DOCUMENT RESUME

ED 407 781 EC 305 539

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TITLE	Comparison of the Effects of a Social Competence Curriculum on the Outcomes of Toddler-Age Children with Disabilities Receiving Early Intervention in Two Types of Settings: Inclusive or Segregated. Final Report.
INSTITUTION	Connecticut Univ. Health Center, Farmington.
SPONS AGENCY	Special Education Programs (ED/OSERS), Washington, DC. Early Education Program for Children with Disabilities.
PUB DATE	30 Apr 97
NOTE	257p.
CONTRACT	H024H20006
PUB TYPE	Reports - Descriptive (141)
EDRS PRICE	MF01/PC11 Plus Postage.
DESCRIPTORS	Child Behavior; *Child Development; Cost Effectiveness; Desegregation Effects; *Disabilities; *Early Intervention; Inclusive Schools; Interpersonal Competence; Mainstreaming; *Outcomes of Treatment; Preschool Education; Social Environment; Social Integration; Socioeconomic Status; Special Programs; *Student Placement; Toddlers
IDENTIFIERS	Connecticut

ABSTRACT

This federally-funded study examined the effect of two early intervention settings on the social behaviors and development of 46 toddler-aged children with disabilities in Connecticut. The toddlers received early intervention services in natural group environments in the community or segregated center-based programs servicing only children with disabilities. Evaluation outcomes were measured at 6-month month intervals beginning when the children entered the study at 24 months to their exit at 36 months. A fourth data point at 42 months served as a follow-up evaluation of the longer term effects of early intervention on social skills and behavior. While there were clear differences found in the classroom demographics, quality, and activities, and the prevalence, intensity, location, and modality of services provided, results found that the type of early intervention setting did not have major effects on the children's development of social behavior, or their families' social support, network, needs, or resources. The study did find that family income, family education, and socio-economic status was related to the children's developmental scores. The study also found that the cost of providing early intervention services in inclusive settings was higher. Attached tables depict specific data findings. (Contains 46 references.) (Author/CR)

Comparison of the Effects of a Social Competence Curriculum on the Outcomes of Toddler-Age Children with Disabilities Receiving Early Intervention in Two Types of Settings: Inclusive or Segregated

FINAL REPORT

Early Education Programs for Children with Disabilities
U.S. Department of Education
Experimental Project
Grant Number: H024H20006
CFDA: 84.024H

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April 30, 1997

II. ABSTRACT

Social Competence Curriculum Experimental Project

An Early Education Program for Children with Disabilities Project

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Director

The Social Competence Research Project (funded by the Early Education Program for Children with Disabilities, U.S. Department of Education) examined the effect of two early intervention settings on the social behaviors and development of 46 toddler-age children with disabilities in Connecticut. The toddlers received early intervention services in either natural group environments in the community, such as day care centers, or segregated center-based programs serving only children with disabilities.

Both settings were being used in Connecticut as early intervention placements for children with all levels and types of disabilities. Natural group environments were used as placement sites for children receiving early intervention under the State Department of Mental Retardation (DMR) while segregated sites were used by Easter Seal Rehabilitation Centers and other private programs. Children attended both programs for two to four half-days each week.

The children in the study were matched on developmental and demographic variables to confirm comparability across settings. Evaluation outcomes were measured at six month intervals beginning when the children entered the study at 24 months to their exit (because of preschool placement) at 36 months. A fourth data point at 42 months served as a follow-up evaluation of the longer term effects of early intervention on social skills and behavior.

The outcome measures focused on child status, family status, and service characteristics. The child measures included developmental and social competency indices. Family measures included measures of social support, community resources, and attitudes. Service measures included a description of the intervention setting, staffing qualifications and patterns, and service types and intensity (e.g., therapists).

An additional program variable, the cost of providing early intervention services in the two settings, was the primary subject of a supplementary study. The cost study focused on the children participating in the study as examples, using their specific profiles, but sought to gain information applicable to other children.

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IV. GOALS AND OBJECTIVES OF THE PROJECT

The purpose of this study was to examine the developmental status of a group of toddler age children with disabilities receiving early intervention in one of two types of settings: classrooms containing only toddlers with disabilities (segregated) and child care classrooms of typical children with a small number (no more than two) of children with disabilities (inclusive). The study was designed to describe both children's background (including family demographics) and service characteristics in an effort to identify factors associated with service delivery within and between the two settings.

State Context for Early Intervention

The state in which this study occurred used a single point of entry for early intervention services. Families were referred into a regional service coordination center, from which their children were assessed for eligibility into the early intervention system. If the child was determined to be eligible for services (established condition; or documented developmental delay of two standard deviations in one area or one point five standard deviations in two or more areas; or clinical opinion), an IFSP was developed and the family was referred to early intervention agency or therapists as needed. The state agency that provided early intervention was used as a first choice for service delivery, provided there were available openings. If there were no openings, families were referred to a private program or private therapists. However, services were delivered according to the child's IFSP, regardless of the agency or therapist who provided services. At the time of this study, approximately one-half of the

2,000 early intervention eligible children attended the state early intervention agency, one-quarter attended one of a number of private agencies (e.g., Easter Seals, ARC), and one-quarter received therapies delivered outside of a formalized program.[1]

Context of Early Intervention for the Children and Families in this Study

The state agency providing early intervention from which the sample of children attending inclusive child care programs were chosen, implemented services in natural environments as described in Part H regulations: in the home or in group programs in which typical children participated. This model of using child care programs as a group environment for toddler age children was established as policy by this agency in 1988. At that time, the state agency closed all segregated centers serving toddlers with disabilities and developed relationships with community child care programs. These relationships included fiscal contracts to support the placement of children with disabilities part time in child care programs for early intervention purposes.

When their child reached 24 months of age, families who participated in early intervention under this state agency were given the option of having their child attend a child care program part time at the early intervention program's expense. The funding for this participation was paid by the state to one of 86 child care programs who were contracted with for this purpose. These programs did not meet any specific criteria; rather they had space available,

[1] On July 1, 1996, the system of service entry and delivery changed as a result of an adoption of

were willing to enter a contractual arrangement with the state agency, were willing to support the child with disability, were willing to have specialists provide services in the child care classroom, and were willing to implement early intervention services through a consultation model. In order to use these programs as early intervention sites, a special educator from the state agency attended each program with a child. There were never more than two children with disabilities in any one child care classroom in which early intervention was delivered, though at times children with disabilities were in more than one classroom distributed throughout a child care center. The special educator could provide support to up to two children receiving early intervention in one class.

Prior to 24 months of age, children received services from this agency in their home or in other caregiving environments arranged by their family. This latter group included children who attended child care programs at their families' expense for child care purposes. Only children who attended child care programs part time at the early intervention program's expense by the age of 24 months were included in the longitudinal study in order to maintain control of the number of hours children attended these natural group environments.

The five agencies from which the children attending segregated classrooms were chosen provided services to both Part H eligible children and children at risk for development. These agencies also provided services to children aged birth through adulthood. All five centers had a history of providing early

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a legislatively mandated early intervention system.

intervention, and had participated in Part H service delivery in the state. As such they provided services according to a child's IFSP. However, the majority of their service delivery was done in a center, either through therapy sessions or group sessions, including classroom based sessions. Two of these agencies were affiliated with hospitals, and three were private nonprofit agencies.

V. THEORETICAL FRAMEWORK

Purpose

The purpose of this proposal was to describe an experimental project which investigated the effectiveness of early intervention settings on the development of toddlers with disabilities receiving early intervention within two types of service delivery settings: natural group environments, serving primarily toddlers without disabilities, and, segregated rehabilitation facilities, serving only children with disabilities. Matching procedures were used (e.g., on child's developmental status; primary disability; family structure and intervention history) on the children to ensure the comparability of children both within and between settings. The study included children representing a range of types and levels of disabilities.

The research design contained both a quasi-experimental comparison (independent variable being setting) and an experimental comparison (independent variable being treatment). Measures were conducted on children at six month intervals beginning when they were 24 months of age (entry into the project). The last set of measures was implemented as a follow-up at 42 months of age, after the child had left the intervention setting and treatment condition used in the study, and had transitioned into preschool services.

Measures included indices of child development; social competence; family background; family use of community resources and social supports; family needs; and a family evaluation of their child's intervention program. Addition, a number of measures documented intervention parameters within settings,

such as the quality of the environment, type and intensity of specialized services, daily schedule, type and quality of IFSP goals, type and level of family involvement, and cost of services to both family and program.

Theoretical Framework Literature Review

Part H of the Individuals with Disabilities Education Act (IDEA) requires "to the maximum extent appropriate to the needs of the child, early intervention services must be provided in natural environments including the home and community settings in which children without disabilities participate" (section 303.12). These settings are further defined as being natural or normal for the child's age peers who have no disability, including such groups as day care centers, play groups or other community groups. This requirement has created many challenges to statewide systems of early intervention. While most systems provide home based services to infants and toddlers with disabilities (Roberts, Akers, & Behl, 1996), services in natural group environments are less prevalent for a variety of reasons. These reasons may include attitudes by staff, insufficient resources for children with disabilities and inappropriate curricula (Bricker, 1995). Nonetheless, the practice of including children with disabilities in programs with children without disabilities continues to grow (Bruder, Deiner, & Sachs, 1990; Wolery, Holcombe, Venn, Brookfield, Huffman, Schroeder, et al., 1993), as does data suggesting positive developmental gains for children with disabilities attending such programs (Bruder, 1993a; Buysse & Bailey, 1993; Fox & Hanline, 1993; Lamorey & Bricker, 1993; McLean & Hanline, 1990).

Many factors besides the legislative requirements of IDEA and research in early intervention have contributed to the growing acceptance of inclusive services. First, families have been increasingly vocal about their expectations for their children with disabilities. It has been well documented that parents of young children with disabilities want their children to have the opportunity to receive services in the mainstream (Guralnick, Connor, & Hammond, 1995; Guralnick, 1994; Hanline & Halvorsen, 1989; Turnbull & Winton, 1983). Parents have also suggested that one of the most important outcomes of early intervention and special education for children with disabilities should be the development of friendships between their children and children without disabilities (Buswell & Schaffner, 1990; Strully & Strully, 1985). A collateral finding in this research has been that parents of young children without disabilities who have participated in inclusive preschool programs have reported positive attitudes toward this practice (Green & Stoneman, 1989; Guralnick, 1994; Peck, Carlson, & Helmstetter, 1992).

Second, there has been an increasing demand for child care services for young children. More than 11 million preschool children attend early care or school programs (Blank, 1993). This is not surprising since statistics show that 53% of women with an infant under the age of one were in the labor force (U.S. Census Bureau, 1990) and, therefore in need of ongoing child care. This large number includes women who have children with disabilities (Crowley, 1990; Fink, 1991). In order to meet this growing need, it has been suggested that early childhood intervention programs collaborate with child care programs and

deliver services within those settings. Model demonstration projects have provided evidence for this model, providing that appropriate supports, such as training, are in place (Bruder, 1993b; Bruder, et al., 1990; File & Kontos, 1992; Hanline, 1990; Wesley, 1994).

Last, the Americans with Disabilities Act, (P.L. 101-336), prohibits discrimination against individuals with disabilities by state and local governments (Title II) and public accommodations (Title III). All state and local government operated services for children such as child care centers, pre-schools, park and recreations services, library services, etc. cannot exclude from participation in, or deny the benefits of, their services, programs or activities, or otherwise discriminate against a child with disabilities (P.L. 101-336, Sec. 202). Moreover, the United States Department of Justice, in their highlights of Title II state, "Integration of individuals with disabilities into the mainstream of society is fundamental to the purposes of the Americans with Disabilities Act" (ADA Handbook, appendix N, p. 5). Among the locations defined as "public accommodations" under Title III are: "a nursery school, a day care center...or other social service center establishment...a gymnasium, health spa or other place of exercise or recreation" (Title III, sec. 301(7)). Early childhood intervention services are becoming more prevalent within such entities (Craig & Haggart, 1994).

Legislation, research and practice are all supporting the expansion of inclusive early childhood intervention services. While data have been collected on preschool age children receiving such services, little is known about its effects

on toddler age children (Lamorey & Bricker, 1993). As a result, questions have been raised about the appropriateness of some natural group environments, such as child care settings, for very young children with disabilities (Bricker, 1995; Graham & Bryant, 1993). For example, it has been documented that the quality of child care programs varies considerably (Cost Quality & Child Outcomes Study Team, 1995; Howes & Hamilton, 1993; Scarr, Eisenberg, & Deater-Deckard, 1994) and these settings may not be the most appropriate for children with disabilities. However, it has also been documented that child care classrooms scored higher on indices of quality than segregated early intervention programs in studies involving both preschool and toddler age children with disabilities (Bailey, Clifford, & Harms, 1982; Bruder & Brand, 1995).

VI. DESCRIPTION OF METHODS AND PARTICIPANTS

Purpose and Design

A longitudinal study examined children with disabilities and their families receiving early intervention services in one of two types of settings --inclusive and segregated. An inclusive program is defined as a community placement in which no more than 20% of the total enrollment of each class is comprised of children with disabilities. A segregated placement is one in which all of the enrolled children have disabilities. The study was designed to examine the developmental status of these children, their families' backgrounds, needs, and available resources and supports, and the service characteristics of their early intervention programs in an effort to identify factors associated with service delivery within and between the two settings. The children were observed initially and every six months over the 12 month period from age 24 months through age 36 months and again at 42 months as a follow-up after the children had left the early intervention (birth to three) program.

A supplementary study comparing the costs of providing services in segregated and inclusive early intervention services was made within the context of the larger longitudinal study. The purpose of the study was to determine a range of costs for services in Connecticut using each model and to explore cost as an additional setting variable on which to compare the two models. Program costs for a particular child included direct personnel costs (salary, benefits and contract costs for all direct service providers), other personnel costs (salary and benefits for supervisors, administration, service coordinators, and support staff), capital assets (office, vehicles and equipment), materials and supplies

(telephone, printing, postage), costs of providing transportation for children, daycare reimbursement costs, and worker travel.

The methodological approach used in the cost study was a hybrid of the common methodology of dividing a total program budget by the number of participants (children and families) served and an approach advocated by Escobar, Barnett and Goetze (1994) in which calculated costs are applied to specific service profiles and the total cost is built up from its components. In this study, the total costs were calculated by summing all the components listed above. Costs for direct service provision, consultative services, transportation, and contract payments to day care centers were calculated from the service profiles of the specific children in the study. The costs of service coordination (direct and indirect), supervisory and supporting personnel, and all material, capital and miscellaneous costs were calculated by dividing total expenditures by the number of children served. The direct service costs were based on individual service profiles but the provider costs applied to the units of service were based on agency averages for salaries, hours and benefits. The supplementary study used a snap shot approach; the service profile and costs in place at the end of 1995 were used for all participants.

Context of the State Early Intervention Program

During the time of the study, Connecticut used a single point of entry for early intervention services. Families were referred to a regional service coordination center at which their children were assessed to determine eligibility for early intervention services. For those children determined to be eligible for services (established condition; or documented developmental delay of two standard

deviations in one area or one point five standard deviations in two or more areas; or clinical opinion), an IFSP was developed and the family was referred to an early intervention agency or therapists as needed. The state agency that provided early intervention was used as a first choice for service delivery, provided there were available openings. If no openings existed, families were referred to a private program or private therapists. Services were delivered according to the child's IFSP, regardless of the agency or therapist who provided services. At the time of this study, approximately one-half of the 2,000 early intervention eligible children attended the state early intervention agency, one-quarter attended one of a number of private agencies (e.g., Easter Seals, ARC), and one-quarter received therapies delivered outside of a formalized program.[2]

The Participants

The Children and Their Families

A total of 42 children participated in the study, 22 girls and 20 boys. Approximately half of the sample was Caucasian (52.4%) with African American and Latino children representing 21.4% and 23.8% of the sample respectively. One child had a mixed race background. The sampling process achieved the goal of diversity, matching or exceeding the percentage of minorities in the state population of children with disabilities. (Complete demographic outline of the children and families appears in Table 1).

