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ABSTRACT

This final report describes Project Dakota, an early intervention demonstration project serving newborns to preschoolers with developmental delay or disability in Dakota County, Minnesota, from 1983 to 1986. The first chapter describes the project model (which focuses on increasing the effectiveness of parents in fostering the child's development) and project goals. Chapter II describes characteristics of the parents and 31 children (mean age at enrollment 27.6 months) served by the project. Implementation and evaluation results are presented in Chapter III, including measures of relative participation in planning and programming by staff, parents, and community and staff role in inservice delivery and consultation. Measures of outcome are described in Chapter IV. Results include data specifying child change, including the separate effects of maturation and intervention; children's contact and interaction with peers; family needs targeted by intervention; parent satisfaction; interagency response; and program operation costs. Chapter V summarizes the implementation and outcomes of the model and concludes that the family-oriented, community-based services model was fully implemented and highly effective, successfully utilizing individualized, flexible, functional curricula and services and challenging established practice which stresses structured programming driven by developmental goals. Appendixes provide evaluation forms and data. (14 references) (DB)

FINAL REPORT

PROJECT DAKOTA: 1983-1986

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PROJECT DAKOTA GOALS

Focus on the child and family needs considered essential by parents.

Insure direct and meaningful collaboration among parents and staff throughout the intervention process.

Promote the acquisition of knowledge, skill and confidence by parents to describe their child's strengths and needs and to identify and carry out goals and strategies for their child.

Encourage the transmission of these strategies by parents and staff to other caregivers and settings.

Increase the child's ability to function in less restrictive environments. Draw upon natural settings and resources for intervention.

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This report of findings is dedicated to the families whose cooperation, insight, and creativity was essential to the success of this project. We thank them for the time, energy, and knowledge they shared.

Project Dakota Outreach, funded in part by the U.S. Dept. of Education, is available to provide strategic planning and technical assistance to states and local programs. For more information call or write:

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CHAPTER I

Project Dakota Model and Goals

Project Dakota was an early intervention demonstration project funded by the Handicapped Children's Early Education Program, U.S. Department of Education from 1983 to 1986. The Project was operated by Dakota Inc, a private, nonprofit agency serving newborns to preschoolers with developmental delay or disability throughout Dakota County, Minnesota. This report describes Project Dakota's model, the children and families it served, and the evaluation findings for its implementation and outcome.

The Project Dakota Model

Project Dakota proposed to develop a model which would "...promote the optimal development of the child by enabling parents and other caregivers to be as effective as possible in interactions with their child" (Proposal, 1982, p.7). The model was to focus intervention on the interaction system(s) having lasting impact on the child's development; it was to deliver intervention services in settings where the child would spend the greatest amount of time and through persons having greatest longterm influence on the child. Parent participation was to be individualized and meaningful in order to bring about "...growth in understanding of their own child and confidence in their own parenting ability..." (ibid. p.6). When this type of intervention was successfully implemented, parents would be empowered "...to assume the advocacy role that is believed to be responsible for the lasting effects of successful intervention" (ibid.). In developing these aims Project Dakota created a model of early intervention which would:

- Focus on the child and family needs considered essential by parents.
- Provide parents with direct and meaningful participation throughout the intervention process.
- Promote parents' acquisition of knowledge, skill, and confidence enabling them to identify their child's needs and carry out intervention.
- Facilitate the establishment of a network to assist with the child's program and meet parents' needs for support.

. Increase the child's ability to function in less restrictive environments by using natural settings and resources for intervention.

In order to accomplish these goals the model was to develop/use innovations in service delivery, curriculum, and staff roles. Dakota assembled a resourceful array of service options with a community orientation. The staff originated procedures to insure that family strengths, resources, and needs were incorporated into functional, ecological curriculums for each child. Dakota generated structures for collaboration with parents which alter the staff role from service provider to consultant. The result was an intervention model which could provide individualized "Tailor Made" services to each family.

Project Dakota Goals and Their Evaluation

Other interactional interventions have directly structured communication between parents and children. Project Dakota developed an intervention model focused on the broader transactional system of the child, family, and community. The uniqueness of Project Dakota's model is its collaborative problem-solving focus on parent-child, staff-parent, staff-child and child-child interactions in the family home and in community settings. The synergistic effect of this broad system impacts day-to-day family life, not just communication. As the model evolved from philosophy to practice, goals were operationalized and their implementation measured.

a. Parents should be provided opportunities for direct and meaningful participation throughout assessment and program planning. Staff would act as consultants and collaborators with parents in order to promote parents' acquisition of knowledge, skill and confidence. Parents would be assisted in describing their child's strengths/needs and in identifying and carrying out goals and strategies. Parent and staff contributions in describing child strengths, needs, identifying goals and implementing program were measured. Accomplishment of and adaptations to the program plan were recorded.

b. Staff resources and skills should supplement not supplant family and community resources. The cooperative efforts of family, staff, and community in carrying out the child's intervention program were

recorded. Staff time in direct service and consultative roles, in homes, with families and in the community was measured.

c. Intervention goals and strategies were to focus on child and family needs considered essential by parents. This insured a functional base for curriculum. The proportion of parent-identified needs specifically addressed by intervention strategies became a measure of staff responsiveness to parents.

d. Families would govern their investment of time and energy; the intervention program would be shaped to fit their changing schedules, priorities, and energy level. The service flexibility this implies was described in records of families' choices from the service menu. Additionally, parents evaluated how closely their child's program matched their desires and priorities.

e. Intervention strategies should be a natural part of families' daily routines and fit comfortably into the routine, interaction, and style of the family. This integration into family life was the ecological foundation of curriculum. Family life integration was also evaluated by parents.

f. Community settings typically used by nondelayed peers were to be used in preference to specialized or segregated settings in order to increase the child's ability to function in less restrictive environments. The relative use of segregated and natural settings was measured. Children's functioning in both settings was observed and measured.

g. Families would be offered on-going information and assistance in using community resources to supplement their efforts. The staff role in interagency referrals and communication was measured and evaluated.

h. Consultation and assistance to parents, children, and community service providers would be provided in the settings where the skills were used or practiced. Parents and community persons evaluated consultation and assistance delivered by staff.

i. Optimal development of the child should be directed by parents' informed priorities following developmental assessments administered every four months. Developmental change was measured by means of yearly standardized norm referenced testing.

The evolution of Project Dakota from a philosphy to a workable system included adaptations to staff functions, staff interactions with families, the program services, and the intervention curriculum. This report presents findings from measures of the staff and program processes found to be integral to becoming family and community oriented as well as those which describe impact on children. Brief descriptions of these processes and the evaluation systems devised for them are included in this report as a resource for other early intervention programs as they seek to become family oriented rather than just involved with families.

After describing characteristics of the parents and children served by Project Dakota (Chapter II), implementation of the model's processes is portrayed and results presented in Chapter III. This data shows year-by-year changes as the model was more fully implemented. Included are measures of relative participation in planning and programming by staff, parents, and community; use of the service options; and staff role in service delivery and consultation. Measures of outcome are described in Chapter IV. Results include data specifying child change, including the separate effects of maturation and intervention; children's contact and interaction with peers, family needs targeted by intervention, parent satisfaction, interagency response, and program operation costs. Chapter V summarizes the implementation and outcomes of the Tailor Made Model and compares aspects of its processes with typical practices.

The findings from Project Dakota are the result of simultaneous programming in multiple settings and collaboration of professional staff, families, and the community. The processes and outcome measures are necessarily numerous, frequently unique, and occasionally complex. The formative value of many of these measures has already been demonstrated in voluntary replication sites. It is hoped that the linear presentation of evaluation data, and its limitations, will not obscure the dynamics of the model's synergistic operation. For further information about the model contact Linda Kjerland, Outreach director; Dakota, Inc. 680 O'Neill Dr.; Eagan, MN. 55121; Area code 612-454-2732.

CHAPTER II

Population Description

Project Dakota is located in South St. Paul within the metropolitan area of Minneapolis and St. Paul. South St. Paul is an older neighborhood of low income, white, blue collar workers.

Sixty-five families were referred to the Project over the three years of HCEEP funding. For purposes of this report only data on the 31 children and parents enrolled by the Project for at least a six month period of time (two assessments) will be reported. Project capacity at any given time was 20.

Parents

Of the 31 families, 42% were headed by single mothers and 58% were two-parent families. 97% where white.

Age

The largest proportion of parents served by Project Dakota were age 25 and younger. Table 1 shows the distribution of ages for the mothers and fathers.

Table 1

Parents' Age

	thru 25 yrs	26 to 30	31 to 35	36 to 40 years
Mother's Age (n=31)	45%	21%	21%	6%
Father's Age (n=17)	55%	12%	12%	9%

	41 to 45	46 to 50	>=51 years
Mother	6%	0	0
Father	6%	3%	3%

Mother's mean age = 28.8 yrs. s.d.= 6.3, range = 21 to 44, n = 31

Father's mean age = 34.4 yrs. s.d.= 8.7, range = 24 to 56, n = 17

Education

22.6% of the Mothers had not completed high school. This proportion is over twice that found in Minnesota's population.

Table 2

Highest Grade Completed

	< HS	= HS	HS + 1,2	HS + 3,4
Mother, (n=31)	22.6%	38.7%	29.0%	9.7%
Father, (n=17)	0	41.2%	35.3%	23.3%
Minnesota*	10.1%	38.8%	17.1%	17.3%

* Source: Bureau of the Census, 1980

Occupation

Parent occupations were classified into categories used by the Bureau of the Census. Table 3 displays that data.

Table 3

Occupation Categories

	Missing	1	2	3
Mothers (n=31)	6.1%	15.2%	9.1%	15.2%
Fathers (n=18)	0	5.6%	22.2%	11.1%
Minnesota	-	23.0%	30.2%	13.9%

	4	5	6	Homemaker
Mothers	0	0	0	54.5%
Fathers	0	16.7%	38.8%	5.6%
Minnesota	5.8%	11.4%	15.7%	

Occupation Classifications (Bureau of the Census, 1980)

1 = Managerial and professional specialty occupations

2 = Technical, sales, and administrative support

3 = Service occupations

4 = Farming, forestry, and fishing

5 = Precision production, craft, and repair

6 = Operators, fabricators, and laborers

It can be seen that over half the mothers were full time homemakers, along with one disabled father. Fathers in the group primarily worked in categories five and six which includes mechanics, repair persons, construction, machine operators, assemblers, motor vehicle operators and freight, stock and material handlers. This distribution is typical of the geographic area served by the Project but is not typical of Minnesota in general.

Income

Parents' income is reported in combined form for married couples on Table 4. The greatest proportion of families earn $15,000 or less. This is the population targeted by the original funding population. Median family income in 1981 for the county was $29,215; $23,230 for the state.

Table 4

Parent's Income

	Public Assist.	to $15K	$16K-$25K	$26K-$35K	$36K-$45K
Single Mothers (n=13)	53.9%	30.8%			
Two-parent (n=18)		61.1%	11.1%	11.1%	11.1%

Children

Programming for children began in January of 1984. Admission criteria included established risk, biological risk up to twelve months, or 20% delay in one or more developmental domains.

Age

Table 5 shows the distribution of children's ages at the time of their admission. Children generally were just past two at admission with the largest group age three or older.

Table 5

Age at Admission (n = 31)	
to 12 mo.	19.4%
13 - 24 mo.	19.4%
25 - 36 mo.	25.8%
=, > 37 mo.	35.5%
Mean age at admission	27.6 mo.

The month of May was chosen to provide a representative sample of the distribution of children's ages in Project Dakota. Table 6 shows the yearly distribution by age.

Table 6

Age Distribution for May of Each Project Year

	1984 n=15	1985 n=21	1986 n=19
to 12 mo.	13.3%	4.8%	0.0%
13 - 24 mo.	20.0%	14.3%	20.0%
25 - 36 mo.	33.3%	19.0%	15.0%
37 - 48 mo.	33.3%	28.6%	20.0%
+48 mo.	0.0%	33.3%	45.0%

In May of 1984 the program had not yet filled. By 1985 81% of the children were over age two and this remains the same in 1986. The absence of children under one year in 1986 was unexpected and could not be controlled.

Handicapping Conditions

Childrens' primary and secondary handicapping conditions are shown in Table 7. The greatest proportion of children had delays or disorders of language as a primary condition. It had been projected that only 14% would be speech and language impaired while 33% would be developmentally delayed.

Table 7

Primary Handicapping Conditions (n=31)

Motor	22.6%
Lang	41.6%
General delay/MR	35.5%
Pers/soc	0

Eighty-four percent also had secondary handicaps. Disordered or delayed personal/social skills accounted for the largest proportion of secondary handicapping conditions (Table 8).

Table 8

Secondary Handicapping Conditions (n=31)

Motor	9.7%
Lang	9.7%
General delay/MR	19.4%
Pers/soc	45.2%
None	16.1%

Severity of Handicaps

Staff used pretest assessment results to assign each child a severity of handicap level for each domain. This practice differs from the standard method of assigning a child to a single severity level. The multiple levels avoid the confounding which occurs when all domain scores for the child are analyzed in the level of his/her lowest functioning. A mild handicap was defined as falling 20% to 39% behind age expectations, Moderate - 40% to 59% delayed, Severe - 60% or more delay. Table 9 displays the distribution of handicaps. "At risk" designations may be due to prematurity, health, or environmental factors. "None" indicates those children neither at risk nor having qualifying delays in that domain.

Table 9

Pretest Severity Groupings (n=31)

	n=	None	At Risk	Mild	Moderate	Severe
Personal/Social	31	19.6%	9.7%	58.1%	12.9%	
Adaptive	31	35.5%	29.1%	25.8%	9.7%	
Gross Motor	31	12.9%	19.4%	51.6%	9.7%	6.5%
Fine Motor	31	41.9%	16.1%	35.5%	6.5%	
Recpt.Language	20	25.0%	35.0%	15.0%	25.0%	
Expres.Language	20	25.0%	20.0%	20.0%	30.0%	5.0%
Communication	31	9.7%	9.7%	45.2%	35.5%	
Cognition	20	20.0%	30.0%	35.0%	15.0%	

Over four fifths of the children were at risk or showed handicaps in personal/social skills (81%), Gross motor (65%) receptive (75%) and expressive language (75%), communication (90.%), and cognition (80%).

Program Tenure

Children remained in Project DaKota an average of 17 months. The distribution of their tenure is shown in six month intervals in Table 10.

Table 10

Tenure: Admission to Termination (n=31)

0 - 6 mo.	6%
7 - 12 mo.	30%
13 - 18 mo.	27%
19 - 24 mo.	21%
=, > 25 mo.	15%

Mean = 17.03 mo., n=31

Children terminated for a number of reasons; moved out of area, achieved age norms, reached public school eligibility.

Ages at Pre and Posttests

Table 11 displays the proportion of children in age intervals at the time of their pre and posttests.

