of both populations.

Parental participation was an important part of this classroom program. Parents were encouraged to visit the classroom as often as possible, and to discuss their child's progress with the teaching staff. Programs were designed for consistent implementation at home and within the classroom.

Toddler Classroom for Handicapped Children

Twelve handicapped children ranging in age from 20 to 40 months were enrolled in this classroom. Handicapping conditions were severe to profound, including cerebral palsy, Down's syndrome, visual impairments, and general developmental delays. This program operated from 8:30 to 1:00 daily. The children spent approximately 80 percent of their day engaged in structured training situations. The areas of focus for these training activities included: receptive language, expressive language, gross motor, fine motor, pre-academic, self-help, and social skills. The remaining 20 percent of the day was spent on toilet training and feeding programs.

The serious nature of the handicapping conditions of this group of children necessitated that training sessions be conducted individually or with small groups of children; however, every day was begun and ended with a large group activity, even though participation on the part of most of these children was minimal.

The significant disabling conditions of this group of children demand regular input from the support staff. The physical therapist spent time in this class each day, training staff and carrying out complex motor intervention with some of the children. A program using biofeedback was

initiated with a severely involved cerebral palsied child in an effort to increase her motoric control. A number of specialists were consulted in devising an intervention program for an autistic-like youngster who attended this class. A specialized feeding program was conducted by a speech pathologist which again focused on both training parents and staff, and working individually with each child.

Parents were encouraged to meet bi-weekly with the staff to discuss the progress of their child at home. . :nts were assisted in implementing programs at home in conjunction with on-going classroom programming.

Preschool Classroom

In the preschool classroom, there were 21 children ranging in age from 3 to 4½ years. These children had a variety of disabling conditions, producing moderate to severe developmental delays. Twelve of these children attended a morning program daily from 8:30 to 12:00, while the remaining nine children attended a program that operated daily from 12:30 to 3:30.

A primary objective of this program was to prepare children to function appropriately in a group instruction format. To accomplish this, children were initially expected to work on instructional programs in 15-minute training sessions. Although the children were given individual turns, they were also required to listen to and observe other children who were participating in the group activity. During the year, the children learned to make group responses when appropriate, and to become progressively more independen in performing other activities (e.g., work sheets).

The instructional content of these classes focused on language, cog-

nitive, and motor skills. Programming in the language area focused upon increasing the child's vocabulary as well as increasing the length of utterances. Children were taught object and picture recognition, verb recognition, prepositions, and a variety of other concepts such as colors and opposites. Motor programs emphasized the refining of the gross motor skills in areas such as balance, climbing, jumping, and running. The fine motor programs were aimed at the development of more adequate hand/finger control. Cognitive activities generally focused on assisting the children in acquiring pre-reading, pre-writing, and pre-arithmetic skills. Self-help skills were not taught directly, but were practiced throughout the day.

As in the other classes, parent participation was encouraged. Some parents become contributing members of the classroom staff by agreeing to conduct specific activities with selected children on a regular basis. All parents were encouraged to attend the small group meeting appropriate to their child's specific needs. In addition, individual meetings between the teacher and parents occurred weekly or on alternate weeks.

Integrated Kindergarten Classroom

This class operated daily from 8:30 to 12:00, and included 17 children. Nine of these children were handicapped, while the remaining 8 children were either at-risk or non-handicapped. These youngsters ranged in chronological age from 4 to 5 years in the fall. Their physical and/or motor problems included Down's syndrome, cerebral palsy, hearing impairment, and developmental delays of unknown etiology.

There were two areas of emphasis in this "integrated" classroom.

The first was instruction in academic skills. The second was the training of classroom survival skills which facilitate the transition of the children into public school classrooms.

The academic skills portion of the classroom curriculum included daily instruction in reading, arithmetic, handwriting, speech, and language. With the exception of some individualized speech therapy, the children were taught in small groups of 2-5 children by means of instructional materials and strategies appropriate to their developmental levels.

The second area of emphasis was the training of classroom survival skills. Thus, the classroom was organized to resemble a public school classroom. There were group instruction areas, individual desks for independent seat work, and a small play area. Classroom time was organized such that children followed the same schedule each day. General classroom rules were established, which again resemble those of public school classrooms. For example, children raised their hands when work was completed, lined up to leave, and returned to the classroom as a group. Feedback from parents of children who have left the classroom, and comments from teachers who received these children in the public schools suggest that these classroom "survival" skills are very important ones which the children are expected to have in their future classroom placements.

The integration of non-handicapped and handicapped children within the same classroom provided both groups of children with experiences which, we believe, helped equip them to deal more effectively with present and future environments. This approach to the education of the young handicapped child met the Public Law 94-142 requirements of "least restrictive environ-

ment" -- a goal toward which the entire Center on Human Development is directed.

Parents of children in this class were also encouraged to participate in the program in whatever manner they deemed most useful to themselves and their child. Consequently, parent participation varied considerably, from mothers who took active teaching roles in the classroom to parents whose contact was minimal.

Public School Kindergarten Class

This class was located in a Eugene Public School, and was jointly administered by the Special Education Division of the Eugene Public Schools and the HCEEP program director. This kindergarten served 8 children between the ages of 5 and 6 years. These children had problems that ranged from moderate to severe in nature. The class operated daily from 8:30 to 2:00.

Although this class was not internally integrated, there were several mechanisms established to provide the youngsters with the least restrictive environment. First, two of the children were able to attend a kindergarten class for non-handicapped children for one hour each day. Second, time on the playground allowed access to other children in the school program (half of whom were handicapped, and the other half not). Third, the children had lunch in the cafeteria with the rest of the student body. Finally, selected sixth graders were used as "tutors" for some of the handicapped kindergarten children throughout the year.

This class was structured to prepare the children for entry into the least restrictive first grade placement. Both behavioral skills

(e.g., paying attention, following directions) and academic skills were considered to be essential targets. The majority of training was conducted in small groups. Support services by a speech pathologist, physical therapist, and behavior management specialist were provided.

Parents were encouraged to observe and participate when possible in the classroom activities. These parents were also encouraged to attend any group meetings at the Center on Human Development that would be appropriate for them and their child.

Home Intervention Unit

The second unit of the Educational Intervention Component was focused upon providing services to 20 infants and young children in their homes. This group of children was served in the home for one of three reasons: the family lived too far from the Center to make attendance in a class feasible; there was no appropriate classroom space available; or they were infants under 6 months of age, and thought to be too young to benefit from classroom experience.

These children ranged in age from a few months to 5 years, and the disabling conditions ranged from moderate to severe. The focus of this program was to assist parents in developing the necessary skills for becoming an effective change agent with their child.

The intervention format consisted of weekly visits to the home by one of two home interventionists. During this visit the interventionist observed the parent/child interaction and progress toward the specific

targets selected previously. The home interventionist then modeled the new activities to be implemented. Parents were encouraged to keep systematic data on the training conducted each week. Support specialists were contacted as necessary.

## Staff

Each classroom was directed by a certified special education teacher whose responsibilities encompassed: the training and supervision of the classroom personnel; coordination with support staff (e.g., physical therapist); the development and implementation of IEP's for each enrolled child; the monitoring of appropriate data collection procedures; the provision of systematic feedback to parents of enrolled children; and the necessary liaison between the classroom and community agencies that were involved, or would be involved with the children (e.g., welfare agencies or public schools).

The teachers regularly participated in three types of meetings. Full program staff meetings were held bi-monthly. During these meetings, general topics of concern, program-wide modifications, and discussions of ensuing activities were discussed. These meetings also were used as in-service training vehicles throughout the year. The second type of meetings included only the teachers. At these times teachers were able to share mutual problems and discuss strategies for solving difficulties: for example, the sharing of information about successful ventures in the classrooms. The third type of regular meetings occurred for individual classroom personnel. An attempt was made to convene all intervention

personnel once a day, either prior to the beginning of class or at the end. Each teacher held his/her own meeting with staff to discuss problems relevant to their particular group of children and classroom activities.

In addition to the teacher, each classroom had an assistant teacher whose role was structured by the teacher. In general, the assistant teacher was responsible for seeing that the daily classroom activities occurred smoothly and as scheduled. The assistant teacher handled large group, small group, and individual instruction as assigned by the teacher. In the teacher's absence, the assistant teacher became the adult in charge.

To augment the regular classroom personnel were three other groups of individuals: students, support personnel, and parents. The location of this preschool program in a university mandated the education of future personnel for the provision of human services (e.g., psychologists, social workers, educators, and medical personnel). Such a commitment required that the program be structured to accommodate a variety of graduate level students. Placement of students in the preschool programs was reciprocally beneficial. Students received excellent in-field experiences with the delivery of a broad range of service to the preschool handicapped child and his/her family. In return, the program was able to augment the service personnel considerable through the deployment of students. The graduate level status of these students meant that the majority had been active professionals, and therefore came to the program with considerable expertise in a variety of areas. This expertise often significantly impacted the program by the introduction of new ideas, strategies, or procedures that enhanced the program's capabilities for delivering quality services.

The support personnel available to this program on a regular basis included a feeding specialist, an educational psychologist, a physical therapist, a social worker, and a speech pathologist. The role each of these specialists played is described in the support service component of this report. In addition to the regularly available support personnel, medical personnel (i.e., pediatrician, nurse, occupational therapist, and physical therapist) associated with the Crippled Children's Division (CCD) also participated as necessary. This state-supported diagnostic and evaluation unit provided the majority of referrals to the program, as well as completing full diagnostic work-ups on all enrolled children. The staff of CCD was accessible to the preschool personnel for consultation. The close liaison between this state-supported diagnostic unit and the preschool produced an efficient and effective transition of children from detection to intervention.

The final group of individuals included as classroom personnel were parents of the enrolled children. All parents were encouraged to spend time in their child's classroom. Parental involvement in this capacity ranged from those parents who became functioning staff members, to those who visited on occasion. Parents were free to decide on the nature of their classroom participation.

The home intervention unit was operated by two half-time, skilled special education teachers. Each teacher carried a case load of 10 to 15 children. The case load varied depending upon referrals to other programs. Support personnel were consulted in terms of programmatic strategies and activities.

## Curriculum Design for the Intervention Component

In discussing the curriculum design for the intervention component, it is essential first to have an understanding of the philosopical orientation that underlies our intervention efforts. Intervention decisions, including the choice of assessment and evaluation instruments, the determination of educational objectives, the selection of strategies for fostering development, and the construction or adaptation of curriculum materials are governed by our developmental interactive approach. This intervention philosophy, discussed in detail elsewhere (Bricker & Iacino, 1977; Bricker, Seibert & Casuso, 1980), involves several basic assumptions about the nature and cause of developmental change. It assumes that important developmental changes are both hierarchical and sequential, that is, current developmental progress involves integration and reorganization of earlier levels of development, and development occurs in a general consistent sequential order. In addition, the philosophy assumes that many important developmental changes result from the resolution of disequilibrium between the child's current level of development and the demands of his environment. There must be a match (Hunt, 1961) between structure and environment, or in other words, the problem posed by the environment must be neither too simple nor too difficult for the child's developmental level in order for developmental change to result. The task of the interventionist then is to structure the environment to place demands on the handicapped child's current level of functioning in order to engage the child actively in the developmental process. Finally, the approach assumes that what is critical to development in some cases may be specific behaviors, and in other cases,

may be broad conceptual targets, tied to a class of behavior rather than one specific behavior. These broad conceptual targets index changes in underlying structural organization rather than change in behavior topography.