[2] On July 1, 1996, the system of service entry and delivery changed as a result of an adoption of legislation mandating an early intervention system.

The children in the sample lived in a wide spectrum of household compositions -- two parents, mother only, father only, extended family (grandparent), and substitute care (foster and adoptive parents). Most of the sample lived with either their mother or mother substitute (52.4%), or both of their parents or parent substitute (42.9%). Thus 24 children (57.1%) lived with one parent, and 18 (42.9%) lived with two.

Two-thirds of the children lived in households in which one or both parents were employed but family income was low. Almost half of the sample (47.6%) reported incomes of $20,000 or less or reported reliance on public assistance as their sole support or as supplementary to a low working income.

Of the 42 children in the sample, 40 children had mothers or mother substitutes, and 20 had fathers or father substitutes. Of the 40 mothers, most were high school graduates with or without some years of college (62.5%); seven did not graduate from high school (17.5%) and eight (20%) were college graduates. The education level of the 20 fathers were similar.

Almost half of the children (45.2%) were referred to early intervention primarily for developmental delay; 21.4% were referred for motor impairments; and 21.4% were referred with multiple disabilities. Five of the children were referred for other reasons. The children were referred at the mean age of one year and thus were in the early intervention system for a year prior to their participation in the study. As the study began at 24 months for each child, he or she demonstrated a developmental level equivalent to approximately 14 months (see Table 2).

Of these 42 children, 41 were represented in the cost study. The data for the remaining child were unavailable because the agency providing services to her was not able to generate the necessary cost information. Each child's data were obtained from the one observation age point which was closest in time and prior to December, 1994. Only the 24, 30 or 36 month age points were included as this was an exploration of birth to three program costs. The 36 month data point was the most frequently used. There were no differences in the age distribution for the two subsamples of children. The age distribution is given in Table 3.

The Classroom Staff

A total of 116 professionals provided services to these children and their families in the classroom or center. Ninety-eight of the professionals were teachers; 45 were specialized instructors; 19 were classroom teachers; and 34 were assistant teachers. In addition, eight therapists and 10 nurses provided center based services. About two-fifths of the classroom staff (39.7%) had Master's degrees; 25% were college graduates and another 25% were high school graduates. (Complete information about staff responsibilities and education is found in Table 4).

Other Participants

All the providers employed or contracted by the State Department of Mental Retardation (DMR), the providers contracted by each of the six Regional Family Service Coordination Centers (RFSCCs) administered by the State Department of Education, and the employees of the five rehabilitation center sites

participated by having their aggregate compensation information released to the study.

The supervisors and administrators of each of the agencies and state departments participated in the study by providing service provision, employee, and fiscal information. In addition, a group of 25 DMR employees and contract professionals participated in a brief time and activity study (description of this auxiliary study is described below as a resolution of a methodological problem). The 25 individuals were from all five regions of the state and included special education teachers (10), speech therapists (6), physical therapists (4), occupational therapists (3), and assistant teachers (2).

The Settings

The inclusive services for children aged 24 months to 36 months were provided by the state agency implementing services in natural environments as described in Part H regulations: in the home or in group programs in which typical children participated. This model of using child care programs as a group environment for toddler age children was established as policy by this agency in 1988. At that time, the state agency closed all segregated centers serving toddlers with disabilities and developed relationships with community child care programs. These relationships included fiscal contracts to support the placement of children with disabilities part time in child care programs for early intervention purposes.

When their child reached 24 months of age, families who participated in early intervention under this state agency were given the option of having their child

attend a child care program part time at the early intervention program's expense. The funding for this participation was provided by the state to one of 86 child care programs who were under contracted for this purpose. These programs did not meet any specific criteria; rather they had space available, were willing to enter a contractual arrangement with the state agency, were willing to support the child with disability, were willing to have specialists provide services in the child care classroom, and were willing to implement early intervention services through a consultation model. In order to use these programs as early intervention sites, a special educator from the state agency attended each program with a child. There were never more than two children with disabilities in any one child care classroom in which early intervention was delivered, though at times children with disabilities were in more than one classroom distributed throughout a child care center. The special educator could provide support to up to two children receiving early intervention in one class.

Prior to 24 months of age, children received services from this agency in their home or in other caregiving environments arranged by their family. This latter group included children who attended child care programs at their families' expense for child care purposes. Only children who attended child care programs part time at the early intervention program's expense by the age of 24 months were included in the longitudinal study in order to maintain control of the number of hours children attended these natural group environments.

Twenty of these contracted day care centers located in various communities across the state participated in the study. Eighteen of the 20 centers provided services to one child in the study; one center provided services to two children,

and one to three children. Most of the children remained at the same center for all the year but several changed sites. Therefore some centers were the site for only one observation point and one was the site for seven observations.

The five agencies from which the children attending segregated classrooms were chosen provided services to both Part H eligible children and children at risk for development delay. These agencies also provided services to children aged birth through adulthood. All five centers had a history of providing early intervention and had participated in Part H service delivery in the state. As such, they provided services according to a child's IFSP. However, the majority of their service delivery was done in a center, either through therapy sessions or group sessions, including classroom based sessions. Two of these agencies were affiliated with hospitals, and three were private nonprofit agencies.

The distribution of the children receiving segregated services was unevenly distributed across the five sites. Two of the sites served only one child each; two others provided services to five children each, and one agency provided services to 11 of the children in the study.

At age 42 months, the children participating in the study were provided services at one of 24 pre-schools. Seventeen of these schools provided services in inclusive environments and seven provided segregated services. (Table 5 lists each setting with the number of children who attended, and the number of observation points).

Procedures

Enrollment in the Study

The state agency providing services in inclusive classrooms funded placements for approximately 200 toddler age children placed in child care programs for early intervention purposes per year. The children entered these programs between the ages of 24-30 months and left at 36 months when they exited from Part H early intervention services. All parents of children who had chosen to enroll their toddler age child in a group child care setting for early intervention by the age of 24 months were asked to participate in the study. In order to qualify for the study, the child could not be enrolled in any other group program. The children from the five agencies providing segregated services also had to be assigned a classroom by the time they were 24 months and not attending any other group program.

If parents chose to participate in the study, they informed their child's early intervention teacher, who then contacted the study coordinator. The coordinator visited the parent(s) to discuss the purpose of the study and the type of information that would be collected until their child was 42 months old. After informed consent from the family was obtained, permission to videotape in the child's classroom was sought from all other families whose children attended the classroom. Informed consent was also obtained from the classroom staff, since they were asked to participate in data collection. Enrollment in the study occurred over an 18 month period. Two deterrents to timely study entry were obtaining video releases for all the children in the participant's class and the age requirement (i.e., in a group setting by 24

months). The final sample represented 40% of the population that was eligible for the study. Unfortunately, these enrollment criteria prohibited random selection.

Data Collection Procedures

Data collection was scheduled at six month intervals for eighteen months beginning when the child entered the study (24; 30; 36; and 42 months). Data were collected through interviews with families and early interventionists, observations (including videotape) and formal assessments. The data were grouped under the categories of family status, child status and service characteristics. Family background information was collected upon entry into the study. Child status and service characteristics were collected on the six month schedule. Table 6 contains a list of the information sources within each of the three categories which were used in this analysis.

Data were collected within two weeks of the child's scheduled age point. Two data collectors who had education (psychology or special education degrees) and experience in child development and were trained to reliability on the data procedures and instruments visited the child at home (one visit) and at the child care program (three separate visits) to collect the data. The total hours used for data collection averaged 10 hours per child's age point.

During the home visit, parents were asked to provide background information and to discuss their perceptions of service implementation. During the program visits, one session was used to gather information on the classroom environment (activity log and Infant and Toddler Environmental Rating Scale).

During the other two program visits the data collector videotaped samples of the child's behavior in the classroom, assessed the child on the developmental assessments listed in Table 6, and interviewed the staff assigned to the child. A copy of the child's current IFSP was also collected at this time to assess the content of each of the outcomes listed on the document.

The data for the supplementary cost study was collected on a special schedule. Most of the information about the child's service provision was already collected as part of the larger study. The information relevant to the cost study included (1) hours per week daycare or center attendance, (2) hours per week of specialized instruction, (3) hours per week of each therapy, received individually and in groups, direct and in consultative mode, and (4) number of children simultaneously receiving group services. Agency supervisors provided the following additional information concerning the child's profile: (1) mode and cost of transportation to the center, (2) cost of the daycare contract (for those in inclusive settings), and (3) information about the whether the providers of the service were salaried employees or contract professionals, and if contract, with whom the contact was made (DMR or RFSCC).

Compensation information such as salary averages, benefit percentage rates, number of working hours in a year, estimates of used sick leave, and a measure of productivity were collected for all early intervention employees from each of the agencies involved. In addition, average hourly rates and productivity measures for contract professionals were collected from DMR and the RFSCC. (The segregated sites did not use contract professionals).

All information about the square footage for all space attributable to the relevant program at each setting; per square foot rental costs or fair market rentals for state owned property; and the total cost of equipment, vehicles, telephones, supplied, printing, postage, and other miscellaneous expenses attributable to providing early intervention services were collected from each agency and from DMR's central and regional offices. Information about the costs of maintaining the RFSCCs and providing service coordination services was collected from the State Department of Education. Average numbers of children served during the previous year was collected from each of the agencies, DMR central and regional offices, and the RFSCCs.

Description of Instruments

A description of each of the instruments and measures listed on Table 6.

Child Status

Battelle Developmental Inventory (BDI) (Newborg, Stock, Wnek, Guildubaldi, & Svinicki, 1984). A standardized assessment which assesses key developmental skills in children birth to age eight, the full BDI consists of 341 test items grouped into five domains: personal-social, adaptive, motor, communication, and cognitive. A 3-point scoring system provides a measure that takes into account emerging as well as fully developed skills. The BDI was designed to accommodate a range of disabling conditions, and adaptations are permitted for children who have sensory or motoric disabilities that might restrict their ability

to perform a target behavior. A total score and individual domain scores were calculated for each child's observation point.

Peabody Developmental Motor Scales (PDMS) (Folio & Fewell, 1983). This instrument is designed to evaluate gross motor and fine motor development from birth to 6.9 years of age. The gross motor section is subdivided into the five skill areas of reflexes, balance, non-locomotor, locomotor, and receipt and propulsion. The fine motor section is subdivided into the four areas of grasping, hand use, eye-hand coordination, and manual dexterity. Although the gross motor section does include a reflex skill area, the assessment is developmental rather than neuro-developmental in substance. A scale total and gross and fine motor subscales were calculated for each child's observation point.

The Preschool Language Scale-3 (PLS) (Zimmerman, Steiner, & Pond, 1992) is a standardized scale developed as a diagnostic instrument to measure the language development of children 2 weeks to 6.11 years of age. The PLS-3 is organized into two standardized subscales: Auditory Comprehension and Expressive Communication. Both subscales are divided into four sections: language precursors; semantics; structure; and integrative thinking skills. Total and subscale scores were calculated for each child's observation point.

Social Participation and Cognitive Play Scale (POS). A 25 minute observation period for each child was videotaped and later coded in ten second intervals for amount and social and cognitive levels of play. The measure is a slightly modified version of the procedure used by

(Guralnick, Connor, Hammond, Gottman, & Kinnish, 1996) for their work with pre-school children with and without disabilities. The social index used was based on Parten's (1932) index of social participation and the cognitive index on Rubin (1985). Social levels included solitary, parallel, simple social, reciprocal and group play; cognitive categories include functional, constructive, dramatic, and games with rules. Types of non-play behavior and information about proximity of adults and peers in the classroom and classroom activity were also coded. The coding was done by two research assistants with reliability training and monitoring. The analytic measure was an aggregated version of this file that focused on frequencies of each type of behavior during the 25 minute observation.

Social Network Scale. This short questionnaire was developed for this study to provide an indicator of the type of social network in which the target child operates. Parents were asked for the number and type of contacts (e.g., birthday party, ...y hour) their child had in the week prior to the data collection point

Social Status Scale. This questionnaire measures the teacher's perceptions of the social status of the target child as indicated by the frequency with which peers chose the target child to participate with them in activities and/or interactions (e.g., snack, buddy, play partner).

Demographic Background. Each parent was asked to complete a questionnaire as their child began in the study. One section of the

questionnaire focused on the child's early intervention history, including the primary reason for referral.

Family Background

Demographic Background. The same questionnaire that requested information about the child had several sections that asked for information about family composition, parents' employment and education. From this information a score for social class was derived using the Hollingshead Four Factor Index of Social Status (Hollingshead, 1975). The assignment of parents' occupations to the index's point system was done independently by two project staff. After a satisfactory reliability was shown, consensus was reached on each disagreement.

The Family Needs Questionnaire (Dunst, Cooper, Weeldreyer, Synder, & Chase, 1988). This questionnaire measures a family's needs for different resources and supports. The scale includes 41 items organized into nine categories of needs (financial, food and shelter, vocation, child care, transportation, communication, etc.). Each item is rated on a 5-point scale ranging from (1) almost never a need to (5) almost always a need. The reliability and validity of the scale were established in a study of 54 parents and preschool and elementary aged retarded, handicapped, and developmentally at-risk children. The Family Needs Scale was specifically developed for work in early intervention.

The Family Resources Questionnaire (Dunst & Leet, 1987). This questionnaire measures the adequacy of different resources in households with young children. The scale includes 31 items rated on a five-point scale ranging from (1) not at all adequate to (5) almost always adequate. The scale items are roughly ordered from the most to least basic.

The Family Support Scale (Dunst, Jenkins and Trivette, 1988). This scale measures a family's perceived level of support within the immediate family and personal network, as well as an assessment of support across broader spheres of the community. The scale includes 18 items.

The Personal Network Matrix (Trivette & Dunst, 1988). This measure provides a way of assessing a number of aspects of needs, resources, and support. A fully completed scale provides a graphic display of a respondent's personal social support network in terms of both needs and support sources. It also yields quantitative (frequency of contacts) and qualitative (dependability) information about the respondent's personal network. Collectively, the various bits of information obtained from the scale provide a basis for a help given and family to explore ways of mobilizing resources for meeting needs. For this study, only the quantitative data (frequencies of personal contacts) were used.

Setting Characteristics

Early Childhood Environmental Rating Scale (ECERS) (Harms & Clifford, 1980) is designed to give an overall picture of the environment for children and adults in preschool settings, including the use of space, materials, and activities to enhance children's development, the daily program schedule, and the supervision of children. The scale consists of 37 items organized into seven subscales: (1) Personal Care Routines, (2) Furnishings and Display, (3) Language-Reasoning Experiences, (4) Fine and Gross Motor Activities, (5) Creative Activities, (6) Social Development, and (7) Adult Needs. The scale was initially developed for use in preschool programs (day care, Head Start, nursery school) for predominantly non handicapped children. Each item is scored from 1 (inadequate) to 7 (excellent), and an overall program index is calculated by summing all of the item scores. This scale was used for all 42 age points and three observations at 36 months because the child had already moved to a pre-school classroom.

The Infant Toddler or Early Childhood Environment Rating Scale (ITERS) (Harms, Cryer, & Clifford, 1990) a modification of the ECERS scale for use in toddler environments. The ratings and the scoring are the same but the items and subscales differ. The scale consists of 35 items organized into seven subscales: (1) Furnishings and Display, (2) Personal Care Routines, (3) Listening and Talking, (4) Learning Activities, (5) Interaction, (6) Program Structure, and (7) Adult Needs. This scale was used for ages 24 - 36 months.

Activity Logs were also completed during one observation session of the child in the child care program. The activity log was completed on a ten minute schedule during the three hours of program participation. The data collector recorded the activity in which the target child was involved every 10 minutes. These activities were categorized as care giving (eating, drinking, dressing, undressing, toileting or diapering, and washing); circle time (structured class activity usually at opening or closing of the session); free play (unstructured time during which the child had free choice to be involved in any classroom play activity); goal directed (activity which had a predetermined purpose and structure which was planned by a teacher and had specific behaviors associated with it such as an art activity, story time, motor activity); and transition (moving from one activity or routine to another including coming or leaving). In addition, the data collector also scored whether the activity in which the child was involved was directed by a teacher; or directed by the child, with or without teacher support.

