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ABSTRACT

The report documents activities and findings of the Preschool Evaluation Project which is developing a model for evaluating program provision to handicapped preschoolers and creating a longitudinal data base to track the short- and long-term progress of preschool children receiving special services in Montgomery County, Maryland. During the first year (1983-84) of the data base development phase the project conducted the following data collection activities: testing of 123 handicapped preschoolers with the Battelle Developmental Inventory (BDI); documentation of type and quantity of service provided; survey of parents regarding degree of satisfaction with their child's special education program. Major findings included the following: (1) with the exception of gross motor skills, Project children exhibited significant improvements in all areas of development beyond that expected by maturation alone; (2) the largest gains were in the areas of personal-social and cognitive skills; (3) children labeled multihandicapped made significant gains in all areas but motor skills; (4) children labeled "articulation disordered" or "language disordered" made gains but not in speech and language areas; (5) parents reported overwhelming satisfaction with their preschool child's program; (6) service providers did not use BDI test results in educational planning or discussions with parents. The body of the report details methodology, results, the parent satisfaction survey, and supplementary BDI validation studies. Appendixes include the parents' evaluation questionnaire, the BDI questionnaire, and additional information about the "value-added analysis" approach employed in the study methodology. (DB)

MONTGOMERY COUNTY
PUBLIC SCHOOLS
ROCKVILLE, MARYLAND

Preschool Evaluation Report: Year 1 Report

August 1985

Wilmer S. Cody
Superintendent of Schools

Prepared by the Department of Educational Accountability

MONTGOMERY COUNTY PUBLIC SCHOOLS
Rockville, Maryland

PRESCHOOL EVALUATION REPORT:
YEAR 1 REPORT

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EXECUTIVE SUMMARY

PRESCHOOL EVALUATION REPORT: YEAR 1 REPORT

In October, 1980, the Preschool Evaluation Project was funded by the Maryland Department of Education to develop a model for evaluating several aspects of program provision to handicapped preschoolers. An outgrowth of this project was the recognition of a need for collection of long-term data on a large number of handicapped preschoolers. This need became apparent when comparisons of beginning and end-of-year test scores were made. Although the comparisons proved interesting, interpreting the scores was difficult because of various problems with the different assessments used and because of the short amount of time between pre- and posttest.

As a result, the second phase of the Preschool Evaluation Project began in September, 1983. Phase 2, like Phase 1, has been jointly administered by two departments in MCPS: the Department of Special Education and Related Services and the Department of Educational Accountability. The purpose of the project is to create a longitudinal data base which can be used to document the short- and long-term progress of handicapped children who receive special services as preschoolers in Montgomery County.
The following three data collection activities were conducted during the first year of the Project:

1. Handicapped preschoolers were tested with the Battelle Developmental Inventory (BDI) prior to entry into special services and at the end of the school year.

2. The type and quantity of service that each child received were documented.

3. Parents were surveyed regarding the degree of satisfaction with the services provided by their child's special education program.

In addition, because the Project was using the BDI, a new assessment instrument, two studies were conducted to examine the appropriateness of this test. The BDI was not yet commercially available when it was incorporated into the Project. The objective of the first study was to determine how MCPS service providers felt about the validity of the BDI based on the results for the child(ren) they served. The second study involved a comparison of parent and teacher information about the child's performance on some of the BDI items. Some of the items are scored by asking an informant whether the child can do certain things. Several of the items in the test focus on the child's performance in a structured, school-like setting, and concerns were raised regarding whether teachers rather than parents should serve as informants for these items.

THE PROJECT POPULATION

Beginning in September, 1983, and ongoing throughout the year, all preschool children (ages birth to five years) who had been diagnosed as handicapped and were new to special services in Montgomery County Public Schools (MCPS) were identified for potential inclusion in the project. During the 1983-84 school year, 123 preschool children who began receiving special services through Montgomery County Public Schools were pre- and posttested, using the Battelle Developmental Inventory. Characteristics of these children were as follows:

- Mean age at time of pretest was 40 months (range: 4-64 months).
- Racial/ethnic makeup of the group was 72 percent white, 20 percent black, 5 percent Hispanic, and 3 percent Asian.
- At least 20 percent of the children were from low-income families as measured by participation in Head Start.
- "Language disordered" was the most frequent handicapping condition (43%), with multihandicapped the next most frequent subgroup (24%).
- Sixty-three percent of the children were enrolled in public school programs. Of those attending private programs, 27 percent were enrolled in a program serving children with primary speech and/or language impairments.
- Most children required a high level of intervention, with 64 percent in Level 4 or 5 programs.
- Three-fourths of the children received speech and language therapy; the average amount of time per week was one hour.
- Children labeled as multihandicapped received a similar amount of speech and language therapy but more occupational and physical therapy than children with other handicapping conditions.

FINDINGS

One of the major goals of the Preschool Evaluation Project was to address the issue of efficacy of the intervention which these preschool handicapped children received. The findings with regard to efficacy were the following:

- With the exception of gross motor skills, Project children exhibited statistically significant improvements in all areas of development beyond what would have been expected by maturation alone.
- The largest gains due to intervention were in the areas of personal-social and cognitive skills.
- Children labeled as multihandicapped exhibited statistically significant gains attributable to intervention in all areas of development except motor skills.

- Children labeled as "articulation disordered" or "language disordered" made gains attributable to intervention, but not in speech and language areas.

- An analysis of specific factors (e.g., number of minutes in therapy, race, and handicapping condition) which might be associated with progress or predictive of gain due to intervention showed no consistent trends.

Other findings from the Project were:

- Parents reported overwhelming satisfaction with their preschool child's program and related services.

- Service providers of Project children reportedly did not use BDI test results in educational planning or discussions with parents about their child's educational progress. However, the majority (over 70%) considered BDI results as within plus or minus three months of their estimate of the child's functioning.

- Reliance on parents as informants for BDI items related to school or group activities, by and large resulted in responses similar to those provided by the child's teacher.

These findings indicate that the gains these preschool handicapped children made during the 1983-84 school year were attributable to the services they received and were greater than that which would have been expected with maturation alone. These same children, along with new children, are being tested in the second year of the Project. Data from Year 2 of the Project will provide even more comprehensive information about the efficacy of intervention because of an increased number of children in the Project population, a greater number of children in each handicapping classification, more extensive data on services received, and a longer time between pre- and posttesting.

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INTRODUCTION

In October, 1980, the Preschool Evaluation Project was funded by the Maryland Department of Education to develop a model for evaluating several aspects of program provision to handicapped preschoolers. An outgrowth of this project was the recognition of a need for collection of long-term data on a large number of handicapped preschoolers. This need became apparent when comparisons of beginning and end-of-year test scores were made. Although the comparisons proved interesting, interpreting the scores was difficult because of various problems with the different assessments used and because of the short amount of time between pre- and posttest.

As a result, the second phase of the Preschool Evaluation Project began in September, 1983. Phase 2, like Phase 1, has been jointly administered by two departments in MCPS: the Department of Special Education and Related Services and the Department of Educational Accountability. The purpose of the project is to document the short- and long-term progress of handicapped children who receive special services as preschoolers in Montgomery County.

The following factors were considered in designing a process for documenting progress:

- An objective, uniform assessment tool which could serve as a valid and reliable measure of functioning was needed. The instrument or instruments had to assess functioning in a number of developmental areas to provide a comprehensive picture of the child's strengths and weaknesses. The Battelle Developmental Inventory (BDI) was selected as the assessment device.

- Baseline data, or preintervention functioning, had to be collected to ascertain the entry-level characteristics of the population under investigation and to allow conclusions regarding the effects of intervention. That is, to discuss how far a child has come, one must have an accurate picture of from where he or she began.

- Ongoing, periodic reassessment with the same instrument as utilized to obtain preintervention data was necessary to document progress. If different test instruments were used, changes in ability level could be attributed to differences in test construction, content, and level of difficulty, rather than to actual child change.

- Information about type and quantity of special education services provided was needed to allow relationships between gains and services to be explored.

- Information about parent satisfaction was necessary to provide information for program improvement and to relate child gains to parent satisfaction.

The following three data collection activities conducted during the first year of the Project were related to the objective of documentation of progress:

1. Testing handicapped preschoolers with the Battelle Developmental Inventory (BDI) prior to entry into special services and at the end of the school year.

2. Documentation of the type and quantity of service that each child receives.

3. Surveying parents regarding the degree of satisfaction with the services provided by their child's special education program.

In addition, because the Project was using the BDI, a new assessment instrument, two studies were conducted to examine the appropriateness of this test. The BDI was not yet commercially available when it was incorporated into the Project. Thus, service providers within MCPS were not familiar with, and were frequently skeptical of, this assessment tool. It was considered critical to obtain a "reading" of their opinion of the test, based on the results for the child(ren) they served. The second study involved a comparison of parent and teacher information about the child's performance on some of the BDI items. Some of the items are scored by asking an informant whether the child can do certain things. Several of the items in the test focus on the child's performance in a structured, school-like setting, and concerns were raised regarding whether teachers rather than parents should serve as informants for these items.

This report will present the results of the first year of Phase 2 of the Preschool Evaluation Project (1983-84).

METHODOLOGY

SAMPLE

Beginning in September, 1983 and ongoing throughout the year, all preschool children (ages birth to five years) who had been diagnosed as handicapped and were new to special services in Montgomery County Public Schools (MCPS) were identified for potential inclusion in the project. An introductory letter from the director of the Department of Special Education and Related Services was mailed to parents explaining the Project and requesting permission to test their children. Subsequently, Project staff contacted the families regarding scheduling of testing. Of the 278 families contacted during the first year of the Project, only six refused to participate. The most frequent reason for noncompliance was the parents' reluctance to have additional testing done. One hundred and fifty children were pretested between October, 1983, and January, 1984, and 124 of them received posttesting in May and June, 1984. The reasons for lack of posttesting were parental refusal (N=4), moved out of county (N=9), and child dropped because Project learned child had previously received services (N=13). Children pretested after January, 1984, (N=122) were not included in the posttesting because of an insufficient amount of time between tests. These children will be posttested at the end of the 1984-85 school year. Additional information regarding the population who received pre- and posttesting will be provided in the Results section.

The Project continues to test all preschool children new to services in MCPS. However, only the first year's data are presented here.

CHILD ASSESSMENT

The Battelle Developmental Inventory (BDI) was selected to measure longitudinal progress in preschool children receiving special services through Montgomery County Public Schools (MCPS) for the following reasons:

- It is appropriate for use with children from birth to eight years.
- Functioning is assessed in five areas of development (called "domains"): personal/social, adaptive, motor, communication, and cognitive.
- Normative data are provided, based on approximately 800 children from all sections of the United States.
- Adaptations for certain handicapping conditions are built into the test administration.