Table 11

Proportions of Children in Age Intervals (n=31)

	Pretest	Posttest
to 12 mo.	15%	6%
13 - 24 mo.	15%	15%
25 - 36 mo.	30%	30%
37 - 48 mo.	33%	39%
49 - 60 mo.	6%	30%

Mean age at pre 31.9 mo.

Mean age at post 42.9 mo.

CHAPTER III

Evaluation of Model Implementation

This chapter will present data describing the implementation of the model developed by Project Dakota. This data covers the parent-staff collaboration in planning individualized intervention programs, the implementation of the planned intervention, use of service menu options, and staff roles as providers of direct service and consultants to the family and community.

Parent and Community Participation in Planning and Implementation

Project Dakota's goal of responding individually to each child/family necessitated changes in staff practices for planning individualized programs. The following will introduce these staff procedures, data collection methods, and how they were used to evaluate parent-staff participation.

Method and Procedures

Step 1. Prior to annual and quarterly assessment parents completed an open ended needs assessment form called Family Assessment Focus (Appendix A). In it they were asked what their child needed help doing, what they wanted the child to learn, what their child enjoyed best, what problems they were experiencing, and what kinds of assistance they wanted as parents.

Program evaluation used this information to examine the proportion of parents' needs and concerns addressed by the intervention program as a measure of program responsiveness to parents.

Step 2. The parent/staff discussion following their joint assessment of the child was structured in three segements:

(a) listing the child's strengths, abilities and interests;

(b) detailing child/family needs, problems, and concerns; including family interactions in the functional areas of feeding, motivating the child, communications and the child's ability to organize, control and direct their body and behavior;

(c) conclusions: parents were asked to identify what they see as over-riding issues, impressions, or priorities;

During this discussion a staff member used a large sheet of poster paper to record the gist of each statement along with the contributor's initials. This procedure served to create a record of "who said what" during the conference as well as maintain an ongoing focus for the discussion. The poster size record was recopied by another staff member onto the Post Assessment Discussion form (see Appendix B) for inclusion in the child's record. Agreement between the poster size records and post assessment discussion form was found to be 87.3%.

Program evaluation used this information to examine relative participation of parents and staff and to examine the proportion of parents' needs and concerns included in the program plan.

Step 3. In this step the Individual Program Plan (IEP) was written. Based on the post assessment discussion goals were determined by parents. These were supplemented as needed by staff.

Methods used to reach the goals were termed strategies. Project Dakota used strategies to establish what are commonly called objectives and methods. The originator of each goal and strategy were recorded on the IEP form. Strategies were carefully devised to fit families' daily routines and fit comfortably into parents' styles and typical interaction patterns of family members.

Decisions as to who would carry out the strategy were recorded, i.e. staff would teach mother, who would teach the brothers and sisters and the daycare provider; and in what settings (where) the strategy would be used, i.e. home, daycare center. A sample IEP form is included in Appendix C.

Using all of the above information the relative proportions of parent and staff participation in the IEP and the proportion of parent concerns/needs addressed by IEP goals and strategies were calculated. Additionally, the evaluation procedure examined the who and where data for a picture of the transmission of strategies to other caregivers and settings. This measured diffusion of programming.

Measuring achievement. The proposal specified that objectives (strategies) were defined as achieved when the parent is able to:

(1) identify the child's behavior, and

(2) express its implications for development, and

(3) appropriately carry out techniques, and

(4) demonstrate and release (teach) the technique to other caregivers.

As staff practices became refined items 1 and 2 above were included as part of the selection of goals on the IEP (see Appendix C), while parts 3 and 4 were recorded by staff during followup visits.

All of the evaluation techniques specified by the original proposal were measures of processes rather than objective outcome measures we usually think of for goal achievement. Because goal statements and strategies were intentionally not written in standard behavioral terms - they were parents' statements - objective evaluation of the achievement of Project Dakota childrens' goals can only be made through the standardized assessment tests. These will be presented in Chapter IV

Step 4. Parent-staff consultations were held at least monthly and the IEP could be expanded or ammended (see Apendix C). Consultation records maintained the same procedures for identifying participation and were included in the program evaluation.

During these consultations the IEP strategies were reviewed to determinine if they had been Achieved, Modified, or Rejected. Achieved was defined as used, followed, or completed.

Results

All of the above procedures were in place by Jan. 1985. A formative evaluation of this aspect of the program was performed in July of 1985 covering 21 families for an average of six months each. The results of this examination were used in streamlining recording forms and altering some staff procedures.

The 1986 evaluation sample included 20 families for an average of seven months each. All data was independently compiled by some combination of two of the following: a Project staff member, a staff member from another early intervention program, a Project intern, and the evaluator. Reliability checks showed 92% agreement.

Data from the 1985 and 1986 samples will be compared in the following presentations.

Participation in discussion of child strengths. Parents and staff jointly discussed the information resulting from assessment. Their participation was recorded. Table 12 displays the relative contributions of staff and parents when the child's strengths were discussed. The staff role was to encourage parents to thoroughly examine their child's strengths.

Table 12

Post-Assessment Discussion:

Participation in the Identification of Childrens' Strengths and Abilities

	Families	Staff
	(n=21)	(n=3)
1985 Strengths, etc.	54%	46%
	(n=20)	(n=3)
1986 Strengths, etc.	64%	36%

It appears that staff became more adept at encouraging parents to describe their child's strengths, abilities and interests following the 1985 evaluation. In 1986 family contributions showed a range of 48 to 83% (sd. 9.6) of the strengths identified. This indicates that all families were highly involved in reviews of their child's abilities.

Child and family needs/concerns. Parents were encouraged to examine family functioning and interaction with their child in a broad range of day to day activities. Staff supplemented the lists as needed. The proportion of concerns identified by staff dropped from 42% to 32% the second evaluation year (Table 13). One staff member's proportion dropped from 47% to 26%, a clear indication of the shift to focus on needs and concerns as perceived by parents.

Table 13

Post-Assessment Discussion:

Participation in the Identification of Needs and Concerns

	Families (n=21)	Staff (n=20)
1985 Concerns, etc.	58%	42%
	(n=20)	(n=20)
1986 Concerns, etc.	68%	32%

In 1985 families expressed an average of 12 needs/concerns over the six month period. The range was 2 to 21. In 1986 families averaged 9.3 needs/concerns, ranging from 3 to 19.

The Parent Satisfaction Survey (Chapter IV) yielded another measure of the thoroughness of staff in eliciting parent's needs/concerns. This survey was used with 13 early intervention teams supervised by the sponsoring agency. When completing the survey many parents added written comments about their concerns and wishes. Project Dakota and one other team were the only teams having no added concerns or needs. We can surmise that parents served by these two teams felt their concerns had been adequately expressed during the IEP process.

This data appears to indicate that Project Dakota parents feel knowledgable, confident and able to identify their child's needs and comfortable expressing their own concerns.

Conclusions drawn. Examination of the childrens' written records shows that conclusions are general summary statements. Parents usually included an indication of satisfaction with progress and critical issues.

Table 14

Post-Assessment Discussion:

Participation in Conclusions

	Families (n=21)	Staff (n=3)
1985 Conclusions	66%	34%
	(n=20)	(n=3)
1986 Conclusions	82%	18%

Table 14 shows that by 1986 parents were making 82% of these summary statements.

Once conclusions are made about the assessment information and the child and family needs, staff and parents begin planning the intervention program. This results in the Individual Program Plan (IEP).

Goal selection. The first step in constructing the IEP is the determination of goals based on priorities and issues of concern identified by the conclusions.

Table 15

IEP Planning:

Participation in Goal Determination

	Families (n=20)	Staff (n=3)
1986 Goals	83%	17%

During the 1985 sample staff incompletely recorded the contributors of goals. Table 15 shows that in 1986 parents determined 83% of the goals for their child's IEP.

Strategy selection. Strategies are the means by which goals are reached.

Table 16

IEP Planning:

Participation in Strategy Determination

	Families	Staff
	(n=21)	(n=3)
1985 Strategies	43%	57%
	(n=20)	(n-3)
1986 Strategies	40%	60%

In most special education programs selection of methods is the role and responsibility of the professional staff. Table 16 shows this trend, yet parent participation is still relatively high. The range was 9% to 78%, SD21.5.

Overall participation. Table 17 shows the relative participation of parents and staff in the combined processes of discussing the assessment and planning the IEP.

Table 17

Overall Participation

Discussion and IEP Planning

	Families (n=21)	Staff (n=20)
1985 Overall Participation	54.0% (n=20)	46.0% (n=3)
1986 Overall Participation	64.7%	35.3%

The Special Education Literature contains only a few reports of parent participation in program planning. Goldstein, Strickland, Turnbull, and Curry (1980) found parents accounted for less than 25% of total IEP conferenrs contributions. McKinney and Hocutt (1982) reported that approximately one third of parents felt they had helped write the IEP. Brickerhoff and Vincent (1986) developed a model for increasing parent participation and compared their experimental group with an untrained group. The experimental group made 41% of the contributions and 56% of the decisions compared to the control groups' 23% participations rate and 28% decision rate. It appears that Brickerhoff's decision category would be the equivalent to Dakota's conclusions (table 14) and goals (Table 15).

Tables 12 through 17 above show that parents' participation in the IEP process was proportionately large and uniform. This data shows that the planning of the intervention was a parent-staff collaborative process.

By whom and where are strategies carried out. Designation of who is responsible is a common part of the program planning procedure, as is specification of where the activity would take place. In Project Dakota this data was used to record the collaboration of parents and staff in programming and the diffusion of strategies to home and community. Tables 18 and 19 show the extent to which diffusion of programing and

the intervention network was planned in the IEP. Appendix D presents means, standard deviations, and ranges for the 1986 data.

Table 18

IEP Planning: Where Strategies Were Carried Out

	1986
In Home	92%
In Center	19%
In Community	43%

N=20 families, 38 IEP's

The Where data (Table 18) is overlapping showing that the intervention program was carried on simultaneously in several settings. The Who data (Table 19) was collected in a manner allowing discrete analysis in 1986.

Table 19

IEP Planning: Who Will Carry Out the Strategies

	1985	1986
Staff Only	7%	4%
Family Only	56%	41%
Staff + Family		16%
Includes Community	37%	38%
Community Only		2%
Family + Community		16%
Staff + Community		.6%
Family + Community + Staff		20%

1985 - 21 families, 33 IEP's

1986 - 20 families, 38 IEP's

Community sources were solely responsible for only 2% of the strategies. They shared responsibility with families and staff for another 36%. While community settings were seen as a major program element they were not expected to bear the IEP responsibility alone. Table 19 shows the extent of collaborative programming in multiple settings, an aspect of children's learning thought to be essential for skill generalization.

It is interesting to note that staff had exclusive responsibility for only 7% of the strategies in 1985 and this figure dropped to 4% in 1986. Staff and families jointly implemented 57% of the strategies; families, staff and community cooperatively implemented 21%. This is strikingly different than is typically found in Early Intervention Programs.

From the above data it can readily be concluded that Project Dakota provided parents with direct and meaningful participation throughout the intervention process , promoted their acquisition of knowledge skill and confidence to describe their child's strengths, needs, and to carry out the intervention goals and strategies for their child. The data also supports the conclusion that intervention strategies were transmitted to other caregivers and settings and staff supplemented the cooperative efforts of family and community in carrying out the intervention program.

Use of strategies. Staff met with parents at least monthly to examine the IEP for needed changes. They reviewed the existing strategies and recorded their status; Achieved (used), Modified, Rejected. Table 20 shows that in 1986 90% of the strategies written into the IEP were used, while only 3% were rejected.

Table 20

IEP Implementation: Proportions of Strategies Used, Modified, and Rejected

	1986
Strategies Used	90%
Modified	7%
Rejected	3%

N=20 families, 38 IEP's

It was hypothesized that more strategies would be carried out when parents played a larger role in the determination of the goals and strategies. Visual examination of family summaries appears to substantiate this hypothesis, however there were so few families with even relatively low participation rates that statistical analysis of this relationship was not performed.

The modification and rejection options are critical when responsibility for completion of the program plan is largely in the hands of the family and community. This flexibility was in operation during 1985 but staff did not systematically recheck and record this information. Given the extensive involvement of nonprofessional persons in carrying out the program, the recheck operation by staff would appear to be an important procedure.

The extremely low modification and rejection rates can be interpeted as an indicator that the program was carefully and thoughtfully planned to accomodate a wide variety of situations and complexities and to comfortably fit family routines and interaction styles.

Achievement of goals. Goals were not written in standard behavioral terms so that achievement was a subjective judgement. Staff considered a developmental goal as being acheived only when age appropriate behavior was consistently observed, a very conservative quideline. They recorded this on only 3.6% of the goals, progress was recorded on 96.4%.

The Individualized Service System

One of the unique aspects of the Project Dakota Model is its overlapping service menu which allows parents to simultaneously participate in in-center, home-based, and community-based services. The model delivers tailored services based on parents' needs and priorites. The service menu offered many choices. Nearly all families drew from all three categories of service and made choices regarding:

(a) The family: who will be included, where will staff meet/talk with family, time of day, and frequency of contact.

(b) Center-Based services: parent-child play groups, staff-child group or individual contact, and family/parent individaul or group contact.

(c) Community-Based services: type, location, and the facilitator's role in these services.

For example, Tim attends the in-center child groups once a week as well as a local nursery school two mornings a week. The facilitator observes and assists in Tim's nursery school every week. The facilitator comes

to the family home once a month for consultations with Tim's mom and dad. Appendix E shows the full range of options.

Parents' Choices of Service

Tables 21 through 24 present information detailing parent's choices from the service menu for their own needs and for intervention service for their child. The following data examines parent's use of these options. Data was derived from clients IEP's and a computerized system of monthly reports of staff utilization of time. Much of this data shows some month-to-month variations. For purposes of evaluation the month of May of each program year was chosen for comparison. The year-to-year changes reflect parent's individual choices from the service menu as well as evolution in the program philosophy. In May of 1984 n=15, May 1985 n=21, May 1986 n=19.

Individual Service. Table 21 compares family choices of where and how frequently they had individual one-to-one service from staff. It can be seen that home visits remained the core of the intervention program regardless of the decreases in incenter groups and increases in group and community-based services.

Table 21

Parents' Choices for Frequency and Location of Parent-Staff Contact

	May 1984 n=15	May 1985 n=21	May 1986 n=19
Weekly home visit	18%	19%	21%
Bi-weekly home visit	5%	10%	37%
Monthly home visit	24%	38%	26%
Quarterly home visits	35%	0%	0%
With parent in community	0%	0%	11%
With parent in center	18%	10%	16%

Quarterly (every three months) home visits show up only in 1984 when service to children was largely incenter four-day-a-week programing. Home visits became more frequent in 1985 and 1986. It will be seen that during these years greater proportions of children were served in community-based settings.