Classroom and Service Profiles. Information about the child's classroom hours, staff, and fellow children was obtained from the teacher every six months. Service information included the type and amount of services received, whether they were received in the classroom or elsewhere, in a group or individually, and whether the services were delivered directly by the specialist or by the classroom staff after consultation with a specialist.

Individual Family Service Plans. The outcomes listed on the IFSP were initially categorized as to whether they were child or family related. A

family outcome was defined as either having a mention of any family member in addition to the enrolled child, or listing an action which would benefit any family member in addition to the enrolled child (e.g., the family will receive translation services during medical visits; the family will receive respite services). Developmental outcomes which targeted specific developmental or behavioral skills were scored as child related unless other members of the family were also mentioned as part of the outcome (e.g., the child will talk; the child will use a motorized device for mobility; the child will eat by himself). The child outcomes were further broken down into areas of development such as motor, communication, cognition, self help, social or health related.

Program Costs. The total cost of services received per week per child was derived from the collected project data using several layers of calculations. To reflect the effects of multiple providers and group service provision both the number providers and the number of children simultaneously receiving services were included in the calculation of the number of hours allocated for cost for each service for each child.

Cost hours = (indiv hrs * # provdrs) + ((group hrs * # provdrs)/# in group)

The providers' per hour cost was also a combination of several factors. For salaried providers these included base salary, fringe benefits, number of working hours, and a productivity factor to calculate additional non child contact time used.

salary/contact hr = ((base salary * fringe)/# working hrs) * non-contact factor

contract/contact hr = hourly charge * non contact factor (if appropriate)

Direct service provision costs were calculated for each child individually by applying the per hour charges for each type of provider to the child's

cost hours and adding the sum of these to the child's transportation and daycare contract costs. The indirect personnel costs all capital and supply costs, and the cost of service coordination were obtained by averaging the totals received by each agency, dividing by the number of children served and applying the results to each child according to his or her center. The total of the individualized and site wide costs for each child (on a weekly basis) was then summed and available for comparisons. A review of the methodology and cost calculations is provided in Tables 7 through 11.

VII. RESOLUTION OF METHODOLOGICAL AND LOGISTIC PROBLEMS

Logistical Problem

The design of the study originally proposed for funding was set to examine the effectiveness of a social competence curriculum (Guralnick, 1992). When the study was proposed, the curriculum was being field tested with pre-school age children. This study was planned to test a version of the curriculum adapted for toddler age children. The original design of the current study called for the enrollment of 60 toddler age children with disabilities, 30 in each setting, half of each assigned to receive the curriculum and the other half to receive standard early intervention treatment. Recruitment difficulties led to delays in recruitment and the initiation of data collection and more crucially to a reduction of the total enrollment to only 42 children. In addition to the lower overall numbers, a number of factors, including location of services available, professional recommendations, and family preferences were not evenly split between the settings. With the likelihood of fewer than 20 children in one of the settings, the assignment into curriculum and standard treatment groups would have resulted in unacceptably small sample sizes.

Resolution

To ensure sufficient numbers of children in each situation, the study concentrated only on the differences between the settings, deferring introduction of the curriculum for future research.

Methodological Problem

A problem common to many longitudinal studies is subject attrition. Because access to children, their families, and teachers was needed over an 18 month period there was ample opportunity for loss of data. Despite the best efforts of the data collectors to keep track of all the children, missing data were inevitable. The most common attrition occurred when some of the children and their families moved out of state or became otherwise irreversibly unavailable to the project. This type of loss occurred for all measures at one or more of the later ages. There were various other problems as well. Some children were not enrolled in a group setting for all ages so all the classroom data were inappropriate. Some children were in a classroom with children who were the responsibility of the state whose regulations disallow any breach of confidentiality including photographs and videotaping, even if the state's child is not the focus of the taping. This situation, which occurred fairly often, made it impossible to collect the play observation data at one of more age points. Although the cooperation of each of the programs was obtained during the initial recruitment of the child, this did not necessarily guarantee the cooperation and availability of individual teachers. Further, it was not known what pre-schools the children would attend at age 42 months when each child was brought into the study so cooperation with pre-school teachers was not even discussed prior to the child's entry to the study. Teacher data were difficult to obtain, especially for the 42 month age point. Parents also promised full participation in the study but many did not fulfill their obligation at all ages. Finally, inclement weather, repeated absences by the children, and other combinations of events required the postponement of some

of the observations to a time when they were no longer relevant. The study was therefore left with incomplete data sets.

The longitudinal nature of the analyses made some of the missing data more crucial. Repeated measures analyses can only be done on children and families which include full sets of data, across the repeated age points. By restricting analyses to these subsets, the power of the statistical tests was diminished.

Resolution

Every effort was made to collect all data possible. When possible, alternative sources of data were used (e.g. program supervisors or IFSPs to give information about services received if teachers were unavailable). For the longitudinal analyses, the sample was restricted to those who appropriately had all data points but wherever possible, larger data sets were used in cross sectional analysis or in other ways to try to broaden the subject base for the study.

Methodological Problem

At age 36 months, all children with disabilities transition from the state birth to three program to pre-school programs. Since assignment to setting was not an experimental condition but a naturally occurring selection, many factors were involved in the placement of the children into a new setting. Again, personal preference, location, and other factors caused a split with unfortunate consequences for research purposes. Of the 42 children in the study, only 25 (12 of the 23 in segregated settings and 13 of the 19 in inclusive settings) were

known to be placed in the same type of setting for pre-school. Fourteen of the remaining children changed type of placement and three children were lost to the study due to attrition by the 42 month age point. For the 14 children who changed type of setting, results of their early intervention setting could be masked or changed by their current situation. Restricting the sample for the longitudinal study to those who remained in the same setting condition through 42 months would have decreased the sample size by over 40%.

Resolution

The effect of setting on developmental change will be explored in several ways and not just as a longitudinal repeated measurement design. A repeated measurement approach will be used to identify good measures of change, to look at setting and development through 36 months of age, and to explore the development of those children who remained in one type of setting. Cross sectional analyses at the different age points will take advantage of the larger sample sizes available.

Methodological Problem

In the cost study, when the administrators and regional supervisors for DMR were asked to estimate the travel, preparation, and record keeping time needed to support one hour of contact time for the various disciplines, the administrators of the segregated sites were quite comfortable in quantifying their thoughts. Their responses were all within a fairly small range. For the inclusive sites, the DMR supervisors were asked to do the estimates. Their responses varied widely, even though they were all estimating professionals

affiliated with one organization and program. . Using an average of the estimates of seven supervisors eliminated the extreme estimates, but the variation reduced confidence in the accuracy of the composite estimate anyway.

Resolution

Other sources of information were sought including department administrators' estimates and a review of records at the DMR central office. These were also not definitive. The decision was made therefore to do a companion time and activity study. Professionals across each region and discipline were asked to keep a daily log of their time indicating whether each 15 minute time period was spent in: direct contact with the child; direct contact with the family; travel; transporting children; case specific paper work, meetings, phone calls, etc.; other early intervention activities; non early intervention program activities; or vacation, sick time, personal leave, etc. (See Table 12 for a copy of the time activity record.) For the purposes of this study only contact time and program related non contact time were needed. The greater specificity was obtained because allowing the workers to chart all of their time and to make finer distinctions made the forms more understandable and comfortable to use and the additional data were desired by DMR. For each discipline a total program related non contact time was calculated by summing all categories except contact, non early intervention related, and time off. The ratio of the non contact and contact time was used as the multiplier for the cost study. Vacation, personal days and other time off was not needed in the calculation because that time was already eliminated from the main cost calculation by using the actual number of working hours. This extra study provided greater confidence in the cost calculation but it is interesting to note

that the ratios obtained by averaging the individual providers' information were actually very close to those originally obtained by averaging the supervisors' estimates. In both cases there was considerable variation from person to person.

Methodological Problem

The various sources of data used different periods of time for their base. The longitudinal data set compiled the service profiles on the basis of weekly totals. Most of the compensation information was based on yearly totals. Rent and worker transportation costs were calculated monthly.

Resolution

The resolution of the problem of different time periods was simple for calculations. Data for months and years were easily converted into weeks which was chosen as the unit of analysis for the study. The more difficult issue was that many of the children did not have a constant schedule all year. The weekly totals collected in the main study were those applicable to a full service week. During the summers and other holiday periods the children often received fewer services. Thus, once the weekly costs were calculated, it was not proper to multiply by 52 to obtain a true yearly cost. There were no problems in the calculations or the comparisons between settings. There could be a problem in interpretation and over estimation of yearly costs. The resolution of this problem was achieved only by making policy makers and others who reviewed and used the cost information to understand the concept of full

service weeks and the problems that would exist with an attempt to multiply back out to obtain information for longer periods of time.

Methodological Problem

The most serious problem for the comparison of costs between the two settings was the existing salary structures. All the inclusive sites were arranged through the State Department of Mental Retardation so all the specialized instructors and most of the therapists were state employees. DMR is administratively treated like a school district in Connecticut. Its employees are all part of a strong state employees' union system. The employees, especially the teachers, employed during the study had long standing tenure in the department. Most were close to the top of a relatively high pay scale. Many of teachers and therapists at the Rehabilitation Centers, in contrast, were newer to the field and were paid out of a tight private, not-for-profit budget. Workers were unprotected by union provisions. The differences in salaries (detailed below) were very strong. Thus a comparison of costs between the two models was more difficult because differences in part reflected this difference in salary, which had nothing to do with the nature of the type or location of service provision. There was no way to isolate the cost of each service model from the existing salary structure of those currently providing it. It was possible to explore service profiles without assigning provider costs but that precluded a comparison of differences across disciplines and an ability to see a total cost related picture.

Resolution

Data were analyzed as collected with the differences in salary structure totally confounded with setting. Despite the methodological problem, this approach does reflect the reality of the situation in Connecticut as it was when the study was conducted. In addition to the basic analysis, additional calculations were made with a single set of average provider costs. The average costs were calculated from the information from the agencies involved in the current study, weighted by the number of children in the sample affiliated with each of the site.

VIII. RESEARCH FINDINGS

Overview

Several conceptual and methodological steps were needed to be able to interpret the large amount of data to yield an answer to the major question of the study -- what is the effect of type of setting of early intervention program on the development of children with disabilities. First, several measures (e.g. developmentals, environmental rating scales, activity log, play observation) involved more than one person making ratings; these data were checked for reliability. Second, the comparability of the two subsamples of children and families was verified. Third, it was necessary to demonstrate that the two settings actually did represent different models of service delivery. Fourth, developmentally sensitive measures (those that show development with increasing age) were identified. After all of this was established, the task then became determining whether the different models of service represented by the two settings influenced the development of children with disabilities and their families. Following this major determination, other analyses were conducted to explore whether the strength or direction of any effects were dependent on other child or family factors and whether other factors were, in themselves, primary determinants of change.

Reliability

Reliability information was obtained for all measures that required the judgment of project staff. This included the developmental assessments,

observations of the environment, and the Social Participation and Play Scale (POS), and the Hollingshead measure of SES. For all measures, independent coders were trained on the data procedures and instruments to a standard of at least 80% agreement prior to the beginning of their coding. Throughout data collection, 20% or more of the data set were independently collected or coded by two research assistants. The percent of agreement (number of agreements divided by the total number of decisions [agreements and disagreements] multiplied by 100) was the main calculation for all instruments. For the largest task -- the POS coding from videotapes, the analysis was more detailed. Individual percent agreements were obtained for each of the measures and the Cohen's Kappa statistic was also used to determine the reliability of coding compared to the likelihood of chance agreements. For the Hollingshead measure, an inter-rater correlation of resulting SES scores was used as the reliability measure of the subjective occupational status points assigned by two independent coders.

The percent agreements ranged from 85% to 100% across all instruments. For the three developmental assessments, the range was 96.8% to 97.7%; for ITERS, 96.3%; for ECERS, 93.9%, and activity, 98%.

For the POS coding, percent agreements were 96% for whether the child was playing, 90% for social level, 88% for cognitive level, 85% for type of non play activity, 93% for who the child is with, 90% for the classroom activity and 93% for peer availability. The Kappa test values for these variables range from .72 for cognitive level to .92 for whether the children were playing. (Complete reliability results can be found in Table 13).

Initial Comparison of Two Samples of Children

The design of the study called for two groups of children comparable in demographic and developmental variables at the onset of the study so that the effect of their early intervention settings on their development could be measured. Due to obvious practical and ethical barriers, random assignment to settings was not an option. Thus, the dependence on random occurrence, central to so much research could not be depended on for equivalence of groups. Therefore, the two samples were compared for differences at the 24 month data collection point.

The goal of comparability was clearly met. There were no significant differences in the sample for sex or race of the children, the reason for referral or age at referral, or the developmental level or service plan at 24 months. (Detailed data for all measures appear in Tables 14 through Table 17.) Both samples were fairly evenly split between boys and girls with slightly more girls (52%) in the sample. Both samples showed diversity of racial background; the sample of children in developmentally segregated settings had a higher proportion of non-Caucasians but the differences were not significant.

The very general description of developmental delay was used more for the children in segregated sites as a reason for referral but again differences were not statistically significant. Similarly, there was some difference in age at referral to early intervention; children in inclusive settings were referred at an average age of approximately 11 months compared to 13 months for those in segregated settings.

At the onset of the study, the children in both groups were behaving at an age equivalence of approximately 14 months as measured by the total scale of the BDI. As can be seen in the Table 16, the average age equivalence level for the children differs little either across measures or between groups, with all means falling between 13 and 15 months. Since the sample variance for the group in inclusive settings seemed to suggest a more developmentally diverse group on almost all the measures, a test of homogeneity of variance for each of the measures was conducted in addition to the more traditional analysis of variance for differences in means. Results showed that neither the means nor the variance of the two samples differed. Thus, the children were developmentally comparable at 24 months.

Not surprisingly, given their comparability both developmentally and for reason for referral, there were no statistical differences on the original plan of service as outlined in the Individual Family Service Plan document in effect at age 24 months, upon entry into the study. For both groups, the IFSP was done at approximately 20 months of age. Family related outcomes were practically absent for both groups of children. There were also no differences in the proportion of IFSPs that included outcomes within various domains. More than half for both groups had motor outcomes (non significantly more prevalent for segregated); about three-quarters had one or more outcomes for communication or speech (non significantly more prevalent for inclusive); and about 40% for play and self help related outcomes for both groups. There were more IFSPs among the children in segregated settings that included one or more outcomes in the cognitive domain, but again this difference was not significant. Only a few IFSPs for either group included other outcomes in other domains. The average total number of outcomes for both groups was four. The

average number of outcomes in each domain was one or fewer, reflecting the same pattern as above (see Table 17).

Comparability of Families

Early intervention services are to be family centered by federal mandate. Because families play such a central role in the provision of services and are key to this study, comparability of family variables in the two groups was also examined. We found that, like their children, the families with children placed in each of the two settings are comparable, although, there were some interesting differences.

Although there were no significant differences in the two groups of families on any of the demographic variables, a pattern emerges that suggest that there might be some socio-economic differences. As can be seen in Table 18, a higher proportion of families with children in segregated settings were single mothers, an unemployed custodial parent, were dependent on public assistance for all or part of their income, report lower incomes, and had fathers who were high school graduates who did not attend college. Many of these differences (education, occupation, presence of two parents) are summed in the Hollingshead measure of social status; the families of children in inclusive settings also had higher scores on this composite measure, but the difference was not significant.

These data are somewhat difficult to interpret and appreciate. The prevalence of the differences from variable to variable suggests an overall socio-economic difference but since there was no significance, the assumption must be that

the population does not differ on these variables and the analyses for the study can proceed.