Administration of the BDI involved two approaches. The Personal-Social and Adaptive Domains, which focus on the child's skills in interacting with peers and adults and in self-help areas, were administered in an interview format, either face-to-face or by phone, with the parent serving as informant. The other three domains contained structured items, which were administered directly to the child in a specified format. The Motor Domain assesses the child's abilities in both gross and fine motor skills. The Communication Domain evaluates a child's understanding and use of language, i.e., both receptive and expressive skills. Finally, the Cognitive Domain assesses a child's general knowledge of the world. Although the BDI allows scoring of some items based on observation, this method was not generally employed in collecting test data because of time constraints.

Testing was done by nine part-time employees. Most of testers had advanced degrees in early childhood or special education, and all had prior experience testing and working with infants and preschoolers with developmental disabilities. Total time involved in assessment averaged two and one-half hours per child (30 minutes for the parent interview, two 40-minute testing sessions with the child, and 15 minutes for scoring). Testing was done within the child's program or at home, depending on the preferences of the parents and the teachers.

To document progress related to the receipt of special services, pretesting was to have occurred prior to a child's entry into these special services. During the first year of the Project, however, pretesting was done in the first few months after a child's enrollment in special services. This delay in pretesting was the result of difficulties in obtaining the BDI which had not yet been released for publication. Since July, 1984, almost all Project children have been tested prior to program entry.

All posttesting occurred during May and June of 1984. As with pretesting, testing occurred either in the child's home or program. Efforts were made to assign each child to the same tester for both the pre- and posttest.

Both pre- and posttest results were sent to parents, and a copy of the test booklet with scores was sent to each child's service provider.

DOCUMENTATION OF SPECIAL SERVICES

Identification of services was done once during the first year of the Project and will be done three times in Year 2 and Year 3. Information regarding type and amount of services scheduled for children in the Project was collected by contacting each child's teacher or primary service provider.[1]

The form with the scheduled program time and related services was sent to each child's teacher or primary service provider to verify that the child actually received the services he or she was scheduled to receive. Service providers verified information for a one-week period in the spring of 1984. The form used for collecting this information is included in Appendix A. For purposes of analysis of Year 1 data, only scheduled, rather than received, services were utilized. Given that service verification information was only collected for a one-week period over the entire year, it was felt that the scheduled information was the better source for services. The Year 2 report will include information on scheduled and received services for three two-week periods.

PARENTAL SATISFACTION WITH SERVICE PROVISION

During Phase 1 of the Preschool Evaluation Project (1980-83), a questionnaire was developed to assess parental satisfaction with the services received by their child during a specified school year. The questionnaire asked the parents to rate their satisfaction with the overall program and the amount and quality of several different types of services and to indicate the frequency of home visits. A copy of the questionnaire is included in Appendix B.

At the end of the 1983-84 school year, parents of the Project children were mailed a questionnaire which they completed and returned. One hundred and thirty-one questionnaires were mailed, and 55 were returned (42%).

BDI VALIDATION

As noted previously, the BDI had not yet become commercially available when it was incorporated into the Project in the fall of 1984. Thus, service providers within MCPS were not familiar with this assessment tool. The first of the two BDI studies was undertaken to obtain feedback on the usefulness of the test results and service provider impressions of BDI

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1. Information on special education program placement and related services is included on the Computerized Educational Data System (CEDS), a computerized system used in Montgomery County for accessing data regarding both handicapped and nonhandicapped children. However, for preschoolers, and particularly those in private programs, the only information included on CEDS is program and not-related services. Therefore, an alternative approach to information gathering was chosen.

results in each domain. At the end of the 1983-84 school year, questionnaires were sent to 131 service providers who had received the results of at least one BDI test. A copy of the questionnaire is included in Appendix C.

The second study involved a comparison of information supplied by the parent to that supplied by the child's teacher and was based on a concern about the accuracy of parent responses to some of the items. Discussions were held with Project testers to identify which test items parents appeared to have little experience observing and which teachers might observe regularly. Eight items were selected and are presented in Table 16. At the time of posttesting, testers administered the selected items to the parent and, subsequently, administered the same items to the child's teacher or service provider. The responses of the parent and the teacher to those eight items were compared. For each item, comparisons were available on a different number of children, ranging from 37 to 71.[2]

RESULTS

DESCRIPTIVE INFORMATION ON THE CHILDREN IN THE STUDY

Number, Age, Sex, Race, and Income. During the 1983-84 school year, 124 preschool children who began receiving special services through the Montgomery County Public Schools were pre- and posttested with the BDI. Because one child was missing some demographic data, only 123 children were utilized in the data analysis. The mean age in months at the time of initial testing was 40 months (range: 4-64 months). Table 1 presents the number of children in the various age categories. At the time of pretest, most children (83%) were above two years of age. Eighty-two (67%) were boys. The racial/ethnic makeup of the group was 88 whites (72%), 25 blacks (20%), 6 Hispanics (5%), and 4 Asians (3%). Figure 1 presents the characteristics of the children at the time of the pretest.

Data regarding parental education and occupation will be available at the end of Year 2 to provide an index of socioeconomic status (SES). However, this information is being collected via record review and was not available when the other data were analyzed. To obtain a gross indication of SES, subjects were divided into two categories: those who had attended Head Start and those who did not. This criterion was selected because the Head Start program primarily enrolls children from low-income families. Thus, with 25 subjects attending Head Start, at least 20 percent of the Project population was from low income families.

Handicapping Condition. The handicapping conditions of the subjects were obtained, using group codes from the Computerized Educational Database System (CEDS), and are presented in Table 2. Children with language disorders comprised the greatest portion of the population (43%) with multiply handicapped children the next most frequent subgroup (24%). Data related to handicapping condition and special services are presented graphically in Figure 2.

2. Not all items were administered to all parents/teachers, because of the varying developmental levels of the Project children.

TABLE 1

Age in Months at Time of Initial Testing with BDI

Age in Months	N	%
0-23	21	17
24-47	49	40
48+	53	43

TABLE 2

Handicapping Condition

Primary Handicapping Condition	N	%
Articulation Disorder	18	15
Language Disorder	53	43
Voice Disorder	1	1
Hearing impairment	6	5
Visual impairment	7	7
Orthopedic impairment	1	1
Multiply handicapped	30	24
Nonhandicapped, receiving services [a]	5	4
Handicapping condition not specified [b]	2	2

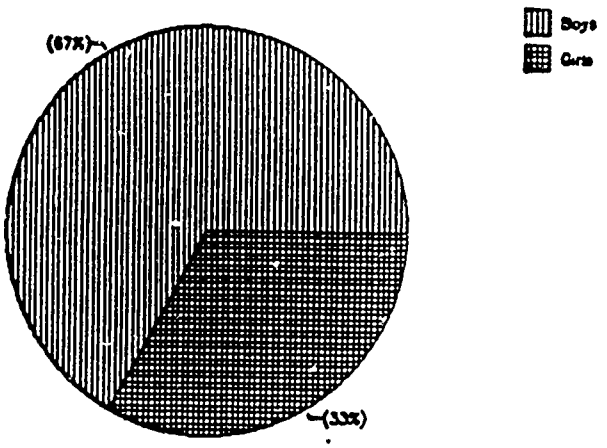
a. These five children had as their "handicapping condition" two CEDS group codes which indicated a nonhandicapped group code, either "nonhandicapped speech and language" or "special need noncategorical."

b. Other available information indicated these children were enrolled in programs and were receiving itinerant speech and language services, but there were no data regarding their handicapping condition on CEDS.

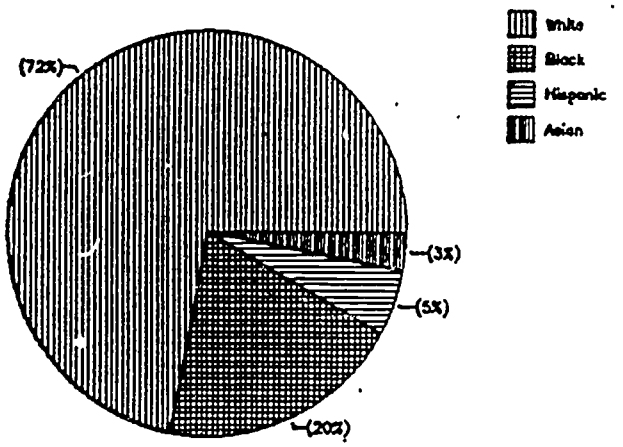
FIGURE 1

Characteristics of Children at Pretest

Sex



Race/Ethnic Group



Age at Pretest

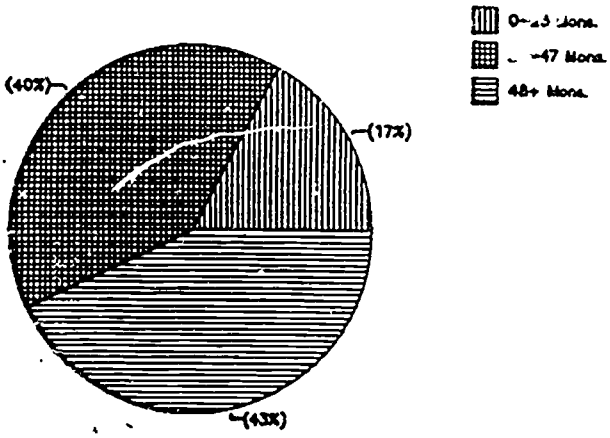
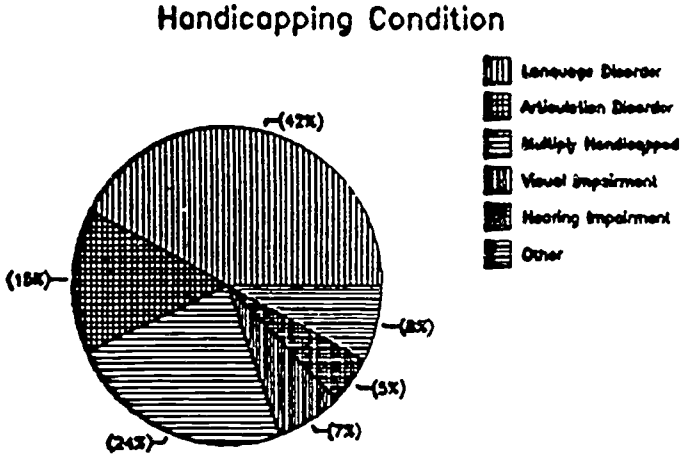
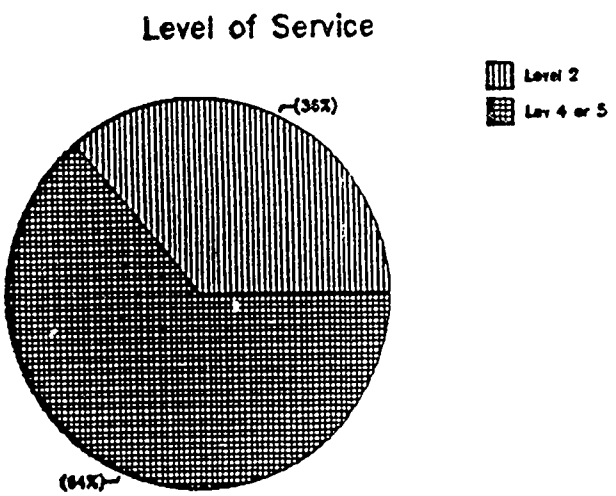
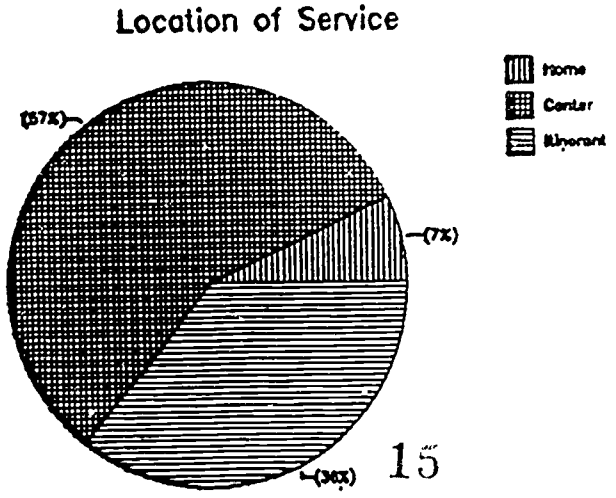