During 1986 the option "with parent in community" is seen. "Parent in community" represents a parent-staff consultation in an environment such as the child's nursery school, a working parent's lunch hour, or a parent-staff session with the child at a local playground, store or library.

Group, Center-Based Services. The data in Table 22 presents evidence of Project Dakota's reduction of service in the specialized, segregated incenter preschool. This chart should be considered along with Table 23 showing the community-based service options. Taken together it can be seen that Project Dakota made a dramatic shift from incenter based service for children in 1984 to integrated community-based service.

Table 22

Percent of Parents' Choosing Among Various Incenter Group Service Options

	May 1984 n=15	May 1985 n=21	May 1986 n=19
Children's group 4/wk*	35%	10%	0%
Children's group 3/wk*	0%	0%	0%
Children's group 2/wk*	18%	33%	11%
Parent/child grp. 2/wk.	12%	0%	0%
Parent/child grp. 1/wk.	0%	0%	37%
Parent/child grp. 2/mo.	0%	0%	0%
Parent child grp. 1/mo.	0%	14%	0%

* Peer tutors from a neighborhood elementary school participated in a portion of each session.

In these parent-child groups intervention is delivered to small groups of parent-child pairs not just to groups of children. This allows the parents to observe their child, other children and to get to know other parents.

Community-Based Services. Table 23 shows those community settings where the childrens' written intervention program (IEP) was being carried out. Families frequently participate in more than one community-based option.

Table 23

Percent of Parents Choosing

Community-Based Service Options

	May 1984 n=15	May 1985 n-21	May 1986 n=19
Childrens' Groups			
Nursery/preschool	12%	30%	53%
Family daycare	0	10%	26%
Neighborhood play	0	30%	42%
Church group	0	0	11%
Recreation or skill	0	0	11%
Parent/Child Groups			
Community Parenting Program	0	10%	16%

In 1985 there was a substantial increase in the proportion of families choosing community-based integrated program settings; in 1986 this trend continues to the 100% level. These increases correspond with expansion in the diversity of options for parents. Recreation or skill programs included lessons such as swimming or tumbling. An additional 23% of the children spent time with kindergarten tutors. Clearly all of the above data shows that Project DaKota used natural and community settings for intervention.

Referrals to Community Resources

One of the staff roles was to locate community services for children and families. Staff recorded each referral in a master log, identifying the child or family and purpose. A limitation of the data is that it cannot be determined how many referrals were completed by parents. Referrals are shown in Table 24.

Table 24

Referrals to Community Resources: Mean per Child and Proportion of the Total: 1985-1986 (n=31)

	Medical	Financial	Early Childhood
Per Child	1.0	.02	4.0
Proportion	13.58%	3.64%	45.36%
	Respite/Child Care		Transition
Per Child	.7		1.2
Proportion	6.62%		14.90%
	Parent Support		Parent Ed/Info
Per Child	.5		.9
Proportion	5.63%		10.30%

Note. In compiling this data a resource was counted only once even if noted several times for the same child.

Nearly half the referrals were for community-based Early Childhood Education (ECE) programs as a part of children's IEP's for purposes of contact with nondelayed peers. Transition referrals are those made when the child moves from this program to others. On the average clients were given 8.53 referrals during their average tenure of 15.7 months.

Thirty-four other children were part of the program for a lesser period of time. Their tenure was short for reasons such as family moves or that the child showed only minimal delay and may not have qualified for program admission after the assessment was completed. Predictably, a sample of these short tenure families and children shows differing rates of referral in most categories. However, referrals for financial aid were approximately three times higher (.63/child). Referrals to other programs occured for every child of this group. This may indicate that all were referred to other, possibly more appropriate programs.

All of the above data is evidence of very extensive interagency coordination with community agencies and the provison of information to parents enabeling them to make appropriate use of available community options.

Staff Role and Function

Implementation of intervention services in community settings and parents' use the overlapping options of the service menu brought about changes in staff roles and their use of time; staff became consultants to each other, to parents and to those providing community-based services.

The data on staff roles/services presented in Tables 25 through 28 was collected by means of a computerized system. The supervising agency, DaKota, Inc., provided the following monthly data sorted by child and by individual staff persons: time per child; service type (what: direct, consultation, assessment); service location (where: home, center, community site); persons involved in the service (who: staff-child, staff-parent, staff-community resource, staff-parent-community resource, staff-staff); cost per unit of time (a unit was defined as 15 minutes of service. Examples of the computerized record keeping system are shown in Appendix F. This system accounted for 90% of each staff person's time, another 5% was predetermined in-service time and 5% other organizational tasks.

Staff in Direct Service and as Community Consultants

One of the Project goals - to encourage the transmission of intervention strategies by parents to other caregivers and other settings - necessitated that staff expand beyond the traditional direct service role to include acting as a consultant.

Table 25

Mean Percent of Staff Time

in Direct and Consulting Service

	1984 n=3	1985 n=3	1986 n=3
Direct	48%	28%	24%
Consulting	37%	54%	64%

Note. This data was collected for each month of 1985 and 1986 but only part of 1984. See Appendix G.

Table 25 depicts what role the staff are performing, comparing time spent as consultants to time as direct service providers. An

Analysis of Variance procedure showed that changes in direct service over time were statistically significant (F=7.39, df2,7, p=.018) while those in consulting approached significance (F=3.92, df2,7, p=.07). Periodic probes of the monthly records showed a substantial shift in these proportions during Fall of 1985 (Appendix G). Month-to-month variation is small.

The increase in consultation time represents both the increased implementation of the transdisciplinary model and the use of staff in consultation with community service providers. Decreases in direct service represent the program committment to involving family and community in the intervention program while providing specialized professional assistance only as needed. Staff no longer spent the majority of their time directing an incenter classroom. This change occured at no expense to time with families and children as can be seen in the charts of <u>where</u> they are being served (Table 26) and <u>who</u> is receiving service (Table 27).

<u>Staff Time in Community and Home Settings</u>

Staff at Project Dakota delivered intervention service in homes, in the community, and incenter. Incenter time included transdisciplinary consultation, recordkeeping, telephone calls to parents, ECE providers, and referral sources, preparation, as well as incenter direct and consultive services to children and families. In 1984 staff spent 78% of their time incenter, 1985 - 69%, and in 1986 - 67%.

Table 26 presents staff time in homes and in the community. In these two settings they were providing direct or consultive services to clients.

Table 26

<u>Mean Percent of Staff Time Used for Intervention in Client's Homes and in Community Settings</u>

	1984 n=3	1985 n=3	1986 n=3
Community	6%	8%	11%
Home	16%	23%	22%

<u>Note.</u> This data was collected for each month of 1985 and 1986 but only part of 1984. See Appendix G.

This data can be taken as evidence that staff increasingly delivered service in the least restrictive settings.

While in the community staff played a number of roles: full or partial assistance to children, consultation with community ECE providers, observing children's functioning in these settings, or encouraging informal neighborhood play groups.

Who Received Service

Table 27 represents who was receiving service from the staff. It differs from Table 26 above which only recorded where intervention service occurred.

Table 27

Mean Percent of Staff Time

with Families and Community Providers

	1984 n=3	1985 n=3	1986 n=3
Family	15%	38%	39%
Community Providers	4%	7%	9%

Note. This data was collected for each month of 1985 and 1986 but only part of 1984 (Appendix G).

The above figure presents a clear trend toward increasing the committment of staff time with both families and community resources. Time with families more than doubled as the model developed. Time with community resources also showed an increase more than double but never-the-less occupied less than 10% of staff time. This relatively small amount of staff time brought tremendous changes in childrens' contact with normal peers which increased from a mean of 5 hours/wk/child to 18 hours/wk/child, a gain greater than threefold (see Chapter IV).

Transdisciplinary Consultation

In the transdisciplinary model of team structure, implementation of specific children's programs is predominately carried out by one staff member. It is an assertion of Project Dakota staff that the transdisciplinary approach enabled them to deliver services in the community.

Table 28

Mean Percent of Staff Time

in Transdisciplinary Consultation (n=3)

	1984	1985	1986
Intra Staff	39%	32%	26%

Note. This data was collected for each month of 1985 and 1986 but only part of 1984. See Appendix G.

The amount of staff time spent doing between-staff consultation (transdisciplinary) decreased 13% between 1984 and 1986 (Table 28). Periodic probes of this data (see Appendix G) show that the decrease occurred during mid 1985. The 1984 data may show the efforts of a staff adopting a new approach. It is also possible that their earlier interdisciplinary method used more staff time than did the transdisciplinary. It must be noted that 26% of staff time (1986 data) represents about six hours per week usually taken in 15 to 30 minute segments by pairs of staff.

This chapter has presented information describing the implementation of the Project Dakota model. The data suggest that the model was fully implemented in terms of parent and community participation in planning and carrying out the intervention, and changes in staff role and function.

CHAPTER IV

Measures of Program Outcome

The preceding chapter presented data describing processes involved in implementing the Project Dakota Model. This chapter will describe child change outcomes as measured on standardized tests; children's contact with and changes in peer interactive behavior; outcomes for parents, the proportion of family needs/concerns addressed by the program, parents' evaluation of the program; evaluation by community-based service providers; and costs of Project Dakota.

Child Change as an Expression of Program Impact

The presentation and interpretation of changes in children's standardized test scores is not a simple subject. While it sounds like it should be simple, i.e., post score minus pre score = child gain, the interpretation of child change must be most cautiously approached. Some methodological issues needing consideration are: what test was used to measure gain, how was the data collected, what handicaps did the children have at the beginning of the intervention, what were the levels-of-handicap, what was the duration of the intervention, and how did children and parents in this program compare to any other samples. Integral to the question of interpreting children's gain are two major questions:

1. What amount of gain is adequate in order to judge an intervention program to have been effective? i.e., how do the gains compare to some standard or expectation? Is statistical significance a sufficient expression of effectiveness?

2. What gains might have been expected to occur without any intervention, i.e., which are maturation-related gains and which are intervention-related gains?

The evaluation questions guiding the analyses of Project Dakota test data were the following: What score changes occured? How do these compare with published data on effectiveness, e.g. statistical probability, Effect Size, Efficiency Index, Proportional Change Index? What score changes can be attributed to the intervention, and how probable are those changes?

A number of widely accepted methods of expressing program impact on child change were employed in this report. They are presented here with their formulae, strengths and weaknesses. Throughout this discussion the following abbreviations will be used: DA = developmental age, age equivalency score; CA = chronological age; Pre = pretest; Post = posttest.

Statistical Analysis of Pre to Post Change

In this commonly used method, the difference between pre and post group mean scores is analyzed by means of a correlated or paired t test. The result is an expression of the probability that the score differences are a chance event, i.e., might have occurred, in a universe of samples, without intervention. Probabilities of .05 (5 out of 100 samples) and .01 (1 out of 100) are commonly selected. The difference between pre and post scores, i.e., gain, is some undetermined combination of maturation-related gain and program-related gain and probability of the pre-post difference does not adjust for ongoing developmental gain we know is occuring. Statistical analysis can only be applied to group data.

Bagnato & Neisworth (1980) Intervention Efficiency Index (IEI)

The IEI shows months of developmental gain for each month in the program. Interpetation of IEI assumes that normally developing children will show one month developmental gain for each chronological month. The calculations can be performed on group data or on individuals.

IEI = (Post DA - Pre DA) divided by (Post age - Pre age)

In this formula pre-to-post gain is expressed by a ratio of time between the pre and post tests (usually called time in program). Without intervention this formula for handicapped children frequently yields scores as low as 0.5, or a half month gain for each month in time. With increasing age this figure may be even lower. Ideally intervention programs strive to accelerate developmental gain so that the IEI approaches or exceeds one.

The IEI reveals its disadvantages when children are ill for periods of time between pre and post testing and, though enrolled in the program, are unable to benefit from the intervention. Its advantage is

of understanding because it is anchored in the concept of change per month.

Proportional Change

Woolery (1983) introduced the Proportional Change Index (PCI).

PCI = [Post DA -Pre DA/Time in Program] / [Pre DA/PreCA]

The result is a ratio of developmental rate while in the program to developmental rate described by the pre test. If PCI was 1.5 then development accelerated to one and a half times its previous rate. PCI can be used on indivdual scores. It is highly regarded in the field and gets closer to separating the effects of maturity and intervention than does the simple IEI. However, there is no established standard for interpreting values of PCI.

Glass, McGraw & Smith (1981) Effect Size (ES)

This formula is used with group data only. The ES is essentially a z score. A z score is a standard score which allows the comparison of scores which have been obtained on different instruments. Z scores the reader may be familiar with are found in the definition of mental retardation (more than 2 s.d. below the mean, or -2 z score units) and, for some states, in the criteria used to qualify children for compensatory services, e.g., more than 1.5 s.d. below the mean (-1.5 z score units). Effect Size has been widely used in recent years to evaluate the compensatory and remedial education programs. The impact of early intervention programs is being compared by means of effect sizes by researchers White and Casto at the Utah State University.

In the ES formula the mean difference (gain) in children's scores is divided by the groups' standard deviation. The result is a ratio of gain to group variation.

ES = [Post DA - Pre DA] divided by Pre standard deviation

An effect size of one quarter (.25) to one third (.33) is interpreted as expressing positive program impact. For most educational programs it is suggested that an ES of .38 represents "important and clinically significant effect" (White, n.d.).

Although it is easy to see how ES can be used for evaluation and comparison, it is difficult to conceptualize what it represents in concrete terms.

Use of the standard deviation is one weakness of this method. If the group is very diverse, the divisor will be large and it will take a much larger gain figure to result in large effect sizes; when a group is homogeneous, a smaller gain may still yield high effect size.

Another problem with ES is the length of intervention. This formula could result in a higher effect size if time between pre and post test were 2 years rather than 9 months. In remedial school programs the uniformity of the school year acts to standardize findings, (virtually all are 9 months in duration). We cannot make this assumption in early intervention. The White & Casto findings do not identify intervention duration in reporting their findings.

Methods of Identifying Maturity and Intervention Effects

The assumption of constant rate of development

Two methods to identify the separate effects of maturity and intervention were found in the early intervention literature. Irwin & Wong (1974) developed a method called the Age-Compensated Score (ACS) and Oelwin, Fewell, & Pruess (1985) have presented a parallel method called Predicted Performance Age (PPA). Both methods presume that each child would have continued to develop at their pretest rate. However, the developmental rate of a handicapped child cannot be predicted with absolute certainty.

For example, children affected by Down syndrome frequently have a near normal rate of development up to about 8 months; from then on development slows and shows significant decrement by the age of language emergence. If a child with Down's syndrome enters a program at 3 months, score-based predictions of maturational development are likely to be very high and it will be difficult to snow any intervention-related effects.

Typically, the developmental rate of a child functioning below normal expectations will decline over time (Irwin & Wong, 1974). Thus, predictions based on developmental pre-scores are likely to be conservative for most children with handicaps. The application of these

formulae must be made judiciously if the sample is composed of very young children.