In addition to demographic data, families were asked to complete four scales measuring various aspects of their social contacts, feelings of support, defined needs, and availability of resources. Although the children were already in the setting placement at the time of data collection, this first data collection point, at 24 months could be viewed as their family's situation as they entered the study. It can be seen by examining the vast array of items for all four scales and their totals (see Table 19 through 22) that families with children in inclusive settings reported somewhat more contacts, somewhat fewer defined needs, more support, and most clearly, greater resources than families of children in segregated settings.

The differences in personal contacts was significant only for spouse's parents and daycare. Given the higher proportion of two parent households and the obvious use of a day care setting for inclusive settings, these differences were not surprising. In fact, when the analyses were rerun including only those families with two parents (have a spouse) the differences were not significant.

The differences in perceived support were somewhat stronger (the total scale shows a borderline difference) and all but a few items showed more support for inclusive. The significant differences included spouse and spouse's friends, again both probably indicative of the difference in household composition since the scale measures the presence of support and not differentiate for reason of non support. (Again, a repeat of the analyses on the subset of families with

spouses showed no significant difference.) Families of children in inclusive settings also reported more support from friends.

The reported families' needs showed few differences between the groups. Only two items showed differences approaching significance, saving for the future and expanding the parent's education and skills. Both of these showed greater need for families with children in segregated settings. Again, this was consistent with the demographic differences, and again, although suggestive, there are no clear group differences.

Reports of family resources showed the most consistent and most significant differences. Families with children in inclusive settings report significantly more resources: money for necessities, transportation, rest, furniture, day care for child, dental care for the family, someone to talk to, and money to buy extras and fun. In addition, there is a significant difference in the scale totals.

The initial comparability of the family measures is therefore not as easy to assume since some of the differences did reach statistical significance. The differences were not so great as to invalidate further analyses at later ages. However, the initial differences, especially for family resources, will be taken into consideration in the methodology and interpretation of the later analysis.

Setting Differences

With comparability between samples of children and their families established, the next analytic task was to show that the settings offered different models of service to the children and parents. To explore this, classroom demographics,

classroom quality, classroom activities, identified outcomes, and prevalence, intensity, location, and modality of services were each compared across settings at each of the age points. The setting differences showed similar patterns at the three early intervention age points, so those three age points were combined. The pre-school settings at age 42 were also compared. All the measures for birth to three settings will be summarized first.

Classroom Demographics (Birth to Three Classrooms)

Segregated and inclusive classrooms differed in the number of children with disabilities present by definition. For inclusive classrooms, the average number of children with disabilities was just a little over two[3], while the average for segregated classroom was over seven children. The range for the segregated classroom was three to twelve. Of course, the difference was highly statistically significant. These classrooms also differed in the total number of children (inclusive more), and the mean number of years experience of the staff with a birth to three population (inclusive higher). All relevant demographics are listed in Table 23.

Classroom Quality

The quality of the environment of the classroom (as measured by the ITERS scale) also showed some differences between the two settings. While the overall mean score did not differ significantly, most of the subscale totals did. Inclusive classrooms were scored higher on furniture, talking and listening,

[3]By definition, inclusive classrooms had no more than two children with disabilities but several of the classrooms in the study were "double classes" with children and staff combined. These classes had three or four eligible children and raise the average slightly.

learning activities, and interactive items; segregated classrooms were rated higher for care giving activities and adult needs; there were no differences for program structure. Table 24 lists the means scores for each subscale and the total for each setting.

Classroom Activities

The classrooms differed on all aspects of classroom activities measured. The activity assigned to each 10 minute interval was categorized into free play, goal directed activity, circle, adult provided direct care, and transition. All but the transition measure showed statistically significant results with the inclusive classrooms showing more free play and direct adult care and the segregated settings showing more circle time and goal directed activities. The ratio of children per staff member was also calculated for each time interval. The average ratio was higher (more children per staff) in the inclusive settings. Table 25 lists the percent of time in each activity for each of the settings.

Identified Needs

The number and domain of outcomes identified for the children and their families in the Individualized Family Services Plan was used above as a measure of the situation of the child at entry to the study. While the individual child and family is clearly a strong determinant of the identified outcomes, predilections of the service providers may also clearly affect the prescribed outcomes. Thus, their review is appropriate to a study of the settings. Although there were more identified outcomes for those children served in segregated classrooms, there were no differences between the settings

in the prevalence or number of outcomes in any domain. The data are summarized in Table 26.

Services Received

While planned outcomes did not differ, almost everything about the services provided was different for the children in the two settings as can be seen in Tables 27 through 30. First, children in segregated settings were more likely to receive a wider range of service than their counterparts in inclusive settings. A higher percent of the children in segregated settings received occupational therapy, physical therapy, and speech services; in this sample, only children in inclusive settings received nursing services.

For those receiving each of these services, children in segregated settings received more hours of all of the therapies and specifically more hours of speech and occupational therapy; the differences for physical therapy were in the same direction but were not significant. The children in inclusive settings received more hours of specialized instruction.

There were also clear significant differences in the location of the services provided -- children in segregated settings, were more likely to receive all their services at the early intervention setting -- and in the way services were delivered -- children in inclusive settings were very much more likely to receive services in a consultative model.

Differences at Age 42 (Pre- School Settings)

Information about the children and families was collected at age 42 months as a follow-up to their early intervention experience. Data were also collected, however, about their pre-school settings. There were 15 children in segregated settings and 23 in inclusive settings (the pre-school setting of four of the children was not known).

There were a few significant setting differences: more children and staff in inclusive classrooms, higher scores for the language subscale of the ECERS for inclusive classrooms, and more children with identified needs in the cognitive domain among those in segregated classrooms. There were, however, no clear differences in services received by the two groups of children. Thus, there was no clear evidence of two different models of service in the two settings at age 42. Therefore, any systematic differences found can more easily be attributed to the early intervention sites (see Tables 31 - 38).

Cost of Services

The cost of services in segregated and inclusive settings was a setting measure of special interest in this project and thus was explored (and will be reported) in more detail than just to show that the two settings represent different models. The findings for each component -- service profiles in terms of cost hours, provider compensation, and other costs -- were explored separately and then tied together for the calculation of total costs. Additional analyses were then conducted on a "what-if" variation of the cost data to better understand the implications of the differences.

Children's Service Profiles. From a cost perspective key factors are service prevalence, service intensity, and whether services were received individually or in group settings were key factors. The average number of "cost" hours, i.e., the number of provider contact hours individually allocated to the child, combines the factors of prevalence, intensity, and mode. This magnified some of the service differences outlined above and offset others. The hours of specialized instruction was a good example of this. From the child's perspective, there was a difference in service intensity with inclusive receiving more service (5.82 hours compared to 3.88 hours across all three ages). For cost hours, the children in inclusive settings received almost triple what the children in segregated sites did (2.96 hours to 1.03 hours). Conversely, the differences in therapy hours was counterbalanced by group settings and, although children in our sample in segregated settings received more cost hours of each of the therapies, only the differences for speech therapy and for each of the therapy assistants were significant. (Table 39 contains setting comparisons for all the services' cost hours.)

The other direct costs calculated for each child were the transportation costs and the costs paid to the daycare center by the for the time at the center attributable to the early intervention program. Transportation costs were similar for the children at the two settings. The average weekly cost of transporting a child to the segregated sites was $32.51 and to inclusive settings, $30.36. Only the children in inclusive settings had daycare costs; the average weekly cost (for service weeks) was $44.07.

Provider Compensation. As discussed above, differences in per hour compensation totals were anticipated between the two settings due to the different salary structures in place. An exploration of the components of compensation -- base salary, number of working hours, and benefit rate confirm that the big difference between the state employees offering inclusive services and the employees in the segregated sites was the base salary. This is clear for specialized instructors; for the other disciplines, the average salaries awarded by state contract were usually higher than the other setting but in some cases only slightly over the range of the others. The benefit rates are similar from site to site with the rate for the inclusive setting clearly midrange. The hours of work vary more from site to site; the one inclusive setting has the lowest number of hours of any site (excepting the site where workers are part time). Table 40 displays the salaries for each discipline, the hours of work for teachers and therapists, and the fringe rate for each agency.

The last crucial element of the provider cost calculation was the correction factor for non contact service provision. The number of additional hours each discipline reportedly spent per contact hour varied considerably between the one inclusive setting and the other settings (see Table 41). As discussed above, this was a difficult area for data collection, but the information for the inclusive setting (which differed from the others) was obtained from several sources which converged on similar estimates. The information for the segregated sites was confirmed with the administrators. The data clearly indicate that the ratio of non contact to contact hours was higher for the children served by DMR in inclusive settings.

From a cost perspective the most important compensation figure is the per contact hour cost of service which combines all the factors discussed above. Also important to understanding the cost analysis for the current sample is the relative number of children's service profiles matched to each of the site compensation profiles. The provider data for each site were thus analyzed weighted[4] by the number of children at each site in the analysis. Table 42 presents the summary of these costs. The differences were strong and consistent and not surprising given the differences in salaries and non contact time. Cost per contact hour was greatly higher in the inclusive setting for each discipline.

Indirect Costs. This category includes all other personnel costs including other providers (social work and nursing). supervisory and administrative, and clerical support; all capital costs including space, vehicles and equipment; all materials and supplies; miscellaneous costs (such as insurance, advertising, etc.) and worker transportation. The costs as detailed in Table 43, showed that the inclusive setting had far lower indirect costs than the segregated sites.

Other Costs. The remaining costs associated with the delivery of early intervention services in Connecticut were related to service coordination. At the time of the cost study, the RFSCCs were responsible for the service coordination function. The direct costs of the time the service coordinator spent with each child and his or her family, and the indirect costs for auxiliary personnel at the Coordination Centers and at the supervisory agency,

[4]As discussed in the previous chapters on study participants, there was considerable variation in the number of children at each site. For the segregated sites, there were 11, 5, 5, and 1 children at the four sites supplying cost data. The 19 children in inclusive settings were at 16 different daycare centers but their operative costs were all the same. (Classroom staff which did differ were paid by the daycare contract costs which were added in as a cost. The providers were therefore not included in the per hour cost).

the State Department of Education, as well as both centers capital and materials cost need to be added for a more accurate child total. The service coordination function is independent of setting so one average was calculated for the state. The average per weekly cost was $27.94 for the direct individual services and $27.76 for the indirect costs.

Total Cost. The data presented above comprise the totality of the costs involved but the hourly service costs need to be calculated from the service profile and the providers' costs. The full cost comparison including the service costs and the costs already discussed are presented in Table 43. It is clear that costs for direct and consultative services were much higher for the children in the sample in inclusive settings. Most of the difference was in the cost of specialized instruction which is over seven times higher than for those children in segregated settings. None of the other provider costs showed significant differences. As discussed above, the indirect costs were reversed; inclusive was considerably lower. The differences were not great enough, however, to offset the difference in specialized instruction, so there was a strong difference in total costs ($621.65 vs. 329.87).

An Alternative Calculation. Given the strong and known differences in salary structures between the tenured, unionized state employees providing services in inclusive settings and the non-tenured, non-unionized employees in not-for-profit agencies providing services in segregated settings, the relative costs with salary held constant was explored. The same profile costs were compared again, substituting only one per contact hour cost for each discipline. The indirect costs also were averaged for the two settings since this seemed to be extrinsic to the setting type and more likely attributable to

differences in scale between the smaller not-for-profits and the larger state agency. The results showed that, as expected, the cost difference between the two settings narrowed but there were still large difference in cost ($500.17 compared to $381.68) All of the difference, was found in the comparison of specialized instruction scores. There were no significant differences in any of the other costs; in fact, the cost of therapy would be marginally greater in the segregated model when personnel costs are even (see Table 44).

Summary of Setting Differences

There were clear differences in the classroom demographics, quality and activities, the prevalence, intensity, location and modality of services provided. It is clear that the two settings offer different models of birth to three service delivery but there was not evidence of differences between the two pre-school settings. Figures 1 through 3 highlight the differences in toddler settings.

There were also clear differences in costs found between the two settings with the inclusive placements staffed by state employees costing more. In addition to service profile factors, there were large differences in salary structure (inclusive higher) and in overhead costs (segregated higher), both of which had little intrinsic relationship with type of setting and were specific to the situation existing in Connecticut at the time of the study. Cost was therefore not further explored in relationship to child developments or family status.

Potential Measures of Change

Several of the instruments used were potentially good measures of developmental change. Three measures were designed to be developmental indices -- Battelle, Peabody Motor, and PLS. These indices and their subscales, were the most likely developmentally sensitive measures for overall, language, motor, cognitive and adaptive development. Because social development and peer interaction was so important to this study, several measures were included in addition to the personal social subscale of the Battelle. These were the number of all social contacts and social contacts with peer age children each parent reported for their children, the classroom social measures rated by the classroom teachers (Social Status Scale), and various measures from the Social Participation and Play Scale including the amount of play, the social level of play, the cognitive level of play, and what the child was doing when not playing. A family's situation with respect to needs, resources, and supports are also potentially influenced by setting over time.

Analysis and Methodological Issues

Each of these measures was subjected to a repeated measures analysis of variance at all four age points without regard to setting to determine which would show a progressive (linear) effect of age. It should be noted, here, that not every child had data for all four age points for each of these measures. Because individual child differences were strong, only those children who had all points of data were included in the longitudinal analysis. This,

unfortunately, reduced the sample size and therefore the power of the statistical analyses. A brief analysis of the full sample numbers for each age point was also done and very few differences from the smaller sample longitudinal analyses were found. The true longitudinal data are presented in the tables that follow which show each of the measures at each of the four age points collected for the study and the longitudinal N available for the analysis.

Developmental Indices Were Measures of Change

As can be seen easily, the developmental indices (here listed as age equivalence scores but raw scores showed similar pattern) were all developmentally sensitive with statistically significant differences between the age points (see Table 45).

Some Social Measures Showed Longitudinal Effects

Among the social measures, the two social network contacts measures did not show developmental change. The classroom social status scale, however, was developmentally sensitive; its total[5] and several of the individual items (sitting near the child for snack, circle, or during other activities, and having a buddy in class) showed increasing social status as the children aged (see Table 46).

For the analysis of the POS, the frequency of all play, and the frequency of each level of social and cognitive play was determined over the 25 minute observation period at each age point for each child. The analyses were done on

[5] The Social Status Scale was developed for this study. To make sure the individual items were appropriate for a unified scale, a reliability test of the scale was conducted. The inter-item correlations ranged from .56 to .87 with a mean of .63. Cronbach's Alpha reliability coefficient was .91.

the aggregated information with a child's age point as the unit of analysis, as was done for all other instruments. The only clear developmentally sensitive measure found on the POS was the amount of play which almost doubled in frequency from 24 months to 42 months (difference was statistically significant). The amount of constructive play also showed a significant linear trend but it appears that the frequency increase simply reflected the increase in play, as the percentage of total play accounted for by constructive was fairly constant, between .8 and .9 across all ages (see Table 47).

The finding that none of the social or cognitive measures were developmentally sensitive was unexpected. It was hypothesized that the lack of developmental results might be due to a logistical problem experienced with the POS data. The project design called for the taping and observation of free play time for these measures, preferably with a peer available for play and social behavior. In the difficult reality of the classrooms, scheduling, absences, travel difficulties, and perhaps most importantly, finding that only approximately one-third of classroom time is spent in free play, made taping all free play time segments too difficult to accomplish. Additional analyses were conducted on the POS data to examine these possible explanations

Each of the play measures was re-analyzed using the amount of free play and amount of time a peer was available during the observation period as covariates. The results indicate few differences. The amount of play remained a statistically significant change measure and the social and cognitive levels again did not show these trends with either factor covaried.

Family Data Were Stable Across Ages

There were also few age differences among the family measures. None of the four total scale measures showed any significant differences and were not linear. Given the number of individual items, it is statistically risky to look at all and "shop" for significance because, over so many tests, the probability of a chance difference is greater. Even with this artifactual "help" towards significance, very few of the items showed any significant change and most of those that did -- reported support from spouse's parents; contact with siblings, and the child's early intervention program; perceived need for transportation, someone to talk to, therapy for the child, child's education, and time with the family; the resource of money to pay bills and time with family -- do not show a linear trend with age. Only perceived support from school and contact with day care was significant and linear. This result was not at all surprising as the children were at the centers for longer days as they got older. It thus appears that families were not showing substantive changes across such a short time as 18 months (see Tables 48-51).