FIGURE 2

Handicapping Condition and Service Information







Program. The 123 Project children were enrolled in ten different Montgomery County programs providing special services to handicapped children. These programs varied in scope and intensity of service, the type of child generally served, and sponsorship. Four of the programs were private; however, tuition for all Project children in these programs was paid for by MCPS. One of these programs tended to serve children with primary speech and/or language impairments, whereas the other three served children with significant developmental disabilities in more than one area. The remaining six were public school programs. Four served specific populations (e.g., preschool children with visual, auditory, or speech/language disorders), whereas the other two served children with more pervasive developmental disabilities.

The number of Project children enrolled in each of the ten programs during 1983-84 is presented in Table 3. Sixty-three percent of the children (N=77) were enrolled in public school programs. Of the children attending MCPS programs, approximately one-third were enrolled in Program 7 (Head Start). It should be noted that these children were involved in the Project because of a speech and/or language impairment and were only receiving itinerant services. Head Start was not considered a special education program. Of the 46 children attending private programs which served children with primary speech and/or language impairments, 27 percent (N=33) were enrolled.

Type and level of service. Within MCPS, children receiving special education are assigned a level of service, which generally indicates intensity. Lower-level services (Levels 1, 2, and 3) are consultative, itinerant, or resource; whereas more intense levels of service (Levels 4 and 5) are found in special class settings or programs. Forty-four of the 123 children (36%) were receiving Level 2 services, whereas the remaining were enrolled in Level 4 or 5 programs. Such findings suggest that this population on the whole was significantly impaired and required a high level of support and intervention.

Preschool children, because of their age and/or disability, are sometimes served in the home. Eight Project children (7%) received some services at home, and 70 (57%) were enrolled in a center-based program. The remaining children received itinerant services at a school. The amount of program time provided to children in home-based and center-based programs is shown in Table 4. Children in home-based services received approximately 60 minutes of program time each week. In contrast, almost half of the children who attended a center-based program received six to twelve hours weekly. Children receiving only itinerant services (e.g., PT, OT, speech) were categorized for Project purposes as receiving only related services and no program time.

Information on time scheduled in speech, physical, and occupational therapy services (both itinerant and program based) was available for 120 children. The number of children receiving each of these services and the mean number of minutes per week in services are presented in Table 5 and illustrated in Figure 3. More than three-fourths of the Project children received speech and language therapy during 1983-84, whereas physical or occupational therapy was provided to significantly fewer children. In addition, the amount of speech and/or language therapy provided on a weekly basis was much higher than physical or occupational therapy services.

TABLE 3

Program Enrollment

Program	N	%
Nonpublic		
1 (Child Center)	6	5
2 (Christ Church Child Center)	1	1
3 (Montgomery Presch. Achievem. Ctr.)	5	4
4 (Treatment Centers)	33	27
Public		
5 (Auditory)	6	5
6 (Early Childhood Program)	4	3
7 (Head Start)	25	20
8 (Preschool Education Program)	16	13
9 (Itinerant Speech/Language)	19	15
10 (Vision)	7	6

TABLE 4

Minutes in Program

Minutes per week	Home-based (N=8) N	%	Center-based (N=70) N	%
1-89	5	63	0	-
90-360	3	38	21	30
361-750	0	-	33	47
750+	0	-	16	23

TABLE 5

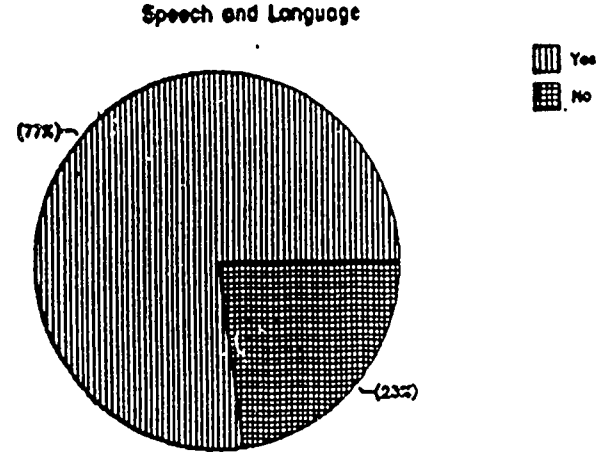
Special Services Received

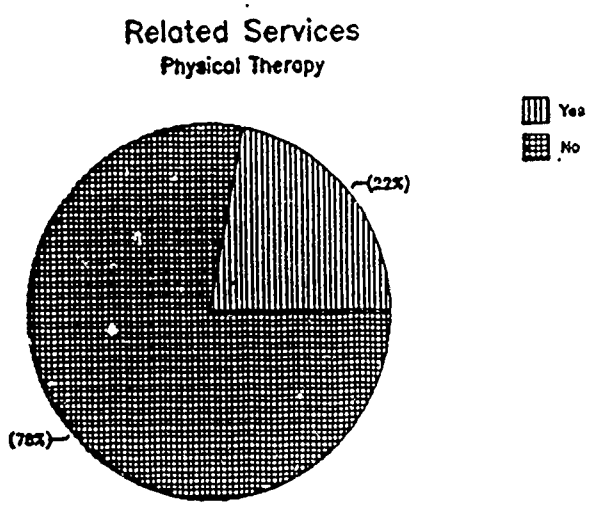
Type of Service	Receiving Service		Data for Those Receiving Services (Minutes/Week)	
	N	%[a]	Mean	Range
Speech and/or language therapy	92	77	56	10-120
Physical therapy	26	22	54	10-120
Occupational therapy	39	33	39	10-110

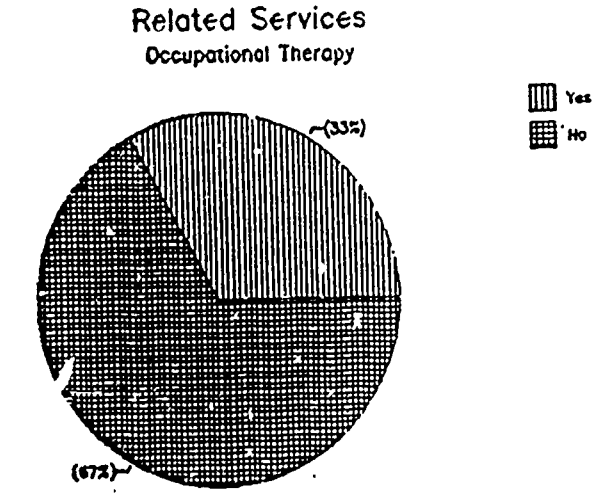
a. Percentage of 120 children with information on services.

FIGURE 3

Percentage of Children Receiving Related Services







It is logical to assume that children with a handicapping classification of "multihandicapped" have multiple needs and subsequently would be more likely than other handicapping conditions to receive varied services at a high level. Table 6 presents information regarding the number of multihandicapped Project children (MH) receiving related services in 1983-84, as compared to those with other labels. This comparison is presented graphically in Figure 4. When compared to non-MH children, MH children received similar amounts of speech and language therapy during 1983-84; but children labeled as MH were more likely to be receiving physical and occupational therapy.

EFFECTIVENESS OF INTERVENTION

Approach. There are numerous questions which need to be addressed when studying the efficacy of early intervention, a few of them being the following:

- What constitutes efficacy? Is it movement to a less intense level of service? Is it movement totally out of special education? Is it improved test scores in areas which have been the focus of intervention?

- What is the appropriate time to assess efficacy? After one year in special education? After five years?

- Is it possible that preschool intervention is "effective" for children with some types of handicapping conditions, but not for others?

For the purposes of this Project, several "stances" were taken regarding these issues. Program effectiveness for the first year of the Project was measured by the amount of gains in BDI test scores, without consideration of the need for fewer services. The longitudinal nature of this Project provides an extended period of time in which to assess and determine efficacy of services. Finally, as the number of children with each handicapping condition increases within the Project population, analyses of subgroup patterns of progress and response to intervention will be possible.

An additional problem is how to determine the amount of growth which should be attributed to program participation. Federal and state laws mandate free and appropriate services to children in Maryland with special needs or handicaps. Thus, it is difficult, a well as illegal, to locate a sizable group of preschool handicapped children who are **not** receiving services to serve as a control or nontreatment group in studies of the efficacy of or response to intervention.

An alternative approach to looking at this issue is to employ a statistical procedure which compares projected growth, based on preintervention functioning, with actual growth, based on the difference between pre- and postintervention scores. Gains attributable to intervention would be reflected in the differences between projected and actual growth. One such statistical strategy, **value-added** analysis (Bryk and Weisberg, 1976), was the method selected to analyze the changes in BDI test scores for children in this Project.