Predicting Maturity

Irwing and Wong's ACS formula results in a mathematically adjusted post test score: The predicted effects of maturation (duration of programming times pre developmental rate) are subtracted from the achieved or actual post score. The result is a maturation-free post DA they term Age Compensated Score (ACS).

ACS = post DA - [(post CA - pre CA) x (pre DA/pre CA)]
or post score - [duration of programming x pre development rate]

Oelwin, Fewell, & Pruess (1985) use a similar method to adjust for maturation. However, their formula adds the predicted maturity to the pre DA and results in an adjusted post score called Predicted Performance Age (PPA) .

PPA = pre DA + [(post CA - pre CA) x (pre DA/pre CA)]
or pre score + [duration of programming x pre rate]

Intervention Effects

Having accounted for maturity by means of predictions based on the Pre developmental rate, the nonmaturity-related portion of the pre-post difference can be considered effects due to the intervention program, i.e., intervention-related gain (IRG).

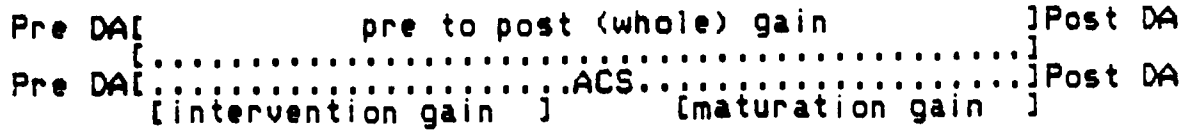
Pre DA.....ACS.....Post DA
[intervention effect] [maturation effect]

Pre DA.....PPA.....Post DA
[maturation effect] [intervention effect]

The mean ACS and Pre DA (or Post DA and PPA) can then be compared in statistical tests of intervention-related effect. These will yield a probability of achieving the maturation-free, intervention-related score differences. Next, the proportions of overall gain attributable to maturation and intervention can be examined.

Proportions of Maturity and Intervention-Related Gain

A comparison of the relative contributions of maturity and intervention can now be made. Recall the logical assumptions: the pre to post difference is composed of a predictable maturity-related proportion; the nonmaturity-related proportion can be considered effects due to the intervention program.



It can be seen that maturity-related gain (MRG) is equal to whole gain (WG) minus intervention-related gain (IRG). In order to find its proportion of whole gain, intervention gain is divided by whole gain.

IRG/WG x 100 = IRG proportion (%)

100% - IRG% = MRG%

or,

MRG/WG x 100 = MRG proportion (%)

For example, in the social domain the pre to post whole gain was 11.62 months and the IRG is 2.64 months.

2.64 / 11.62 x100 = 22.7% IRG.,

100% - 22.7% = 77.3% MRG

or,

11.62-2.64 = 8.98 months MRG;

8.98/11.64 x 100 = 77.3% MRG.

In the social domain, maturity accounted for 77% of the gain while 23% can be attributed to the intervention program.

Dakota's Testing Procedures

Systematic standardized testing of children was initiated in October of 1984 using the Gesell Developmental Schedules. In August 1985 post tests for the eleven outgoing clients were administered using the Gesell. After September 1985 the Battelle Developmental Inventory was administered to all children at entry and exit. Figure 1 diagrams this change and the testing schedule.

Gesell		Battelle	
Oct. '84	Aug. '85	Sept.'85	May '86
Pre----------Post		Pre----------Post	
n=11		n=20	
Inter rater agreement = 95.3%		Inter rater agreement = 94.9%	

Figure 1

Scheme of Pre, Post, Gesell and Battelle Testing

Figure 1 also reports inter-rate reliability figures obtained on 20% of the tests by comparing the independent scoring of two staff members. Overall reliability was 95.1%.

Scores will first be reported separately for each program year, '84-'85, '85-'86. Children whose scores are reported in the '84-'85 group are NOT included in the '85-'86 group in this set of analyses because their scores were from different tests. Between-group examinations of both the pre and post scores of each subtest show no statistical differences between the '84-'85 children and those in the '85-'86 group.

Impact for Each Year: T Tests, IEI, PCI, & ES

Pre to Post Score Differences

Table 29 shows mean Pre and Post scores, differences between them (gain), and the resulting t statistics for the eleven children having Gessell pre and posttests from '84-'85. The gain here is not adjusted for expected maturity. These children were an average of 35.73 months old (s.d. 13.43) at the pre test, and 44.73 mo. (s.d. 13.79) at the posttest.

Table 2[illegible]

1984-85 Gesell Developmental Schedules Pre and Post Scores

	n	Pre Months	s.d.	Post Months	s.d	Difference Months	Corr. t
Pers/Soc	11	29.27	12.11	37.[illegible]	16.71	8.09	3.55*
Adaptive	11	30.36	13.70	39.64	15.67	9.27	8.10*
Gross Mot	11	24.36	9.36	35.82	13.34	11.45	6.61*
Fine Mot	11	27.18	11.29	39.09	15.53	11.91	5.58*
Communic	11	26.55	11.34	36.55	15.00	10.00	7.24*

$p < .000$

The average difference - across all developmental domains - was 10 months achieved during an average of 9 months between pre and post tests. All differences were statistically significant at probabilities <.000.

Table 30 shows the Pre and Post scores and t statistics from the comparison of differences for the 20 children having pre and posttests on the Battelle in 1985-86. These children were an average of 34.6 months old (s.d. 13.9) at the pretest, and 41.95 mo. (s.d. 13.35) at posttest.

Table 30

1985-86 Battelle Developmental Inventory Pre and Post Scores

	n	Pre Months	s.d.	Post Months	s.d.	Difference Months	Corr. t *
Pers/Soc	20	25.40	13.73	35.00	13.07	9.60	12.89*
Adaptive	20	29.85	14.69	39.50	15.86	9.65	10.78*
Gross Mot	20	27.00	15.04	35.20	16.87	8.20	8.30*
Fine Mot	20	31.30	16.29	39.55	14.11	8.25	7.31*
Recpt. La	20	24.45	11.17	35.40	14.04	10.95	7.46*
Exp. Lang	20	23.10	12.45	31.25	14.33	8.15	6.65*
Communic	20	24.10	11.55	32.80	13.75	8.70	7.20*
Cognition	19a	27.10	12.34	35.35	13.33	8.25	9.9*

* p = <.000

a The cognition subtest was not administered to one child

The average difference for these 20 children was 8.96 months achieved during the average pre to post duration of 7.35 months. All differences were statistically significant at probabilities <.000.

Intervention Efficiency (IEI)

From the summary figures cited above it is easy to predict that IEI - childrens' gain per month of programming - was slightly greater than one. IEI is displayed for both program years in Table 31.

Table 31

Months of Developmental Gain for each Month in The Program:

The Intervention Efficiency Index (IEI)*

	1984-85 n = 11 IEI	1985-86 n = 20 IEI
Pers/Soc	.90	1.31
Adaptive	1.03	1.31
Gross Mot	1.27	1.12
Fine Mot	1.32	1.12
Recpt.Lang		1.49
Exp. Lang		1.11
Communic	1.11	1.18
Cognition		1.14

* Bagnato & Neisworth (1980)

The average IEI for '84-'85 was 1.1 and 1.2 for '85-'86.

Proportional Change

The Proportional Change Index (PCI) expresses changes in the developmental rate. Table 32 presents PCI for both program years.

Table 32

Change in Developmental Rate: The Proportional Change Index (PCI)*

	1984-85 n = 11 PCI	1985-86 n = 20 PCI
Pers/Soc	1.10	1.78
Adaptive	1.20	1.52
Gross Mot	1.86	1.44
Fine Mot	1.74	1.24
Recpt.Lang		2.11
Exp. Lang		1.66
Communic	1.35	1.69
Cognition		1.46

The average PCI for '84-'85 was 1.4

The average PCI for '85-'86 was 1.6

* Woolery (1983)

The above table shows that during programming the developmental rate accelerated an average of one and a half times.

Effect Sizes

The meta analysis work of White & Casto at Utah State University provides effect size (ES) findings which can be used as a standard of comparison for program impact:

- Early intervention programs for handicapped children ES = 0.56;
- Where parents had high participation ES = 0.41;
- Where parents had minor or no participation ES = .42;
- Where the intervention program had low or no structure imposed by the curriculum ES = 0.30;
- Where the intervention program had high curriculum structure ES = 0.47.

The above comparisons were chosen because they provide the most equivalent descriptors: Project Dakota serves handicapped children, it's curriculum was ecological and functional rather than predetermined, the intervention was carried out primarily by families. Comparisons to minor parent participation and high curriculum structure programs are included to provide the reader with contrasts. Table 33 presents the effect sizes for the program years '84-'85 and '85-'86.

Table 33

Effect Sizes (E.S.)*

	1984-85 n = 11 E.S.	1985-86 n = 20 E.S.
Pers/Soc	.67	.70
Adaptive	.68	.66
Gross Mot	1.22	.55
Fine Mot	1.06	.51
Recpt.Lang		.98
Exp. Lang		.65
Communica	.88	.75
Cognition		.67
Mean	.90	.68

*E.S. Glass, McGaw, & Smith, 1981

Each effect size is greater than those found in the University of Utah meta analysis.

Maturity-Free Program Impact: T Tests, Proportion of Intervention-Related Gain (IRG), IRG by Level-of-Handicap, & IR-IEI

In an earlier section methods for the calculation of maturity adjusted (ACS) and predicted post scores (PPA) were reviewed. The following sections will present impact data separating the effects of maturity and intervention derived from the use of these formulae. Calculation of the ACS and the PPA both involved a prediction of expected development based on a pre DQ ratio multiplied by the number of months between pre and post tests. Because use of the ratio DQ eliminates the need to separate scores from the Gessell and Battelle tests, the following presentations will combine data from both tests allowing a sample size of 31. Comparison of pre and post scores between the two test groups shows no statistically significant differences. Confidence in combining data from the two tests is bolstered by the correlations between test scores of 11 children administered both the Gesell and Battelle tests within one month. Table 34 presents the very strong relationships found between children's scores on the two tests. The Person Product Correlation was used in the between-test analysis.

Table 34

Gesell Battelle Between-Test Correlations (n=11)

	BATTELLE					
	Pers/Soc	Adaptive	Fine Motor	Gross Motor	Cognition	Communication
GESELL						
Per/Soc	.96*					
Adaptive		.88*			.98*	
Fine Motor			.99*			
Gross Motor				.98*		
Language						.99*

	Rcpt Lang	Exp Lang
Language	.99*	.99*

* p=<.001

Table 34 shows a statistically significant relationship between children's scores on the adaptive subtests of the two test instruments. Despite this score similarity, items on the Gesell adaptive subtest do

not examine the same skills as those on the Battelle adaptive subtest. Gesell adaptive items have greater similarity to those found in the Battelle cognitive subtest and the between-test score correlation is also higher (.98 vs .88). In the following analysis outcomes from the Gesell adaptive and Battelle cognitive subtests are pooled and considered cognitive.

Intervention-related effects

Table 35 shows pre and adjusted post score (ACS) differences for each subtest. These differences are maturity-free child gain. The following analysis could have been performed using PPS; in this case, the statistical comparison would have been between the predicted PPS and the post score, as it is this proportion of overall difference which is intervention-related.

Table 35

Pre-Post Score Differences Using Maturity-Free Post Scores

	N	Pre mean	s.d.	ACS mean	s.d.	Diff.	s.d.	Tvalue(df)	p=
Social	31	24.48	11.49	27.13	14.64	2.64	7.31	2.02 (30)	.050
Adaptive	20	29.85	14.69	33.49	15.57	3.64	3.69	4.43 (30)	.000
Gross Mot	31	23.84	11.10	26.87	13.96	3.03	7.27	2.32 (30)	.027
Fine Mot	31	27.07	12.39	30.47	13.82	3.40	5.58	3.39 (30)	.002
Rec Lang	20	24.45	11.17	30.07	14.25	5.62	7.01	3.55 (19)	.002
Exp Lan	20	23.10	12.45	26.71	13.96	3.61	5.01	3.22 (19)	.004
Communic	31	22.55	10.09	25.88	13.62	3.33	7.19	2.58 (30)	.015
Cognition	30	25.00	11.38	27.71	12.99	2.71	4.76	3.11 (29)	.004

While it can be seen that most of the gain was due to predictable maturity, comparison of the pre score with the maturity-free post scores found that differences were still statistically significant. The average intervention benefit was 3.65 months developmental gain for the average pre-post duration of 10.97 months. The highest intervention gains were found in receptive language, the lowest in cognition and personal/social.

Proportions of Maturity and Intervention-Related Gain

Table 36 shows the relative proportions of overall gains which are attributable to predictable maturity and that which can be described as intervention-related.

Table 36

Relative Proportions of Gain Due to Maturity and Intervention

	Maturity	Intervention
Soc.	77.3%	22.7%
Adap	62.3%	37.7%
GM	72.6%	27.4%
FM	72.6%	27.4%
Recpt	48.7%	51.3%
Exp	55.7%	44.3%
Comm	70.7%	29.3%
Cog	76.4%	23.6%

This breakdown is valuable in examining program impact on each specific domain. The majority of the children served by Project Dakota had language and communication handicaps and it can be seen that the intervention was most effective in that domain. The intervention had least impact on gross motor and cognitive effects - domains which are understood to be highly dependent on organic maturity. On the average, the intervention was responsible for 33% of the difference showed in children's pre to posttest scores.

Intervention Gains by Level-of-Handicap

One of the long standing questions in early intervention is the relation of level-of-handicap to program gains. Table 37 shows the intervention gains for each domain of the tests stratified by level-of-handicap. Recall that upon entering the program, children were assigned a level-of-handicap for each developmental domain based on test scores, percent of developmental delay and staff clinical judgement. No handicap indicated pre scores less than 20% delayed, at risk indicated pre scores less than 20% delay, but environmental, familial, or health factors could jeopardize future development. Mild delays were 20% to 39%, moderate were 40% to 59%, and delays of 60% or greater were classified as severe. For example, subject 7 was found to be moderately

handicapped in expressive language, mildly delayed in receptive language and cognition, but scored normally in gross and fine motor. The latter two domains were classified as no handicap. Although the social score was also normal, these skills are known to become depressed over time when communication is handicapped, so he was labeled at risk for social skills.

Table 37 shows the intervention-related gains for each domain of the tests stratified by level-of-handicap. At this level of analysis group sizes are too small for generalization of these findings (see Appendix F).