How, one may reasonable ask, does this philosophy translate into actual classroom practice? To begin with, it aids our program in selecting assessment/evaluation instruments by specifying criteria for those instruments: they should be developmentally sequenced, and at least ideally should tap the development of conceptual targets as well as behavioral targets, based on descriptions of normal development. In other words, a strict developmental behavioral sequence may provide sufficient information for programming for an infant in the gross and fine motor, and to a lesser extent, self-help domains; however, broader conceptual targets must be understood for programming in the social/affective, communication, and sensorimotor/cognitive domains. For example, with a severely motorically involved infant, use of a symbol to refer to a desired object should be the training target, and the symbol use could be manifested by a vocal utterance, a sign, or pointing to a communication board symbol, rather than a specific behavior such as the spoken word. The spoken word may, of course, be the most desirable behavioral expression of the conceptual target of symbol use, but for an infant who is physically incapable of speech, one must be aware of the underlying conceptual target as well. An example in the sensorimotor/cognitive domain of a conceptual target would be any behavior of the infant that indicates that he/she understands the continued existence of a perceptually absent object. The behavior used to express this concept need not be the action of removing a cloth that covers an object,

but any activity indicating that the infant recognizes the object still exists.

Unfortunately, available assessment based on normal development still tend to be tied to specific behaviors, and so, while assessments are chosen that approximate the ideal, it is often necessary to adapt instruments for individual children as a function of their sensory and motor impairments.

The philosophical orientation of the program also directs the selection of educational objectives for children, since assessment places the infant or child somewhere in developmental space, and the sequence to be followed is already mapped out. The philosophy also directs our focus to questions of inter-relationships among developments in the various intervention domains. The child is an integrated whole; rarely does he/she develop skills and concepts in isolation. For example, the early development of communication skills depends on social developments such as the establishment of reciprocal give-and-take games between the infant and others (Bruner, 1975; Bates, 1979; Chapman & Miller, 1980). More effective programming results when the interdependencies across domains are taken into account. Intervention time can also be spent more efficiently because several targets from different domains can often then be worked on concurrently.

The developmental interactive approach also influences the selection of strategies of intervention to foster development. By focusing on developmental sequences, and therefore in many cases, on developmental antecedents, by looking for interdependencies across domains, and by emphasizing conceptual as well as behavioral targets which direct attention to underlying processes, the intervention activities should produce changes that are functional and generalizable because they are built on a solid

developmental foundation in a hierarchical fashion.

In more specific terms then, the curriculum for the project was designed to include instruction in the gross motor, fine motor, self-help, communication, social, and sensorimotor/cognitive domains. Therapy input from the physical therapist was seen as critical for programming in the gross motor, fine motor, and self-help domains; the speech patnologist's input was essential for communication programming; and the classroom teacher was directly responsible for all major decisions in the social and sensorimotor/cognitive domains, although, of course, his/her intervention efforts cut across all six domains.

Training activities in the fine and gross motor domains were determined primarily by the therapist, teacher, and parent. In the self-help domain, activities were programmed to help establish feeding, toileting, and dressing skills. Communication and language activities were based upon a social communication approach: an attempt was made to provide the child, under the supervision of the speech pathologist, with a means of communication that met his/her needs, and was functional in his/her environment. The appropriateness of establishing any formal communication system for a child was determined by observing the child's interactions with persons, and noting his/her interactions with the environment. Training activities were then directed at providing the child with a consistent system for communication with others. As the child demonstrated the antecedent skills, his/her communication system was expanded to include more symbolic referential elements. Prior to the child demonstrating a readiness for a formal communication system, antecedent targets in the

social and sensorimotor/cognitive domains were the focus of training.

Activities for social and sensorimotor/cognitive development covered a broad range of conceptual targets. To understand the kinds of targets and activities that were included in the sensorimotor/cognitive domain, a domain probably more difficult to envisage activities for than most of the others, consider the following: a child will reach and take his/her favorite doll when it is partially hidden; when it is pushed completely behind a box, or put under a table, or covered completely with a cloth, he/she acts as if the object is no longer there. Training activities involved many different hiding games with desirable objects, such as playing peek-a-boo, covering a toy that the child was already holding, dropping objects so that the child followed their paths to the point of landing, covering and uncovering objects, placing objects in containers that the child could see through, and so on. This training process illustrates the developmental interactive approach to intervention: it involves the arousal of conflict or disequilibrium by the presentation of a problem just beyond the child's current developmental level; it builds hierarchically and sequentially upon what the child already knows; and it emphasizes the concept to be acquired, rather than any one specific behavior. It should be emphatically noted that observable behavior remains the only measure of developmental change; however, the concept is measured by a class of behaviors, rather than by the specific rote behavior, helping to insure generalizability of the concept.

This approach to intervention and development emphasizes flexibility,

synthesis of skills, and generativity on the part of all intervention staff; a necessity, we believe, when dealing with handicapped infants and children. Therefore, it is never anticipated that a cookbook or lock-step program of curriculum activities will result from our efforts. Such a rigid product would defeat the spirit of our developmental interactive philosophy. Nevertheless, consistent training and careful emphasis on recording pertinent educational information should insure that our approach is replicable.

The procedures used to develop each child's IEP long-term targets and the subsequent monitoring of progress towards accomplishing these targets is described in the evaluation section of this report.

## PARENT INVOLVEMENT COMPONENT

The nature of the parent involvement in this project has changed significantly over time. Initially, parents' participation in classroom and training activities was minimal, with considerable time directed toward advocacy projects. This latter advocacy function was needed during the beginning stages of this program in order to educate the community and garner the necessary resources for the maintenance of early intervention efforts for the handicapped preschool child.

The discussion of this component is divided into two sections: 1) initial contact and entry into the program, and 2) the structure of the program once the parent/child dyads were enrolled. Each of these areas is described below.

Entry into the Program

The primary referral source for this program was the Crippled Children's Division (CCD). Those infants and children who were referred to the program by other agencies or physicians were immediately referred by this program to CCD. Consequently, almost all children made contact with the program through this primary diagnostic/evaluation unit. Once a child was referred by CCD, a specific intake procedure was followed. Figure 1 provides an overview of the intake procedure.

All referrals to the preschool program were directed to the program's social worker. This contact was generally in the form of a telephone call or letter. As soon as possible, the social worker contacted the family to determine if the child was potentially appropriate for the program (e.g., under age six and lives in the region), and if the child had been seen previously by CCD. If the child did not meet the general criteria of acceptance for the program, the family was assisted in locating the proper resource. If the child appeared potentially appropriate, and had not been evaluated by CCD, a referral was made immediately for a comprehensive diagnostic work-up. If the child had been referred by CCD, an appointment was made for the family at the Center.

At the first meeting, the screening committee, composed of the social worker, psychologist, and program coordinator saw the family. During this meeting, some basic demographic information was collected: two sub-scales of the Adaptive Performance Instrument (CAPE, 1978), and observation of the child in a classroom or small group setting was conducted. The data collected from these procedures as well as the results

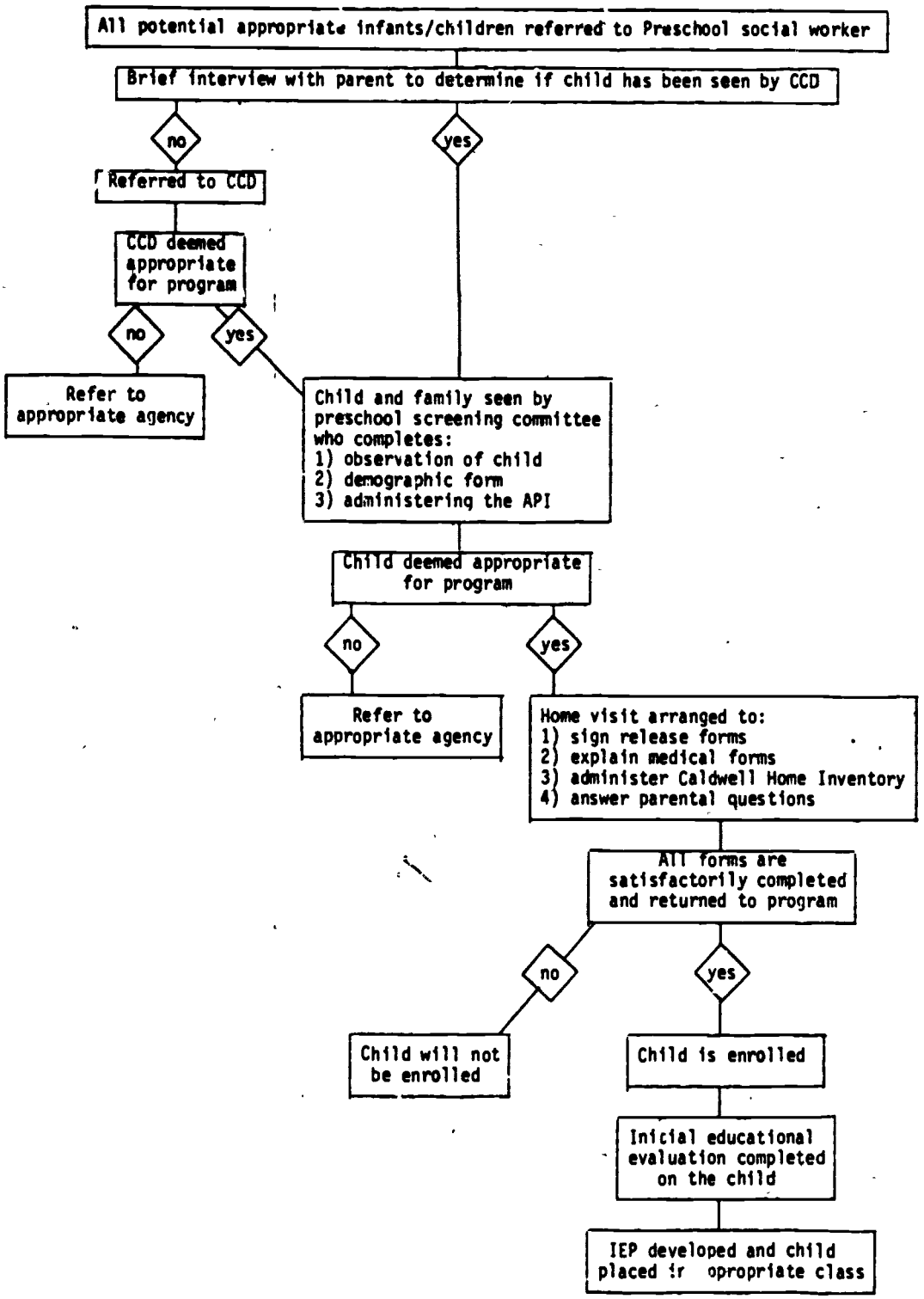



Figure 1. Schematic of intake procedure.

of the assessment were used to determine the appropriateness of the program for the child. If the child was not appropriate, the social worker assisted the family in locating the proper resource. If the child appeared appropriate, a home visit was arranged. During this home visit, the social worker attemped to answer all parental questions. All medical forms were explained, and the parent was asked to have them completed by a physician as soon as possible. In addition, the following information was gathered: signed release forms, and an evaluation of the home environment by administering the Caldwell Home Inventory (Caldwell, 1978).

Once all required forms had been satisfactorily completed and returned to the program, the child was formally enrolled. Prior to attending the program, an educational evaluation was completed. Once completed, an IEP meeting was scheduled. All appropriate professionals plus the parent attended this meeting and shared in the development of an appropriate IEP for the child.

Following the IEP meeting, the parents and staff members developed a contract to specify both parental and program committment for the ensuing term. This procedure was undertaken to assure understanding and accountability. A detailed discussion of this procedure can be found in Bricker and Casuso (1979).

At the completion of the intake procedure, the following documents were completed:

a) an initial IEP on the child

b) the demographic form

c) history and medical information form

d) all appropriate release forms

e) parental contract specifying their commitment to the program and the program's responsibility to the family.

Parent Program

The parent involvement program can be conveniently divided into three areas: educational, social service, and advocacy. Parental participation in each of these areas was dictated by the agreed upon parent/program contractual agreement as described above.