TABLE 6

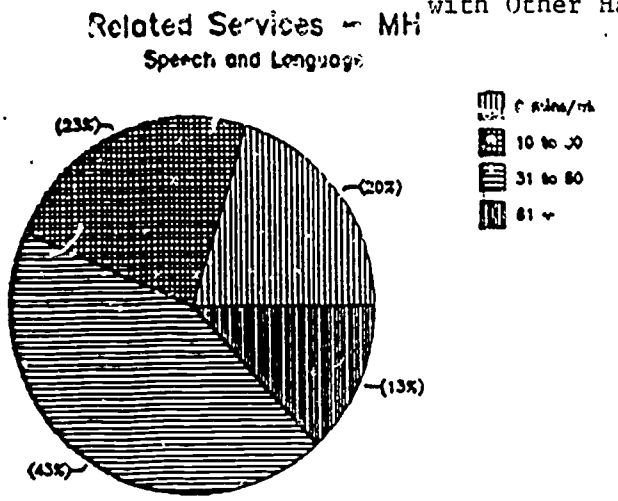
Related Services Received by Multihandicapped and Other Children

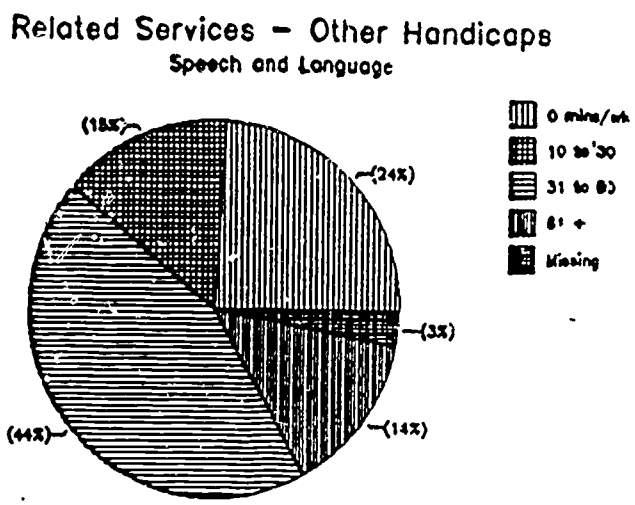
Amount of Weekly Service in Minutes	Multihandicapped (N=30) PT	OT	S/L	Other Labels (N=93) PT	OT	S/L
	Percentage					
No service	23	30	20	94	81	24
10-30	30	37	23	0	4	15
31-60	30	33	43	2	11	44
61+	17	0	13	1	1	14
Information not available	0	0	0	3	3	3

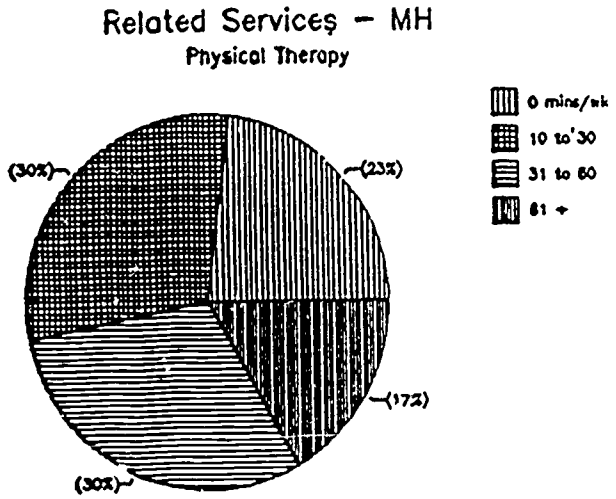
Note. Table entries are column percentages.

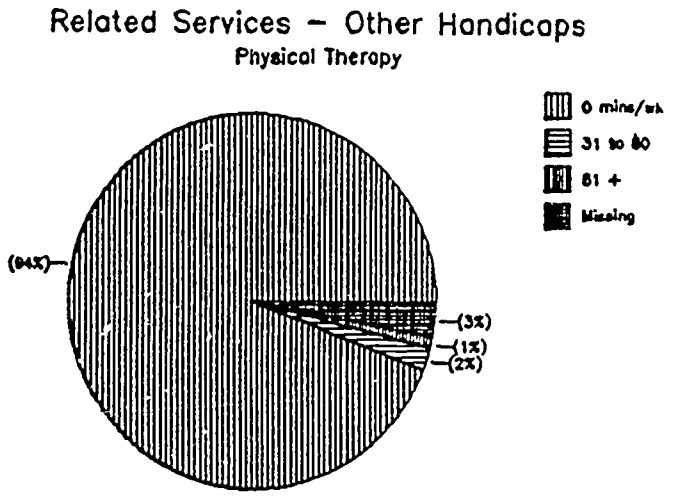
FIGURE 4

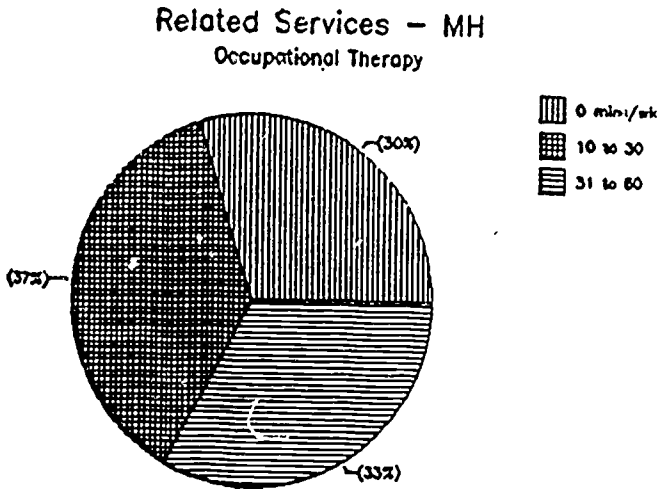
Comparison of Services Received by Multihandicapped Children and Children with Other Handicaps

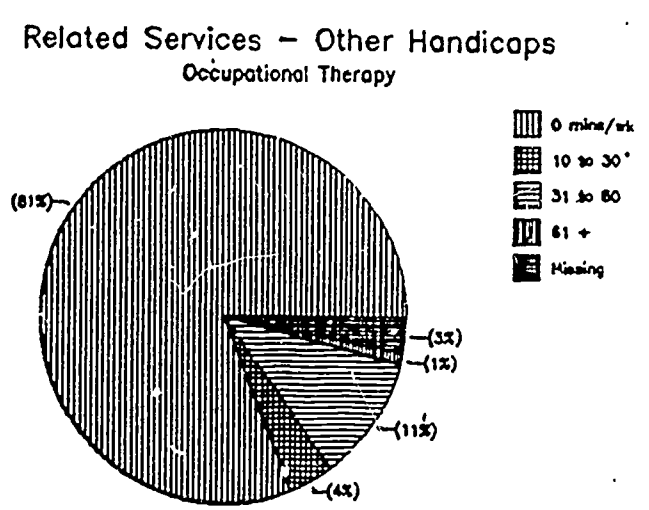












With reference to interpreting the Project data on efficacy, the following are caveats which must be made:

- Because of the delay in obtaining the BDI, the amount of time between pre- and posttesting was not as great as desired (Mean: 4.5 months). This short amount of time means that there may not have been sufficient time for statistically significant progress to have occurred. Interpretation of results must take this factor into account, particularly with reference to certain populations for whom observable progress within a four-month period might be unrealistic.

- Most children received some MCPS services prior to assessment with the BDI for reasons noted earlier. The time the children were in MCPS services prior to testing varied somewhat, up to a maximum of approximately three and one-half months. Thus, progress made during that period would not have been recorded by the BDI. Certain handicapping conditions may be associated with early and rapid progress upon intervention, with a subsequent leveling off. If this were to be the case, such children would not show as great an intervention effect in the analysis of the first-year data. Both of these problems will be corrected when second-year data are analyzed.

- In interpreting group trends related to progress, it is important to consider the heterogeneity of the Project population and the ranges of severity within a given handicapping population. Although there is a strong desire to ascertain the efficacy of early intervention with the "preschool handicapped population," this term includes a varied population who may exhibit quite different trends from the group as a whole. While this problem could be addressed by analyzing growth for subgroups, at this time the size of the Project subgroups for all but the most frequent handicapping conditions are too small to warrant analysis. Again, this problem will become less serious as more children become part of the Project.

- Due to resource limitations, no data could be collected on the precise characteristics of the intervention or services provided to Project children (e.g., a cognitively oriented program, neurodevelopmental therapy, and pragmatically based language therapy). Thus, no comment can be made about the type or approach which is most effective with a particular group.

Assessment Results. Mean BDI pre- and posttest raw scores and standard deviations by age for the 123 Project children are presented in Table 7. At the time of pretest, mean scores were below normal in development for ages. Mean posttest raw scores increased in all BDI domains.

Several questions were asked to address the issue of child change as a function of intervention. All analyses were based on an N of 120 and were generated using the value-added strategy discussed earlier. Additional technical information on value-added analysis is presented in Appendix D.

TABLE 7

BDI Scores by Age Groups

BDI Domain	Age in Months at Pretest				
	0-11 (N=8)	12-23 (N=13)	24-35 (N=18)	36-47 (N=31)	48+ (N=53)
Pretest Age					
Mean	9	15	31	42	53
SD	2	2	4	4	4
Personal-Social					
Pretest					
Mean	26	38	74	99	128
SD	6	17	18	19	26
Posttest					
Mean	38	51	110	125	142
SD	7	19	31	18	25
Normal Raw Score for Mean Age[a]	34-36	53-55	99-100	125-126	144-145
Adaptive					
Pretest					
Mean	16	27	53	68	81
SD	5	11	10	8	14
Posttest					
Mean	27	36	70	79	87
SD	7	13	15	10	14
Normal Raw Score for Mean Age[a]	26-27	38-39	65	80	91
Gross Motor					
Pretest					
Mean	9	19	48	59	65
SD	4	10	12	8	13
Posttest					
Mean	12	28	54	62	70
SD	6	15	12	9	14
Normal Raw Score for Mean Age[a]	27-29	40-41	57	64	71

TABLE 7 (cont.)

BDI Scores by Age Groups

BDI Domain	Age in Months at Pretest				
	0-11 (N=8)	12-23 (N=13)	24-35 (N=18)	36-47 (N=31)	48+ (N=53)
Fine Motor					
Pretest					
Mean	6	13	30	41	49
SD	3	6	8	6	8
Posttest					
Mean	10	18	36	48	55
SD	5	8	10	6	11
Normal Raw Score for Mean Age[a]	14	20	34	45	56
Receptive Language					
Pretest					
Mean	7	10	15	21	28
SD	2	2	3	6	9
Posttest					
Mean	12	13	18	25	31
SD	2	4	5	6	9
Normal Raw Score for Mean Age[a]	9	13	21	29	37
Expressive Language					
Pretest					
Mean	6	9	18	28	36
SD	2	4	5	6	9
Posttest					
Mean	12	14	25	34	40
SD	4	6	8	8	9
Normal Raw Score for Mean Age[a]	9	16	31	40	47

TABLE 7 (cont.)

BDI Scores by Age Groups

BDI Domain	Age in Months at Pretest				
	0-11 (N=8)	12-23 (N=13)	24-35 (N=18)	36-47 (N=31)	48+ (N=53)
Cognitive					
Pretest					
Mean	9	15	29	44	55
SD	4	7	7	10	17
Posttest					
Mean	17	19	39	53	70
SD	5	8	11	12	19
Normal Raw Score for Mean Age[a]	17	22	37	52-53	71-72

a. "Normal raw score" was taken from the BDI Age Equivalency tables. It is the raw score that corresponds to the mean pretest age equivalency for the group. For example, in the Personal-Social Domain, a child of 45 would be expected normally to get a raw score of 131.

In which areas of development (i.e., BDI domains) did Project children exhibit gains attributable to intervention?