Table 37

Months of Intervention-Related Gain by Level-of-Handicap and Domain

	No Hcp.	At Risk	Mild	Mod	Sev
Pers/Soc	-0.56	-0.54	5.86	1.33	
Adaptive	3.64	2.72	7.11	2.00	
Gross Mot	1.61	3.70	2.95	5.77	.33
Fine Mot	.61	2.91	6.45	6.00	
Cognition	2.63	2.53	3.58	-.76	
Rcpt Lang*	-3.56	.75	11.32	6.83	
Exp Lang	-.62	-2.44	3.89	6.09	.12
Communic.	-1.33	4.65	3.18	4.56	

* $F = 5.68$ (3,16) $p=.0076$

Two-way analysis of variance showed that differences between the maturity-free intervention impact for the levels-of-handicap were not statistically significant, i.e., these differences between levels could have occurred by chance; except for receptive language. This can be interpreted to support the belief that Project Dakota's intervention program was of relatively equal benefit to children of all levels-of-handicap. This is an important conclusion for Project Dakota because all children received high proportions of intervention programming in integrated community settings, a practice widely reserved for those with mild delays.

In four of eight domains, intervention-related gains made by moderately handicapped children were at least six months greater than that predicted by maturity. And in four domains moderately handicapped

children experienced equal or greater intervention impact than the mildly handicapped children.

Children with a moderate cognitive handicap showed no intervention-related gain. The test's ability to predict cognitive maturity may be responsible, but we must also consider to what degree any intervention program can alter substantially impaired cognitive abilities.

Only three children had been classified as having severe deficits. Their intervention-related gain is very low. It is probable that the assumption of a stable rate of development obscures the program benefit.

Examination of mean intervention-related gains for those originally designated as having no handicap (in that domain) show that in some domains childrens' development did not maintain the pretest rate. Reasons for the lack of intervention effect on social, fine motor, and the language areas should be explored. Again, the test's ability to predict is suspect. Fewell and Sandall (1986) found negative differences in every domain for a group of children with Downs syndrome. They suggest that high entry scores of very young children resulted in predicted developmental rates which were unrealistically high. Language and personal/social scores would be very vulnerable to this distortion.

Another interpetation might be that personal/social skills and communication skills are at risk in the presence of other handicaps. It is possible that we should consider all domains at risk when some show delays. This area needs further exploration using methods that separate maturity and intervention effects.

Intervention-Related Efficiency

Table 38 presents results when the maturity-free post scores (ACS) are used in the IEI formula.

Table 38

IEI and Intervention-Related IEI (IR-IEI)

	n	IEI	IR-IEI
Pers.Social	31	1.2	.35
Adaptive	20	1.3	33
Gross Motor	31	1.1	.28
Fine Motor	31	1.2	.31
Recpt. Lang	20	1.5	.51
Exp. Lang	20	1.1	.33
Communication	31	1.1	.36
Cognition	30	1.2	.25
Avg.		1.2	.34

Here too it can be seen that much of the monthly gain was maturity-related. However, we can now say with considerable assurance that these children gained an average of 10 developmental days per month (.34 x 30 days = 10.2 days/month) due to the intervention.

Are Results Comparable?

Tables 29 thru 38 have provided data needed to answer the basic evaluation question: Does this model have an appreciable impact on child change? It appears that children in this model show gains comparable to and greater than those reported for most early intervention model and demonstration programs. Those gains remain highly statistically significant when the predicted effect of maturity is accounted for.

Children's Contact and Interaction with Nondelayed Peers

By May of 1985, the program's second year, 86% of the children received one or more half days per week of programming in integrated settings. In May of 1986, 100% of the children were involved in such programming.

Peer Contact

One of the methods used to evaluate progress toward increased use of natural settings (i.e., community-based, integrated settings) was a record of children's contact with other children. Each month parents reported their child's average hours of contact per week with delayed and nondelayed peers. Nondelayed peers might be neighborhood children,

visitors to their homes, children in nursery schools, daycare, Sunday School, neighborhood yards and playgrounds, etc. but not siblings.

Table 39

Mean Hours/Child of Weekly Contact with Delayed and Nondelayed Peers

	1984 n=15 Hours/wk	1985 n=21 Hours/wk	1986 n=19 Hours/wk
Delayed Peers	4.56	2.67	.95
Nondelayed Peers	5.05	14.03	18.03

Table 39 displays a steep and regular increase in the amount of time children spent with normal peers, and a corresponding decrease in time with delayed peers. A two-way analysis of variance was used to compare the data. This procedure found that differences between contact with delayed and nondelayed peers over time was statistically significant ($F=8.216$, df 1,10, $p=.017$).

The trend toward increasing contact with nondelayed peers was evident by May of 1984 (see Appendix J), the first program year. This was a full year prior to increases in staff-community consulting time and about six months before the incenter peer tutor program was initiated. These data may show that parents' use of community settings increased when they were encouraged to consider nondelayed peer contact as a valuable part of programming.

Table 40

Mean Hours/Week Contact with Nondelayed Peers by Age Group

	1984 n=15 Hours/wk	1985 n=21 Hours/wk	1986 n=19 Hours/wk
to 12 mo.	2	4	N/A
13 - 24 mo.	7	12	6
25 - 36 mo.	12	24	14
37 - 48 mo.	6	24	21
+ 48 mo.	N/A	27	24

Table 40 shows that time with nondelayed children was promoted and supported for infants and toddlers as well as preschoolers. The above data show that contact with nondelayed peers substantially increased for each age group by the second project year. It is understood that there

will always be variation based on individual parent choices. In 1984 there were no children over age four and in 1986 there were no children under one year.

Children in Integrated Settings

Recorded use of integrated settings and hours of contact with nondelayed peers describes the extent of this kind of programming but a measure was sought which might demonstrate its impact.

During the school year '85-'86 a system of observation and evaluation of children's peer interaction skills in integrated setting was piloted. The pilot sample of five children attended a neighborhood preschool with 15 nondelayed children two days per week for two and one-half hour sessions. The children began attending the preschool in September and, beginning in December, a staff member recorded peer-related behaviors for a minimum of twenty 15 second intervals each month (mean = 25.6, range 20 to 54 intervals).

In addition to specific interactive behaviors, a record was kept of who the child was playing with (delayed/nondelayed, peer changes during the interval), the size of the play group, physical distance from peers (<3 or >3 ft.), and the degree (hi/med/low) of teacher- or material-imposed structure limiting children's peer interactions.

Choice of playmates. Major measures of integration and social behavior skill development for handicapped and delayed children have been their choice of nondelayed peers as playmates and the frequency with which they are chosen by nondelayed peers. During the first four months of attendance all the delayed children primarily attempted to interact with nondelayed peers. Instances of inapproporate behavior, rejection and/or nonsocial self isolation were recorded for each delayed child during this time. By January and thereafter the majority of the playmates of the delayed children were other delayed children. One possible explanation for this trend may be that the handicapped children all rode the bus together to and from the school. However, after January, no more incidents of inappropriate behavior were recorded. Table 41 shows the averaged playmate choice of the sample children from December 1985 to May 1986.

Table 41

Peer Playmate Choice Over Time: Percent of Observed Intervals

	Dec.	Jan	Feb.	March	Apr.	May
Peer choice	%	%	%	%	%	%
Nondelayed	53	24	28	50	12	14
Delayed	47	76	73	50	88	86

Clearly, the delayed children ultimately selected other delayed children as playmates. But, choice of playmate should not be the sole criteria for the measurement of social integration skills or the success of integrated programming. The following may show that it may not be an appropriate one.

Observed interaction skills. The observational data on these children in the integrated setting reveals that, despite their choice of other delayed children as playmates, the social behavior of the delayed children showed increasing maturity and interactive skill over time.

The observational recording scheme developed for this project is included in Appendix K. Behaviors listed on this form were derived from literature on handicapped and nonhandicapped peer social interaction. Twenty-four specific skills were selected because they appear to be critical to eliciting positive responses from peers. The behavior skills to be observed are arranged in the following hypothesized developmental stages:

I. Directing attention toward other children

II. Random exploration of other children

III Incentional exploration of other children

IV. Anticipating other children's response to actions

V. Intentional reciprocal actions

VI. Coordinating mutuality with other children

It was hypothesized that, with increasing maturity, behaviors in stages I through III would show decreases over time while those in stages IV thru VI would increase.

All children showed reductions in the earlier stages of peer interactive behavior and gradual increases in the occurance of more advanced behaviors. These observed changes are substantiated by the

significant changes in children's scores on the Battelle personal/social subtest.

It needs to be specified that the peer behaviors were <u>not</u> directly targeted by intervention programming by either the nursery school teacher or the Project DaKota staff. For most of these children, the parents had identified that their child did not share, or behaved nonsocially; in each case the intervention strategy was placement in the integrated setting. While in the nursery school the program they received was no different than that of the normally developing children. Under these circumstances, we can conclude that the changes in socialization are likely due to incidental learning.

Table 42 shows examples of the type of behavioral stage data cumulated by means of this observational system. Because behaviors from several stages frequently occurred during an observation interval, percent figures may not total 100. The nature of this data makes it inappropriate for group reporting. Child A, B, and E did not display any Stage VI behaviors.

Table 42

Stages of Peer Interactive Behaviors: Percent of Observed Intervals

Stage		Dec. %	Jan. %	Feb. %	March %	Apr. %	May %
		Child A					
Directed Attention	I	100	45	70	45	10	0
Random Explore	II	11	5	70	60	35	25
Intentional Explore	III	5	0	10	5	5	0
Anticipating Responses	IV	38	55	25	30	40	50
Intentional Reciprocal	V	17	0	30	10	15	15
		Child B					
Directed Attention	I	100	95	65	15	10	0
Random Explore	II	50	25	10	50	35	0
Intentional Explore	III	10	25	45	10	20	0
Anticipating Responses	IV	20	0	25	50	35	15
Intentional Reciprocal	V	0	0	0	0	0	90
		Child C					
Directed Attention	I	36	95	80	0	0	0
Random Explore	II	21	0	80	0	0	0
Intentional Explore	III	14	5	10	60	70	60
Anticipating Responses	IV	21	100	10	60	70	60
Intentional Reciprocal	V	0	0	45	30	40	55
Coordinating Mutuality	VI	0	0	0	10	10	0
		Child D					
Directed Attention	I	100	75	100	80	5	5
Random Explore	II	33	5	60	45	0	0
Intentional Explore	III	33	0	0	0	5	5
Anticipating Responses	IV	16	95	50	0	85	80
Intentional Reciprocal	V	0	0	0	10	35	40
Coordinating Mutuality	VI	0	0	0	10	0	0
		Child E					
Directed Attention	I	68	45	70	15	15	0
Random Explore	II	67	100	10	0	20	0
Intentional Explore	III	10	0	15	10	10	0
Anticipating Responses	IV	0	0	10	0	41	45
Intentional Reciprocal	V	0	0	30	80	9	70

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By following each behavior stage in Table 42 from Dec. to May it can be seen that stage I and II behaviors decrease irregularly for each child. Child A, B and E have initially low occurances of Stage III, the behaviors then emerge and subsequently decrease. For Child C, Stage III behaviors still have high occurrence in May. Child D shows high initial levels which drop and then reoccur at a low rate. All five children show irregularities in the occurance of stage IV behaviors and increases in Stage V behaviors. Only Child C and D displayed any stage VI behaviors.

These children all showed more mature social behavior in situations free of teacher imposed structure (i.e. free play). Only one child consistently was more than three feet from peers. All children appeared to prefer a single partner in play to a group of three or more. One child showed a dramatic decrease in the rate of changing partners during the observed intervals and an increase in the duration of play with any one partner.

It can be conjectured that although these delayed children did not achieve truly integrated acceptance as peers and playmates of the nondelayed children, they benefited a great deal from the exposure to these children. The same maturity of peer interactive skills may also develop in delayed children served in nonintegrated settings. What is important is that this development occurred even though the children were <u>not</u> regularly choosing and chosen by nondelayed peers and peer social skills were <u>not</u> specifically targeted by programming.

Outcomes for Parents: Needs Targeted and Satisfaction

Project Dakota's objectives specified that programming would focus on the child and family needs considered essential by parents. An unexpressed objective was that parents would be satisfied with the processes and outcome of the intervention program.

Needs/Concerns Addressed in the IEP

Chapter III presented process measures which confirmed high levels of parents' participation in the planning and execution of their child's intervention program. While it could be assumed that this collaborative planning would result in programming which fits parents' needs, a direct

and objective measure of program focus on child and family needs was developed. A Needs Targeted Ratio (NTR) was constructed from the parent needs/concerns found on the Family Assessment Focus (FAF) document (completed prior to assessment) and those attributed to parents during the post assessment discussion. The FAF and post assessment discussion record were discussed in Chapter II and can be found in Appendices A and B. Parents' needs/concerns were examined for correspondence with the IPP goals and strategies. The proportion of needs-identified and needs-addressed was called the Needs Targeted Ratio (NTR). It is expressed in the following formula:

$$NTR = \frac{\text{number of needs \& concerns corresponding to IEP goals \& strategies}}{\text{number of needs/concerns noted by parents}} \times 100$$

NTR as a formative evaluation tool. A search of the special education literature reveals no figures for comparison, nor equivalent measures. Table 43 displays the mean NTR for 1985 and 1986 and for each staff member. Staff report that review of the 1985 data from this accountability measure increased their awareness, and they became more systematic in reviewing parents needs/concerns to insure their inclusion. This awareness may account for the increases between 1985 and 1986.

Table 43

Mean Needs Targeted Ratio (NTR) Overall and by Staff

	1985	1986
	n=21	n=20
Overall NTR	65%	89%
staff A	58%	91%
staff B	69%	90%
staff C	69%	88%

NTR results. In 1985 families expressed an average of 12 needs over a 7 month data collection sample. The number of needs per farily ranged from 2 to 21. Mean NTR for the 21 families in 1985 was 65%; 29%, (n=6) of the families had all their needs met (NTR= 100%), 38% (n=8) of the families had NTR's between 90% and 99%, while 19% (n=4) of the families

had 80% to 89% of their needs addressed, 14% (n=3) were under 80%. The NTR range was 69% to 100%.

In 1986 families identified 252 concerns for an average of 12.6 per child for the 6 month data collection sample. The range was 3 to 17. Eight of the 20 families had all their concerns addressed (NTR=100%), six had all but one concern targeted, four had two unmet needs, and two had three untargeted needs. Mean NTR for 1986 was 89%, range was 73% to 100%, s.d. 8.56.

This NTR data indicates that Project Dakota achieved its goal to focus programming on those child and family needs considered essential by parents. Furthermore, the data support the conclusion that parents had been, or became very skilled in identifying their child's primary needs. It would appear that collaborative assessment, plus collaborative program planning resulted in intervention strategies which very thoroughly met parents' needs and concerns for their child as well as those related to their family and their child.

Parent Satisfaction

Parent satisfaction surveys are a standard evaluation method in early intervention programs. The results of such surveys are frequently very positive. Gratifying results do not serve the purpose of formative program evaluation, i.e. identifying areas which need improvement. It has been found that results from parent satisfaction surveys do not discriminate between programs using very different intervention methods or services. Many of the problems related to making use of parent satisfaction for program evaluation can be solved when surveys are developed and validated using standard psychometric methods and principles, in particular, the establishment of standards or norms for comparison.