Identified Measures

As a result of these analyses -- the developmental effects of setting will primarily be sought in the developmental indices, the Social Status Scale, and the frequency of all play on the POS. The family total scales will be used to provide some measurement of family despite their lack of developmental trends. Figures 4 through 6 highlight the age progression of the identified measures; Figure 7 shows the stability of the family scale measures across the four age points.

Effects of Setting on Identified Developmental Measures

Methodological Notes

With the identification of measures shown to be developmentally sensitive for this sample of children and having shown that the classroom environments and service delivery were different for the two groups of children, analyses were conducted to determine if the setting affected the developmental progress of the children.

Because of the complications related to the setting measure -- the setting changes at 36 months for all children and the type of setting changed for about one-third of the sample -- several different analyses were conducted. First repeated measures analyses of variance were run for three age points (24-36) for the measures with developmental trends, this time with the addition of setting as a between subjects factor. For some of the measures, where there were large variance among the scores and high correlations between individual children's initial age 24 scores and those at later ages (e.g. the developmental indices), additional analyses were run to try to statistically eliminate the effects of individual differences.

The analysis of child status at age 42 was run as two separate cross sectional analyses using both setting at age 42 and earlier setting as independent variables.

The effects of setting on the three developmental indices, the Social Status Scale, play observation measures, and several family measures were explored. They are each described below.

Developmental Indices

The results for the developmental age equivalence scores on the developmental indices are given in Table 52. There were no main or interactive effects of setting on any of the three developmental indices, Battelle Developmental Inventory, Peabody Motor Scales, and Pre-School Language Scale, or their subscales for the repeated measures analysis of ages 24 - 36. Similarly, there were no setting differences on any of the measures for these two groups of children at age 42 months. Nor were there any differences found between two recombined groups of children based on their setting at age 42. Thus, these first analyses showed no effects of setting on developmental progress of the children (see Tables 53 and 54).

The developmental indices were key examples of measures where individual differences were strong and consistent from age to age. The correlations between each developmental scale or subscale at age 24 and the corresponding score at age 36 or age 42 varied from .75 to .97. The correlations for ages 24 and 36 for the total scales were .93, .97, .87 for Battelle, Peabody and PLS, respectively; predicting scores at age 42, the correlations were .87, .96, .85 in the same order. All correlations were statistically significant. The full correlation matrix is in Table 55.

To statistically offset these strong individual differences a method recommended by Shonkoff, Hauser-Cram, Krauss, and Upshur (1992), exploring residual change scores was used. In this approach the developmental scores at a later age are regressed on the corresponding scores at 24 months across both settings, thereby creating an "expected" score for the later age, independent of setting. The differences between the expected score and the actual scores "the residuals" reflect the relatively larger or smaller changes that occurred for each individual in each setting. The residual scores were then standardized to a mean of zero and a standard deviation of one, allowing for easier comparison across measures. In this analysis, this process was used to predict the 36 month and 42 month scores, within each of which the two settings were then compared.

As with the original age equivalency scores, there was little evidence of any effect of setting on the standardized residuals. None of the total scale measures showed any differences, and among the subscales, only the Peabody gross showed a statistical difference. While this difference (at 36 months) suggests that the children in segregated sites have greater increase in gross motor scores than expected, that the effect was not even hinted at age 42 months, raises some doubts about the finding. (The analysis of standardized residuals is found in Tables 56 and 57).

One additional attempt was made to see if there were effects of setting that might be influenced by the initial developmental levels. An aptitude by treatment analysis isolates setting and setting-by-initial-level interaction as factors and, using a hierarchical regression process, explores whether setting or the interaction increases the prediction of later scores beyond that predicted by

the initial level. The changes in R^2 for the second and third step of the regression are the key statistics. The range for the three scales and the nine subscales was .0001 to .028. Again, there was little significance and little evidence of an effect of setting. As with the residual change analysis, the only measure that showed any significance was the gross motor subscale of the Peabody. The analysis was again similar, as the effect is seen only when predicting age 36, not age 42. Table 58 contains a fuller description of this analysis.

Thus, whatever the analysis, cross sectional or longitudinal, simple age equivalence scores or more elaborate change measures, there is little evidence of an effect of setting on any developmental index measure. The only exception was the Peabody Gross Motor subscale which seems to show some effect at age 36, but which was not present when predicting developmental levels at age 42. This inconsistency raises doubts about importance of the finding at 36 months.

Social Measures

Several of the items of the Social Status Scale and the scale total showed clear developmental effects. When the repeated measures analysis of variance was expanded to include setting, there were significant main setting effects for each of the items and the total but there were no significant interactions of setting and age. The scores assigned by teachers, as listed in Table 59, were uniformly higher in inclusive settings than in segregated settings but this difference was present from age 24 and did not change in direction or intensity as the children aged and increased their reported social status.

This effect was not carried forward to age 42 months, however. At that age there were no differences on any of the items or on the scale total between the children who had been in segregated or inclusive toddler settings. There were also no differences by setting if the children were split according to the type of their 42 months setting. (See Tables 60 and 61 for complete data).

Among the play observation variables, only the gross amount of play showed clear developmental effects. In the current analysis, the amount of play did not differ for setting initially nor were there any interactive effects of age and setting in the toddler classroom.

Given their conceptual importance, the social and cognitive variables were explored for setting differences despite their not showing the expected developmental effects. There were no effects of setting directly or interactive with age on any of the cognitive variables and virtually no significant effects for social levels of play. The frequency of group play did show a significant main effect of setting; there was a low level of group play exhibited by the children in the inclusive settings and no group play at all in the segregated settings. As with the social status scale, this difference was already present at age 24 months. Also, like the social status scale items, it was not consistent across the ages. The difference was present at ages 24 and 36 but not at ages 30 and 42. This inconsistency, again, sheds doubt on the meaningfulness of the finding (see Tables 62 and 63).

There were a few effects of pre-school setting on play behavior. Children in segregated pre-school classrooms, played more than children in the inclusive

classroom. This higher frequency was manifested also in significant differences in parallel play and constructive play, the social and cognitive categories that account for most of the overall play (see Table 64).

The categories of non play behavior were also explored as some of the categories suggested more or less social awareness -- unoccupied, onlooker, active conversation, etc. None of the measures showed any effects of setting, alone or in interaction with age during the toddler or pre-school years.

Additional analyses using residual change scores or aptitude by treatment methods were not appropriate to these social measures because there were not high correlations among individual children's scores at each of the ages. Unlike the developmental indices where all of the correlations were significant and most were in excess of .8, very few of the pairs of scores showed correlations significantly higher than 0 and only eight of a possible 50 pairs had correlations larger than .50 (see Tables 65 and 66).

The lack of consistent findings for the effect of setting across ages and the low correlations of children's scores from one age to another was an impetus to further exploration. The play variables were conceived and have been analyzed as child status variables, but other setting and taping related variables were likely additional factors. The intent for the measures was to observe the children only during free play times while peers were available for play. Due to logistical problems this was not always accomplished. Differences in the amount of free play and peer availability during the observation time would be expected to affect the amount of play, and perhaps the social and cognitive level of play. The differences across settings were some part reflective of actual

differences in the settings but also of the taping opportunities. (Comparison of the amount of free play during POS observation and the level found on the fuller scope activity logs is correlated only .34.) Differences for an individual child in a particular setting from age point to age point would be a potentially confounding factor to the evidence of developmental progress.

Two further analyses were planned to test these ideas: the first was to establish the relationship between these two POS "setting" measures and the POS child behavior measures; this would then be followed by rerunning the analysis of the effect of setting type, covarying the two setting measures -- free play and peer availability.

The first analysis produced unexpected results. Over the 25 minute period the frequency of free play and peer availability was not related to the amount of play, or the frequency of most of the social and cognitive levels of play. Without the relationship established, the analysis of covariance was not done.

Thus, the analysis of the play variables remained somewhat inconsistent and not supportive of an effect of setting type. Additional research with attempts to better control the content of the observation period is needed.

Family Measures

Although the family response scales did not show overall effects of the age of the child, the possibility that there were differences between the settings, or that setting and time in the setting (roughly varying with age of the child)

might interact was of great interest to a general understanding of early intervention in natural and segregated settings. A setting analysis of the each of the four scales totals was therefore conducted.

As can be seen in Table 67, there were no significant effects of setting on family responses during the children's toddler years. There were, however, a few borderline effects on two of the four scales which hint at some influence by setting on family contact and support. For the family support scale, families of children in inclusive settings report higher levels of perceived support at all three toddler age points. For reported contact, a borderline interaction suggests that families of children in inclusive settings increased their amount of contact as their child grew while the families of children in segregated settings did not.

Looking at the cross sectional analysis at age 42 months adds to the perception concerning family support. At the follow-up point, families of children who were in inclusive settings during their toddler year reported statistically significant more perceived support than families whose children had been in segregated settings (see Table 68) This difference did not occur when the families were compared based on the type of setting at 42 months (see Table 69).

With these somewhat ambiguous results, additional analyses were run to obtain a clearer picture. Although the family data at subsequent age points were not as strongly correlated with the 24 month data as were the developmental indices, the inter-age correlations averaged over .5 and all but one was statistically significant (see Table 70). Given these relationships, a

standardized residual score analysis was conducted. The results give support to the effect of setting on amount of reported personal contact. Predicting age 36 month data from 24 month, families of children in inclusive settings reported higher than expected contact while the level of contact reported by families of children in segregated settings was lower than expected (see Table 71). The difference was statistically significant but was not repeated for the analysis predicting age 42 month data (see Table 72). There was no additional evidence of effects on perceived family support. An aptitude by treatment analysis was also run and yielded similar results: setting's only significant effect was on contact at 36 months (see Table 73). There were no significant interactions.

Summary of Setting Effects

In summary, there were few effects of setting on any type of measure. For developmental indices, there were no simple effects and only one subscale of the Peabody showed effects when individual differences were statistically eliminated and this occurred only for age 36 months not for age 42 months. For social measures, the social status scale showed a clear pattern of greater status for children in inclusive settings during toddler ages but the effect did not increase with age and additional time in the respective settings, and, in fact, did not exist at the 42 month age point. The amount of play was affected only by the pre-school setting: children in segregated pre-schools played more. The frequency of play at various social and cognitive levels showed no effects beyond what the overall level of play was indicating. Family effects were also few; personal contacts seemed to be higher for families of children in inclusive

settings at age 36 months. Figure 8 highlights the strongest effect of setting -- on the social status scale for ages 24 - 36.

Are Other Factors Intervening or Suppressing Effects of Setting?

With so few effects of setting found, the possibility that other factors were covarying with setting and affecting its relationships is raised. As can be recalled from earlier analyses testing the comparability of the children and their families at entry into the study, a non-significant but consistent pattern emerged suggesting the possibility of socio-economic differences between the families in the two settings. There was also the suggestion that age of entry into early intervention was different (again no significant difference was found) across the two settings. These possible relationships were explored further in a brief correlational analysis. Conforming to the main analyses in which setting was tested separately for ages 24 - 36 and for age 42, two sets of correlations were run. The results summarized in Table 74 confirmed that SES (as measured by the Hollingshead score) and age at referral were both significantly related to toddler setting and that SES was marginally related to setting at age 42.

Additional analyses showed that the two variables (SES and age at referral) were also found to be correlated with the each of the three developmental indices' totals and most of the subscales, two items on the social status index, the amount and social level of play the children were observed engaging in, and the family support scale total for ages 24 - 36. The pattern of relationships with the dependent measures at age 42 was similar but not as strong for the

developmental indices and not present for the other measures. (See Tables 75 and 76).

Thus, as suspected, demographics and age at referral are related to both setting and the dependent measures (at least for the earlier ages) so that the possibility of suppression by one or more of these variables should be tested and confirmed or rejected.

To look at pot. ntial effects of these variables, the repeated measures analysis of variance for ages 24 - 36 and the two cross sectional analyses at age 42 were all repeated using the Hollingshead scale score as a composite demographic variable and the age of early intervention onset as constant covariates. In addition because developmental level was such a basic measure of child functioning, the social and family measures were also redone using developmental level as a covariate (varying for the repeated measures analysis and constant for the two analyses at age 42 months).

The results of all of these analyses were consistent. None of the covariates -- SES, age at early intervention onset, or developmental level -- changed the pattern of results found in the simple analysis of setting. (Table 77 outlines the effects of setting alone and in interaction with age for the repeated measures, and at 42 months with and without potential covariates.)

Setting had very few effects; social status again showed a significant main effect of setting for ages 24 - 36 and not at age 42 regardless of covariate; several other variables, including the amount of family personal contact, amount of reciprocal play, and amount of conversation when not playing all

showed suggestive but insignificant interactive effects of setting and age for the toddler ages and no effects at age 42 months when developmental level was covaried. All of the effects were either somewhat stronger or weaker reflections of previous findings. There were no clear differences and no new variables or patterns emerged. Thus, whatever small but consistent differences existed between the settings for demographic and other factors, they were not suppressing setting effects nor causing any spurious relationships to appear.

Factors Related to Development of Children in Early Intervention Settings

It is clear from the preceding analyses that the type of early intervention setting children did not have major effects on children's development or social behavior, or their families' social support, network, needs or resources. This was true at least within the context of a year to 18 months after placement in the setting and with the sensitivity available using paper and pencil measures and observation of behavior. There was, however, a range of developmental profiles demonstrated among the 42 children in the study. What then, influenced the developmental progress of these children?

Overview of Analysis

Several steps of analyses were conducted to explore this question. First, data at all four age points were combined and simple bivariate correlations between potentially key variables were calculated. This produced interesting and extensive data (as this type of exercise always does) but carried several

methodological limitations. There were so many correlations produced, the risk of producing apparently significant results by chance increased. Much of the data were repeated measures so the data points were not all independent. Also, many of the potential predictor variables were themselves interrelated so it was difficult to isolate the effects of any particular variable. These limitations suggest that a hypothesis testing, multivariate approach that incorporates the repeated measures design is necessary. Such analyses were undertaken but this first step was valuable in identifying potential related variables thereby making the analysis more focused and logical and reducing the risk of spurious relationships.

The correlations were produced in several sub groups. First, as has been done throughout this report, the child and family status variables were divided into three categories: the developmental indices; social measures, including the social status scale and the play observation frequencies; and the family measures of support, contact, needs and resources. The potential related variables were also divided into three categories: child and family demographics; aspects of the intervention process and the classroom; and the developmental indices and the family scales as potential factors influencing other measures.

The two basic goals in the exploration of these data were to find some basic patterns in the relationships and to identify which variables from each larger group would best serve future analyses.

Correlations with Demographic Variables

Clear patterns emerged for the demographic variables, answering both of these questions (see Tables 78 through 81). The variables studied included sex and race of the child, whether the child was in a one or two parent family, the age and education of primary caregiver (mother if present; father for those without mother), family income, and the Hollingshead Four Factor Index of Social Status which uses education and occupational status information about one or both parents if present. Sex was significantly related only to two items on the social status scale; race only to family resources; age of caregiver only to family support and one measure on the play observation scale. This was in clear contrast to the other four demographic variables which showed significant relationship with all three areas. Thus, household composition (one or two parents), caregiver education, family income, and the composite Hollingshead measure were clearly identified as key demographic variables. The correlations show that demographic factors were clearly related to developmental scores, not particularly related to social status ratings by the teachers, related to overall level of play but not as strongly related to other aspects of play behavior, and strongly related to three of four family scales (support, contact and needs).

Correlations With Service Characteristic Variables

Service characteristics explored included the age early intervention began; the scope, intensity. location, and modality of service; the years of staff experience; amount of free play activity; and overall rated quality (ITERS or ECERS) of the classroom.