Nearly all Project children had higher scores on the posttest than on the pretest. However, it was critical to ascertain the relative contributions of intervention and normal growth to this change between pre and post-testing. Table 8 presents information about the extent of change between pre- and posttest, including pre- and posttest score differences, standard deviations, and the amount of gain or progress attributable to intervention (referred to as "v" for the value added by intervention) for the 123 Project children. A "v" of zero indicates that, in general, changes in BDI scores were the result of normal growth. In other words, growth equaled exactly what was expected based on pretest scores. A negative "v" indicates that the posttest score is poorer than would have been predicted **without** intervention. A positive "v" reflects an intervention effect. Figure 5 shows the actual pre- and posttest scores for each of the domains and the expected posttest score based on the value-added analysis.

With the exception of gross motor skills, Project children exhibited significant improvements in all areas of development as a function of participation in special services. The largest gains were seen in the Personal-Social and the Cognitive domains. The last column in Table 8 presents the number of months gain that is equivalent to the observed change in raw score points. In Personal-Social, the children gained 4.4 months above what would have been expected for them due to maturation alone. The corresponding figure in the cognitive area was 5.1 months gain. Based on these data, it appears that intervention was measurably effective for these children, even over the short time between pre- and posttests.

How do gains compare for children with different handicapping conditions?

As was evident in Table 2, certain handicapping conditions were more highly represented than others in the Project sample. The most frequently occurring conditions were articulation disorders, language disorders, and multiple handicaps. The small numbers in other conditions did not allow their consideration for this question. The data on the extent of gain due to intervention for the three most frequently occurring handicapping conditions are shown in Table 9.

Children labeled as multihandicapped (N=30) exhibited statistically significant treatment gains in all areas of development with the exception of fine and gross motor. Children labeled as "language disordered" (N=53) comprised the largest disability group in the Project population. These children exhibited gains attributable to intervention only in personal-social and cognitive. Finally, children labeled as "articulation disordered" (N=18) exhibited progress which was the result of intervention only in fine motor and cognitive areas.

All three groups of handicapped children appear to have received some benefits from the special services received in Montgomery County. Despite what were probably quite different interventions, with regard to content and and amount, significant gains occurred in cognitive abilities in all three groups.

TABLE 8

Amount of Change Between Pre- and Posttest Scores Attributable to Intervention (N=123)

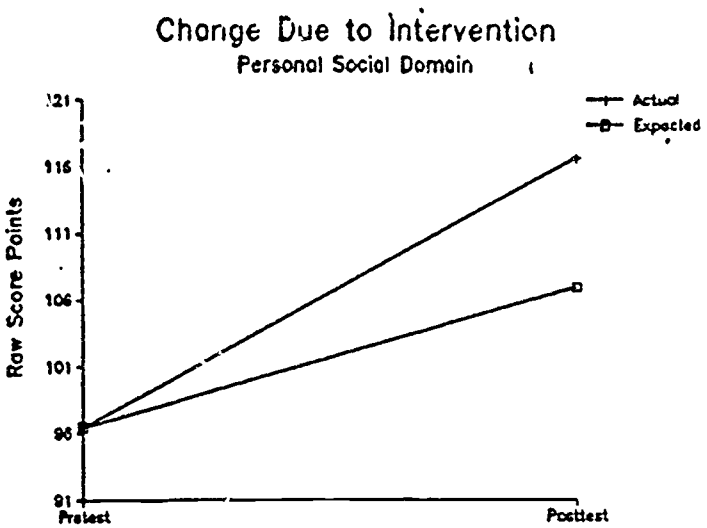
BDI Domain	Mean Differences Between Pre- and Posttests[a]	Amount Attributable to Intervention[b]			
		Mean	S.D.	p	Equivalent to Months Gain
Personal-social	20	9.7	17.0	.000	4.4
Adaptive	9	2.4	9.0	.002	1.8
Gross motor	6	-0.5	6.3	NS	0
Fine motor	5	1.2	5.4	.01	1.3
Receptive language	3	1.1	5.7	.03	1.8
Expressive language	5	1.7	5.6	.001	2.1
Cognitive	12	6.6	9.6	.001	5.1

a. Raw score points

b. Raw score gain which exceeded that expected by maturation alone. The difference between the first and second column, e.g., 20-9.7, was the amount of growth expected by maturation alone.

FIGURE 5

Actual and Expected Posttest Scores
for Each BDI Domain



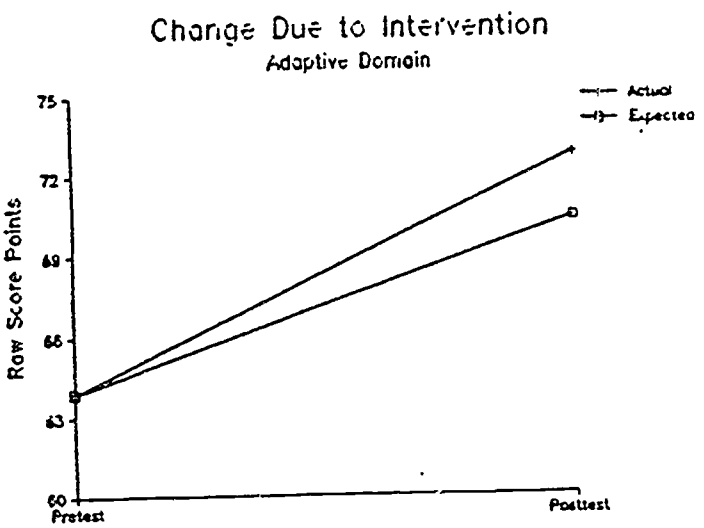
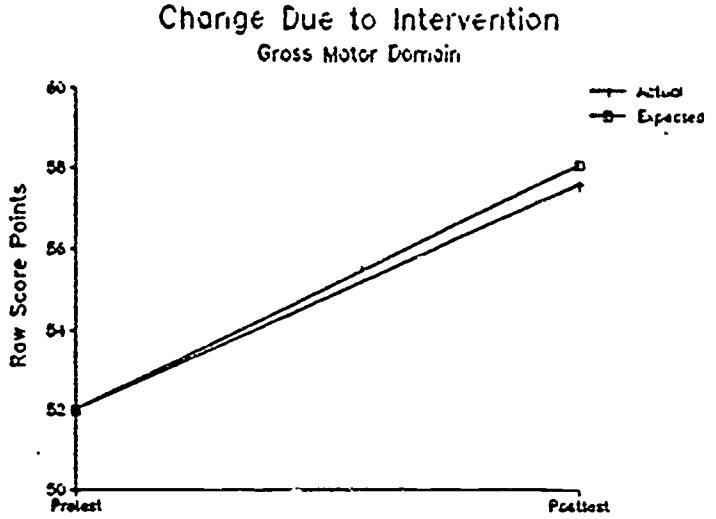


FIGURE 5 (Cont.)



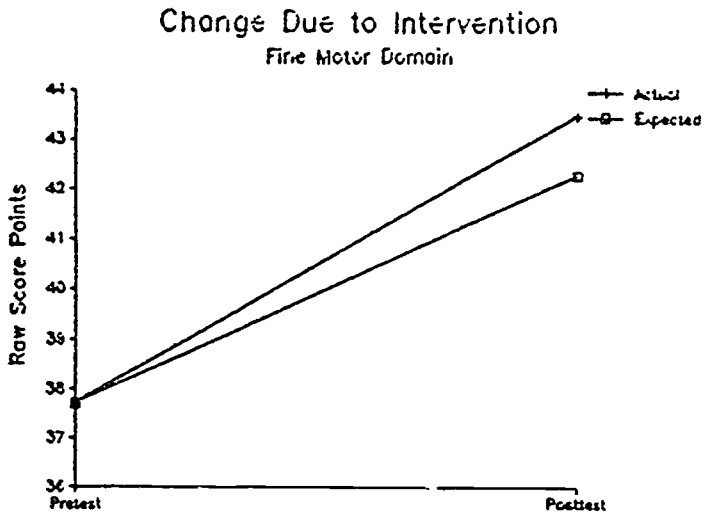
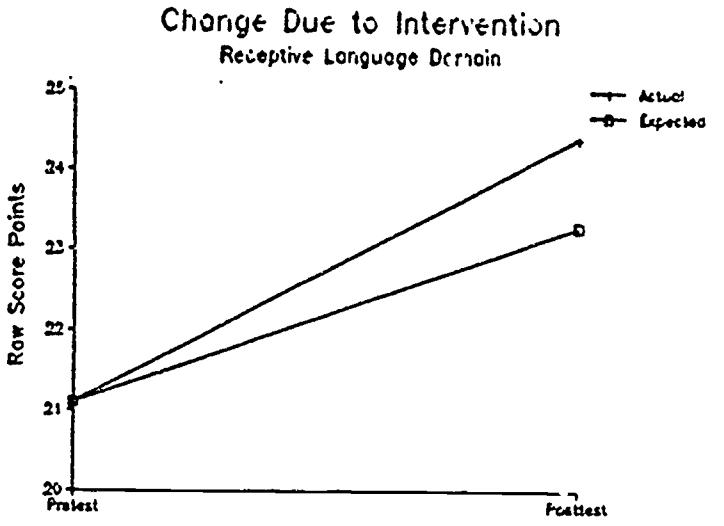
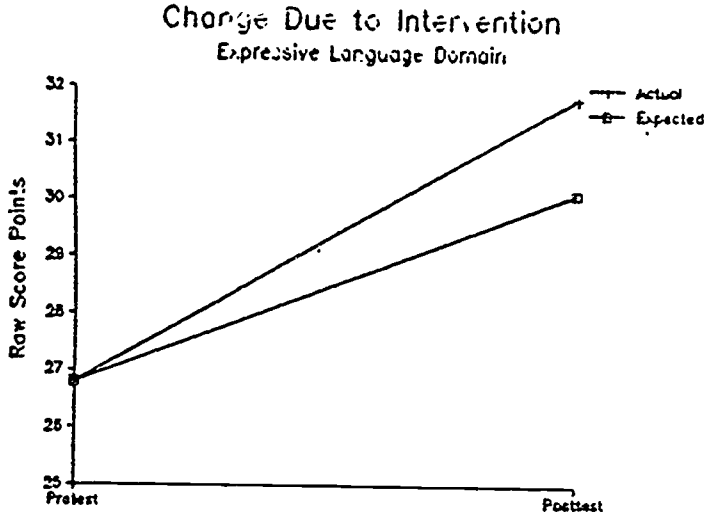


FIGURE 5 (Cont.)