The construction, validation, and results of Project Dakota's survey are described below. The survey was used to evaluate seven early intervention programs for two consecutive years. This provides a very large data base (n=128 in 1985, 248 in 1986) used to validate the survey items and establish the comparative standards. Thus, the survey's use in evaluating outcomes from the Project Dakota model program provides

results having greater validity and functionality than is usually found with satisfaction surveys.

Construction of the survey. Questions for Project Dakota's satisfaction survey were selected congruent with "best practices" of the field and the specific goals of the six programs. The questions for the survey were examined for content validity by eight practicing early childhood special education professionals holding at least masters degrees in the field. Questions and directions were reworded until a maximum seventh grade reading level was achieved. In 1986 three questions were deleted from the original 22, and new items constructed for a total of 34 questions grouped under five program goals.

Questions were stated as a positive standard; e.g., "The program for my child included what was important to me." A four point scale allowed these response options: Strong Disagree, Disagree, Agree, and Strong Agree. Intuitively we can interpret "strong agree" as an indication of high satisfaction while "strong disagree" and "disagree" are indicators of dissatisfaction. A copy of the survey is included in Appendix L.

Using the survey. The survey was used as part of program evaluation in both 1985 and 1986 for Project Dakota and for the six other early intervention programs administered by Dakota, Inc., the parent agency of Project Dakota. These programs share the same agency goals but only Project Dakota had a specified parent-staff interaction process. In 1985 the programs differed widely in their practices and service array but all were generally considered high quality programs. Their satisfaction results serve as a comparison for Project Dakota results.

Standards for comparison of results. In both 1985 and 1986, data for standards were collected from a stratified random sample of parents (n=39, n=50) from the seven programs. Using a four point scale, parents rated each question on the basis of "how important it is". Seventy-seven percent of the requests for importance ratings were returned each year. These importance ratings may be said to represent the "Parents' Ideal" and can be used as a standard against which to compare the results of the program evaluations. Having such standards allows us to know that a mean response of 3.1 (Agree) cannot be

interpreted as high parent satisfaction if the parents' ideal is 3.7 (Strong Agree).

Another set of criteria for interpreting results was developed based on the proportion of replies for each of the response scale points, i.e., the frequency distribution. For example, when 50% or more parents respond "Strong Agree", the item can be considered an area of high satisfaction and a program strength. These criteria include specifications for areas of program strength, as well as mild, moderate, and severe deficits. This set of criteria are based on agency expectations of consumer (parent) satisfaction.

1985 results from the comparison programs. In 1985 statistically significant between-program differences were found for questions from four of the survey's factors: Parents' satisfaction with their growth in knowledge, skills, and confidence ($p=.05$); Satisfaction with program individuation and staff responsiveness ($p=.05, .02$); Understanding of normal behavior and problems ($p=.05, .001$); and Use of community resources ($p=.05$). Table 44 shows the distribution of program strengths and weaknesses identified by means of the 1985 survey.

Table 44

Number of Identified Strengths and Weaknesses in Seven Programs

Program	Strength	Mild Wk.	Mod. Wk.	Sev. Wk.
1	2	4	3	1
2	7	0	1	0
3	2	5	0	0
4	2	2	0	0
5	0	2	3	2
6	0	6	0	2
Project DaKota	11	0	0	0

Following the 1985 evaluation agency goals were rearticulated and all intervention staff were trained in Project DaKota's parent-staff interaction process.

1986 results from the comparison of programs. Results from 1986 showed greatly improved parent satisfaction and no statistically significant between-program differences. Where as Table 44 displayed

outcomes in terms of the agency distribution criteria, Table 45 compares the pooled Ideal criteria and pooled program means from the two years.

Table 45

Agency-wide Pooled Parent Satisfaction Results: 1985, 1986 and Ideals

	Pooled Ideals*	Pooled Results 1985	1986	Program
Responsiveness - Goal I	3.7	3.1	3.5	
Parents' Knowledge/Skill - Goal II	3.4	3.2	3.3	
Child Behavior & Problems - Goal III	3.3	2.8	3.1	
Use of Community Resources - Goal IV	3.2	3.0	3.2	
Overall	3.4	3.0	3.3	
Response Rate		62.6%	78.7%	

* Ideals for both years were pooled.

Note. Includes only the 21 questions included on the survey for both years.

Validation. Analysis of internal consistency using Cronbach's Alpha produced a coefficient of .95 for the 128 anonymous replies in 1985, and .96 for the 248 replies from 1986. Factor analysis yielded item clusters having close correspondence with the program goals on which the survey was developed. Factor analysis the second year confirmed these clusters.

During both program evaluation years concurrent data was collected on other factors thought to impact parent satisfaction. These investigations ruled out a number of alternative explanations of the satisfaction survey results. This data included children's age, level-of-handicap, time in the program, family marital status, and working or nonworking status of the mother. In addition to use of the parent-staff interaction process one variable, the service menu, showed systematic relationships with satisfaction; those programs with restricted or static service menus received low satisfaction values for Goal I, III, and IV.

Results for Project DaKota

The above table, displaying results from the entire data base, used only those questions which appeared on the survey during both years.

This was necessary for a between-year comparison of outcome. Table 46 below uses all the questions from each year. This table compares Parent Ideals, Project Dakota outcomes, and the highest-rated (High), and lowest-rated (Low) ratings of the six other programs.

Table 46

Comparison of Ideals, Project Dakota, the Highest and Lowest Rated Programs

	Parents' Ideal	Project Dakota	Center High	Center Low
1985				
Goal I	3.6	3.4	3.5	3.1
Goal II	3.6	3.4	3.3	3.1
Goal III	3.4	3.2	2.9	2.7
Goal IV	3.1	3.4	3.2	2.9
Average 1985	3.4	3.3	3.2	2.9
Response Rate	77%	77%	67%	55%
1986				
Goal I	3.7	3.4	3.5	3.4
Goal II	3.6	3.4	3.2	3.3
Goal III	3.3	3.3	3.2	3.1
Goal IV	3.3	3.2	3.2	3.2
Goal V	3.3	3.2	3.2	3.2
Average 1986	3.4	3.3	3.3	3.2
Response Rate	77%	95%	79%	71%

Note. Goal V is Parent Support. These items were added in 1986.

In both years the Project's overall satisfaction rating was 3.35 compared to a Parents' Ideal average of 3.4. Substantive and significant between-program differences were identifed in 1985, but in 1986 differences between the programs are minimal. Project Dakota's results show very little change while programs with low ratings showed substantial increases in parents' satisfaction.

Summary, Parent Outcomes

NTR was conceived as an expression of program responsiveness. NTR data show that Project Dakota focused its programming on the needs identified by families. The parent satisfaction survey constructed for Project Dakota very thoroughly probed parent response to the processes,

practices, and outcomes of the model. When parents were asked the importance (their Ideal), we found they had very high expectations. Project Dakota was rated very high by parents, 3.35 compared to a Parent Ideal of 3.4. The contribution of parent-staff interaction developed by the model to parent satisfaction is clearly shown by the increased ratings found in programs after staff received specific training in those processes.

The parent-staff interaction processes were described and measures of their implementation were presented in Chapter II. Data presented in that chapter showed that the model was fully implemented, i.e., staff were practicing the procedures unique to this model. This data, parent ideals and the satisfaction survey results, show that parents thought very highly of the Tailor Made Services model, and parent satisfaction was positively impacted in other programs when the model was implemented.

Evaluation by Community-Based Services

Project Dakota staff supported children and families served in community settings in a number of ways. Their role was defined by needs of the child, desires of the family, and requests of the community service provider. In general, the following list describes those roles:

- full assistance with the child, i.e., Project staff there whenever the child was;
- partial assistance with the child, i.e., Project staff were there part of the time;
- consultation to community provider; i.e., at the provider's request or when the child's program indicated the need;
- consultation with family who then implement communication with the community provider including any assistance or consultation.

The latter is an important alternative: not all families wish to be introduced to the neighborhood caregiver by means of a 'special needs' label. The Project Dakota service menu offered that possibility and provided parents the support they needed to act as consultants and advocates for their child.

Staff or directors of the six most frequently used early childhood community-based settings were asked to evaluate their satisfaction with

the collaboration experienced when children from Project DaKota were placed in their program. Responses were received from four of the six programs. Table 47 describes the results.

Table 47

Evaluation by Community-Based Service Providers (n=4)

	Strongly Disagree	Disagree	Agree	Strongly Agree
1. The children referred could be appropriately served by my program.	-	-	25%	50%
2. Adequate information was give me in initial contacts.	-	25%	25%	50%
3. On-going consultation was timely and useful.	-	-	25%	75%
4. My concerns and expectations were addressed.	-	-	25%	75%
5. Sufficient support &/or assistance was provided	-	-	25%	75%

While this is a very small sample, it does show that Project DaKota Staff provided the consultation and support necessary to make the placements successful for the child and comfortable for the providers. Written comments indicated that the providers wanted still more family information prior to intake but said "...the children fit in perfectly", "I look forward to working with the children and staff again."

Cost of Project Dakota

The computerized recording system described in Chapter III was also the source of data used in cost analysis. This system generated monthly summaries of services for each child and services delivered by each staff member. See Appendix F for a sample of the recording form and of the computer reports it yields.

Costs will be reported in two ways: staff time in hours and dollar cost of services. Time/child will allow other practitioners to use their own cost estimates for salary and overhead etc. in order to

project what costs of this model would be in their area. Transportation time and costs are not included in any of the following analyses.

Project Dakota Staffing

The intervention team consisted of a fulltime Early Childhood Special Education Teacher, a speech/language clinician, and an occupational therapist. They were supported by a .50 FTE paraprofessional, .25 FTE supervisor, a .10 FTE consulting family service counselor, and a .05 FTE consulting physical therapist. Fulltime positions are 35 hours/week. Project Dakota staff provided 27hrs/wk (70%) of service to children. Thirty percent was model project-related activities such as development and dissemination. This team model served approximately 24 children age birth to four. In 1985-86, the team (considered to be three staff) case load became 28 children ages birth to three.

Staff time. Important elements of any early intervention program are caseloads and actual staff hours necessary to design and implement each child's program. On the average, each child received fifteen hours of staff time per month. This time included child contact, parent contact, staff-to-staff consultation, staff-to-community consultation, service preparation, travel, and quarterly planning and assessment related to the IEP. The range, two hours per month to 50 hours per month, demonstrates the high degree of individuation in this model. A breakdown from a six month period of time in 1986 shows the following distribution:

Table 48

Distribution of Monthly Service Hours per Child

Range	n=	%	Mean
21 - 50 hrs/mo.	4	17%	34.3 hours
8 - 20 hrs/mo.	11	48%	14.3 hours
2 - 7 hrs/mo.	8	35%	4.6 hours

For example, the report for a child receiving 50 hours of service in the month of March might have specified the following:

Treatment	21.0 hours	EI Teacher	20.0 hours
Consultation	27.5 hours	EI assistant	9.5 hours
Evaluation	1.5 hours	Speech clinician	5.5 hours
Transportation	8.0 hours	Occupational therapist	5.0 hours

These figures would have been reported in 15 minute units (20 hours = 80 units).

Dollar Costs

Table 49 shows a distribution of costs for 23 children averaged from a six month period of time. Costs are arranged in quartile ranges.

Table 49

Distribution of Monthly Per/Child Costs

Cost Range	n=	%	Mean
$813 - $1038	3	13%	$994
$589 - $812	2	9%	$681
$364 - $588	7	30%	$412
$139 - $363	11	48%	$262

Project Dakota's costs averaged $440 per child per month or $5280 for the twelve month program year. These figures include direct and indirect costs such as rent, utilities, secretarial, professional and paraprofessional staff, equipment, and insurance. Professional direct service staff salaries average $21,000 per year. The higher monthly costs typically represented older preschool children whose service plans included incenter or integrated settings with staff present the entire time, e.g., 2-4 days/week, 2.5 hours/day.

Cost Comparisons and Replication Site Costs

Project Dakota costs are best understood in relation to the costs of similar early intervention programs operating in the same geographic area, therefore having a similar wage and price basis.

Other early intervention programs funded by the same agency began gradual adoption of the Project Dakota model during '85-'86. The factor most responsible for variation was hours of staff assistance needed in homes and integrated community settings. It is valuable to examine the change in costs as this model became more fully implemented. Table 50 shows average costs from the first six months of 1986 ('85-'86) and October 1986 through March 1987 ('86-'87) from four agency-operated

programs. The annualized costs are thought to be representative of the year. Again, the costs shown here do not include transportation.

Table 50

Comparison of Monthly Per Child Cost;

Four Programs and Project Dakota

Center	'85-'86	'86-'87	Diff.	n=
A	$632	$555	-$77	37
B	$469	$468	-$01	56
C	$536	$479	-$57	58
D	$570	$470	-$100	28
Avg A-D	$552	$493	-$59	
Project Dakota	$440			

During the second year ('86 - '87) the monthly activity reports verify greater use of community resources and lesser use of in-center group services. During that time the average annualized per child cost for these four sites fell from $6624 to $5916. This represents an annual cost reduction of $126,732 for the 179 children served in these four programs. During this same year each center also experienced a population shift, from birth-to-four to birth-to-three.

It can be seen that the Tailor Made model of services - even with it's high frequency of home visits, consultation time in community settings, and quarterly assessment procedure - has costs which are less than other local programs, and that, as the Project Dakota procedures are adopted, service costs are reduced.

Summary: Outcomes

This chapter has presented data showing that the Tailor Made model provides intervention services which are highly effective for children and highly responsive to parents. Parents rate the program near Ideal. In this model children's contact with normally developing peers significantly increased, as did their peer interactive skills. In addition, the model is also highly cost efficient.

CHAPTER V

Summary and Conclusions

Previous chapters have presented process and outcome data from Project Dakota's Tailor Made model for early intervention. Project Dakota delivered family oriented services. The report has included quantitative measures describing families' integral role and staff support functions. These data and measures of impact on children and families will now be summarized.

Summary

Thirty-one children enrolled in the program for periods greater than six months. Their mean age at enrollement was 27.6 months, and 42.9 months at termination. The children exhibited either mild to severe delays/handicaps or were at risk for potential developmental problems. Followup shows that 80% of these children met the public schools' stringent criteria for special services. Forty-one percent of the children's primary handicaps were in communication, thirty-five percent showed general learning delays and twenty two percent were motorically impaired. Forty percent of the families were single mothers on public assistance. Family demographics showed a range from those with limited education and income to those whose income and education were average. These data suggest that the model was able to accommodate a range of families and children.

Focus on Family-Identified Needs: Program Responsiveness

Project Dakota intended to design intervention services which would focus on child and family needs considered essential by parents, i.e., be responsive to parents. The Needs Targeted Ratio (NTR) is a process measure devised by the Project to measure the degree to which family needs were addressed by the program. NTR compares the number of needs addressed by the program to the number identified by the family. In 1985 the overall NTR was 65%. Staff awareness of this measurement of accountability was reported to be instrumental in focusing their attention on the needs, priorities and concerns of parents. In 1986 NTR rose to 89%. No comparable data was found in the special education literature.