The educational area can be separated into three types of activities: individual instruction, small group, and large group participation. Individual instruction was provided to parents by either the teacher, home interventionists, or support staff. The type of individual instruction and the provider was determined by the nature of the parental need. The major thrust of the home intervention was generally individual instruction. Often parents of children in classroom programs required individual attention as well.

In addition to the individual instructions, small group instruction was provided on a regular basis by specific staff. The topics for the small group instruction were determined by parental need. For example, a questionnaire was distributed quarterly, and then groups formed on the basis of the needs noted on this questionnaire. A behavior management group generally was held throughout the year. The objective of the group was to assist parents in acquiring more effective child management skills. Small groups were also operating that targeted the development of child

skills in specific areas such as language or sensorimotor behavior.

Large group meetings occurred regularly, and were of two types. Parents met one morning a week to discuss mutual concerns and problems, to make announcements, or to simply share their feelings about their children. These meetings varied in both content and attendance, and therefore were loosely structured to attempt to accommodate current parental needs. In addition, parents met as a group once a month. A wide variety of individuals (e.g., lawyers, educators, other informed parents, and legislators) were invited to address the group on specific selected topics. The objective of these meetings was the continued education of all interested parents.

The social service areas encompassed a broad range of activities to assist parents in meeting some environmental or psychological need. Generally, these activities were carried out by the social worker, but on occasion the teachers and support staff became involved. The social service needs of our families ranged from transportation to marital counseling. Parents with the latter and similar problems were referred to appropriate community mental health professionals. The role of the project in these cases was one of referral, liaison, and follow-up, as appropriate.

The final content area was advocacy. It was deemed important by the project staff that parents have the opportunity to become articulate spokespersons for not only their child, but preschool handicapped children in general. To meet this objective, parents were provided information and support for advocacy activities. In particular the parents, with the help

of the social worker, developed a slide/tape presentation describing the preschool program. Groups of parents then volunteered to show the presentation and answer questions. Parents have made a number of these presentations in Eugene and state-wide.

At the policy and administrative decision-making level, a group of parents met monthly with the Preschool Director. Generally, this group, named the Parent Advisory Council, functioned to set administrative objectives, provide advice on policy matters, and assist the director in meeting the overall objectives of the program.

Although the emphasis on parent advocacy has been balanced with efforts directed towards parent education and the provision of social services, the staff continues to view parent advocacy as essential to the continued growth of effective programs for handicapped infants and children.

## SUPPORT SERVICES COMPONENT

During the three years of this project, we have found the contributions from a variety of professionals to be essential to the delivery of quality services to the handicapped infant and young child. This Program required the services of a physical therapist, psychologist, speech pathologist, communication specialist, social worker, and feeding specialist.

Because this program could not support the cadre of needed professionals on a full-time basis, a model termed "the educational synthesizer" (Bricker, 1976) was adopted. In this model, the specialist functions primarily as an evaluator and consultant who subsequently monitors the implementation

of the developed program. In such a model, the classroom staff and parents rather than the specialist provide the primary hands-on therapy to the child. In this approach, the teacher (parent) must organize the input from other disciplines into an integrated, developmentally sound approach.

The teacher (parent) cannot function effectively in the role of synthesizer unless the various specialists are willing to make some significant modifications in their roles. The change in role primarily requires the specialist to shift from providing direct hands-on service to the children to providing consultative services to the direct intervention staff and parents.

The success of the synthesizer model is predicated on the willingness of the direct interventionist and the specialist to interact. In particular is the on-going need to share information about specific children. In effect, the teacher's (parent's) attempt to acquire relevant information will be futile if the specialist does not support such a model. The specialist must be willing to explain, share, and assist in implementation of appropriate programs. That willingness is probably predicated on the specialist's belief that the teacher (parent) is capable of using specific inputs properly, and that allowing the teacher (parent) to function in such a role is an efficient, effective approach to the child.

The implementation of this model has evolved during the three years of the project. The synthesizer approach has been adopted, in part, because of financial exigencies, but also because staff, parents, and specialists have become convinced that, generally speaking, the synthesizer

model is more effective in producing desired change in the child. For a more detailed description of this model, see Bricker, 1976.

## TRAINING AND DISSEMINATION COMPONENT

This component encompassed the training and dissemination activities associated with this demonstration project, and was considered an important and integral activity for the project staff.

### Training Activities

The training activities were divided into three areas, and included: general practicum placement for university and community college students; practicum and intern placement for the graduate students enrolled in the Early Childhood/Special Education personnel preparation program at the University of Oregon; and placement for individuals from other agencies and universities. The University of Oregon offers a number of programs (e.g., special education, early childhood, community service, rehabilitation, psychology, and speech pathology) whose students can benefit from placement in applied habilitative settings for young children. In addition, the local community college offers programs of study where placement in early intervention programs is essential. This project served these needs by accepting a number of students for practicum placement within the classroom or home intervention programs. Participation was specified in order to assure that the student received useful training, and that the project benefitted as well.

The major training efforts associated with this project were the practicum and intern activities provided the master's and doctoral students

enrolled in the Division of Special Education and Rehabilitation's Early Childhood/Special Education (ECH/SE) Program. This program was developed to prepare teachers, supervisors, program developers, and researchers specifically in the area of ECH/SE. Each student was required to participate in practicum activities each term. The nature of this participation was tailored to meet both the needs of the student and the project. The ECH/SE program is described in detail in the Final Report of this Personnel Preparation Project (Bricker, 1980).

The final area of training encompassed the activities provided by the staff to individuals from other agencies. These activities ranged from intern placement for an entire term to visits which lasted only a few days. For example, during the summer this project in conjunction with the State of Oregon's Mental Retardation/Developmental Disabilities agency provided a full week of training for 10 teachers from throughout the state. This training sequence has been described in detail by Taylor (1979).

Dissemination Activities

The dissemination activities of this project encompassed a number of diverse areas: short-term visits, consultation with other programs, paper presentations and written products. Examples of each of these activities are provided below.

During each year a number of individuals and groups requested tours of the demonstration program. Such requests were seen as a potentially useful way to "educate" a broad spectrum of people to the importance of early intervention efforts for young handicapped children and their families. Requests have ranged from local groups (e.g., high school

classes, civic organizations, concerned citizens) to international visitors. Generally, a visit consisted of an introductory session in which an overview of the project was provided. This overview was followed by a tour through the classroom during which time explanations of activities were provided. Individuals were encouraged to ask questions. Following observation of the classrooms, requests for individual time with specific staff members (e.g., feeding specialist or physical therapist) were honored if possible. The goal of these visits was to stimulate a general interest and enthusiasm for early intervention, and provide specific information to the visitor.

The staff, and in particular the project director, have engaged in a number of consultative visits to other agencies and programs. Such visits usually have specific objectives (e.g., how to develop an infant curriculum) to which the staff addresses their input.

Although less personal, the written products and presentations by the program staff have probably had a greater dissemination impact. Again, these activities were considered an essential aspect of the program. Below is a list of the major presentations and written products.

Selected Paper Presentations:

Fink, W.T., & Gabrielson-Krambs, P. Small group instruction: Preparing multihandicapped children for public school environments. A paper presented at the Third Annual Convention of the American Association for the Education of the Severely and Profoundly Handicapped, Kansas City, Missouri, 1976.

Gabrielson, P., Sandall, S.R., Reid, R., & Fink, W.T. Integrating handicapped and nonhandicapped preschoolers in academic activities: Structure, organization and outcomes. A paper presented at the Eleventh Oregon Conference, Eugene, Oregon, 1977.

Fink, W.T., & Gabrielson, P. A continuum of services preschool programming model. A paper presented at the Fifty-fifth Annual International Convention of the Council for Exceptional Children, Atlanta, Georgia, 1977.

Fink, W.I. Integrating preservice and inservice teacher training in early childhood education of the developmentally disabled: A direct instruction approach. A paper presented at the National Developmental Disabilities Workshop, Hollywood Beach, Florida, 1977.

Fink, W.T., & Sandall, S.R. Integrated kindergartens: Rationale, methodology, and data. A paper presented at the Twelfth Oregon Conference, Eugene, Oregon, 1978.

Fink, W.T., Gabrielson-Krambs, P., Sandall, S.R., & Taylor, S.J. Curriculum development for the moderately and severely handicapped: Flexibility in the context of accountability. A paper presented at the Twelfth Oregon Conference, Eugene, Oregon, 1978.

Fink, W.T. Integrated academic instruction: What have we learned in three years of experience? A paper presented at the Fifty-sixth Annual International Convention of the Council for Exceptional Children, Kansas City, Missouri, 1978.

Fink, W.T. Some antecedent conditions in a new psychology of instruction. A paper presented at the One Hundred and Third Annual Meeting of the American Association on Mental Deficiency, Denver, Colorado, 1978.

Bricker, D. 1978/79
AAESPH Meeting, October 24-25, Baltimore, MD. Presented a paper on the results of a 3-year federally supported early intervention project.

Invited speaker, state-wide meeting of Early Childhood educators, Wausau, Wisconsin, October 26-27.

Invited speaker, regional meeting for teachers, supervisors, administrators working with young handicapped children, San Diego State University, November 8-9.

Invited speaker at National Meeting of Teacher Education Division of CEC, San Antonio, Texas, January 3-5.

Invited speaker at Regional Meeting of AAESPH, Seattle, Washington, March 10.

Invited speaker at meeting at Georgia State University, Atlanta, March 27.

Invited speaker, University of Georgia, Athens, Georgia, March 30.

Invited speaker, 5-state regional meeting for early childhood/special educators, Springfield, Missouri, April 12-13.

Invited speaker, Strother's Seminar, University of Washington, April 29.

Bricker, D. 1979/80
Invited speaker for the Alice Hayden Symposium, Seattle, Washington, February, 1980.

Invited speaker for a state-wide meeting on Early Childhood/Special Education, Billings, Montana, Febraury, 1980.

Presented a paper at an invitational conference on High-Risk and Handicapped Infants, Monterey, California, April, 1980.

Presented a paper at Council for Exceptional Children, Philadelphia, PA, April, 1980.

Presented a paper at American Association on Mental Deficiency, San Francisco, CA, May, 1980.

Invited speaker for Early Childhood meeting, Phoenix, Arizona, June, 1980.

Written Products:

Fink, W.T., & Sandall, S. The effects of small group and one-to-one instructional strategies on word identification by developmentally disabled preschool children. Mental Retardation, 1978.

Fink, W.T. The effects of emphasizing stimulus dimensions on concept identification by retarded children. Education and Training of the Mentally Retarded, in review.

Fink, W.T., Sandall, S.R., Gabrielson-Krambs, P., Taylor, S.J., & Layton, G.L. The Preschool for Multihandicapped Children curriculum and data management system. Center on Human Development, University of Oregon, 1977.

Fink, W.T., & Sandall, S.R. The effects of integrated academic instruction on multi-handicapped and typical preschool children. Mental Retardation, 1978.

Bricker, D., & Sandall, S. The integration of handicapped and non-handicapped preschoolers: Why and how to do it. Education Unlimited, 1979, 1, 25-29.

Bricker, D. Educating the severely handicapped: Philosophical and implementation dilemmas. Teacher Education and Special Education, 1979, 2, 59-65.

Bricker, D. Program planning. In C. Ramey & P. Trohanis (Eds.), Finding and educating the high-risk infant, in press.

Bricker, D., & Carlson L. Issues in early language intervention. In R. Schiefelbusch & D. Bricker (Eds.), Early language: Acquisition and development. Baltimore: University Park Press, in press.

Bricker, D., & Carlson, L. An intervention approach for communicatively handicapped infants and young children. In D. Bricker (Ed.), Language resource book. San Francisco: Jossey-Bass, 1980.