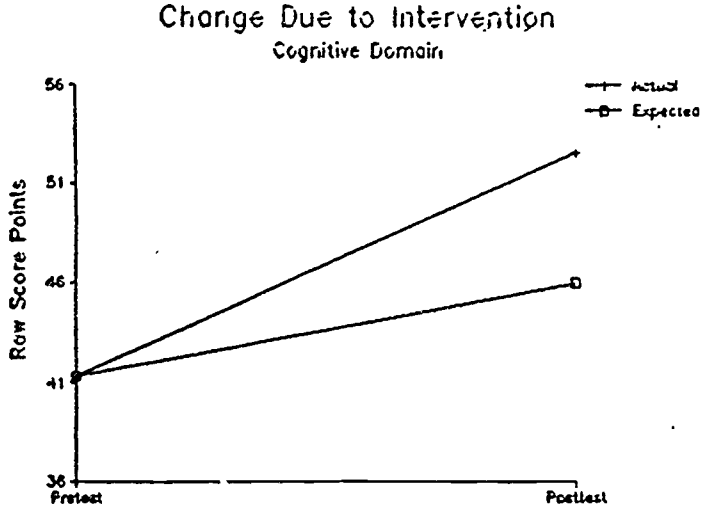


TABLE 9

Amount of Change Between Pre- and Posttest Scores Attributable to Intervention by Specific Handicapping Conditions

BDI	Mean Between Pre- and Posttests[a]	Amount Attributable to Intervention[b]			
		Mean	S.D.	p	Equivalent to Months Gain
Articulation Disorder (N=18)					
Mean Age at Pretest: 51 months					
Personal-social	9	-2.8	10.0	NS	-1.3
Adaptive	6	-1.1	9.3	NS	-0.8
Gross motor	6	0	7.6	NS	0.1
Fine motor	9	3.7	5.2	.01	4.0
Receptive language	1	-1.7	7.5	NS	-2.7
Expressive language	3	-1.2	5.3	NS	-1.5
Cognitive	11	5.8	11.1	.05	4.5

a. Raw score points

b. Raw score gain which exceeded that expected by maturation alone. The difference between the first and second column, e.g., 9-3, was the amount of growth expected by maturation alone.

TABLE 9 (cont.)

Amount of Change Between Pre- and Posttest
Scores Attributable to Intervention
by Specific Handicapping Conditions

BDI	Mean Between Pre- and Posttests[a]	Amount Attributable to Intervention[b]			
		Mean	S.D.	p	Equivalent to Months Gain
Language Disorder (N=53)					
Mean Age at Pretest: 44 months					
Personal-social	25	13.3	17.1	.001	6.0
Adaptive	10	2.2	9.8	NS	1.7
Gross motor	5	-1.2	5.8	NS	-1.3
Fine motor	5	0	5.0	NS	0.4
Receptive language	3	0	5.3	NS	0.5
Expressive language	4	1.3	6.2	NS	1.6
Cognitive	12	7.2	9.0	.001	5.5

a. Raw score points

b. Raw score gain which exceeded that expected by maturation alone. The difference between the first and second column, e.g., 25-133, was the amount of growth expected by maturation alone.

TABLE 9 (cont.)

Amount of Change between Pre- and Posttest
Scores Attributable to Intervention
by Specific Handicapping Conditions

BDI	Mean Between Pre- and Posttests[a]	Amount Attributable to Intervention[b]			
		Mean	S.D.	p	Equivalent to Months Gain
Multi-Handicapped (N=30)					
Mean Age at Pretest: 29 months					
Personal-social	18	9.9	20.1	.05	4.5
Adaptive	10	4.6	7.7	.01	3.5
Gross motor	4	0	6.7	NS	-0.1
Fine motor	5	1.4	6.5	NS	1.5
Receptive language	4	2.6	4.7	.01	4.1
Expressive language	6	3.2	4.1	.001	4.0
Cognitive	10	6.3	8.9	.001	4.9

a. Raw score points

b. Raw score gain which exceeded that expected by maturation alone. The difference between the first and second column, e.g., 18-9.9, was the amount of growth expected by maturation alone.

The absence of treatment-related growth in motor skills in the multi-handicapped children is of concern because this is an area of focus and treatment for many preschool handicapped children so labeled. This finding may be the result of the limited amount of time between pre- and post-testing or could be a weakness of the assessment tool. The absence of treatment-related growth in the articulation disordered group in expressive language is considered a reflection of limitations of the BDI. This test only minimally evaluates articulation/phonology, the area of deficit, and the focus of remediation for these children. Thus, the area in which these children would be most likely to exhibit treatment-related growth was not adequately evaluated.

What factors were associated with the greatest gains in intervention?

The presence and lack of substantive progress in intervention may be the product of myriad factors, events, or variables within and beyond the scope of any program. Multiple regression was used to explore the independent contribution of a number of variables to the amount of progress attributable to intervention. Factors which were explored as possibly contributing to or hindering progress in special services were as follows:

- Age in months at the time of initial testing
- Race
- Sex
- Home-based services
- Center-based services
- Total number of scheduled minutes in a center-based program
- Total number of scheduled minutes in therapy: speech-language, physical, and occupational
- Handicapping condition
- Income (defined as participation in Head Start)

The regression analyses were based on an N of 120.[3] The amount of variance explained and factors which were related to gains due to intervention for each BDI domain are presented in Table 10. The results indicated that factors examined explained only a small percentage of the variance in gains due to intervention. Furthermore, there was no consistent pattern from domain to domain as to the factors contributing to that amount of variance. The short time interval between pre- and posttest may have limited growth so that relationships between predictions and growth could not be detected. A better answer to the question of which factors predict gain due to

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3. For three of the 123 Project children, information was unavailable on their precise handicapping condition; and thus it was necessary to eliminate them from this analysis.

TABLE 10

Results of Regression Analysis To Explain Gain Due to Intervention
(N=120)

Domain	Percentage Variance Explained	Significant Factors[a]	Direction of Factors[b]
Personal-social	16	Enrollment in a center-based program	+
		Number of minutes in speech therapy	-
		Number of minutes in physical therapy	-
		Income	+
Adaptive	11	Age in month at time of pretest	-
		Income	+
Gross motor	12	Being black (0=no, 1=yes)	+
		Total number of program minutes/week	-
		Being speech/language impaired (0=no, 1=yes)	-
Fine motor	9	Being black (0=no, 1=yes)	-
		Income	-
Receptive language	13	Number of minutes in speech therapy	+
		Number of minutes in physical therapy	-
		Being speech/language impaired (1 = yes)	-
Expressive language	20	Enrollment in home-based services	+
		Enrollment in center-based services	+
		Number of minutes in physical therapy	-
Cognitive	13	Age in months at time of pretest	+
		Being speech/language impaired (1 = yes)	-

a. Arranged in order of amount of variance explained. Gains were related to the higher values on the variables listed.

b. For example, the children who made the most progress due to intervention in gross motor skills were black, received the least amount of Program time, and did not have a "speech/language impaired" handicapping classification.

intervention will be available in subsequent Project years when there are more children in the analyses and when the time in intervention will be longer. Also, analyses in subsequent years will include additional background data from the record review as well as attendance data.

PARENT SATISFACTION

Fifty-five of the 123 parents (45%) returned the questionnaire on parent satisfaction, although not all questionnaires had all items completed. Ninety-three percent of the respondents (N=51) indicated that they were satisfied or very satisfied with the amount of the overall program TIME, and 95 percent (N=52) were similarly pleased with its quality. Satisfaction with the amount and quality of services is presented in Table 11. These results indicate overwhelming parent satisfaction with the preschool program and related services. However, parents appeared to be slightly less happy with the amount of counseling, home visits, and PT services provided.

Thirty-eight of the 55 parents (69%) indicated they had received a home visit from a staff member in their child's program during the 1983-84 school year. Seventy-nine percent of the parents (N=30) received one or two visits. Of the 26 parents who provided information regarding the average length of the visit, 73 percent (N=19) reported home visits were one hour in length. The remaining parents indicated the visits were longer.

To ascertain if there were particular special education programs for which parents indicated greater or lesser satisfaction, questionnaire results were analyzed by program. Results are presented in Table 12. Again, parents, regardless of program, voiced a strong positive vote for the amount and quality of the program in which their preschool handicapped child was enrolled, although the numbers in many of the programs were too small to allow definitive conclusions.

BDI VALIDATION STUDIES

OPINIONS OF SERVICE PROVIDERS

Seventy-three questionnaires on the BDI (65%) were returned by service providers. The type of individual completing the questionnaire and program affiliation are provided in Table 13. Over half the respondents were either teachers or speech-language pathologists. Fifty-nine percent of the respondents based their answers on review or exposure to the results of the BDI for one to five children.

Respondents were asked to indicate if they used BDI test results for educational planning and discussion with parents about their child's educational progress. Results, presented in Table 14, indicate that most respondents did not utilize the BDI findings for either purpose, and for those who did, less than half noted the usefulness of these results as moderate or higher. These findings may be the result of several of the following factors:

TABLE 11

Parental Satisfaction with the Amount and Quality of Services

Service	N[a]	Percentage Satisfied or Very Satisfied with Amount of Services	N	Percentage Satisfied or Very Satisfied with Quality of Services
Overall program	55	93	55	95
Speech/ language	50	92	48	90
OT	34	82	32	81
PT	28	71	27	81
Behavior management/ counseling	25	68	26	81
Home visits	24	75	25	84

a. N's include only those parents whose children were receiving service and who completed the item.

TABLE 12

Parental Satisfaction by Program

Program	N	Percentage Satisfied/Very Satisfied with Amount	Percentage Satisfied/Very Satisfied with Quality
1. (Auditory)	3	100	100
2. (Christ Church Child Center)	0	-	-
3. (Child Center)	3	100	100
4. (Early Childhood Program)	3	100	100
5. (Head Start)	3	100	100
6. (Montgomery Preschool Achievement Center)	3	100	100
7. (Preschool Education Program)	10	90	80
8. (Speech/Language)	11	73	100
9. (Treatment Centers)	17	100	94
10. (Vision)	2	100	100

TABLE 13

Respondents to BDI Questionnaire: Role and Program Affiliation (N=73)

Characteristics	N	Percentage of Respondents
Role		
Director/coordinator	0	---
Physical therapist	3	4
Special educator/teacher	26	36
Speech-language pathologist	20	27
Occupational therapist	1	1
Head Start teacher	8	11
Not specified	15	21
Program		
1. (Auditory)	2	3
2. (Christ Church Child Center)	4	5
3. (Child Center)	8	11
4. (Early Childhood Program)	4	5
5. (Head Start)	13	18
6. (Montgomery Preschool Achievement Center)	5	7
7. (Preschool Education Program)	8	11
8. (Speech/Language)	17	23
9. (Treatment Centers)	10	14
10. (Vision)	2	3

TABLE 14

Use of BDI Test Results by MCPS Service Providers

Task	N	Percentage Who Use	N	Percentage of Those Who Noted at Least Moderate Usefulness
Educational planning	57	25	20	45
Talking with parents about educational progress	57	21	6	30

- Service providers received the test results after they had already made educational plans and decisions for the year.
- Impressions were based on just pretest results.
- Service providers may have viewed the BDI as one component of a research project that was not of clinical relevance.
- Service providers may have been skeptical of the test and the testers and continued to rely on familiar, established assessment tools.
- Speech-language pathologists might not have considered the BDI as detailed an assessment as other measures of speech and language, particularly in articulation.