As early intervention programs strive toward family orientation, staff will need to examine their attention to parent identified needs, priorities, and concerns. NTR provides a useful method of focusing staff efforts and monitoring program responsiveness.

Meaningful Parent Participation in Planning

Measures of participation during IEP conferences revealed that parents contributed two thirds of child and family strengths and needs identified. Parents were the source of 82% of the conclusions about their child and 83% of their child's program goals. Overall, parents made 65% of the contributions during the post-assessment discussion and planning of the program plan. These participation figures can be compared to the 25% parent contributions found by Goldstein, Strickland, Turnbull, and Curry (1980) and the damonstration model of Brinckerhoff & Vincent (1986) which showed parent decisions at 56% and overall parent contributions at 41%.

The methods developed by Project Dakota elicited very high rates of meaningful parent participation in planning the intervention. This structured planning process is the basic mechanism for tailoring intervention to individual families and children. Meaningful parent participation in planning was integral to meaningful parent participation in implementing programs: Families assumed sole responsibility for 41% of the strategies and jointly carried out another 52%. The effectiveness of the collaborative planning process is indicated by follow up data which show that 90% of the strategies for families were used as planned. These data tend to indicate that when plan ing is a collaborative process parent participation in carrying out the program can be very high.

Interventention by Multiple Caregivers and in Multiple Settings

In the Project Dakota model goals were facilitated by multiple persons in multiple settings. Most strategies were targeted in at least two settings. Ninety-two percent of the intervention strategies were carried out in the home, 43% in community settings, and 19% incenter. The IEP designated who would carry out the strategies in each setting: 16% were carried out by both family and staff, 38% by some combination

of family, staff, and community program personnel, 4% were implemented solely by staff, and 41% exclusively by families.

It can be seen that the intervention program was delivered largely by parents and among peers - the people and settings likely to be a continuing part of the child's environment.

Use of integrated community settings. Examination of families' choices of service options shows that over time increasing numbers participated in community-based service options. Settings for the intervention shifted from center plus home to home plus community. In 1986 100% of the children's IEP's designated at least one integrated community setting for implemention of their intervention program. These settings included informal neighborhood play groups, community and church nursery schools, family and community daycare settings and community programs such as story time at the local library, and tumbling, dancing and swimming lessons.

In order to encourage parents to make use of community settings, Project Dakota provided tuition subsidies, on-site staff assistance, and transportation. Parents continued to experience the security, individuality, and continuity of programming in the home and/or incenter while encountering the wider world of community settings. Staff assisted community staff by means of consultation, physical assistance, and direct service to children when necessary. Dakota staff were responsible for interagency communication and planning.

Staff as consultants to family and community caregivers. In order to tailor services to individual children and families in homes and integrated community settings staff needed to become more mobile. The transdisciplinary (TD) method of staff organization was seen as an essential mechanism in providing these mobile, flexible services. [In the TD model a child's program is implemented by a single staff person who learns and subsequently uses specific methods of other disciplines, within the limit of circumstances discussed for this child. These vital intra-staff consultations accounted for 26% of staff time.]

Home services (two or more visits/month) were chosen by 84% of families. Home visits remained the core of individualized services

accounting for 22% of staff time in 1986. In all settings, 39% of staff time was devoted to contact with families.

Staff spent 9% of their time consulting with community service providers and an additional 11% was used for intervention services in community settings. As consultants, staff aided parents and community service providers to develop the knowledge, skills and confidence to carry out children's intervention programs. In order to implement service in multiple settings, staff time in direct service to children decreased and time as consultants to families and community persons increased. By 1986 staff spent only 26% of their time in direct service, half of the original figure.

Project Dakota used quantitative process measurements to document extremely high parent participation rates, the successful use of multiple caregivers for intervention, diffusion of programming into home and community settings, and the extensive role change staff experienced as family orientation became a reality.

Outcomes of Increased Nondelayed Peer Contact

Monthly parent reports of their children's contact with handicapped and typically developing peers showed statistically significant differences over time. These changes were evident for infants and toddlers as well as preschoolers. In 1984 children averaged 5.05 hours/week with nondelayed peers. This rose to 18.03 hours/week in 1986. Conversely, their time with delayed peers decreased from an average of 4.56 hours/week to 0.95 hours/week in 1986. In 1986, 48% had five or more hours/week contact with nondelayed peers.

Nine monthly observational recordings of peer social interaction were made for five Project Dakota children in a community preschool with 15 nonhandicapped peers. Prior literature has repeatedly shown that normally developing and handicapped children do not play together unless special efforts are made to facilitate such play. Because the integrated settings used were ordinary community resources, their personnel were not asked to rearrange their schedules, curriculum, or classroom supervision, not were peers directed how to interact. Predictably, after several months of experimentation the handicapped children played primarily with other handicapped children in the

integrated setting. However, within five months each Project child demonstrated gains in mature peer social interactive behaviors. Because the social behaviors of the delayed children were not addressed or targeted in any way different than for the nondelayed peers it may be that increases in maturity resulted from incidental learning in the integrated setting. It appears that playmate status (with nondelayed peers) was not a prerequisite for the development of mature social behaviors.

It is not possible to compare the observed social skill development with what might have occurred if these children had been placed in segregated settings for the same time interval. However, we can conclude that it did occur, and in normal settings, and that these observed changes are substantiated by statistically significant pre to post changes in social skills on standardized tests. The statistical and educational significance of the pre post differences remained after accounting for maturity predicted by the pre-intervention rate of development. High rates of regular contact with normally developing peers in typical community nursery settings was accompanied by significant increases in mature interactive behaviors.

Parent Satisfaction

Parents expressed high levels of satisfaction with the Project Dakota services. However, since that statement occurs in virtually every report of early intervention, Project Dakota developed a statisfaction survey which could be used to compare programs and identify their strengths and weaknesses. Data for comparison included parents' expectation of services in an early intervention program (Parents' Ideals) and parents' evaluation of six other high quality programs. Validation of the parent satisfaction survey instrument included professional content validation and yielded an internal reliability coefficient of .955 (n=128, 248). The satisfaction survey instrument administered in the seven programs was able to detect statistically significant between-program differences on each of the goals. Alternative explanations of program differences were ruled out by concurrent data.

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Comparison with parent expectations. During both years it was administered, the survey showed that Project Dakota came very close to parents' expectations of ideal service on each goal of the satisfaction survey: Program Responsiveness, Assisting Parents' Growth in Knowledge and Skill, Assisting Parents to Understand Normal Behavior and Manage Problem Behavior, Using Community Resources, and Development of a Support Network.

Comparison with other programs. In 1985 Project Dakota parents rated their program significantly higher than ratings assigned by parents participating in the other programs which had the same goals but lacked the parent-staff collaboration processes. The following year, after staff received training in components of the Project Dakota model, all these programs received substantially higher parent ratings.

The above data provide evidence that the Tailor Made services model developed by Project Dakota is considered nearly ideal by parents and can be transmitted to staff of other programs.

Child Change

Children served by this intervention model evidenced substantial and highly unusual developmental gains. Differences between the pre and post scores were statistically significant even after accounting for predictable maturity. The average developmental gain by children in Project Dakota was 14.33 months for their average pre to post tenure of 10.97 months. To separate maturational effects from intervention effects each child's predictable maturity (at their pre developmental rate applied over the duration of programming) was subtracted from their achieved developmental post score. Intervention related gains averaged 3.50 months more than predicted by the pre developmental rates and accounted for an average of 33% of the overall pre to post differences. Intervention effects accounted for over 50% of receptive language gains and 47% of expressive language gain. The analysis of intervention effect for differing levels of handicap showed statistical differences only for receptive language. In this domain the mildly handicapped showed 11 months gain and the moderately handicapped seven months while those identified as having no handicap or risk experienced only maturity effects. It was encouraging to find that

intervention effects for the moderately handicapped were often greater than for those categorized as mild and at risk. Intervention related gains for the moderately handicapped children exceeded six months in half the developmental domains.

The educational significance of change is frequently measured by effect size. Compared to those found by the meta analysis carried out at Utah State University (White, n.d.) the averaged Effect Size for Project Dakota was:

1.4 times that found for all early intervention programs for handicapped children;

1.9 times that for programs in which parents were the major intervenor;

2.6 times that for programs which have no or low curricum structure;

1.7 times those found in programs having high curriculum structure. It can be seen that Project Dakota yielded greater size of effect than found in many early intervention programs. Dakota's average effect size of .79 is substantiated by analysis showing that the children experienced an average of 10 days/month develpmental gain over and above gains predicted by the pre development rates. It appears that the Tailor Made model of services using both parents and community resources to implement the intervention is a highly effective model.

The Project Dakota Model and Goals

Project Dakota's goals were to focus on needs identified by parents, provide parents with meaningful participation and the knowledge, skill and confidence to identify the child's strengths and needs and carry out intervention. They aimed to use family and community resources to create a network for family support as well as for programming and to use those settings to increase the child's ability to function in less restrictive environments. The model developed by Project Dakota stands in vivid contrast to traditional intervention programs.

In Project Dakota services were collaboratively planned by parents and staff to fit parents' priorities, preferences, and to make use of existing family and community resources. More typically staff design programs and provide resources in which parents are expected to

participate and parent effort is viewed as a supplement to staff efforts.

In Project DaKota the intervention strategies were concurrently and cooperatively implemented by many persons likely to exert greatest longterm impact. Conventional programs are implemented by a series of professionals likely to be with the child for that year only.

In Project DaKota intervention programming took place largely in homes and in the community - settings where the child would normally spend the greatest amount of time. Early intervention programs frequently implement interventions segregated from family life and without contact with nondelayed peers.

In Project DaKota the staff role was that of consultant to parents and community persons in order to supplement their efforts and share expertise. Traditionally, the professional acts as teacher to both the parents and children, and is unaware of the contributions they and community early childhood caregivers could be making.

Project DaKota individualized curriculum so that it became ecological and functional, based on child and family needs in their day-to-day life. Ordinarily, programs individualize curriculum based on developmental needs which may or may not include the demands of the child's family life, nor take advantage of every day events for functional interventions.

It needs to be noted that all of the staff in Project DaKota previously operated in traditional models. None of the changes occurred abruptly: emphasis on collaborative planning led to ecological curriculums which focused on family and community settings. The staff role and service options changed gradually as the program became more responsive to parents.

Conclusions

The data summarized in the previous sections has described the staff and program processes by which Project DaKota achieved their goals with major impact on children's standardized test scores. The process and impact evaluations clearly indicate that Project DaKota's Tailor Made, family oriented, community-based services model was fully implemented and highly effective. The intervention resulted in significant changes

in children's developmental scores which are attributable to intervention and unlikely to have occurred by chance. The model has demonstrated the effectiveness of simultaneous programming achieved through synergistic efforts of staff, families, and the community.

Project DaKota implemented collaborative planning to include the broader transactional systems of the child, family, and community. The outcome - individualized, flexible, functional curriculums and services - should inspire reexamination of the profession's structured programming driven only by developmental goals.

DaKota's successful use of normal community environments challenges the profession to explore the possibilities of alternative service delivery using existing community resources.

The alteration of staff roles to focus on program responsiveness to families presents the profession with new insights into parent/professional relationships. Their success should encourage critical examination of staff roles and program philosophy with regard to parents.

DaKota's program philosophy, procedures and their quantitative measures can serve as prototypes, if not standards, for other programs seeking to become more family and community oriented.

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Appendix A

FAMILY ASSESSMENT FOCUS

These questions will help focus and plan your child's assessment to include your observations, concerns, and suggestions. Dakota, Inc. staff person will discuss your comments with you before the assessment.

1. My child's name is _____ and I would describe her/him in this way:

2. My name is _____ and I would describe our relationship (the child and I) in this way:

3. A typical day with my child includes:

4. What my child is really good at or likes to do:

5. What my child needs help with or avoids:

6. What we like to do together (parent[s] and child):

FAMILY ASSESSMENT FOCUS (cont)

7. Recent progress or changes I have seen in my child at home:

8. Questions I have about my child:

9. My child does best when:

10. How my child lets me know when he wants something:

11. My child is really interested in:

12. I would like my child to learn or get better at _____.

13. To help my child, I would like help with:

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Appendix B

Post Assessment Discussion

INDIVIDUAL PROGRAM PLAN
POST-ASSESSMENT DISCUSSION

DAKOTA

DAKOTA, INC.
680 O'Neill Road
Eagan, MN. 55121

Name	Date	Facilitator	Participants

Who	1. Strengths, Interests, Motivators, Progress, Abilities of Child; Family Activities and Interests	Who	2. Concerns, Problems, Delays, Frustrations, Needs of Child; Family Concerns about Child

Who 3. Conclusions/Priorities/Questions:

4. Current Contact With Non-Delayed Peers	Who	5. Major Goal Areas

(1-107 (Rev. 9/85) WHITE - Office YELLOW - Parent/Guardian PHOTOCOPIES - Center & Facilitator

Appendix C

Individual Program Plan (IPP)

INDIVIDUAL PROGRAM PLAN
GOALS AND STRATEGIES

DAKOTA

DAKOTA, INC.
680 O'Neill Road
Eagan, MN. 55121

Name	Date	Age	Facilitator

Participants

The Individual Program Plan promotes optimal development and reduces the negative effects of delay on disability by responding to parent's priorities & using natural settings & resources.

Dakota, Inc. promotes learning in settings typically used by non-delayed children.

Group Setting(s)	No. of Times/Wk.	Individual Setting(s)	No. of Times/Wk.

GOAL

What Child/Adults Do Now	Reasons To Change/Adapt	Strategies, "How To"	Who	Status	Who Teach/Learn	Where

GOAL

What Child/Adults Do Now	Reasons To Change/Adapt	Strategies, "How To"	Who	Status	Who Teach/Learn	Where

My priorities for my child are included in this Individual Program Plan.