Bricker, D., & Peterson, N. Parenting and the young handicapped child. In N. Peterson (Ed.), Early childhood education for the handicapped. New York: Little-Brown, in preparation.

Schiefelbusch, R., & Bricker, D. (Eds.). Early language: Acquisition and development. Baltimore: University Park Press, in press.

Bricker, D. (Ed.). Language resource book. San Francisco: Jossey-Bass, 1980.

## RESEARCH AND EVALUATION COMPONENT

Although the primary thrust of this project was a demonstration of the delivery of effective educational services to handicapped preschool children and their families, such a project, given additional resources, can serve as an ideal research base, particularly when located in a university setting, for conducting applied work focused on enhancing the quality of the program. For a discussion of the service/research interchange see: Bricker, Seibert & Casuso, 1980. The availability of research support has allowed exploration into two major areas associated with this project: 1) examination of strategies to enhance early developmental processes; and 2) evaluation of program effect on the enrolled children.

The first step to improving the content of intervention was directed towards the systematic exp' ion of the development of early social-

communicative behavior and object play behavior with our population of handicapped children below 36 months of age. A considerable amount of work has been done with non-handicapped infants in these areas (see for example: Bruner, 1975; Sugarman, 1978; Zelazo & Kearsley, in press; Rosenblatt, 1977; Bates, 1979) but little similar research has been conducted with handicapped infants. Consequently, before initiating change in the curricular approach, it seemed appropriate to first examine the comparability of the development of social-communicative and play behaviors of handicapped and non-handicapped infants. This research is underway and has been described elsewhere (Bricker & Carlson, 1980b). We believe it is essential for such work to continue within early intervention programs.

Evaluation

The second major research/evaluation effort was the documentation of child progress in the program. Because of the importance of this topic for the field, a comprehensive description of the project's evaluation plan is provided below. The data generated from this plan are presented in the results section of this report.

The evaluation plan of this project to monitor child progress was composed of four types of assessment: 1) collection of selected demographic information on the child and his family; 2) pre-post administration of standardized or norm-referenced tests; 3) pre-post administration of criterion-referenced tests; and 4) collection of daily/weekly data on progress towards reaching IEP target objects.

Upon entry into the program, a demographic data form was completed on each child and his/her family. This brief form contains items which have been constructed to yield quantifiable responses. The areas covered include: identification and description of the child and family; prenatal data; information regarding children's impairments and handicapping conditions; and findings of previous assessments.[1]

The demographic data forms were updated each fall at the beginning of the school year, or when any children enter or exit from the program. The information collected from the demographic data forms (minus identifying information) were then transferred to fortran sheets, along with code numbers.

There are no ideal or completely appropriate instruments available for use with a population of handicapped infants and preschoolers. In recognition of this, interventionists must make compromises in selecting the instrumentation to be used. This project therefore chose two instruments which have norms available for the non-handicapped population. These included the Bayley Scales of Infant Development (Bayley, 1969), and the McCarthy Scales of Children's Abilities (McCarthy, 1972).

The Bayley Scales and the McCarthy Scales were administered during October and November or upon entry, and again in April through June, or upon exit. All of the instruments were administered by diagnosticians according to the developmental age schedule contained in Table 1.

---

[1] This section of the report is taken from a paper entitled, "Early education for the handicapped infant and child: A plan to evaluate child progress", Bricker and Sheehan, 1980.

Three criterion-referenced instruments were used in the intervention program. These included the Student Progress Record (SPR), the Uniform Performance Assessment System (UPAS), and the Adaptive Performance Instrument (API).

Criterion-referenced measures do provide norms or points of comparison, just as the norm-referenced measures do. For example, two of the three instruments noted (UPAS, SPR) do provide comparative data, and the third instrument (API) is currently being field tested, from which some initial standardization data will be obtained. The provision of norms is not the major advantage of the criterion-referenced measures. Rather the strength of these instruments is the relationship which their content has to specific program goals and objectives.

The Student Progress Record (SPR) is a developmentally based instrument that covers 14 important areas of behavior (e.g., communication, self-help) which was developed in Oregon and adopted by the Mental Retardation/Development Disabilities Office as the state-wide mechanism for monitoring progress of all TMR children and preschool handicapped children. This test was administered in the fall and again in the spring by the teacher or home interventionist. Results were mailed to a central site (Salem, Oregon) to be summarized using a specially developed computer program.

The remaining two criterion-referenced instruments, the Uniform Performance Assessment System (White, Edgar & Haring, 1978) and the Adaptive Performance Instrument (CAPE, 1978) were administered quarterly by the intervention program's instructional staff according to the developmental age schedule specified in Table 1.

Table 1

TESTING SCHEDULE

| Instrument | Developmental Age | | | | |
|---|---|---|---|---|---|
| | Birth-2 years | 2-3 years | 3-4 years | 4-5 years | Elementary School 6 years |
| Bayley | Δ----------Δ | | | | |
| McCarthy | | Δ----------Δ | ----------Δ | ----------Δ | |
| Adaptive Performance Instrument | Δ----------Δ | | | | |
| Uniform Performance Assessment System | | Δ----------Δ | ----------Δ | ----------Δ | |
| Student Progress Record | Δ----------Δ | ----------Δ | ----------Δ | ----------Δ | |
| Curriculum Monitoring | Δ----------Δ | ----------Δ | ----------Δ | ----------Δ | |

The usefulness of the Uniform Performance Assessment System (UPAS) has been discussed elsewhere (Bricker & Dow, 1980). UPAS consists of a fine motor/pre-academic, gross motor, communication, self-help/social, and behavior management scales. Each scale is composed of developmentally sequenced items accompanied by extensive administration guidelines. The major drawback with UPAS is the limited number of items covering the developmental period from birth to 24 months. Consequently, this assessment instrument is useful primarily with children who are functioning above a developmental age of 24 months

The third criterion-referenced tool is the Adaptive Performance Instrument (API), which somewhat resembles the UPAS. The API, however, concentrates on the developmental age span from birth to 24 months. Another distinction between the API and the UPAS is that the API allows for novel modifications or adaptations in the assessment for children with specific handicapping conditions. These modifications are possible for children who a visually impaired, hearing impared, visual/hearing impaired, and orthopedically impaired. This instrument is currently undergoing field testing, and thus is considered to be a research tool rather than a codified, published scale. The experimental nature of this instrument (e.g., validity and reliability still undetermined) argued for excluding these data from the analysis of programmatic impact.

The API covers 8 domains of behavior, including: physical intactness, reflexes and reactions, gross motor, fine motor, sensorimotor, communication, social, and self-help. Each of the 8 domains is divided into a number of test strands that are arranged into developmental sequences. Monitoring of

both API and UPAS is currently done by plotting the number of items and percentage of items passed in each domain at the quarterly testings. In addition, the UPAS also yields developmental age equivalents, and in time, the API may also provide such information.

The final area that was included in the evaluation plan was curricular assessment. In the fall, an IEP was written for each child, in which parents and staff specify long-term and quarterly short-term targets.

In order to attempt to insure that a comprehensive intervention program was planned for each child, and to insure continuity for a child from year to year, a set of programmatic training targets was developed for the following domains: language, speech-hearing, gross motor, self-help, cognitive, fine motor, and sensorimotor. Each domain is divided into a number of sequential targets that would be appropriate for the majority of children enrolled in the program. The targets are laid out developmentally, and as often as possible, the intervals between targets are approximately 2 to 3 months. As an example, Table 2 contains a list of the long-term training targets, birth through 36 months, for the fine motor domain.

If an infant were developing normally, one would expect that all five fine motor targets specified from birth to 12 months in Table 2 would be accomplished during the first year, while mildly to moderately handicapped infants would be expected to acquire fewer targets, and the more severely impaired infant still fewer targets per year. The same procedure would be used to determine long-term targets across domains. Following each school year, a new IEP would be written incorporating a new set of long-term training targets. For example, if the infant had completed the first three targets in the fine motor area, items 4 through

Table 2

Training Targets for the Fine Motor Domain

| Age in months | Training Targets | |
|---|---|---|
| | Skill | Activity |
| 0-12 | Eye tracking visually directed | 1. Tracks 180 degrees, both direct. |
| | | 2. Grasps objects held at all levels. |
| | Voluntary release | 3. Releases block into cup. |
| | Midline orientation | 4. Manipulates objects with both arms about midline. |
| | Transfer of object | 5. Uses both hands to transfer objects. |
| 12-24 | Pincer grasp | 6. Picks up items with pincer. |
| | Wrist rotation | 7. Turns lid on jar; opens door. |
| | Refined pincer grasp | 8. Turns pages in book. |
| | Eye-hand coordination | 9. Builds tower of 2-3 blocks. |
| | Visual Motor | 10. Places 3 shapes in form board. |
| 24-36 | Eye-hand coordination and pincer grasp | 11. Places 2 small pegs in peg board. |
| | Eye-hand coordination and pincer grasp | 12. Imitates vertical and horizontal lines. |
| | Eye-hand coordination and pincer grasp | 13. Imitates circular lines |
| | Visual Motor | 14. Uses scissors to snip paper. |
| | Visual Motor | 15. Completes 3 piece puzzle |

7 might be included as targets for the coming year. Such a system provides a general continuity for the selection of IEP objectives from year to year for each child.

After targets are selected and prioritized, a planning sheet for the chosen targets was completed. A sample planning sheet is contained in Table 3, and incorporates the following activities:

Antecedent: Developing and writing a set of antecedent events which shall occur when the child has an opportunity to perform the targeted behavior (e.g., the verbal cue, "come here").

Acceleration response: Writing a description of the behavior which the child should acquire (e.g., child walks towards teacher on command).

Acceleration consequence: Writing a description of the events which shall follow the child's performance of the targeted.

Deceleration response: Writing a description of child behaviors which have been targeted for deceleration in the context of the antecedent events because these behaviors interfere with performance of the targeted behavior (e.g., elimination of stereotypic response of hand waving).

Deceleration consequence: Writing a description of events which shall follow the child's performance of behaviors to be decelerated (e.g., restrain hands upon occurrence of waving behavior).

Table 3

A Sample Planning Sheet

PLAN SHEET

Plan sheet number ___ of ___ Date _____ Manager (person implementing progr

Pupil (child's name) STOBJ (relevant short-term objective) LTOBJ (relevant long-term objectiv

Target (area working in) STO completion date (projected) LTO completion date (projected)

| Antecedent | Acceleration | | Deceleration | |
|---|---|---|---|---|
| | Response | Consequence | Response | Consequence |
| (This includes events set up to bring about objective and what the teacher needs to do and set up before she can ask for the targeted behavior.) | (This is a description of the targeted behavior--behaviorally written with criteria specified.) | (This is a description of events set up to consequate the targeted behavior.) | (This is a description of behaviors that are incompatible with the targeted behavior and that may interfere with the teacher's implementation of the program.) | (This is a description of events that are set up to move each incompatible response closer to the targeted behavior.) |

To insure consistency and continuity in monitoring the child's progress, a general data collection procedure was developed. To implement this procedure, three data recording forms have been devised. Description and uses of these forms are provided below.

The data recording form contained in Table 4 provides space for noting pertinent identification information and includes:

| | |
|---|---|
| Target area | Refers to the general area within which the objective is located, such as gross motor, self-help, etc. |
| LTO | Long term objective |
| Original STO | Original short term objective from the Programming Training targets. In the event that a teacher must branch from the STO in the skill sequence, this space specifies that STO from the sequence. In this way, the data records always relate to the core skill sequences, in spite of necessary variations by each teacher. |
| Program Objectives | Refers to either: (a) the STO from the skills sequence (if it was appropriate); or (b) the objective that was branched from the original STO. |
| Data Collection Specifications | Refers to specific data collection procedures: e.g., 15-minute time sample; frequency data; correct/incorrect (+/-) collection; order of occurrence (1,2,3,4, etc.). |

## Table 4

## Sample Data Recording Form

TARGET AREA: Fine Motor

ORIGINAL STO: Infant will track from mid-line to right.