Service providers were asked to rate their impressions of the accuracy of the assessment in each of the five domains of the BDI, using a nine-point scale. A sizable percentage of the respondents (from 30% to 47%, depending on the domain) felt they could not make a judgment. Results, presented in Table 15, indicate that service providers who could make judgments viewed scores obtained on the Adaptive and Motor Domains as more reflective of their perceptions of the child's abilities than the scores obtained in other areas. The Communication Domain fared most poorly, with only slightly more than one-third considering the scores to be about right. However, for all domains, over 70 percent of those who felt they could make a judgment felt the BDI results were within plus or minus three months of their estimate of the child's functioning. Service providers who did not consider BDI test results an accurate representation of the child's abilities tended to consider the scores too low; i.e., these results tended to make the child look more impaired than the service provider judged him or her to be.

As indicated previously, special educators and speech-language pathologists comprised a large portion of the respondents. Each of the two groups' responses were analyzed to ascertain if certain professionals viewed the BDI in a particular way. Ratings of "accuracy" of BDI scores varied between the two professional groups. Over three-fourths of the speech-language pathologists considered BDI scores accurate or within plus or minus three months (i.e., a rating of 2, 3, or 4) in all domains except Communication, for which only 60 percent considered the scores accurate. Eleven percent considered the scores six months lower than anticipated, and eleven percent considered the scores six months higher. Over half the special educators viewed BDI scores as "on target" or within plus or minus three months for all domains. The Adaptive Domain fared the best, with 80 percent of the special educators rating those scores as accurate. There was slightly less "enthusiasm" for the Personal-Social and Cognitive Domains, for which only 55 percent considered the scores as accurate.

Finally, service providers were asked to indicate on which of the following they formulated their impressions of BDI test results: clinical impressions/classroom performance, other test data, feedback from other professionals, and feedback from parents. Regardless of the domain in question, a majority of respondents indicated they most strongly relied on clinical impressions and/or classroom performance in judging the validity of

TABLE 15

Rating of BDI Domains by Service Providers[a]

Domain	N[b]	Percentage Rating BDI Score As: 1	2	3	4	5	6	7
Personal-social	51	8	12	43	16	6	10	6
Adaptive	40	0	10	55	15	10	5	5
Motor	43	0	7	58	16	9	7	2
Communication	46	7	9	39	20	17	4	4
Cognitive	44	0	2	45	22	20	0	9

a. Respondents were asked to rate their impressions of each of the BDI developmental domains, using the following scale:

1 = BDI scores are six or more months higher than I think they should be.
2 = BDI scores are about three months higher than I think they should be.
3 = BDI scores are about what I think they should be.
4 = BDI scores are about three months lower than I think they should be.
5 = BDI scores are six or more months lower than I think they should be.
6 = BDI scores are sometimes too high and sometimes too low, but generally about six months off.
7= BDI scores are sometimes too high and sometimes too low, but generally about three months off.
9 = I cannot make a judgment.

b. N includes only those who felt they could make a 1-7 judgment.

BDI test results (Personal-social: 83 percent; Adaptive: 81 percent; Motor: 57 percent; Communication: 67 percent; and Cognitive: 68 percent).

PARENT-TEACHER COMPARISONS

Seventy-eight parent-teacher comparisons on BDI items were available for analysis. However, not all item comparisons were based on this number because not all children were administered all items. Item administration is determined by the child's functioning; therefore, an item notably above or below a child's ability was not administered. A score on an individual BDI item may be a "2" (correct; fully developed behavior), "1" (partially correct; emerging behavior), or "0" (failed item, no opportunity, no response). Discrepancy scores were calculated for each of the eight items examined by subtracting the score given by the parent from the score given by the teacher. For example, if both parent and teacher indicated a child was unable to do a task (i.e., information from both informants resulted in a score of "0"), there was no discrepancy. If the teacher scored the child a "2" and the parent scored the child a "1," the discrepancy score was 1.

Table 16 presents the eight items and the percentage of items with discrepancies between the responses of parent and teacher. Results indicated that for the majority of comparisons for most of the items no discrepancy occurred. This is particularly significant because these were items selected by the testers as those most likely to result in a discrepancy. PS61 ("serves as a leader in peer relationships") and A37 ("responds to instructions given in a small group and initiates an appropriate task without being reminded") were most likely to result in discrepant responses between parent and teacher. For the later item, one-fifth of the parent-teacher pairs gave responses which differed by two points.

The direction of the differences between parents and teachers was determined and is presented in Table 17. In general, there was no strong trend of one group scoring the child higher than the other group, with the exception of Item PS44 regarding "show and tell" where the parents were more likely than the teachers to give the child a higher rating.

In sum, it appears that reliance on parents as informants for information related to school or group activities by and large results in responses similar to those provided by the child's teacher. In those cases where it does not, there was no consistent trend for parents to over or underestimate their child's abilities in comparison to the teacher's estimate.

SUMMARY

The Preschool Evaluation Project was begun in September, 1983, to document short- and long-term progress of handicapped children who receive special services as preschoolers in Montgomery County. During the 1983-84 school year, 123 preschool children who began receiving special services through Montgomery County Public Schools were pre- and posttested, using the Battelle Developmental Inventory. Characteristics of these children were as follows:

TABLE 16

Parent-Teacher Comparisons on Selected
BDI Interview Items

Item	N	Percentage Responding: No discrepancy	1-point discrepancy	2-point discrepancy
Demonstrates ability to "show and tell" without major discomfort (PS44)	57	81	9	10
Attends to learning task or story in small group (A9)	71	73	15	12
Follows rules given by adult for playing simple childhood games (PS63)	37	70	11	19
Uses adults other than parents as resources (PS16)	53	68	25	8
Completes learning tasks having two or more steps (A38)	66	65	18	17
Follows classroom rules and directions (PS65)	65	60	29	11
Responds to instructions given in small group and initiates appropriate task without being reminded (A37)	68	50	29	21
Serves as leader in peer relationships (PS61)	45	42	42	16

Note: Table entries are row percentages.

TABLE 17

Direction of Differences of Parent-Teacher Comparisons

BDI Item	Parent Higher Than Teacher	No Discrepancy	Teacher Higher than Parent
	Percentage		
PS44	16	81	4
A9	14	73	13
PS63	16	70	14
PS16	17	68	15
A38	14	65	21
PS65	17	60	23
A37	24	50	26
PS61	31	42	27

- Mean age at time of pretest was 40 months (range: 4-64 months).
- Racial/ethnic makeup of the group was 72 percent white, 20 percent black, 5 percent Hispanic, and 3 percent Asian.
- At least 20 percent of the children were from low-income families as measured by participation in Head Start.
- "Language disordered" was the most frequent handicapping condition (43%), with multihandicapped the next most frequent subgroup (24%).
- Sixty-three percent of the children were enrolled in public school programs. Of those attending private programs, 27 percent were enrolled in a program serving children with primary speech and/or language impairments.
- Most children required a high level of intervention, with 64 percent in Level 4 or 5 programs.
- Three-fourths of the children received speech and language therapy, on the average, for one hour each week.
- Children labeled as multihandicapped received a similar amount of speech and language therapy but more occupational and physical therapy than children with other handicapping conditions.

One of the major goals of the Preschool Evaluation Project is to address the issue of efficacy of the intervention which these preschool handicapped children are receiving. Despite several caveats which must be considered in interpretation of these data (the restricted amount of time between pre- and posttesting, the receipt by some children of special services prior to pretesting, and the heterogeneity of the population), the following findings emerged:

- With the exception of gross motor skills, Project children exhibited statistically significant improvements in all areas of development beyond what would have been expected by maturation alone.
- The largest gains were in the areas of personal-social and cognitive skills.
- Children labeled as multihandicapped exhibited gains attributable to intervention in all areas of development except motor skills.
- Children labeled as "articulation disordered" or "language disordered" made gains attributable to intervention, but not in speech and language areas.
- An analysis of specific factors (e.g., number of minutes in therapy, race, and handicapping condition) which might be associated with progress or predictive of gain due to intervention showed no consistent trends.

- o Parents reported overwhelming satisfaction with their preschool child's program and related services.

- o Service providers of Project children reportedly did not use BDI test results in educational planning or discussions with parents about their child's educational progress. However, the majority (over 70%) considered BDI results as within plus or minus three months of their estimate of the child's functioning.

- o Reliance on parents as informants for BDI items related to school or group activities by and large resulted in responses similar to those provided by the child's teacher.

These findings indicate that the gains these preschool handicapped children made during the 1983-84 school year were attributable to the services they received and beyond that which would have been expected with maturation alone. With an increased number of children in the Project population, a greater number of children in each handicapping classification, more extensive data on services received, and a longer time between pre- and posttesting, the data generated during Year 2 of the Project will be even more powerful. It is becoming clear that the results of this Project will provide answers to questions being asked across the country regarding the efficacy of intervention to preschool handicapped children.

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APPENDIX A

Documentation of Special Services

SERVICE DELIVERY FORM

PROGRAM: _____ WEEK OF: _____ PERSON COMPLETING FORM: _____ DATE: _____

CHILD'S NAME	DAY	PROGRAM TIME		SPEECH/LANGUAGE THERAPY		OCCUPATIONAL THERAPY		PHYSICAL THERAPY		PARENT SERVICES		OTHER
		Home	Center	Home	Center	Home	Center	Home	Center	Home	Center	
1.	M											
	T											
	W											
	TH											
	F											
2.	M											
	T											
	W											
	TH											
	F											
3.	M											
	T											
	W											
	TH											
	F											

A-1

✓ = Service received (at least ½ scheduled time)

O = Service NOT received

/ = Child or service dropped (specify reason) or service permanently changed

Person accompanying child:

P = Parent

C = Other caregiver (grandparent, sitter, etc.)

****TIME RECORDED IN MINUTES****

APPENDIX B

Parental Satisfaction with Service Provision

Preschool Evaluation Project
Montgomery County Public Schools
Rockville, Maryland

SERVICE DELIVERY
Parent Questionnaire

Parent's Name: NOT NECESSARY

Often the educational services given to a child are seen differently by the many adults who work with that child. For example, the child's teacher may have a very different view of the speech therapy given to a child than the child's parents may have. The purpose of this questionnaire is to better understand parents' feelings and attitudes toward the service their child is receiving.

Directions: To answer most questions, you will be asked to select an answer from a list of choices. Some questions will ask you to write out your answer.

Example:

How satisfied are you with the amount of the services your child receives? Indicate how satisfied you are with the amount of each service given to your child by writing the number of one of the answer choices in the space next to each service.

Answer Choices:

1=My child does not receive this service.
2=Very satisfied.
3=Satisfied.
4=Neither satisfied nor dissatisfied.
5=Dissatisfied.
6=Very dissatisfied.

Overall Program 3

Physical Therapy (help in use of gross motor, sit, crawl, walk .. 1

An answer of "3" next to "Overall Program" means that you are satisfied with all parts of your child's program. An answer of "1" next to "Physical Therapy" means that you cannot rate physical therapy services because your child does not receive them.

Your answers will be coded to an identification number (ID). All answers will be kept strictly confidential.

Please use the reverse side of this page to clarify any of your answers.