Developmental Indices. There was somewhat more variation in the relationships involving service characteristics variables. Age at referral to early intervention, the number of areas of service provided, percent of therapy provided in groups, percent of therapy provided within the early intervention or day care center, and the total amount of therapy were each clearly related to the developmental measures. Total hours of service, percent of service provided in a consultative mode, and classroom environment quality showed no significant relationships. The total hours of specialized instruction, the amount of free play in the classroom, and teacher experience showed some relationships (see Table 82).

Social Status. Teacher experience, total hours of specialized instruction; and total hours of all services were related to the social status variables. Many of the key variables for developmental measures showed no such relationship with these measures. Quality of classroom and consulting percent again showed no relationships (see Table 83).

POS. For the play observation measures, the pattern was more varied. Age intervention began, amount of free play, number of services, total therapy

hours and percent of services at the center and in groups showed some relationships (see Table 84).

Family Status. Family reports of support, contact, needs and resources were related to age intervention started, percent of service delivered in groups, and amount of free play (see Table 85).

Given the differences in patterns among the subsets of variables, it was not as easy to define the key variables for further analysis. Age at referral to early intervention, the number of services received and the percent of service received in the center and in groups were clearly identified as variables for study. Because of their relationship with at least one set of variables, total therapy (for relationship with developmental measures), experience of classroom staff (for relationship with social status), and amount of free play (for relationship with observed play variables) were also identified for further study. Total hours of specialized instruction complements hours of therapy and was also included. Environmental quality, total hours of service, and percent of consultative services showed no relationship and were not included in subsequent analysis.

Correlations Among Developmental, Social and Family Measures

To round out the survey of relationships, the developmental measures, social status, play observation, and family measures were correlated with each other (see Tables 86 and 87). For the developmentals, only the three scale totals, and the Battelle subscale for personal-social development were included. This limited set was chosen based on previous analyses which showed that the developmental totals and their subscales were closely related to each other and

had similar patterns of relationships with the other variables. The personal social subscale was included based on its intrinsic relevance to the social nature of the other variables.

The results showed that developmental measures were significantly related to other variables including: child social status total scale and all the individual items except "watches out for child"; the frequency of all play, amount of solitary, parallel and simple social play; amount of constructive play; amount of non-occupied, onlooker, and active conversation during non-play and several of the more common sub-categories of play and non play, and to the family support and contact scales. All four developmental measures had very similar correlation profiles.

The social status variables and the level of overall play were all related to the family support scale; amount of all play, amount of parallel play, and the teachers' report of toy sharing were related to the family contact scale. The family needs and resources scale were not at all related to the other measures.

Summary of Correlation Analysis

The brief look at bivariate correlations met the specified goals. There was sufficient evidence of interrelationships of variables to expand to a multivariate and repeated measures approach. Key demographic and service characteristic variables were identified. Among the developmental, social and family measures, all the scale totals and composites showed similar patterns to their components to make a streamlined analysis reasonable. The totals of the Battelle, Peabody, and PLS developmental indices and personal social subscale

of the Battelle, the total of the brief social status scale, total amount of play from the Play Observation measure, and family support and personal contact scale totals will be the focus of future study.

Relationships of Demographic Factors and Child and Family Status

The demographic factors -- coming from a one or two parent family, family income, education level (years of education) of the primary caregiver, and the Hollingshead composite education and occupation measure -- are all characteristics of the children and their families prior to their introduction to early intervention. They are factors that the children "bring with them" into their program. The first analysis explored the effects of the demographic factors on the children and family measures as they entered the study. The four variables were examined in multivariate analyses of covariance of the 24 month scores on the key dependent variables defined above -- developmental indices, social status, play, and family measures.

No significant relationships were found between the demographic variables and any of the developmental index totals or the personal social subscale, although the Battelle and Peabody total scale analyses approached significance. Similarly, the four variables showed no relationship to the amount of play observed.

The social status scale at 24 months did show a significant relationship with the covariates. More specifically, the Hollingshead index and the education level of the primary caregiver each showed significant univariate effects when the other covariates were statistically eliminated. Children from families with

higher social status score on the Hollingshead had higher classroom social status scores; the relationship of the primary (usually mother) caregivers' education to classroom social status was negative; that is, greater years of parent education were associated with lower classroom status for the child. The other social measure, amount of play observed, was not found to be related to the demographic variables.

The demographic variables were significant covariates of the family social support scale and showed a borderline relationship for social contacts. For both measures, there was a significant univariate relationship with family income with higher income related to more support and more contact. (The relationships between demographic variables and child status at 24 months are summarized in Table 88).

Repeated measures analyses of covariance were run for each of these dependent variables to see whether relationships existed between the demographic factors and the child status measures across the age points but no significance was found (see Table 89)

Thus, the relationships of demographic variables with child and family status variables were limited. Only family support, family contact, and child social status were related to any of the demographics. Further, the relationships that did exist were limited to the children's initial scores at 24 months; there was no evidence of the demographics being related to changes in status. Finally, no one demographic variable emerged as key. Income was related to the family measures while Hollingshead and family education were related to social status. Of the relationships, the inverse univariate relationship with

caregivers' education and child social status was most surprising since all other socio-economic variables showed direct relationships.

Relationships of Service Characteristics and Child and Family Status

Characteristics. Eight characteristics of the children's service profile including measures of scope, intensity, and modality were selected for further study based on the results of the preliminary bivariate correlation analysis. These were: the number of types of services received (of specialized instruction, speech therapy, physical therapy, occupational therapy, and nursing); the number of hours of specialized instruction; the number of hours of therapy; the percent of therapy received at the rehabilitation or daycare center; the percent of therapy received that was provided in groups; the experience of the classroom teacher; the percent of the classroom hours spent in free play; and the age of the child when referred for early intervention services.

Methodological issues. All the factors except the age at referral varied across the four ages. Therefore, the analysis began for each dependent measure with a repeated measures analysis of covariance with eight covariates, seven of which varied and one of which was constant. Due to missing service characteristics data, especially at the 42 month observation point, the number of children available for each of the analyses was low: 20 for the developmental indices, 11 for the social status scale, and 14 for the play observation scale, family support scale, and the family contact scale. As these numbers were very low and might not yield an accurate picture, the analysis was done across the first three age points only. This raised the number of children available for analysis

to 28 for the developmentals, 22 for social status, 24 for the play observation scale, and 18 for the two family scales.

Results. The Battelle total score and the personal social subscale, the Peabody Motor Scale, and the Play Observation Scale were all found to be significantly related to the covariates. In univariate analyses of the regression factor, the Battelle total scale was significantly related to the total hours of therapy, percentage of therapy in groups, the percent of class time in free play, and the experience of the classroom teachers. The first three characteristics were also related to the Peabody total scale. Teacher experience, percentage of therapy in groups, and total hours of therapy were related to the Personal Social subscale of the Battelle. Only percentage of therapy in groups was related to the Preschool language scale total. Teacher experience was related to the ratings the teacher gave to the child's social status. Amount of free play in the classrooms and the percent of therapy in groups was related to the amount of observed play on the play observation scale. For all of these, the relationship was direct (e.g. more free play time in classroom related to higher age equivalent on the BDI) except for the relationships involving total hours of therapy which was always inversely related (e.g. more therapy hours related to lower age equivalence scores on the Peabody). The number of types of services, age at referral, total hours of specialized instruction, and the percentage of therapy provided in the center were not related to any of the measures and the two family scale totals were not significantly related to any of the covariates. (A summary of the relationships with the service characteristics appears in Table 90).

The pattern of results raised some interesting issues. The finding that the amount of free play was related to general and motor development, and the amount a child played when observed suggested the importance of play and choice in a classroom environment. The finding that group as compared to individual therapy was related to higher age equivalencies on all the developmental scales suggested that being in the presence of other children and not being singled out was related to several areas of development. The inverse relationships between the intensity of therapy and developmental and play measures were most compelling as they suggested the opposite of the common wisdom that more is better and suggested that slower progress, rather than greater benefit might result from therapy.

Additional analyses. The controversial nature of some of these interpretations of the findings combined with the difficulty of trying to make causal inferences from correlations and regression data demand that alternative explanations be explored. One such explanation for the inverse relationship with intensity of therapy is that children who had more therapy given the higher levels because they were more developmentally delayed and played less. To clarify the interpretation of the inverse relationship between the developmental levels and amount of therapy additional analyses were run using measures of change and focusing on prior rather than current levels of therapy.

Standardized residual scores replaced the absolute scores for the developmental indices and composite measures (means) of past services received were used in place of the mean levels of concurrent service. Averages of the 24 and 30 month characteristics were used as covariates for the residuals obtained by predicting the 36 month scores and averages for the 24, 30 and 36 month

observations were used as covariates for the 42 month residuals. This analysis was limited to the developmental measures because the play observation scale and social status variables did not have high enough interage correlations to calculate meaningful residual scores.

The results for the two age points were similar. The results for both ages confirmed the importance of the service characteristics for the Battelle index total and personal social scales. Data related to the 42 month residuals are presented in Table 91. The effect for the composite regression of the covariates was significant for both developmental scales. Several of the covariates, including those measuring service intensity, were found to have a significant effect independent of the other covariates. Hours of specialized instruction, hours of therapy, and number of services received were all significantly related to the Battelle total in univariate tests. Each of those and the percentage of therapy delivered in groups were related to the residual for the personal social subscale. As was found in the earlier repeated measures analysis, more therapy was associated with lower developmental age equivalencies but a higher proportion of therapy delivered in groups was associated with higher age equivalencies.

While the interpretation of the covariance results is still tentative, the confirmation of the inverse relationship between measures of relative developmental progress and past service characteristics suggests that the role of therapy needs to be questioned and studied further.

Relationships Among Child and Family Status Measures

The final exploration of factors influencing child and family status variables involved the interrelationships among these variables. Developmental level (Battelle total) and family support and contact were analyzed as covariates for the remaining variables. The Battelle total was a significant varying covariate for the amount of observed play at all four ages. Developmental level also showed a significant relationship for within subject regression for the amount of perceived family support. The family scale variables were not significantly related to the other measures as covariates (see Table 92).

Summary and Conclusions

A longitudinal study of a group of toddlers with disabilities and their families originally designed to explore the effects of a social competency curriculum in two types of early intervention settings was limited by recruiting circumstances to focus solely on the settings. Because the sample was small and the two groups were not randomly determined, the first step was the confirmation that the groups of children and their families were comparable demographically and developmentally. Additional analyses confirmed that the two settings, segregated and inclusive (defined by the presence of typically developing children in the classroom) did in fact offer two different models of service delivery as measured by differences in the prevalence, intensity, location, and modality of therapy received, and in the demographics, quality, and activities of the classrooms.

The measures of child and family status included the Battelle Developmental index, Peabody Motor Scale, and Pre-School Language Scales; a play behavior scale; measures of social status and social network for the children; and self report scale measures of family support, needs, resources, and personal contact. Whether a child was placed in a segregated or inclusive classroom was not shown to affect his or her progress. This remained the case when demographic, and developmental variables were used as covariates.

With the type of setting not proving to be differentially predictive of future development, a search for relevant factors independent of setting showed many of the variables to be interrelated. Multivariate analyses suggested that among demographic variables, family income was related to the initial level of the family measures, family education and socio-economic status was related to the child's social status in his or her class room at age 24 months.

Despite the lack of differences for setting, several of the process variables that differed between the settings were shown to affect changes in general and social developmental measures. These included the amount of therapy and the percent of therapy delivered in groups. The findings suggest on a specific level that the best approach uses therapy sparingly and uses it as an opportunity for the child to be with other children. More generally, the findings suggested that the way in which services are delivered (the process) might be a more potent factor than is the setting or context of the services.

IX. PROJECT IMPACT

A project informational brochure was produced and was distributed to families, early intervention staff, and other key personnel throughout the state and nationally. The procedural handbook was revised to reflect the study's current focus and objectives, as was the data collection handbook. In addition to at least 50 presentations on the study conducted in the state, the following two presentations were conducted nationally during the last year of the study:

Bruder, M., Hoffman, D., Staff, I., & Hafner, D. (1995, November). Delivery and cost of early intervention in segregated and inclusive settings. Presented at NEC*TAS National Conference on Part H. Washington, D.C.

Bruder, M., McMurrer-Kaminer, E. (1995, November). Delivery and cost of early intervention in segregated and inclusive settings. Presented at the International Division for Early Childhood Conference. Orlando, Florida.

Lastly, a manuscript on the project has been submitted to Topics in Early Childhood Special Education.

X. FUTURE ACTIVITIES

None planned.

XI. ASSURANCE STATEMENT

This final report has been sent to ERIC and other agencies.

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List of Tables

Table 73

Comparison of Segregated and Inclusive Toddler Settings
Aptitude by Treament Analysis of Family Support, Contact, Needs and Resources

	Change in R^2			
	Predicted Age 36 Months		Predicted Age 36 Months	
	Setting	Setting and Initial Level Interaction	Setting	Setting and In Level Interact
Family Support	.072	.003	.086	.063
Family Contact	.205*	.052	.008	.048
Family Needs	.002	.013	.0003	.024
Family Resources	.0001	.074	.043	.002

*p<.014

Table 74

Further Exploration of Setting
Searching for Potential Intervening Variables
Correlations with Type of Setting

	Toddler Setting (Ages 24-36)	Pre-School Setting (Age 42)
Hollingshead SES Measures	.2751 (n=123) p=.002	.2801 (n=38) p=.081
Age at Referral	-.1819 (n=126) p=.042	.0622 (n=39) p=.707

Table 75

Further Exploration of Setting
Searching for Potential Intervening Variables
Correlations of SES, Age of Referral, and Developmental Indices with Dependent Measures, Ages 24-36

	SES (Hollingshead)	Age at Referral
Developmental Measures	**(N=120)**	**(N=123)**
BDI Total	-.2047 p=.025	.3286 p=.000
personal-social	-.1688 p=.065	.1933 p=.032
adaptive	-.1851 p=.043	.3361 p=.000
motor	-.2140 p=.019	.4843 p=.000
communication	-.2466 p=.007	.1898 p=.036
cognitive	-.0917 p=.319	.1654 p=.068
Peabody Total	-.2244 p=.014	.4523 p=.000
fine motor	- 2264 p=.013	.3710 p=.000
gross motor	-.2091 p=.022	.5068 p=.000
PLS Total	-.1809 p=.048	.1651 p=.068
auditory language	-.1782 p=.051	.1369 p=.131
expressive language	-.1807 p=.048	.2030 p=.024

Table 75 (continued)

	SES (Hollingshead)	Age at Referral	Developmental Level
Social Status Measure	**(N=105)**	**(N=108)**	**(N=108)**
sit near child during snack	.1469 p=.135	-.0500 p=.607	.2869 p=.003
play with childs toys	.0789 p=.421	-.0479 p=.621	.1807 p=.060
choose child as buddy	.0776 p=.429	0841 p=.384	.2404 p=.012
watch out for child	.2665 p=.006	-.2621 p=.006	.0765 p=.429
sit near child during circle	.0973 p=.321	-.2112 p=.027	.3222 p=.001
sit near child during activities	.0397 p=.686	-.0454 p=.639	.3370 p=.000
Total Social Status	.1483 p=.131	-.1164 p=.230	.2945 p=.002
Play Observation Scale	**(N=112)**	**(N=115)**	**(N=115)**
play	-.2936 p=.002	.3612 p=.000	.6449 p=.000
solo play	.0769 p=.420	.2350 p=.011	.1894 p=.043
parallel play	-.3611 p=.000	.2946 p=.001	.6277 p=.000
simple social play	-.0906 p=.342	.2320 p=.013	.2681 p=.004
reciprocal play	-.0306 p=.749	.2264 p=.015	.1893 p=.043
group play	.0445 p=.641	.1244 p=.185	.1742 p=.063

Table 75 (continued)