PROGRAM OBJECTIVE: Infant will track 30°, 60°, and 90° from mid-line to right.

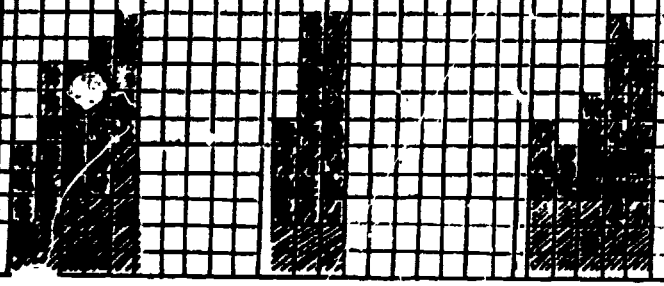
LTO: Infant will track a slowly moving object 180° in both directions.

DATA COLLECTION SPECIFICATIONS: Ten trials per day; criteria 8/10 trials correct for two consecutive days

CHILD: Jon TEACHER: Ms. Jones

| Date | STEP- 1 Tracks 30° to right | STEP- 2 Tracks 60° to right | STEP-3 Tracks 90° to right | STEP- | Comments |
|---|---|---|---|---|---|
| 6/5 | - - - - - + + + + + | | | | |
| 6/6 | - - + + + + + + + + | | | | |
| 6/7 | + - + - + + + + + + | | | | |
| 6/8 | + + - + + + + + + + | | | | |
| 6/9 | + + + + + + + + + + | | | | |
| 6/12 | | - - - - + + + + + + | | | |
| 6/13 | | + + + + + + + + + + | | | |
| 6/14 | | + + + + + + + + + + | | | |
| 6/15 | | | - - - - + + + + + + | | |
| 6/16 | | | - - - - - + + + + + | | |
| 6/17 | | | + + + - - + + + + | | |
| 6/18 | | | + + + + + + + + + + | | |
| 6/19 | | | + + + + - + + + + + | | |

10
9
8
7
6
5
4
3
2
1



The data recording form is composed of three sections: a space to indicate the data; a series of columns to record trial by trial data; and a space for comments. The data columns are divided into four sections, each composed of ten squares. The space above the recording squares is for specifications of the behavior, cues, and criterion for that particular target step in the training program. Moving from left to right, the steps targeted should more closely approximate the program objective. This form can be used to record a variety of data, such as frequency, correct/incorrect, rate, or interval. The bottom of the form can be used to visually graph the data.

Table 5 contains a data recording form that is somewhat different from the previously described form. This form is particularly useful for collecting information on small groups of children, or when there is a desire to compare an individual child's progress across four different objectives.

The recording form contained in Table 6 was developed to accommodate the collection of data in which it is important to specify the context, antecedent, and consequence for a targeted behavior: for example, monitoring the occurrence of productive language during a free play period.

In general, data were collected on a child's progress towards targets on a daily or weekly basis. The frequency of data collection was dependent upon a number of variables.

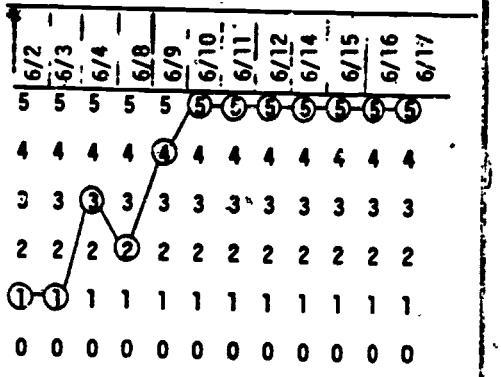
Table 5

Sample Data Collection Form

Name: Tom

Target: Answering questions appropriately during small group time.

Steps:

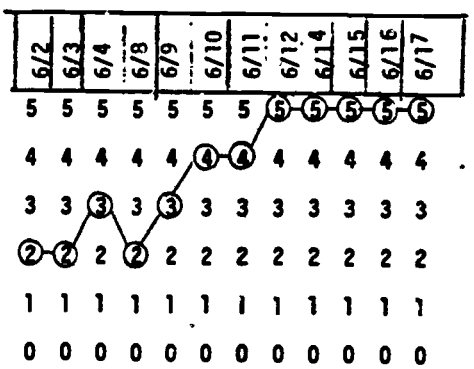



Baselines:

Name: Bill

Target: Same

Steps:

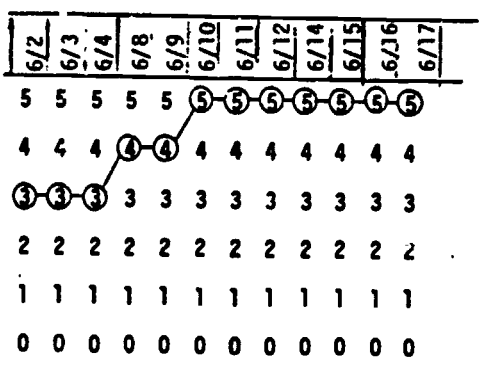



Baselines:

Name: Susie

Target: Same

Steps:

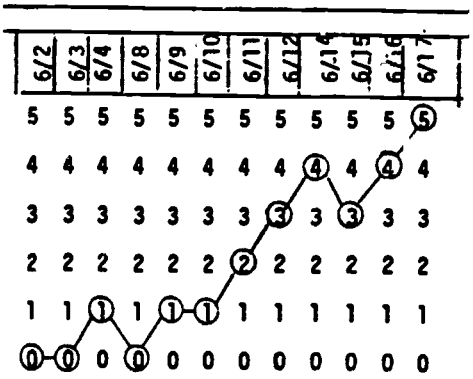



Baselines:

Name: Jane

Target: Same

Steps:




Baselines:

## Table 6
## Sample Data Recording Form

DOMAIN: Communication

LTO: Expresses linguistic functions of labeling of objects.

CHILD: Kevin

TEACHER: Ms. Smith

PROGRAM OBJECTIVE:

| DATE | CONTEXT | ANTECEDENT | BEHAVIOR | | | | | | | | CONSEQUENCE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Vocalize | Gesture | Word | | | | | | |
| 6/20 | Play area/peer | Peer points | | | ball | | | | | | Peer takes ball |
| 6/20 | Play area/peer | Ball rolls away | | | go | | | | | | Peer looks at ball |
| 6,20 | Play area/peer | Ball rolls away | | points | ball go | | | | | | Peer looks at ball |
| 6/20 | Play area/peer | Ball rolls away | | points | ball go | | | | | | Peer retrieves ball |
| 6/20 | Play area/peer | Peer holds ball | | points | ball | | | | | | Peer gives ball to Kevin |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

# RESULTS

The major form of evaluation undertaken by this project was the monitoring of child progress over time. During the first year, efforts were directed toward generating and piloting an evaluation plan; consequently, systematic information of programmatic impact on enrolled children was collected during years 2 and 3.

The evaluation plan described in the previous section of this report was composed of four levels of data collection: demographic data on the child and family, standardized assessments, programmatic assessments, and daily/weekly child progress data. The results of each of the demographic analysis, the standardized assessments, and the programmatic assessments are presented below. The daily/weekly progress data collection was tailored to the individual child's IEP objectives, and therefore does not lend itself to any form of systematic compiling or group analysis.

Progress towards the establishment of a preschool program for severely handicapped children by the local public school is described below in the final section.

## Demographic Information

The demographic information presented here was collected on the enrolled children and their families who met the 7-month test interval criterion during year 3 (1979-80) of this project. The mean chronological age for this sample was 36.5 months, with a range from 5 to 69. Forty-six percent of this sample were female, and fifty-four percent were male. These children and their families were predominantly Caucasian (97 percent) as shown in Table 7.

Table 7

Sex and Race of Enrolled Children

| | N | Percent of Sample |
|---|---|---|
| Sex | | |
| Female | 29 | 46 |
| Male | 34 | 54 |
| Race | | |
| Caucasian | 61 | 97 |
| Mixed | 2 | 3 |

Prenatal and perinatal information included estimated gestational age at time of delivery. Table 8 indicates the percent of full-term, pre-term, and post-term infants in this population.

Table 8

Percentage of Full-Term, Pre-term and Post-term Infants

| Gestation Period | N | Percent of Sample |
|---|---|---|
| Full-term | 48 | 76.2 |
| Pre-term [a] | 11 | 17.4 |
| Post-term [b] | 2 | 3.2 |
| Unknown | 2 | 3.2 |

[a] Gestation under 37 weeks.
[b] Gestation over 42 weeks.

In examining the family composition for enrolled children, 65 percent had siblings present in the home. Table 9 presents additional information on family characteristics.

Table 9

Family Characteristics of Target Population

| Family Characteristic | N mother | N father | Percentage of Sample mother | Percentage of Sample father |
|---|---|---|---|---|
| Level of Education | | | | |
| Grade School | 3 | 2 | 5.0 | 3.2 |
| High School | 22 | 21 | 34.9 | 33.4 |
| College | 34 | 31 | 54.0 | 49.2 |
| Post-Graduate | 4 | 9 | 6.3 | 14.2 |
| Annual Income | N | | Percentage of Sample | |
| Under $5,000 | 11 | | 17.5 | |
| $5,000 to $15,000 | 20 | | 31.8 | |
| $16,000 to $25,000 | 21 | | 33.3 | |
| Over $26,000 | 8 | | 12.7 | |
| Unknown | 3 | | 4.8 | |

The primary identifying or handicapping condition for the population served by this project is indicated in Table 10. This information was taken from the child's records and was generally determined through an inter-disciplinary evaluation.

## Standardized Assessments

Formal assessments were conducted on those children in the center-based program who met the 7-month interval criteria between pre- and posttest. A sub-group of children was eliminated from the standardized assessment because their motor impairments were so substantial they were unable to perform on a standardized test. A second sub-group of children reached the ceiling on the Bayley at the spring testing and were consequently shifted to the McCarthy, precluding a pre-posttest comparison on the same instrument. The first phase of standardized testing

Table 10

Type and Severity of Impairment for Target Population

| Type of Impairment | N | Percent of Sample |
|---|---|---|
| Intellectual Impairment | | |
| None | 24 | 38.1 |
| Mild | 16 | 25.4 |
| Moderate | 12 | 19.1 |
| Severe | 4 | 6.4 |
| Undetermined | 7 | 11.1 |
| Hearing Impairment | | |
| Normal | 55 | 87.3 |
| Some Loss | 6 | 9.5 |
| Undetermined | 2 | 3.2 |
| Visual Impairment | | |
| Normal | 45 | 71.4 |
| Glasses | 11 | 17.5 |
| Blind | 3 | 4.8 |
| Undetermined | 4 | 6.3 |
| Motor Impairment | | |
| Normal | 24 | 38.1 |
| Some Impairment | 29 | 46.0 |
| Non-ambulatory | 10 | 15.9 |
| Behavior Problems | | |
| No Problems | 43 | 68.3 |
| Mild | 17 | 27.0 |
| Severe | 3 | 4.8 |

was undertaken during the second year of the project. Forty-two children were given standardized assessments during year 2, while 51 children were assessed using either the Bayley or McCarthy during year 3. In general, children below a CA of 32 months were given the Bayley and those over 32 months were given the McCarthy.

After the child's formal entry into the program, a period for rapport-building elapsed in which the child's initial adjustment to the unfamiliar

environment and people occurred. Following this adjustment period of approximately 3 to 4 weeks of daily attendance, the child was given either the Bayley or McCarthy by the staff psychologist. Testing was conducted in a quiet room, with observation available for the parent. In the case of an infant, the primary caregiver accompanied the baby. Testing continued on successive days as necessary, taking into account child fatigue as well as attendance. The posttest was administered approximately 7 months later under similar conditions.