Parent/Guardian Signature(s):

(1-:81 Rev. 4/85) WHITE - Office YELLOW - Parent/Guardian PHOTOCOPIES - Center & Facilitator

Appendix D

Who and Where Strategies Were Carried Out, 1985 - 1986

	Means	s.d.	Range
Needs targeted ratio	88.6%	8.6	70 - 100%
Parent identified strengths	64.1%	9.6	48 - 83%
Parent identified strategies	40.1%	21.5	9 - 78%
WHO CARRIES OUT STRATEGIES			
Staff only	4.0%	10.0	0 - 43%
Family only	41.1%	32.0	0 - 99%
Staff and Family	16.4%	20.5	0 - 75%
Community only	2.1%	3.4	1 - 9%
Family and Community	16.3%	14.8	0 - 44%
Staff, Family and Community	20.1%	24.0	0 - 63%
WHERE STRATEGIES CARRIED OUT			
Home	91.2%	10.2	58 - 99%
Center	19.4%	25.2	0 - 94%
Community	42.7%	25.9	0 - 94%

n=20 Families

Appendix E

SERVICE MENU

Home-Based Services

with: ___one parent
___both parents
___and siblings
___and other family members

where:
___family home
___EI center
___other locations
___requested by family
___via telephone

time of day:
___a.m. ___p.m. ___eve

day of week:
___(Monday-Friday)

Frequency:
___1x month
___2x month
___1x week
___2x week
___3x week

Community-Based Services

locations: ___parent-child group
___family day care
___neighborhood playmates with staff help
___church group/program
___recreation program
___group lessons such as tumbling, dance, swim
___nursery school, daycare
___other:

facilitator role:
___full assistance with child
___partial assistance with child
___consultation to group teacher
___consultation with family who carries out assistance or consultation with group teacher

Center-Based Services

Parent-child Play Groups
___a.m. ___p.m. ___early evening
___1x month ___2x month ___1x week ___2x week

Child Groups
___small, non-integrated group
___peer tutors (non-delayed other peers)
___one to one
___1x week ___2x week ___3x week ___4x week

Family Events
___siblings
___grandparent
___support or coffee groups
___family retreat
___parent discussions

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Appendix F

CHILD SERVICE/STAFF ACTIVITY CODING SYSTEM FOR COMMUNITY BASED EARLY INTERVENTION

Dakota, Inc. devised a computerized service code system which tracks the time and amount of service provided to each child as well as the type and amount of service provided by each staff member. Staff spend approximately 3 minutes each day completing the units of service record using the codes below. Units are recorded in 15 minute increments.

Activity:	Location:	Who:	Time: 1 = 15 minutes
1 = Direct	1 = Home	1 = Family Member	5 = Family/Other Agency Staff
2 = Consultation	2 = Center	2 = Dakota Staff	6 = Dakota Staff/Other Agency Staff
3 = Evaluation	3 = Community	3 = Other Agency Staff	7 = Family/Dakota Staff/Other Agency Staff
8 = Other		4 = Family/Dakota Staff	8 = None of the Above - Child Only

Examples A staff consults with another staff in-center about a child for 15 minutes is coded as 2221. An hour long assessment in the home with parents and other staff present would be coded as 3144. If a parent, and community preschool teacher met with a staff member for 1/2 hour at the preschool the code would read 3252.

Sample monthly profiles for a child and staff member are printed below.

SERVICE TYPE DESCRIPTIONS Child UNITS 1=15minutes

01	EI TEACHER	186
02	EI TEACHER ASSISTANT	48
04	SPEECH THERAPY	24
06	OCCUPATIONAL THERAPY	28
98	EI TRANSPORTATION	8

ACTIVITIES

01	TREATMENT	119
02	CONSULTATION	156
03	EVALUATION	11
		8

LOCATIONS

01	[illegible]	29
02	CENTER	194
03	COMMUNITY	72
		8

WHO

01	FAMILY MEMBER	13
02	DAKOTA STAFF	181
03	OTHER AGENCY STAFF	34
04	FAMILY & DAKOTA STAFF	23
05	FAMILY & OTHER AGENCY STAFF	13
06	DAKOTA STAFF & OTHER AGENCY ST	16
08	NONE OF THE ABOVE	66
		8
	CLIENT TOTAL --->	894 for month =

CLIENT NUMBER AND NAME . Staff UNITS .

[illegible]	[illegible]	16
00012	JASON	7
00129	[illegible]	1
[illegible]	NICOLE	9
[illegible]	JASON	48
00329	MARK	25
[illegible]	MEGAN	9
00333	REBECCA	22
[illegible]	CHAD	2
[illegible]	TONY	1
[illegible]	MELISSA LOUISE	68
[illegible]	KRISTINA	1
[illegible]	MEGAN	66
00591	VON	12

ACTIVITIES

01	TREATMENT	64
02	CONSULTATION	154
03	EVALUATION	67

LOCATIONS

01	HOME	69
02	CENTER	181
03	COMMUNITY	17

WHO

01	FAMILY MEMBER	46
02	DAKOTA STAFF	52
03	OTHER AGENCY STAFF	12
04	FAMILY & DAKOTA STAFF	71
05	FAMILY & OTHER AGENCY STAFF	2
07	FAMILY & STAFF & OTHER AGENCY	0
08	NONE OF THE ABOVE	96
	STAFF MEMBER SUBTOTAL --->	287 for month

Appendix G

Percent of Staff Time: What, Where and Who

	Mar '84	Apr '84	Oct '84	Nov '84	Mar '85	Apr '85	Oct '85	Nov '85	Mar '86	Apr '86
WHAT										
Consultation	29.99%	30.11%	40.34%	46.80%	49.00%	41.00%	63.00%	62.00%	65.20%	63.30%
Direct Service	54.90%	55.00%	40.20%	39.80%	39.00%	43.00%	16.00%	14.50%	20.40%	28.30%
WHERE										
In Community	3.60%	4.40%	8.70%	7.80%	7.00%	3.50%	12.00%	10.00%	7.50%	14.70%
In Home	11.00%	12.20%	17.20%	24.00%	11.00%	16.50%	32.00%	30.50%	24.00%	20.00%
WHO										
With Family	16.50%	13.20%	18.40%	14.60%	32.00%	29.50%	47.00%	47.00%	44.50%	34.60%
With Community	3.00%	2.24%	.98%	9.60%	7.00%	5.00%	9.00%	7.60%	6.10%	12.40%
With Staff	41.00%	37.00%	39.50%	40.00%	43.00%	37.00%	23.00%	26.00%	28.30%	24.40%

Appendix H

Intervention Effects, Means and Standard Deviations

	n=	Premean	s.d.	ACS mean	s.d.	Diff.	s.d.	T Value(df)	p=
Social	31	24.48	11.49	27.13	14.64	2.64	7.31	2.02 (30)	.050
Adaptive	20	29.85	14.69	33.49	15.57	3.64	3.69	4.43 (30)	.000
Gross Motor	31	23.84	11.10	26.87	13.96	3.03	7.27	2.32 (30)	.027
Fine Motor	31	27.07	12.39	30.47	13.82	3.40	5.58	3.39 (30)	.002
Rec. Language	20	24.45	11.17	30.07	14.25	5.62	7.01	3.55 (19)	.002
Exp. Language	20	23.10	12.45	26.71	13.96	3.61	5.01	3.22 (19)	.004
Communication	31	22.55	10.09	25.88	13.62	3.33	7.19	2.58 (30)	.015
Cognition	30	25.00	11.38	27.71	12.99	2.71	4.76	3.11 (29)	.004

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APPENDIX I

Intervention-Related Gain by Level-of-Handicap

	No Hcp.	At Risk	Mild	Mod.	Sev.	ANOVA Between Levels
Personal/Social						
n=	10	2	13	5	0	F=1.87
Mean IRG	-.559	-.539	5.86	1.33		df=3,27
s.d	5.99	1.80	8.44	4.39		p=.158
Adaptive						
n=	8	6	3	3	0	F=1.26
Mean IRG	3.64	2.72	7.11	2.00		df=3,16
s.d.	3.28	4.60	1.35	3.40		p=.32
Gross Motor						
n=	4	6	16	3	2	F=.20
Mean IRG	1.60	3.72	2.95	5.77	.33	df=3,27
s.d.	12.15	10.20	4.95	9.82	3.78	p=.93
Fine Motor						
n=	13	5	11	2	0	F=2.745
Mean IRG	.61	2.90	6.45	6.00		df=3,27
s.d.	2.27	6.13	6.14	11.31		p=.06
Cognition						
n=	5	8	14	3	0	F=.668
Mean IRG	2.63	2.53	3.58	-.76		df=3,26
s.d.	2.19	4.90	5.03	6.77		p=.579
Communication						
n=	3	3	15	10	0	F=.528
Mean IRG	-1.33	4.64	3.18	4.56		df=3,27
s.d.	1.82	3.78	5.13	10.85		p=.66
Receptive Language						
n=	2	5	6	7	0	F=5.68
Mean IRG	-3.55	.75	11.32	6.83		df=3,16
s.d.	4.29	3.95	5.77	5.99		p=.008
Expressive Language						
n=	2	2	6	9	1	F=2.21
Mean IRG	-.62	-2.44	3.89	6.09	.12	df=3,16
s.d.	.54	2.51	5.33	4.35	0.00	p=.1165

Appendix J

Peer Contact Report

	Jan '84 n=14	May '84 n=15	Jan '85 n=19	May '85 n=21	Jan '86 n=19	May '86 n=19
AVERAGE HOURS/WEEK						
Delayed	4.64	4.47	2.47	2.86	1.05	.84
Nondelayed	2.57	7.53	5.68	22.38	17.58	18.47
Total Hours/Week	101	180	155	530	354	367
Average Hours/Child	7.21	12.00	8.16	25.24	18.63	19.32

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SOCIAL GROWTH BEHAVIORS interval used.....sec.

1 TARGET CHILD_____DATE____OBSERVER____SETTING_____

INTERVALS..... .1.2.3.4.5.6.7.8.9. .0.1.2.3.4.5.6.7.8.9.0.

2 PEERS (D/ND)..... .2

3.STRUCTURE L/M/H... .3

4 Watch only..... .4
5 Drtd Vocalize..... .5
6 Drtd smile/laugh.. .6
7 Drtd fuss/cry..... .7
8 Drtd gesture 8
9 Touch peer..... .9
10 Strike peer..... .10
11 Same material ..... .11
12 Accept/take..... .12
13 W+ show/offer.... .13
14 Give/share ..... .14
15 W+ imitate..... .15
16 Struggle toy..... .16
17 Play next to..... .17
18 App. verbal..... .18
19 Wait ..... .19
20 p together ..... .20
21 p - suggest ..... .21
22 p - elaborate ..... .22
23 p - coordinate... .23
24 affection, rfmt.. .24
25 help, symp, comft .25

26 reject (V)erb (N).. .26
is rejected .....
Non Social:
27 (r)ule, (s)elf... .27
28)3ft to peer..... .28
29 Adult intervenes. .29

0 N H M L 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26v 26n 27r s 28 29

BEHAVIOR TYPICAL?

INTERVALS..... .1.2.3.4.5.6.7.8.9. 0.1.2.3.4.5.6.7.8.9.0.

contrast child who? peers #
4 Watch only..... .4
5 Drtd Vocalize..... .5
6 Drtd smile/laugh.. .6
7 Drtd fuss/cry..... .7
8 Drtd gesture 8
9 Touch peer..... .9
10 Strike peer..... .10
11 Same material ..... .11
12 Accept/take..... .12
13 W+ show/offer.... .13
14 Give/share ..... .14
15 W+ imitate..... .15
16 Struggle toy..... .16
17 Play next to..... .17
18 App. verbal..... .18
19 Wait ..... .19
20 p together ..... .20
21 p - suggest ..... .21
22 p - elaborate ..... .22
23 p - coordinate... .23
24 affection, rfmt.. .24
25 help, symp, comft .25

26 reject (V)erb (N) .26
Non Social:
27 (r)ule, (s)elf... .27
28)3ft to peer..... .28

4 5 6 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26v 26n 27r s 28

BEHAVIOR TYPICAL?

Appendix L

PARENT SATISFACTION SURVEY
1986
Dakota, Inc.

Center
Team ____

GOAL I - PROGRAM AND STAFF RESPONSIVENESS	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE
The staff listen and respond to my concerns, questions, and ideas.	SD	D	A	SA
In my meetings with staff (for assessments, conferences, monthly updates, etc.), I feel I am an active member of the team and not just a listener.	SD	D	A	SA
I feel the program for my child includes what is important to me.	SD	D	A	SA
My child's program meets my child's needs.	SD	D	A	SA
The help my child is getting is based on his/her individual needs.	SD	D	A	SA
I am satisfied with my child's progress since beginning this program.	SD	D	A	SA
Although only one staff member mainly serves my child, I feel that we receive the expertise of the other staff.	SD	D	A	SA
I am informed of a variety of choices for how my child could be served.	SD	D	A	SA
The help I get fits into our family routines and activities.	SD	D	A	SA
The staff respect the limits my family puts on our time and energy for our child's program.	SD	D	A	SA
Staff give me information that is clear and useful to me.	SD	D	A	SA

GOAL II - GROWTH IN KNOWLEDGE AND SKILLS FOR HELPING YOUR CHILD

Since my participation with the program....	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE
...I am better able to look at and see more of what my child is learning to do.	SD	D	A	SA
...I have learned more about helping my child.	SD	D	A	SA
...I am more confident in deciding on goals for my child.	SD	D	A	SA
...I now know more about what my child needs to learn.	SD	D	A	SA
...I am more aware of how ordinary activities are part of my child's learning and development.	SD	D	A	SA
...I feel more confident about how my family and I are helping our child.	SD	D	A	SA
...I am more aware of how to help my child's development.	SD	D	A	SA
...I now have a clearer picture of my child's special needs.	SD	D	A	SA
...I know more now when it comes to setting goals and strategies for my child.	SD	D	A	SA

GOAL III - GROWTH IN UNDERSTANDING NORMAL BEHAVIOR AND PROBLEMS

Since my participation with the program....	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE
...I am more aware of how my child is like other children.	SD	D	A	SA
...I feel satisfied that my child's strengths are being discussed.	SD	D	A	SA
...I am more aware of ways to handle my child's behavior.	SD	D	A	SA
...I am getting the help I need to learn about handling my child's behavior.	SD	D	A	SA

GOAL IV - UTILIZATION OF COMMUNITY RESOURCES

Since my participation with the program....	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE
...I get help when I need to know about other programs or people who could do things for me, my child, or my family.	SD	D	A	SA
...I know more about community agencies, services, and programs that can help my family and add to what the intervention program offers.	SD	D	A	SA
...I now have greater contact with services and programs in the community who may help my child or my family.	SD	D	A	SA
...I am satisfied with the communication between my child's team and community resource persons involved in my child's program.	SD	D	A	SA
...I am more able to get information that is important to the health and happiness of my family and child.	SD	D	A	SA

GOAL V - BUILDING A SUPPORT SYSTEM

Since my participation with the program....	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE
...I feel that I know more people who are caring and understanding.	SD	D	A	SA
...I now have more family or friends or others helping me help my child.	SD	D	A	SA
...I feel less alone as the parent of my child.	SD	D	A	SA
...Staff are willing and able to help my family and friends when we have concerns or questions about my child.	SD	D	A	SA
...I more strongly value my child spending time with children who don't have developmental delays.	SD	D	A	SA

Comments: _____

_____

My child is _____ years _____ months old.

My child has been receiving services from Dakota, Inc.

_____ less than 6 months

_____ less than 2 years

_____ more than 2 years.

Signature (optional) _____

THANK YOU!