	SES (Hollingshead)	Age at Referral	Developmental Level
functional play	-.1481 p=.119	-.0367 p=.697	.1042 p=.268
constructive play	-.2536 p=.007	.3606 p=.000	.6127 p=.000
dramatic play	-.0995 p=.297	.0196 p=.836	.1119 p=.234
game	-.0035 p=.971	.1306 p=.164	.1080 p=.251
non occupied	.0830 p=.384	-.1135 p=.227	-.4002 p=.000
onlooker	.0677 p=.478	.0656 p=.486	.2949 p=.001
active conversation	.0754 p=.429	-.1080 p=.251	.3634 p=.000
exploratory non play	.1489 p=.117	-.0734 p=.436	-.1527 p=.103
Family Measures			
Family Support	(N=98) .3866 p=.000	(N=101) -.2086 p=.036	(N=101) -.3381 p=.001
Personal Contact	(N=98) .3359 p=.001	(N=101) -.1610 p=.108	(N=101) -.1756 p=.079
Family Needs	(N=99) -.1597 p=.114	(N=102) .0224 p=.823	(N=102) -.0803 p=.423
Family Resources	(N=94) .1645 p=.113	(N=97) -.0396 p=.700	(N=97) -.0071 p=.945

Table 76

Further Exploration of Setting
Searching for Potential Intervening Variables
Correlation of SES, Age of Referral, and Developmental Indices with Dependent Measures, Age 42 months

	SES (Hollingshead)	Age at Referral
Developmental Measures	**(N=38)**	**(N=39)**
BDI Total	-.2477 p=.134	.3128 p=.053
personal-social	-.2233 p=.178	.1939 p=.237
adaptive	-.2794 p=.089	.3468 p=.031
motor	-.2405 p=.146	.4370 p=.005
communication	-.2872 p=.080	.2479 p=.128
cognitive	-.1103 p=.510	.1570 p=.340
Peabody Total	-.2729 p=.097	.4325 p=.006
fine motor	-.2382 p=.150	.3000 p=.064
gross motor	-.2844 p=.084	.5301 p=.001
PLS Total	-.1746 p=.295	.1510 p=.359
auditory language	-.1193 p=.475	.0118 p=.943
expressive language	-.2829 p=.085	.3019 p=.062

Table 76 (continued)

	SES (Hollingshead)	Age at Referral	Developmental Level
Social Status Measure	**(N=26)**	**(N=27)**	**(N=27)**
sit near child during snack	-.1910 p=.350	.0614 p=.761	-.0457 p=.821
play with childs toys	-.3089 p=.125	.0211 p=.917	.1560 p=.437
choose child as buddy	.0127 p=.951	-.1513 p=.451	-.1121 p=.578
watch out for child	.2112 p=.300	-.2763 p=.163	-.1978 p=.323
sit near child during circle	-.0791 p=.707	.0467 p=.821	-.0633 p=.759
sit near child during activities	-.3184 p=.113	.1101 p=.584	.0598 p=.767
Total Social Status	-.1095 p=.602	-.0341 p=.869	-.0572 p=.781
Play Observation Scale	**(N=29)**	**(N=30)**	**(N=30)**
play	-.4293 p=.020	-.1181 p=.534	.4004 p=.028
solo play	-.1595 p=.409	-.1047 p=.582	.1726 p=.362
parallel play	-.4704 p=.010	-.1240 p=.514	.3659 p=.047
simple social play	-.0352 p=.856	.0190 p=.921	.4083 p=.025
reciprocal play	-.1640 p=.395	-.0255 p=.895	.1551 p=.413
group play			

Table 76 (continued)

	SES (Hollingshead)	Age at Referral	Developmental Level
functional play	-.0805 p=.678	-.0446 p=.815	-.2596 p=.116
constructive play	-.4049 p=.029	-.0949 p=.618	.4083 p=.025
dramatic play	-.2692 p=.158	-.1720 p=.363	.1268 p=.504
games			
non occupied	.1752 p=.363	.1486 p=.433	-.4374 p=.016
onlooker	-.0452 p=.816	.0582 p=.760	.3559 p=.054
active conversation	-.3872 p=.038	.0720 p=.705	.4412 p=.015
exploratory non play	-.0591 p=.761	.1591 p=.401	-.1016 p=.593
Family Measures			
Family Support	(N=34) .3105 p=.074	(N=34) -.2951 p=.090	(N=34) -.3691 p=.032
Personal Contact	(N=33) .1864 p=.299	(N=33) -.2745 p=.122	(N=33) -.5098 p=.002
Family Needs	(N=33) -.3005 p=.089	(N=33) -.0232 p=.898	(N=33) -.2728 p=.125
Family Resources	(N=33) -.0138 p=.939	(N=33) -.1414 p=.433	(N=33) .1514 p=.400

Table 77

Further Exploration of Setting
Summary of Effects of Setting With and Without Covariates

Measure	Effects of Setting	Effects of Setting with SES and Age at Referral as Covariates	Effects of Setting v Total Scale Age Equ Score as Covar
Developmental Age Equivalence Scores	No effects	No effects	Inappropriate analysis measures
Social Status Measures	Main effect of setting ages 24-36; no effects	Main effects all items of setting 24-36 No effects age 42	Main effects on all iter "watch out for child" ' child during snack" sc effects at 42
Play Observation Measures	Significant Effects Main effects group play	Significant Effects Main effects group play exploratory	Significant Effects Main effects group play exploratory (2nd borderlin
	Interactive Effects reciprocal play (borderline)	Interactive Effects reciprocal play active conversation (both borderline)	Interactive Effects reciprocal play active convers (2nd borderlin
	At age 42 by early setting play solitary play parallel play constructive play	At age 42 by early setting nothing significant	At age 42 by early se solitary play
	At age 42 by toddler setting nothing significant.	At age 42 by toddler setting nothing significant.	At age 42 by toddler s play parallel play constructive p
Family Measures	Family support at age 42 by preschool setting only significant effect	Nothing significant	Nothing significant

Table 78

Factors Other Than Setting
Correlations of Demographic Factors and Developmental Indices Age Equivalencies

Developmental Scale/Subscale Age Equivalent	Sex	Race	Age of Primary Caregiver	One Parent or Two	Years of Education Primary Caregiver	Family Income
Battelle Total	-0.0367 N = 162 P = .643	0.0591 N = 162 P = .455	0.0224 N = 154 P = .783	-0.1985 N = 162 P = .011	-0.2259 N = 162 P = .004	-0.2961 N = 162 P = .000
Personal Social	-0.0450 N = 162 P = .570	0.0187 N = 162 P = .813	-0.0252 N = 154 P = .756	-0.1972 N = 162 P = .012	-0.2001 N = 162 P = .011	-0.2573 N = 162 P = .001
Adapt Scale	0.0275 N = 162 P = .728	0.0520 N = 162 P = .511	-0.0416 N = 154 P = .609	-0.2163 N = 162 P = .006	-0.2205 N = 162 P = .005	-0.3247 N = 162 P = .000
Motor Scale	-0.0143 N = 162 P = .857	0.1054 N = 162 P = .182	0.0819 N = 154 P = .313	-0.2084 N = 162 P = .008	-0.2284 N = 162 P = .003	-0.3137 N = 162 P = .000
Communication Scale	-0.1085 N = 162 P = .169	0.0378 N = 162 P = .633	0.0007 N = 154 P = .993	-0.1772 N = 162 P = .024	-0.2527 N = 162 P = .001	-0.2681 N = 162 P = .001
Language Scale	-0.0525 N = 162 P = .507	0.0768 N = 162 P = .331	0.0507 N = 154 P = .532	-0.0803 N = 162 P = .309	-0.1466 N = 162 P = .063	-0.1624 N = 162 P = .039
Peabody Total	0.0151 N = 162 P = .848	0.0856 N = 162 P = .279	0.0086 N = 154 P = .916	-0.1965 N = 162 P = .012	-0.2727 N = 162 P = .000	-0.3471 N = 162 P = .000
Fine Motor	-0.0085 N = 162 P = .914	0.0720 N = 162 P = .362	-0.0233 N = 154 P = .774	-0.1545 N = 162 P = .050	-0.2753 N = 162 P = .000	-0.3495 N = 162 P = .000

Table 78 (continued)

Developmental Scale/Subscale Age Equivalent	Sex	Race	Age of Primary Caregiver	One Parent or Two	Years of Education Primary Caregiver	Family Income	Holl
Gross Motor	0.0384	0.0937	0.0406	-0.2264	-0.2517	-0.3214	-(
	N = 162	N = 162	N = 154	N = 162	N = 162	N = 162	N
	P = .628	P = .236	P = .617	P = .004	P = .001	P = .000	P
PLS Total	-0.0668	0.0542	-0.0145	-0.1200	-0.2176	-0.2047	-(
	N = 162	N = 162	N = 154	N = 162	N = 162	N = 162	N
	P = .398	P = .493	P = .859	P = .128	P = .005	P = .009	P
Auditory	-0.0968	0.0826	-0.0405	-0.0883	-0.1930	-0.1762	-(
	N = 162	N = 162	N = 154	N = 162	N = 162	N = 162	N
	P = .220	P = .296	P = .618	P = .264	P = .014	P = .025	P
Expressive	-0.0373	0.0062	0.0041	-0.1672	-0.2447	-0.2330	-(
	N = 162	N = 162	N = 154	N = 162	N = 162	N = 162	N
	P = .637	P = .938	P = .960	P = .033	P = .002	P = .003	P

Table 79

Factors Other Than Setting
Correlations of Demographic Factors and Social Status Scale

Scale Item	Sex	Race	Age of Primary Caregiver	One Parent or Two	Years of Education Primary Caregiver	Family Income	He
Others sit near child during snack	-0.0708 N = 135 P = .414	0.1496 N = 135 P = .083	-0.0858 N = 127 P = .338	0.1343 N = 135 P = .121	-0.0810 N = 135 P = .351	0.0404 N = 135 P = .642	
Others share child's toys	-0.1449 N = 136 P = .092	0.1366 N = 136 P = .113	-0.0524 N = 128 P = .557	0.0835 N = 136 P = .334	-0.1103 N = 136 P = .201	0.0013 N = 136 P = .988	
Others are child's buddies	-0.2219 N = 136 P = .009	0.0468 N = 136 P = .588	0.0130 N = 128 P = .884	0.0176 N = 136 P = .839	-0.0729 N = 136 P = .399	0.0078 N = 136 P = .928	
Others watch out for child	-0.0489 N = 136 P = .572	-0.0691 N = 136 P = .424	0.0323 N = 128 P = .717	0.1799 N = 136 P = .036	0.1265 N = 136 P = .142	0.2056 N = 136 P = .016	
Others sit next to child in circle	-0.1743 N = 135 P = .043	0.1359 N = 135 P = .116	-0.0983 N = 127 P = .272	0.1296 N = 135 P = .134	-0.0974 N = 135 P = .261	0.0194 N = 135 P = .823	
Others sit near child during activities	-0.0813 N = 136 P = .347	0.1455 N = 136 P = .091	-0.1511 N = 128 P = .089	0.0358 N = 136 P = .679	-0.1763 N = 136 P = .040	-0.0526 N = 136 P = .543	
Total Scale	-0.1459 N = 134 P = .092	0.1139 N = 134 P = .190	-0.0792 N = 126 P = .378	0.1196 N = 134 P = .169	-0.0811 N = 134 P = .352	0.0475 N = 134 P = .586	

Table 80

Factors Other Than Setting
Correlations of Demographic Factors and Play Observation Measures

Frequency of	Sex	Race	Age of Primary Caregiver	One Parent or Two	Years of Education Primary Caregiver	Family Income	Hol
ALL PLAY	0.0010	0.0158	-0.1532	-0.2323	-0.2821	-0.3155	
	N = 145	N = 145	N = 137	N = 145	N = 145	N = 145	
	P = .991	P = .850	P = .074	P = .005	P = .001	P = .000	
SOCIAL LEVEL							
Solitary Play	0.1052	-0.0814	0.1963	0.0469	0.0051	0.0963	
	N = 145	N = 145	N = 137	N = 145	N = 145	N = 145	
	P = .208	P = .330	P = .021	P = .576	P = .952	P = .249	
Parallel Play	-0.0321	0.0531	-0.2452	-0.2570	-0.3092	-0.3828	
	N = 145	N = 145	N = 137	N = 145	N = 145	N = 145	
	P = .702	P = .526	P = .004	P = .002	P = .000	P = .000	
Simple Social Play	0.0282	-0.0395	-0.0394	-0.1604	-0.1657	-0.1309	
	N = 145	N = 145	N = 137	N = 145	N = 145	N = 145	
	P = .737	P = .637	P = .648	P = .054	P = .046	P = .117	
Reciprocal Play	-0.1546	-0.0700	0.0281	-0.1450	-0.0201	-0.0797	
	N = 145	N = 145	N = 137	N = 145	N = 145	N = 145	
	P = .063	P = .403	P = .745	P = .082	P = .811	P = .341	
Group Play	0.0732	-0.0442	-0.0228	0.0810	-0.0034	0.0879	
	N = 145	N = 145	N = 137	N = 145	N = 145	N = 145	
	P = .382	P = .598	P = .792	P = .333	P = .968	P = .293	
COGNITIVE LEVEL							
Functional Play	0.0488	-0.0711	-0.0782	-0.0501	-0.1820	-0.1291	
	N = 145	N = 145	N = 137	N = 145	N = 145	N = 145	
	P = .560	P = .395	P = .364	P = .549	P = .028	P = .122	

Table 80 (continued)

	Sex	Race	Age of Primary Caregiver	One Parent or Two	Years of Education Primary Caregiver	Family Income	Hol
Constructive Play	0.0045 N = 145 P = .957	0.0210 N = 145 P = .802	-0.1257 N = 137 P = .143	-0.2055 N = 145 P = .013	-0.2263 N = 145 P = .006	-0.2693 N = 145 P = .001	
Dramatic Play	0.0614 N = 145 P = .463	-0.0918 N = 145 P = .272	-0.0688 N = 137 P = .424	-0.1449 N = 145 P = .082	-0.1224 N = 145 P = .142	-0.1778 N = 145 P = .032	
Games with Rules Play	0.0041 N = 145 P = .961	-0.0930 N = 145 P = .266	0.1544 N = 137 P = .072	0.0106 N = 145 P = .899	-0.0029 N = 145 P = .972	-0.0331 N = 145 P = .693	
NON PLAY BEHAVIOR							
Non occupied	-0.0017 N = 145 P = .984	-0.0837 N = 145 P = .317	-0.0101 N = 137 P = .907	0.1786 N = 145 P = .032	0.0663 N = 145 P = .428	0.1881 N = 145 P = .023	
Onlooker	0.0756 N = 145 P = .366	-0.0820 N = 145 P = .327	0.0647 N = 137 P = .452	0.0349 N = 145 P = .677	0.0905 N = 145 P = .279	-0.0433 N = 145 P = .605	
Active Conversation	-0.0357 N = 145 P = .670	-0.0568 N = 145 P = .497	0.0127 N = 137 P = .883	0.0015 N = 145 P = .985	-0.0717 N = 145 P = .391	-0.0638 N = 145 P = .445	
Exploratory	0.0181 N = 145 P = .369	-0.0121 N = 145 P = .885	-0.0432 N = 137 P = .616	-0.0301 N = 145 P = .719	0.0934 N = 145 P = .264	-0.0067 N = 145 P = .936	

Table 81

Factors Other Than Setting
Correlations of Demographic Factors and Measures of Family Support, Contact, Needs and Resources

Scale Total	Sex	Race	Age of Primary Caregiver	One Parent or Two	Years of Education Primary Caregiver	Family Income	Hol
Family Support	-0.0170	-0.1586	0.2947	0.4334	0.3482	0.5122	(
	N = 135	N = 135	N = 130	N = 135	N = 135	N = 135	I
	P = .845	P = .066	P = .001	P = .000	P = .000	P = .000	I
Family Social Contact	0.1498	0.1624	0.0355	0.2007	0.2184	0.3582	(
	N = 134	N = 134	N = 129	N = 134	N = 134	N = 134	I
	P = .084	P = .061	P = .690	P = .020	P = .011	P = .000	I
Family Needs	0.0249	0.0238	-0.1395	-0.2610	-0.3241	-0.3000	-
	N = 135	N = 135	N = 130	N = 135	N = 135	N = 135	I
	P = .775	P = .784	P = .113	P = .002	P = .000	P = .000	I
Family Resources	0.0124	-0.3125	0.1601	-0.0347	0.0924	0.1457	(
	N = 130	N = 130	N = 125	N = 130	N = 130	N = 130	I
	P = .889	P = .000	P = .074	P = .695	P = .296	P = .098	I