For each measure, pre- and posttest comparisons are provided for the total sample. In addition, where suitable numbers of children exist, analyses were conducted for the following sub-groups: normal, at-risk, mildly, moderately, and severely handicapped. A child's placement into one of these sub-groups was determined a priori by the staff prior to the analysis. Two staff members independently categorized children, and in cases where disagreements occurred, a consensus was reached by having a third staff member categorize the child.

All analyses described below employed a comparison in which each subject was measured twice -- once in the fall (pretest), and once in the spring (posttest) with a testing interval of approximately 7 months. Since each pretest score had a corresponding posttest score, a correlated t-test was employed.

Pre-Posttest Comparisons: Bayley Scales of Infant Development

During year 2 (1978-79) and year 3 (1979-80), the Bayley was administered to 18 and 17 children respectively. The mean CA for these populations was 20.1 months, with a range of 10 to 29 months, and 15.7 months, with a range of 7 to 23 months. For a number of children, performance

on the Bayley resulted in scores below 50, and therefore precluded the calculation of an MDI or PDI on an adequate sample for a meaningful comparison from pre- to posttest. However, suitable sample sizes were available for comparing mental age equivalent (MAE) and psychomotor age equivalent (PAE). Table 11 contains these results for years 2 and 3. A reliable difference

Table 11

Pre-posttest Analyses of MAE and PAE Differences on the Bayley Scales of Infant Development for Years 2 and 3.

| | Pretest | | | Posttest | | | $t^a$ | Educationally Significant |
|---|---|---|---|---|---|---|---|---|
| | N | Mean | SD | N | Mean | SD | | |
| Year 2 | | | | | | | | |
| MAE | 18 | 12.7 | 7.9 | 18 | 16.0 | 9.4 | 5.38*** | Yes (.378) |
| PAE | 18 | 11.3 | 7.0 | 18 | 13.1 | 7.0 | 1.94* | Yes (.261) |
| Year 3 | | | | | | | | |
| MAE | 17[b] | 7.5 | 5.1 | 17 | 11.0 | 7.0 | 2.09* | Yes (.573) |
| PAE | 19 | 8.9 | 4.9 | 19 | 12.2 | 7.2 | 2.30* | Yes (.533) |

[a] t-test for correlated means, one tailed
[b] Two children scored ceiling of 30 months
* $p < .05$
*** $p < .001$

from pre- to posttest was found on the MAE for both year 2 ($p < .001$) and year 3 ($p < .05$). Pre-post analyses of the PAE also yielded significant differences at the 5% level for both year 2 and year 3. In addition, the MAE and PAE differences were found to be educationally significant when employing a procedure suggested by Abt (1977) and Tallmadge (1977). This procedure entails comparing gains from pre- to posttesting with the average pooled standard deviation of the pretest and posttest scores. If they exceed .25 of the pooled standard deviation, the gains are considered educationally

significant (Abt, 1977). A comparison of pre- and posttest DQ's found no statistical or educationally significant effects. This finding is not unexpected, since use of the DQ metric with handicapped children is problematic because they are increasingly penalized as the population diverges from the normative sample.

Table 12 presents comparisons of the MAE and PAE pre-posttest scores for years 2 and 3 for three sub-groups: mildly, moderately, and severely handicapped. The number of normal and at-risk children given the Bayley precluded a meaningful comparison (N = 3). In year 2 the mildly handicapped sub-group showed significant statistical and educational effects on both the MAE ($p < .01$) and PAE ($p < .05$) pre-posttest comparisons. A reliable difference was found for the moderately handicapped sub-group on the MAE pre-post comparison for year 2. However, for the PAE comparison, the difference was educationally significant but not statistically reliable. For the sub-group of severely handicapped children, pre-posttest differences were not significant; however, differences on the MAE were found to be educationally significant for this subgroup. In year 3, differences were found to be statistically significant for the MAE comparisons for the moderately ($p < .001$) severely ($p < .05$) handicapped groups. The PAE comparisons in year 3 yielded significant pre-post improvement for the moderate group ($p < .01$) as well as for the severely handicapped group ($p < .05$). All of these differences also proved to be educationally significant.

Pre-Posttest Comparisons: McCarthy Scales of Children's Abilities

For those children in the program whose chronological age exceeded 32 months, the McCarthy Scales were generally administered rather than the Bayley Scales. The mean CA for the 24 children included in the year 2

Table 12

Bayley MAE and PAE Pre-Posttest Analyses for Sub-Groups of Mildly, Moderately, and Severely Handicapped Children for years 2 and 3.

| | | MAE | | | | | | | PAE | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Subgroups | N | Pretest Mean | SD | Posttest Mean | SD | t[a] | Educationally Significant | Pretest Mean | SD | Posttest Mean | SD | t[a] | Educationally Significant |
| Year 2 | Normal | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| | At-Risk | 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| | Mild | 6 | 14.8 | 6.2 | 19.2 | 8.3 | 3.38** | Yes (.599) | 12.3 | 2.5 | 15.5 | 4.9 | 2.19* | Yes (.852) |
| | Moderate | 4 | 14.3 | 7.0 | 18.0 | 6.3 | 5.96** | Yes (.565) | 12.8 | 6.7 | 15.0 | 4.7 | 2.03 | Yes (.395) |
| | Severe | 5 | 3.8 | 2.5 | 4.8 | 2.8 | 1.00 | Yes (.405) | 4.8 | 6.3 | 4.4 | 2.7 | .17 | No (.086) |
| Year 3 | Normal | 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| | At-Risk | 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| | Mild | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| | Moderate | 6 | 7.0 | 3.4 | 13.0 | 4.7 | 6.71*** | Yes (1.48) | 7.5 | 2.2 | 12.2 | 3.4 | 5.53** | Yes (1.69) |
| | Severe | 7 | 4.1 | 2.1 | 6.6 | 2.9 | 2.56* | Yes (.961) | 5.6 | 3.5 | 7.6 | 4.7 | 2.65* | Yes (.493) |

[a] t-test for correlated means, one tailed

* $p < .05$

** $p < .01$

*** $p < .001$

analysis was 46.8 months, with a range of 24 to 69 months. The mean CA for the 32 children included in the year 3 analysis was 45.9 months, with a range of 29 to 68 months. For this test, the N was sufficient for comparisons of the General Cognitive Index (GCI) and mental age (MA) for years 2 and 3. Pre- and posttest differences for both the GCI and MA were found to be statistically different; however, educationally significant differences were found for only the MA comparisons in years 2 and 3.

Table 13

Pre- and Posttest Analyses of McCarthy GCI and MA for Years 2 and 3

| | | N | Pretest Mean | Pretest SD | Posttest Mean | Posttest SD | t[a] | Educationally Significant |
|---|---|---|---|---|---|---|---|---|
| Year 2 | GCI | 24 | 79.9 | 25.9 | 85.2 | 27.2 | 3.30** | No (.198) |
| | MA | 23 | 36.4 | 14.4 | 46.1 | 14.7 | 9.62*** | Yes (.659) |
| Year 3 | GCI | 32 | 66.9 | 24.1 | 72.8 | 25.0 | 2.17* | No (.239) |
| | MA | 36 | 31.5 | 9.5 | 38.4 | 13.0 | 5.36*** | Yes (.619) |

[a] t-test for correlated means, one tailed
* $p < .05$
** $p < .01$
*** $p < .001$

A sub-group analysis by level of handicap found GCI differences to be educationally significant for all groups, and statistically significant for the at-risk, mild and moderate sub-groups for year 2, as shown in Table 14.

In year 3 this difference attained the 5% significance level for the normal group and approached conventional significance levels for both the mildly and moderately handicapped sub-groups ($.05 < p < .1$).

The sub-group analyses by level of handicap for MA comparisons are presented in Table 15. These analyses indicate all differences to be educationally and statistically significant except for the severely handicapped group ($n = 4$) in year 3.

Table 14

Pre- Posttest Analyses of McCarthy GCI Differences by Sub-Groups for Years 2 and 3

| | | N | Pretest Mean | Pretest SD | Posttest Mean | Posttest SD | t[a] | Educationally Significant |
|---|---|---|---|---|---|---|---|---|
| Year 2 | Sub-group: | | | | | | | |
| | Normal | 0 | - | - | - | - | - | - |
| | At-risk | 7 | 114.4 | 5.3 | 119.3 | 7.0 | 2.17* | Yes (.788) |
| | Mild | 14 | 65.9 | 16.3 | 70.9 | 19.9 | 1.97* | Yes (.273) |
| | Moderate | 3 | 65.0 | 7.9 | 72.7 | 8.5 | 4.35* | Yes (.933) |
| | Severe | 0 | - | - | - | - | - | - |
| Year 3 | Sub-group: | | | | | | | |
| | Normal | 6 | 102.5 | 6.2 | 111.2 | 11.8 | 2.25* | Yes (.962) |
| | At-risk | 0 | - | - | - | - | - | - |
| | Mild | 15 | 66.7 | 17.0 | 71.9 | 16.5 | 1.51 | Yes (.307) |
| | Moderate | 10 | 46.5 | 14.9 | 55.5 | 10.8 | 1.59 | Yes (.703) |
| | Severe | 1 | - | - | - | - | - | - |

[a] t-test for correlated means, one tailed
* $p < .05$

## Programmatic Assessments

The Student Progress Record (SPR) and the Uniform Performance Assessment System (UPAS) were selected to assess the programmatic impact of the project on the enrolled children. Such assessments were directed towards measuring the effectiveness of the specific educational programming that was the focus of the program. These assessments were conducted by the teaching staff because resources were unavailable for a third party assessment, and more importantly, children's performance on these instruments was used to develop IEP's and establish educational objectives to be targeted for the next school year.

Table 15

Pre- and Posttest Analyses of McCarthy MA Differences by Sub-Groups for Years 2 and 3

| | N | Pretest Mean | Pretest SD | Posttest Mean | Posttest SD | t[a] | Educationally Significant |
|---|---|---|---|---|---|---|---|
| Year 2 Sub-group: | | | | | | | |
| Normal | 0 | - | - | - | - | - | - |
| At-Risk | 7 | 49.8 | 4.7 | 59.1 | 6.0 | 7.22*** | Yes (1.931) |
| Mild | 13 | 32.9 | 13.5 | 43.8 | 13.0 | 7.22*** | Yes (.820) |
| Moderate | 3 | 20.3 | 3.5 | 27.3 | 5.0 | 7.00** | Yes (1.647) |
| Severe | 0 | - | - | - | - | - | - |
| Year 3 Sub-group: | | | | | | | |
| Normal | 6 | 43.3 | 6.3 | 54.0 | 5.5 | 5.06** | Yes (1.813) |
| At-Risk | 0 | - | - | - | - | - | - |
| Mild | 15 | 34.1 | 7.8 | 40.4 | 11.6 | 3.09** | Yes (.653) |
| Moderate | 11 | 24.6 | 5.1 | 33.1 | 9.7 | 3.42** | Yes (1.14) |
| Severe | 4 | 22.8 | 6.7 | 22.5 | 5.9 | .08 | No (.039) |

[a] t-test for correlated means, one tailed
* $p < .05$
** $p < .01$
*** $p < .001$

Pre-Posttest Comparison: Student Progress Record

The SPR was administered in the fall and spring, allowing for a 7-month pre-posttest interval. A total of 51 children in year 2 and 60 children in year 3 met the 7-month interval criterion. A comparison of pre-posttest means using a correlated t-test showed statistically significant ($p < .001$) effects for the total group for years 2 and 3. Further analyses were conducted on the sub-groups with adequate N's. Differences for the sub-groups were found to be both statistically ($p < .001$) and educationally significant, as shown in Table 16.