SERVICES DELIVERY
Parent Questionnaire

Office Use

Form Code: 610 1-3
Program ID: _____ 4-5
Parent ID: _____ 6-8

Program Name: _____

1. How satisfied are you with the amount of services your child receives? Indicate how satisfied you are with the amount of each service given to your child by writing the number of one of the answer choices in the space next to each service.

Answer Choices:

1=My child does not receive this service.
2=Very satisfied.
3=Satisfied.
4=Neither satisfied, nor dissatisfied.
5=Dissatisfied.
6=Very dissatisfied.

Overall Program ..... _____ 9
Speech Therapy (help in speech, saying sounds and words, eating without choking) ... _____ 10
Occupational Therapy (help in use of fine motor, fingers, hands) ..... _____ 11
Physical Therapy (help in use of gross motor, sit, crawl, walk) ..... _____ 12
Behavior Management/Counseling (help with behavioral or emotional problems) ..... _____ 13
Home Visits ..... _____ 14

2. a. Approximately how many times during this school year has someone from your child's program visited and/or is scheduled to visit your home? Write your answer on the line to the right. If your answer is 2, write 02 on the line ..... _____ 15-16

b. On the average when staff have visited your home, how long did they stay? Write your answer in hours and minutes in the space to the right. If your answer is 1 hour, write 1 on the line labeled "Hours" and 00 on the line labeled "Minutes."

Minutes _____ 17-18

Hours _____ 19-20

3. How satisfied are you with the quality of the services your child receives? Indicate how satisfied you are with the quality of each service given to your child by writing the number of one of the answer choices in the space next to each service.

Answer Choices:

1=My child does not receive this service.
2=Very satisfied.
3=Satisfied.
4=Neither satisfied, nor dissatisfied.
5=Dissatisfied.
6=Very dissatisfied.

Overall program ..... _____ 22
Speech Therapy (help in speech, saying sounds and words, eating without choking) ... _____ 23
Occupational Therapy (help in use of fine motor, fingers, hands) ..... _____ 24
Physical Therapy (help in use of gross motor, sit, crawl, walk) ..... _____ 25
Behavior Management/Counseling (help with behavioral or emotional problems) ..... _____ 26
Home Visits ..... _____ 27

4. What do you like best about the services your child receives and why?

5. What do you like least about the services your child receives and why?

6. What recommendations do you have that you believe would improve the services your child receives?

This concludes this questionnaire. Thank you.

APPENDIX C

BDI Questionnaire to Service Providers

Preschool Evaluation Project
Montgomery County Public Schools
Rockville, Maryland

BATTELLE DEVELOPMENTAL INVENTORY (BDI) QUESTIONNAIRE

If you have not had sufficient contact with the BDI to answer the following questions, please check here and return the blank questionnaire. _____

1) Approximately how many children that you serve have been tested with the BDI? (Please check one answer.)

1-5 _____ 6-10 _____ 11-15_____ 16-20 _____ More than 20 _____

2) What percentage of the test booklets and results have you had an opportunity to review? (Please check one answer.)

0-25% _____ 26-50% _____ 51-75% _____ 76-100% _____

For part A of the next five (5) questions, please use following scale:

1 = BDI scores are 6 or more months higher than I think they should be
2 = BDI scores are about 3 months higher than I think they should be
3 = BDI scores are about what I think they should be
4 = BDI scores are about 3 months lower than I think they should be
5 = BDI scores are 6 or more months lower than I think they should be
6 = BDI scores are sometimes too high and sometimes too low, but generally about 6 months off
7 = BDI scores are sometimes too high and sometimes too low, but generally about 3 months off
9 = I cannot make a judgment

3) A. In general, what are your impressions of the BDI test results in the Personal/Social Domain? (Please enter number from scale above.)

_____

B. On what do you base your answer? (Rank order from 1 to 4, with 1 being the source which most influenced your answer.)

Clinical impressions/Classroom performance..... _____
Other test data..... ..... _____
Feedback from other professionals ..... _____
Feedback from parents ..... _____

MCPS # 150-0623

4) A. In general, what are your impressions of the BDI test results in the Adaptive Domain? (Please enter number from scale above.) _____

B. On what do you base your answer? (Rank order from 1 to 4.)

Clinical impressions/Classroom performance..... _____
Other test data..... _____
Feedback from other professionals..... _____
Feedback from parents..... _____

5) A. In general, what are your impressions of the BDI test results in the Motor Domain? (Please enter number from scale above.) _____

B. On what do you base your answer? (Rank order from 1 to 4.)

Clinical impressions/Classroom performance..... _____
Other test data..... _____
Feedback from other professionals..... _____
Feedback from parents..... _____

6) A. In general, what are your impressions of the BDI test results in the Communication Domain? (Please enter number from scale above.) _____

B. On what do you base your answer? (Rank order from 1 to 4.)

Clinical impressions/Classroom performance..... _____
Other test data..... _____
Feedback from other professionals..... _____
Feedback from parents..... _____

7) A. In general, what are your impressions of the BDI test results in the Cognitive Domain? (Please enter number from scale above.) _____

B. On what do you base your answer? (Rank order from 1 to 4.)

Clinical impressions/Classroom performance..... _____
Other test data..... _____
Feedback from other professionals..... _____
Feedback from parents..... _____

8) Did you attempt to use the BDI test results for educational planning?

Yes _____ No _____

If yes, how useful were the BDI test results for this purpose? (Please circle the number which best describes your answer.)

Very useful		Moderately useful		Not useful
1	2	3	4	5

9) Did you attempt to use the BDI test results to talk with parents about their child's educational progress?

Yes _____ No _____

If yes, how useful were the BDI test results for this purpose? (Please circle the number which best describes your answer.)

Very useful		Moderately useful		Not useful
1	2	3	4	5

10) Please check one category which best describes your present role.

_____ Director/Coordinator
_____ Physical Therapist
_____ Special Educator/Teacher
_____ Speech/Language Pathologist
_____ Occupational Therapist
_____ Head Start Teacher
_____ Other (please specify)_____

Additional Comments_____

_____

_____

_____

_____

_____

Thank you very much for your time.

APPENDIX D

Additional Information About Value-added Analysis

The primary objective of the Preschool Evaluation Project is to determine the effectiveness of program participation for handicapped preschoolers. None of the standard evaluation approaches to program impact were feasible for the Project. There was no control group of unserved children. Furthermore, children could not be randomly assigned to programs; rather, children had to be placed in the program most appropriate to their needs. On what basis could the Project determine that the programs had been effective?

One approach which has been suggested in the early childhood special education literature for this kind of situation is the use of a "change index." Wolery and Bailey (1984) list a number of such change indices. The basic concept is to use what is known about the child from the pretest to project where the child should be functioning any number of months down the road. For example, a child who is 24 months old and functioning at the 12-month level prior to intervention would be projected to be functioning at the 18-month level at 36 months of age if all conditions stayed the same. If the child is functioning at a higher level, then the difference is attributed to an effective program.

As Wolery (1983) points out, this kind of analysis assumes that the child's pretest score is an accurate reflection of the child's rate of development. To the extent that rates vary and the child is pretested at a particularly "slow" time, the projected rate of growth is inaccurately low. The child may show a substantial amount of gain between pre- and posttest due entirely to a developmental growth spurt. An analysis which uses a change index, however, will incorrectly attribute that growth to participating in a program.

The particular type of change index selected for the Project data is based on "value-added" analysis (Bryk and Weisberg, 1976; Bryk, Strenio and Weisberg, 1980). The goal of this type of analysis is to determine the "value added" by the program above and beyond the growth that would have been expected without the program. The growth shown between the pre- and posttest is divided into two components:

- The amount of growth due to maturation
- The amount of growth due to program.

Growth due to maturation is calculated by projecting where the children would have been expected to score based on the results of the pretesting. The value-added approach is not as prone to error due to developmental growth spurts because the growth rates are computed for the entire group of children or subgroups of children through a regression equation rather than for each child individually through the use of a ratio.

The basic steps in a simple value-added analysis are illustrated in the top of Figure D-1. The particular analysis used by the Project was slightly more complicated in that it incorporated a number of other factors hypothesized to be related to developmental growth in the Project's population. These factors were the following:

- Sex
- Race/ethnic group (white, black, Hispanic, and other)
- Family income (low income, not low income)

- o Handicapping condition (speech and language impaired, multihandicapped, other)
- o Severity level (as measured by program level, itinerant or full program)

Based on their pretest scores, the analysis calculated a different growth rate for children who differed on these characteristics. For example, a black speech and language impaired male from a non-low-income family receiving itinerant services had a different projected growth rate than a white multihandicapped female from a low-income-family in a full program. The use of the child's characteristics to compute different coefficients is illustrated in the bottom half of Figure B-1.

The value-added approach provided a way to determine the extent of gains in each of the BDI domains which could be attributed to program participation. The amount of gain in each domain was then tested to see is it was significantly different from zero.

References

Bryk, A.S., Strenio, J.F., & Weisberg, H.I. (1980). A method for estimating treatment effects when individuals are growing. Journal of Educational Statistics, 5(1), 5-34.

Bryk, A.S., & Weisberg, H. I. (1976). Value-added analysis: A dynamic approach to the estimation of treatment effects. Journal of Educational Statistics, 1(2), 127-155.

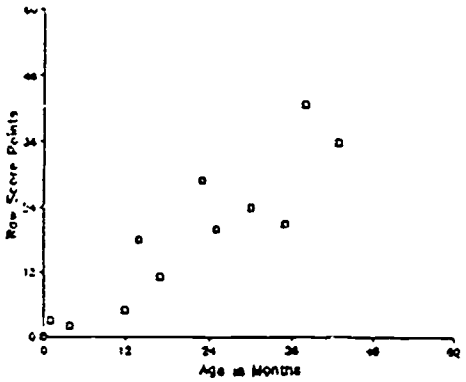
Wolery, M. (1983). Proportional change index: An alternative for comparing child change data. Exceptional Children, 50(2), 167-170.

Wolery, M., & Bailey, D. B. (1984). Alternatives to impact evaluations: Suggestions for program evaluation in early intervention . Journal of the Division for Early Childhood, 9(1), 27-36.

FIGURE D-1

Steps in Value-Added Analysis

Progress = Growth due to maturation + growth due to program participation

Step	Example
1. Regress pretest on age.	Pretest = .8 Age
	
2. Use coefficient from the regression as the growth rate prior to pretest.	Coefficient = .8
3. Multiply rate by the amount of time in program to determine the amount of growth due to maturation.	.8 x 10 months = 8 points
4. Subtract pretest from posttest to determine the total amount of growth.	36 - 24 = 12
5. Subtract growth due to maturation from total growth to determine growth due to program participation.	12 - 8 = 4 points

Growth due to program participation = 4 points

Computing Coefficients for Different Groups

1. Regress pretest on age, sex, race, handicapping condition, family income	Pretest = .8Age -.3Multi-handicapped + .1Male...
2. Use "corrected coefficient" which depends or child's characteristics.	$Coefficient_{MHmale}$ = .8 - .3 + .1 = .6
	$Coefficient_{MHfemale}$ = .8 - .3 -.1 = .5

Continue as above.