In addition to examining the composite SPR scores, a subscale analysis was conducted on the 14 subscales of the instrument (e.g., receptive language, eating skills, motor skills, etc.). A pre-posttest comparison for all

Table 16

Pre-Posttest Analyses of Mean Number of Items Passed on SPR
by Total Group and Sub-Groups for Years 2 and 3

| | Groups | N | Pretest Mean | Pretest SD | Posttest Mean | Posttest SD | t[a] | Educationally Significant |
|---|---|---|---|---|---|---|---|---|
| Year 2 | Total | 51 | 2319.3 | 406.3 | 2431.0 | 436.1 | 7.32*** | Yes (.265) |
| | Normal | 0 | - | - | - | - | - | - |
| | At-risk | 7 | 2776.9 | 132.1 | 3003.0 | 148.9 | 10.58*** | Yes (1.61) |
| | Mild | 17 | 2540.4 | 256.7 | 2653.2 | 274.0 | 4.76*** | Yes (.425) |
| | Moderate | 13 | 2265.2 | 341.7 | 2360.5 | 290.2 | 3.20** | Yes (.302) |
| | Severe | 14 | 1872.4 | 207.8 | 1940.5 | 215.2 | 2.29* | Yes (.322) |
| Year3 | Total | 60 | 2081.0 | 339.1 | 2329.1 | 399.0 | 17.61*** | Yes (.674) |
| | Normal | 8 | 2257.9 | 268.0 | 2578.3 | 318.2 | 8.99*** | Yes (1.093) |
| | At-risk | 2 | - | - | - | - | - | - |
| | Mild | 16 | 2320.5 | 328.1 | 2584.3 | 383.1 | 11.41*** | Yes (.742) |
| | Moderate | 20 | 2069.3 | 268.5 | 2324.1 | 296.2 | 9.35*** | Yes (.902) |
| | Severe | 14 | 1732.8 | 177.9 | 1904.2 | 237.8 | 8.04*** | Yes (.825) |

[a] t-test for correlated means, one tailed
* $p < .05$
** $p < .01$
*** $p < .001$

subscales for both years yielded statistically significant results for all possible comparisons. Educationally significant effects were found in all comparisons except for the Social and Eating subscales in year 2 and Physical Fitness subscale in year 3.

Pre-Posttest Comparisons: Uniform Performance Assessment System

UPAS is a developmentally-based, criterion-referenced instrument which consists of four subscales: pre-academic, communication, motor, and social/self-help. Since the items are appropriate educational objectives,

this instrument is useful for assessing programmatic impact. UPAS was adopted for use during year 3 of the project, and was administered by the teaching staff in the fall and spring. Sixty-three children met 6-month test interval criterion for comparing pre- and posttest performance. Table 17 presents the pre-posttest comparisons for the total group and those sub-groups for which an adequate N existed. The t-test for correlated means found all differences to be statistically ($p < .001$) as well as educationally significant.

Table 17

Pre-Posttest Analyses of Mean Number of Items Passed on UPAS by Total Group and Sub-Groups for Year 3

| Groups | N | Pretest Mean | Pretest SD | Posttest Mean | Posttest SD | t[a] | Educationally Significant |
|---|---|---|---|---|---|---|---|
| Total | 63 | 38.6 | 23.3 | 54.1 | 26.7 | 15.83*** | Yes (.622) |
| Normal | 8 | 53.7 | 20.9 | 75.4 | 20.0 | 12.47*** | Yes (1.061) |
| At-risk | 2 | - | - | - | - | - | - |
| Mild | 17 | 52.0 | 22.7 | 69.8 | 23.8 | 8.94*** | Yes (.766) |
| Moderate | 22 | 36.9 | 20.2 | 52.5 | 21.4 | 10.34*** | Yes (.751) |
| Severe | 14 | 16.6 | 12.4 | 25.7 | 16.7 | 6.17*** | Yes (.628) |

[a] t-test for correlated means, one tailed
*** $p < .001$

Table 18 presents the data on the four UPAS subscales for the total group. Again all differences were statistically ($p < .001$) and educationally significant.

Patterns of Children's Progress

The evaluation effort incorporated in this project made use of several measures administered at sequential time periods on groups of children which yielded a variety of indicators of child progress. These indicators have been summarized in Tables 19 and 20.

Table 18

Pre-Posttest Analyses of Mean Number of Items Passed on Four Subscales of UPAS for Total Group for Year 3

| Scale | N | Pretest Mean | Pretest SD | Posttest Mean | Posttest SD | t[a] | Educationally Significant |
|---|---|---|---|---|---|---|---|
| Pre-academic | 63 | 30.9 | 21.0 | 47.3 | 28.0 | 10.92*** | Yes (.670) |
| Communication | 63 | 38.8 | 24.2 | 55.1 | 27.4 | 11.27*** | Yes (.632) |
| Motor | 63 | 48.1 | 28.3 | 61.3 | 29.4 | 10.35*** | Yes (.455) |
| Social/Self-Help | 63 | 36.6 | 24.6 | 53.0 | 27.4 | 13.29*** | Yes (.628) |

[a] t-test for correlated means, one tailed
*** p <.001

Table 19 summarizes the patterns of child progress seen across children for all measures included in the present evaluation design. As this Table indicates, 100% of the pre-posttest differences were found to be statistically significant when combining years 2 and 3. In addition, 87.5% of the pre-posttest differences were found to be educationally significant for combined years.

Table 20 summarizes the patterns of statistical and educational significance for three subgroups of handicapped children: mild, moderate, and severe. These three groups demonstrated similar patterns of progress. During years 2 and 3, 76% of the possible tests were of statistical significance while educational significance was reached on 90% of possible tests.

Establishment of a Preschool Program in the Public School

An important objective of this project was to assist the local public schools in developing a program for handicapped preschoolers. At the initiation of this project, the local public schools provided educational programs for only hearing impaired children under 6 years of age. No programs

Table 19

Patterns of Performance of Children Across Tests

| | Year 2 | | Year 3 | |
|---|---|---|---|---|
| | Stat. Sig. | Educ. Sig. | Stat. Sig. | Educ. Sig. |
| Bayley | | | | |
| MAE | + | + | + | + |
| PAE | + | + | + | + |
| McCarthy | | | | |
| GCI | + | 0 | + | 0 |
| MA | + | + | + | + |
| SPR | | | | |
| Social | + | 0 | + | + |
| Rec. Lang. | + | + | + | + |
| Exp. Lang. | + | + | + | + |
| Reading | + | + | + | + |
| Writing, Spell. | + | + | + | + |
| Number | + | + | + | + |
| Money | + | + | + | + |
| Time | + | + | + | + |
| Eating | + | 0 | + | + |
| Dressing | + | + | + | + |
| Per. Hygiene | + | + | + | + |
| Motor | + | + | + | + |
| Phys. Fitness | + | + | + | 0 |
| Vocabulary | + | + | + | + |
| UPAS | | | | |
| Pre-Academic | n/a | n/a | + | + |
| Communication | n/a | n/a | + | + |
| Motor | n/a | n/a | + | + |
| Social | n/a | n/a | + | + |

+ = Positive significant differences
0 = No significant differences
n/a = No data available

Table 20

Patterns of Performance of Subgroups of Handicapped Children Across Tests

| Test | Mild | | | | Moderate | | | | Severe | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Year 2 | | Year 3 | | Year 2 | | Year 3 | | Year 2 | | Year 3 | |
| | Stat. Sig. | Educ. Sig. | Stat. Sig. | Educ. Sig. | Stat. Sig. | Educ. Sig. | Stat. Sig. | Educ. Sig. | Stat. Sig. | Educ. Sig. | Stat. Sig. | Educ. Sig. |
| Bayley | | | | | | | | | | | | |
| MAE | + | + | n/a | n/a | + | + | + | + | 0 | + | + | + |
| PAE | + | + | 0 | 0 | 0 | + | + | + | 0 | 0 | + | + |
| McCarthy | | | | | | | | | | | | |
| GCI | + | + | 0 | + | + | + | 0 | + | n/a | n/a | n/a | n/a |
| MA | + | + | + | + | + | + | + | + | n/a | n/a | 0 | 0 |
| SPR | + | + | + | + | + | + | + | + | + | + | + | + |
| UPAS | n/a | n/a | + | + | n/a | n/a | + | + | n/a | n/a | + | + |

\+ = Positive Significant Differences
0 = No Significant Differences
n/a = No Data Available

existed for preschool children with other handicapping conditions in the public schools; therefore, the initiation of a kindergarten program for moderately to severely handicapped children was an important event in the process of extending public school services to the non-school age handicapped population in this local community. Through an active exchange between public school and project personnel, the groundwork was laid for the formulation of a kindergarten class to be housed in a public school under the joint supervision of public school personnel and the project director. This program was operated using support from this project and support from the public schools for 3 years. At the termination of this project in June 1980, the local public school agency assumed full responsibility for this program.

## Discussion

The results reported in the previous section indicate that the intervention program provided to enrolled children produced improvements in important domains of behavior. These data suggest that in evaluating the impact of intervention, it is not sufficient to assess change across a limited range of behavior. Rather, evaluation efforts should focus on the effects of intervention on a comprehensive sample of the target population's behavior.

Since the impact of structured early intervention has been a major concern of educators, scientists, parents, taxpayers, and legislators during the 1970s and 1980s, considerable resources have been invested in both the development and maintenance of these programs. Although such programs receive only a small proportion of the funds allocated to other public

activities by local, state, and federal agencies, credible outcome data should be available for program evaluation. These data should not be used to defend the need for high quality early experiences for the nation's young but, rather should be viewed as providing information about the parameters of intervention which cause desired outcomes.

Unfortunately, the determination of causal relationships between intervention format and childrens' progress is difficult for a variety of reasons. Three primary problems are:1) limitations of research designs; 2) problems of assessment and measurement; and 3) the individualized nature of early intervention programs (Bricker, 1978; Sheehan, 1979). To the evaluator, the most distressing of these limitations is the inability to establish appropriate procedures of experimental control. Programs cannot ethically withhold educational or medical services from a child in need of assistance if resources are available for such intervention. The logical solution to this dilemma would be to compare diverse treatment programs to one another rather than to attempt to compare children who receive treatment with children who do not. Although this solution is conceptually appealing, the comparative approach has serious design and implementation problems. Figure 2 shows the most serious of the problems in gathering good evaluation data, gives examples of them, and indicates potential solutions.

In addressing these problems, this project evolved an evaluation model based on the assessment of a wide range of children's behavior. The battery of measures selected included both standardized instruments as well as instruments designed to assess specific program objectives. Utilization of a battery of measures allowed for the examination of children's performance across several developmental areas. As Table 19 shows, the positive and

| Problems | Examples | Solutions |
|---|---|---|
| Comparability of subjects in group to be served. | How to equate 1) Down's child with a sensorily impaired child, 2) a retarded visually impaired child with a non-retarded visually inpaired child, 3) a Down's child with heart ailment with a Down's child who is physically intact. | 1) Analyses of covariance.<br>2) Single subject design. |
| Restricted range of assessment instruments may lead to unwarranted conclusions in generalizing to other populations. | Similar MDI's for two children does not imply that the youngsters function equally in the cognitive, social, communicative or motor domains. | 1) Wide range of assessment.<br>2) Caution in discussing results of intervention.<br>3) Do not overgeneralize results. |
| Traditional assessments fail to tap domains which are significant for child's adaptive behavior. | Few appropriate measures exist for evaluating infant's early social-communicative behavior. | 1) Design instruments for the problem at hand. |
| Variability of treatment due to differences in implementation. | Personnel, emphasis, and resources will differ across sites. Some programs may have full-time physical and/or speech therapists. Some programs may emphasize motor skills, others may focus on cognitive and linguistic competence. | 1) Careful analysis of implementation system.<br>2) Selection of intervention package according to available resources. |
| Variability in program objectives and individual objectives for child. | IEP objectives must, legally, be individualized for each child. This makes comparison of outcomes across children very difficult. | 1) Single subject designs.<br>2) Analyses of covariance where sample size permits. |
| Attrition. | Families move or may seek alternative placement for child. Compliant families with moderately involved children may remain in a program while non-compliant families with severely involved children may leave program. This would lead to overestimate of program's effectiveness. Conversely, attrition of families with moderately involved children may result in an underestimate of the program's effectiveness. | 1) Careful analysis of clinical skills required to deliver program successfully.<br>2) Continuous monitoring of structure of sample. |
| Controlled evaluation is expensive. | Most agency-based programs do not have funds available for standardized evaluation with guarantees of good data quality built in. | 1) Evaluation of simple evaluation methods.<br>2) Funding of basic research to establish program's effectiveness in field settings. |

Figure 2. Problems, examples and potential solutions to a comparative treatment approach.

significant progress of children in this early intervention program was strikingly consistent across the tests and subtests of this battery. That one hundred percent of all pre-posttest analyses for the total group demonstrated statistically reliable improvement is solid support for the efficacy of this intervention program. Furthermore, the absence of any significant declines, particularly for the more severely handicapped children, is encouraging. The analyses of the changes in the various subgroups of children proved to be especially fruitful. Normal, at-risk, mildly, moderately, and severely handicapped children all showed improvement on multiple measures.

As noted above, acceptable control and comparison groups were unavailable. Therefore, the evaluation of the efficacy of the program was tied to an improvement in each child from pretest to posttest. Allowing each child to serve as his or her own control and the consequent use of correlated t-tests to assess improvement in as many domains as possible provided a useful assessment of the impact of the program on individual children. Though sample sizes did not permit technically appropriate multivariate analyses, the overwhelming proportion of univariate tests demonstrating pre-to posttest improvement strongly supports the conclusion that the patterns of progress were reliable and stable. In addition to traditional tests of statistical significance, the educational significance of intervention was assessed. Although the .25 level (Abt, 1977) is an arbitrary criterion, it nonetheless provides information about the potency of the improvements induced by the intervention.

Of particular interest was the performance of the handicapped subgroups. During years 2 and 3, the mildly handicapped children exhibited 80% statistically significant gains and 90% educationally significant gains.

The moderately handicapped population demonstrated 81% statistically significant gains and 100% educationally significant gains. The severely handicapped population yielded 62% statistically significant gains with 75% educationally significant gains. The concomitant progress seen in subgroups of the normal and at-risk children lends support for the feasibility of integrated or "mainstreamed" programs. A central issue in the mainstreaming controversy has been the impact on the normally developing child of integrating handicapped and non-handicapped preschoolers. The results of this project suggest that youngsters classified either as at-risk or as normal can make significant progress in such programs across many domains of behavior.

A less quantitative measure of the impact of the program was its effect on the local school system. The kindergarten program has been continued for the severely handicapped children by the local schools. The importance of local financial support for such programs has been stressed by Swan (1980) and is self-evident. In view of the federal mandate the Handicapped Children's Early Intervention Program to support demonstration programs with the explicit goal of promoting continuing local funding, the present project succeeded.

Another important goal of this project was to serve as a model site for training, research and dissemination. This project has become an integral part of a personnel preparation program for the area of early childhood/special education. The graduate programs have both master's and doctoral students who have used this project as their primary practicum site. The student participation has been mutually beneficial in that the quality of services delivered is likely enhanced because of additional classroom personnel and the student is trained in a setting engaged in

the application of exemplary practices currently available in the field. During the three years of operation this project has been visited by numerous individuals from the local community, state, nation and other countries as well. Many hours have been spent in describing the program and answering questions. In addition, formal in-service training activities have been conducted with regularity for teachers and other allied professionals. Finally, this project has been associated with an active research effort. The availability of children and their families for participation in research activities has greatly enhanced the productivity of this project in a non-parochial sense. That is, findings have been objectified and then disseminated to the field for broad application as others see fit.

## Summary

This project began three years ago with the five objectives spelled out in the introductory section of this report. During the life of this project an evaluation system was developed that produced objective findings that suggest the enrolled children did change over time. Given the parent participation, it is safe to assume that they saw the program as both educationally relevant and supportive. The local public schools have assumed responsibility for the kindergarten program. Finally, the project has provided an accessible site for the training of university students, the conducting of relevant research, and provision of active possibilities and support for the dissemination of findings.

## References

ABT Associates, Education as experimentation: A planned variation model (Vol. IVA). Cambridge: Mass., 1977.

Baer, D. M., Peterson, R. F., & Sherman, J. A., The development of imitation by reinforcing behavioral similarity to a model. Journal of Experimental Analysis of Behavior, 1967, 10, 405-416.

Bates, E. Emergence of symbols: Cognition and communication in infancy. New York: Academic Press, 1979.

Bayley, N. Bayley Scales of Infant Development. New York: The Psychological Corporation, 1969.

Bricker, D. Educational synthesizer. In A. Thomas (Ed.), Hey don't forget about me: Education's investment in the severely, profoundly, and multiply handicapped. Reston, Va.: The Council for Exceptional Children, 1976.

Bricker, D. Early intervention: The criteria of success. Allied Health and Behavioral Sciences Journal, 1978, 1, 567-582.

Bricker, D. Final report: Preparation of personnel for program supervision, instruction and research in the area of early childhood/special education, Division of Special Education and Rehabilitation, University of Oregon, Eugene, Oregon, 1980.

Bricker, D., & Bricker, W. A programmed approach to operant audiometry for low-functioning children. Journal of Speech and Hearing Disorders, 1969, 34, 312-320.

Bricker, D., & Carlson, L. An intervention approach for communicatively handicapped infants and young children. In D. Bricker (Ed.), Language Resource Book. New York: Jossey-Bass, 1980a.

Bricker, D., & Carlson, L. The relationship of object and prelinguistic social-communicative schemes to the acquisition of early linguistic skills in developmentally delayed infants. Paper presented at the Conference on Handicapped and At-risk Infants: Research and Application, held at Asilomar, Monterey, California, April, 1980b.

Bricker, D., & Casuso, V. Family involvement: A critical component of early intervention. Exceptional Children, 1979, 46 (2), 108-116.

Bricker, D., & Dow, M. Early intervention with the young severely handicapped child. Journal of the Association for the Severely Handicapped, 1980, 5, 130-142.

Bricker, D., & Iacino, R. Early intervention with severely/profoundly handicapped children. In E. Sontag, J. Smith, & N. Certo (Eds.), Educational programming for the severely and profoundly handicapped. Reston, Va.: The Council for Exceptional Children, 1977.

Bricker, D., Seibert, J., & Casuso, V. Early intervention. In J. Hogg & P. Mittler (Eds.), Advances in mental handicap research. London: John Wiley Co., 1980.

Bricker, D., & Sheehan, R. Early education for the handicapped infant and child: A plan to evaluate child progress. Center on Human Development, University of Oregon, 1980.

Bricker, W., & Bricker, D. The infant, toddler, and preschool research and intervention project. In T. Tjossem (Ed.), Intervention strategies for high risk infants and young children. Baltimore: University Park Press, 1976.

Brinker, R., & Bricker, D. Teaching a first language: Building complex structures from simpler components. In J. Hogg & P. Mittler (Eds.), Advances in Mental Handicap Research. London: John Wiley, 1980.

Bronfenbrenner, U. Research on the effects of day care on child development. In Toward a national policy for children and families. Washington, D.C.: The National Academy of Sciences, 1976.

Bruner, J. The ontogenesis of speech acts. Journal of Child Language, 1975, 2, 1-19.

Caldwell, B. Home Observation for Measurement of the Environment. Syracuse, N.Y.: Syracuse University Press, 1978.

Caldwell, B., & Richmond, J. The Children's Center in Syracuse, New York. In L. Dittman (Ed.), Early child care: The new perspectives. New York: Atherton Press, 1968.

CAPE, Consortium on Adaptive Performance Evaluation. Adaptive assessment for evaluating the progress of severely/profoundly handicapped children functioning between birth and 2 years. The annual report of a field initiated research project funded by the Bureau of Education for the Handicapped, Grant No. G 007702139, 1978.

Chapman, R., & Miller, J. Analyzing language and communication in the child. In R. Schiefelbusch (Ed.), Nonspeech language and communication. Baltimore, Md.: University Park Press, 1980.

Clarke, A., & Clarke, A. Early experience: Myth and evidence. New York: The Free Press, 1976.

Cohen, S., Semmes, M., & Guralnick, M. Public Law 94-142 and the education of preschool handicapped children. Exceptional Children, 1979, 45 (4), 279-285.

DeWeerd, J., & Cole, A. Handicapped children's early education program. Exceptional Children, 1976, 43, 155-157.

Field, T., Sostek, A., Goldberg, S., & Shumar, H. Infants born at risk. Jamaica, N.Y.: Spectrum Publications, 1979.

Guess, D., Sailor, W., Rutherford, G., & Baer, D. An experimental analysis of linguistic development: The productive use of the plural morpheme. Journal of Applied Behavior Analysis, 1968, 1, 297-306.

Hobbs, N. Classification options. Exceptional Children, 1978, 44, 494-497.

Hunt, J. McV. Intelligence and experience. New York: Ronald Press, 1961.

Jordon, J., Hayden, A., Karnes, M., & Wood, M. (Eds.) Early childhood education for exceptional children: A handbook of ideas and exemplary practices. Reston, Va.: The Council for Exceptional Children, 1977.

Kagan, J., Kearsley, R., & Zelazo, P. Infancy: Its place in human development. Cambridge, Mass.: Harvard University Press, 1978.

McCarthy, D. McCarthy Scales of Children's Abilities. New York: Psychological Corporation, 1972.

Metz, J. R. Conditioning generalized imitation in autistic children. Journal of Experimental Child Psychology, 1965, 2, 389-399.

Rosenblatt, D. Developmental trends in infant play. In B. Tizard, & D. Harvey (Eds.), Biology of play. Philadelphia: William Heinemann Medical Books, Ltd., 1977.

Rubenstein, J., & Howes, C. Caregiving and infant behavior in day care and in homes. Developmental Psychology, 1979, 15, 1-24.

Scott, K., & Masi, W. The outcome from and the utility of registers of risk. In T. Field, A. Sostek, S. Goldberg, & H. Shuman. Infants born at risk. Jamaica, N.Y.: Spectrum Publications, 1979.

Sheehan, R. Evaluation strategies in early childhood special education: A national perspective. Paper presented at WESTAR Topical Conference, January, 1979.

Sugarman, S. Some organizational aspects of pre-verbal communication. In I. Markova (Ed.), Social context of language. New York: John Wiley, 1978.

Swan, W. The handicapped child's early education program. Exceptional Children, 1980, 47, 12-16.

Tallmadge, G. The joint dissemination review panel IDEABOOK. Mountain View, CA: RMC Research Corporation, 1977.

Taylor. S. Evaluation of summer training at the Center on Human Development Preschool, University of Oregon, Eugene, August, 1979.

Turnbull, A. Parent-professional interactions. In M. Snell (Ed.), Systematic instruction of the moderately and severely handicapped. Cols., Ohio: Charles Merrill, 1978.

White, O., Edgar, E., & Haring, N. Uniform performance assessment system. College of Education, Experimental Education Unit, Child Development and Mental Retardation Center, University of Washington, Seattle, Washington, 1978.

Zelazo, P., & Kearsley, R. The emergence of functional play in infants: Evidence for a major cognitive transition. Journal of Applied Developmental Psychology, in press.