Table 82

Factors Other Than Setting
Correlations of Service Characteristic Factors and Developmental Indices Age Equivalencies

Developmental Scale/Subscale Age Equivalent	Age of Entry into Early Intervention	Quality of Classroom Environment	Mean Years Experience Classroom Teacher	Percent of Class Time Spent in Free Play	Number of Services Received	Total Hours of Service Per Week	Total Hours of Special Instruction Per Week	Total Hours of Therapy Per Week	Percent of Therapy at EI Center	Perc Ther Cons M
Battelle Total	0.3007	-0.0794	0.1426	0.1723	-0.3153	0.0318	0.1475	-0.1705	0.2439	0.0
	N = 162	N = 155	N = 157	N = 155	N = 152	N = 152	N = 152	N = 152	N = 152	N =
	P = .000	P = .326	P = .075	P = .032	P = .000	P = .697	P = .070	P = .036	P = .002	P =
Personal Social Scale	0.1799	-0.0757	0.2233	0.1003	-0.2255	0.0519	0.1296	-0.1079	0.1839	-0.
	N = 162	N = 155	N = 157	N = 155	N = 152	N = 152	N = 152	N = 152	N = 152	N =
	P = .022	P = .349	P = .005	P = .214	P = .005	P = .525	P = .112	P = .186	P = .023	P =
Adapt Scale	0.3163	-0.1114	0.1243	0.1107	-0.3039	0.0305	0.1369	-0.1563	0.2767	-0.
	N = 162	N = 155	N = 157	N = 155	N = 152	N = 152	N = 152	N = 152	N = 152	N =
	P = .000	P = .168	P = .121	P = .170	P = .000	P = .709	P = .093	P = .054	P = .001	P =
Motor Scale	0.4459	-0.0719	0.0406	0.2304	-0.3375	0.0460	0.1602	-0.1650	0.2252	0.0
	N = 162	N = 155	N = 157	N = 155	N = 152	N = 152	N = 152	N = 152	N = 152	N =
	P = .000	P = .374	P = .613	P = .004	P = .000	P = .573	P = .049	P = .042	P = .005	P =
Communication Scale	0.1885	-0.0604	0.1526	0.1416	-0.3245	0.0366	0.1508	-0.1671	0.1781	-0.
	N = 162	N = 155	N = 157	N = 155	N = 152	N = 152	N = 152	N = 152	N = 152	N =
	P = .016	P = .456	P = .056	P = .079	P = .000	P = .655	P = .064	P = .040	P = .028	P =
Language Scale	0.1483	-0.1171	0.1583	0.1210	-0.2588	0.0886	0.1478	-0.0719	0.1559	-0.
	N = 162	N = 155	N = 157	N = 155	N = 152	N = 152	N = 152	N = 152	N = 152	N =
	P = .060	P = .147	P = .048	P = .134	P = .001	P = .278	P = .069	P = .379	P = .055	P =

Table 82 (continued)

Developmental Scale/Subscale Age Equivalent	Age of Entry into Early Intervention	Quality of Classroom Environment	Mean Years Experience Classroom Teacher	Percent of Class Time Spent in Free Play	Number of Services Received	Total Hours of Service Per Week	Total Hours of Special Instruction Per Week	Total Hours of Therapy Per Week	Percent of Therapy at EI Center	Per The Con M
Peabody Total	0.4287	-0.0752	0.0647	0.2053	-0.3789	0.0253	0.1506	-0.1866	0.2769	0.
	N = 162	N = 155	N = 157	N = 155	N = 152	N = 152	N = 152	N = 152	N = 152	N
	P = .000	P = .352	P = .421	P = .010	P = .000	P = .757	P = .064	P = .021	P = .001	P =
Fine Motor	0.3346	-0.0915	0.1285	0.1312	-0.3471	0.0202	0.1252	-0.1565	0.2725	-0
	N = 162	N = 155	N = 157	N = 155	N = 152	N = 152	N = 152	N = 152	N = 152	N
	P = .000	P = .258	P = .109	P = .104	P = .000	P = .805	P = .124	P = .054	P = .001	P =
Gross Motor	0.4965	-0.0532	-0.0052	0.2668	-0.3848	0.0288	0.1661	-0.2042	0.2619	0.
	N = 162	N = 155	N = 157	N = 155	N = 152	N = 152	N = 152	N = 152	N = 152	N
	P = .000	P = .511	P = .948	P = .001	P = .000	P = .725	P = .041	P = .012	P = .001	P =
PLS Total Scale	0.1451	-0.0519	0.1863	0.1072	-0.2716	0.0949	0.1677	-0.0914	0.1171	-0
	N = 162	N = 155	N = 157	N = 155	N = 152	N = 152	N = 152	N = 152	N = 152	N
	P = .065	P = .521	P = .019	P = .184	P = .001	P = .245	P = .039	P = .263	P = .151	P =
Auditory	0.0860	-0.0320	0.1734	0.0706	-0.2205	0.1359	0.1772	-0.0345	0.0733	-0
	N = 162	N = 155	N = 157	N = 155	N = 152	N = 152	N = 152	N = 152	N = 152	N
	P = .277	P = .693	P = .030	P = .383	P = .006	P = .095	P = .029	P = .673	P = .369	P =
Expressive	0.2127	-0.0610	0.1885	0.1421	-0.3391	0.0172	0.1372	-0.1801	0.1660	-0
	N = 162	N = 155	N = 157	N = 155	N = 152	N = 152	N = 152	N = 152	N = 152	N
	P = .007	P = .451	P = .018	P = .078	P = .000	P = .833	P = .092	P = .026	P = .041	P

Table 83

Factors Other Than Setting
Correlations of Service Characteristic Factors and Social Status Scale

	Age of Entry into Early Intervention	Quality of Classroom Environment	Mean Years Experience of Classroom Teacher	Percent of Class Time Spent in Free Play	Number of Services Received	Total Hours of Service Per Week	Total Hours of Special Instruction Per Week	Total Hours of Therapy Per Week	Percent of Therapy at EI Center	Per The Con
Others sit near child during snack	-0.0128 N = 135 P = .883	-0.0377 N = 133 P = .667	0.3155 N = 134 P = .000	0.1332 N = 133 P = .127	-0.1699 N = 129 P = .054	0.1352 N = 129 P = .127	0.1349 N = 129 P = .127	0.0305 N = 129 P = .732	-0.0016 N = 129 P = .986	-(N P
Others share child's toys	-0.0278 N = 136 P = .748	-0.1193 N = 134 P = .170	0.1930 N = 135 P = .025	0.1392 N = 134 P = .109	0.0141 N = 130 P = .873	0.1860 N = 130 P = .034	0.1533 N = 130 P = .082	0.0893 N = 130 P = .312	0.0075 N = 130 P = .932	-(N P
Others are child's buddies	0.0571 N = 136 P = .509	-0.0803 N = 134 P = .356	0.3503 N = 135 P = .000	0.0475 N = 134 P = .585	-0.0547 N = 130 P = .537	0.2215 N = 130 P = .011	0.1898 N = 130 P = .031	0.0958 N = 130 P = .278	0.0151 N = 130 P = .865	-(N P
Others watch out for child	-0.2305 N = 136 P = .007	0.1170 N = 134 P = .178	0.3177 N = 135 P = .000	0.0168 N = 134 P = .847	-0.1183 N = 130 P = .180	0.1105 N = 130 P = .211	0.1698 N = 130 P = .053	-0.0607 N = 130 P = .492	-0.0482 N = 130 P = .586	-(N P
Others sit next to child in circle	-0.1486 N = 135 P = .086	-0.0726 N = 134 P = .405	0.3516 N = 135 P = .000	0.0930 N = 134 P = .285	-0.1247 N = 129 P = .159	0.2236 N = 129 P = .011	0.2039 N = 129 P = .020	0.0683 N = 129 P = .442	0.0087 N = 129 P = .922	-(N P
Others sit near child during activities	-0.0015 N = 136 P = .986	-0.0723 N = 134 P = .406	0.3051 N = 135 P = .000	0.1570 N = 134 P = .070	-0.2076 N = 130 P = .018	0.2180 N = 130 P = .013	0.2421 N = 130 P = .006	0.0144 N = 130 P = .871	0.0432 N = 130 P = .625	-(N P
Total Scale	-0.0820 N = 134 P = .346	-0.0484 N = 133 P = .580	0.3690 N = 134 P = .000	0.1220 N = 133 P = .162	-0.1425 N = 128 P = .109	0.2191 N = 128 P = .013	0.2226 N = 128 P = .012	0.0228 N = 128 P = .799	0.0195 N = 128 P = .827	-(N P

Table 84

Factors Other Than Setting
Correlations of Service Characteristic Factors and Play Observation Measures

Frequency of	Age of Entry Into Early Intervention	Quality of Classroom Environment	Mean Years Experience of Classroom Teacher	Percent of Class Time Spent in Free Play	Number of Services Received	Total Hours of Service Per Week	Total Hours of Special Instruction Per Week	Total Therapy Per Week	Percent of Therapy at EI Center	Perce Thera Const Mo
ALL PLAY	0.2119	-0.0138	0.1032	0.1749	-0.2668	0.0139	0.1244	-0.2094	0.1994	-0.0
	N = 145	N = 143	N = 145	N = 144	N = 140	N = 140	N = 140	N = 140	N = 140	N =
	P = .011	P = .870	P = .217	P = .036	P = .001	P = .871	P = .143	P = .013	P = .018	P = .
SOCIAL LEVEL										
Solitary Play	0.1409	-0.0338	-0.0966	0.2571	-0.2397	-0.0406	0.0739	-0.2245	0.1343	0.09
	N = 145	N = 143	N = 145	N = 144	N = 140	N = 140	N = 140	N = 140	N = 140	N =
	P = .091	P = .689	P = .248	P = .002	P = .004	P = .634	P = .385	P = .008	P = .114	P = .
Parallel Play	0.1696	-0.0158	0.1409	0.1189	-0.2017	0.0455	0.1161	-0.1285	0.1761	-0.0
	N = 145	N = 143	N = 145	N = 144	N = 140	N = 140	N = 140	N = 140	N = 140	N =
	P = .041	P = .851	P = .091	P = .156	P = .017	P = .593	P = .172	P = .130	P = .037	P = .
Simple Social Play	0.1722	0.0555	0.0931	0.0797	-0.2163	-0.0441	0.0643	-0.2133	0.0879	0.04
	N = 145	N = 143	N = 145	N = 144	N = 140	N = 140	N = 140	N = 140	N = 140	N =
	P = .038	P = .511	P = .265	P = .342	P = .010	P = .605	P = .451	P = .011	P = .302	P = .
Reciprocal Play	0.2012	-0.0085	0.1088	-0.0420	-0.1066	-0.1010	-0.0406	-0.1295	-0.0124	0.13
	N = 145	N = 143	N = 145	N = 144	N = 140	N = 140	N = 140	N = 140	N = 140	N =
	P = .015	P = .920	P = .193	P = .617	P = .210	P = .235	P = .634	P = .127	P = .884	P = .
Group Play	0.1172	0.0045	0.1187	0.0026	-0.1185	-0.0513	0.0160	-0.1357	-0.0433	0.26
	N = 145	N = 143	N = 145	N = 144	N = 140	N = 140	N = 140	N = 140	N = 140	N =
	P = .160	P = .957	P = .155	P = .975	P = .163	P = .547	P = .851	P = .110	P = .612	P = .
COGNITIVE LEVEL										
Functional Play	-0.0323	-0.0470	0.1532	0.1384	-0.0537	-0.0569	-0.0170	-0.0843	0.1563	-0.0
	N = 145	N = 143	N = 145	N = 144	N = 140	N = 140	N = 140	N = 140	N = 140	N =
	P = .700	P = .578	P = .066	P = .098	P = .528	P = .504	P = .842	P = .322	P = .065	P = .
Constructive Play	0.2047	0.0123	0.0903	0.1504	-0.2770	0.0000	0.1320	-0.2524	0.1529	0.02
	N = 145	N = 143	N = 145	N = 144	N = 140	N = 140	N = 140	N = 140	N = 140	N =
	P = .014	P = .884	P = .280	P = .072	P = .001	P = 1.00	P = .120	P = .003	P = .071	P = .

Table 84 (continued)

Frequency of	Age of Entry into Early Intervention	Quality of Classroom Environment	Mean Years Experience of Classroom Teacher	Percent of Class Time Spent in Free Play	Number of Services Received	Total Hours of Service Per Week	Total Hours of Special Instruction Per Week	Total Therapy Per Week	Percent of Therapy at EI Center	Per Tha Co
Dramatic Play	-0.0411	0.0592	-0.0470	0.0333	-0.1566	-0.1172	-0.0741	-0.0986	0.0733	-0
	N = 145	N = 143	N = 145	N = 144	N = 140	N = 140	N = 140	N = 140	N = 140	N
	P = .624	P = .482	P = .574	P = .692	P = .065	P = .168	P = .384	P = .246	P = .389	P
Games with Rules	0.1221	-0.0962	0.0410	-0.1346	-0.0010	0.0494	0.0138	0.0750	0.0124	-0
	N = 145	N = 143	N = 145	N = 144	N = 140	N = 140	N = 140	N = 140	N = 140	N
	P = .143	P = .253	P = .624	P = .108	P = .991	P = .562	P = .872	P = .378	P = .885	P
NON PLAY BEHAVIOR										
Non occupied	-0.0674	0.0631	0.1199	-0.1715	0.0682	0.0518	0.0672	-0.0222	-0.2185	-0
	N = 145	N = 143	N = 145	N = 144	N = 140	N = 140	N = 140	N = 140	N = 140	N
	P = .421	P = .454	P = .151	P = .040	P = .423	P = .543	P = .430	P = .794	P = .009	P
Onlooker	0.0548	-0.0250	-0.0519	0.0370	-0.0036	-0.1274	-0.1194	-0.0328	0.1815	-0
	N = 145	N = 143	N = 145	N = 144	N = 140	N = 140	N = 140	N = 140	N = 140	N
	P = .513	P = .767	P = .535	P = .660	P = .966	P = .134	P = .160	P = .700	P = .032	P
Active Conversation	-0.0765	0.0523	0.0758	-0.0123	0.0233	-0.0193	0.0066	-0.0522	0.0095	-0
	N = 145	N = 143	N = 145	N = 144	N = 140	N = 140	N = 140	N = 140	N = 140	N
	P = .360	P = .535	P = .365	P = .884	P = .785	P = .821	P = .939	P = .540	P = .912	P
Exploratory	-0.0258	0.0424	-0.0619	0.0977	-0.0088	-0.1215	-0.1067	-0.0451	0.0825	-0
	N = 145	N = 143	N = 145	N = 144	N = 140	N = 140	N = 140	N = 140	N = 140	N
	P = .758	P = .615	P = .460	P = .244	P = .918	P = .153	P = .209	P = .597	P = .333	P

Table 85

Factors Other Than Setting
Correlations of Service Characteristic Factors and Measures of Family Support, Contact, Needs and Resourc

Family Scale Total	Age of Entry into Early Intervention	Quality of Classroom Environment	Mean Years Experience Classroom Teacher	Percent of Class Time Spent in Free Play	Number of Services Received	Total Hours of Service Per Week	Total Hours of Special Instruction Per Week	Total Hours of Therapy Per Week	Percent of Therapy at El Center	Per The Con
Family Support	-0.2291	0.1463	0.0239	0.1129	0.0657	0.0149	0.0632	-0.0910	-0.1667	0.
	N = 135	N = 129	N = 131	N = 130	N = 126	N = 126	N = 126	N = 126	N = 126	N
	P = .008	P = .098	P = .787	P = .201	P = .465	P = .869	P = .482	P = .311	P = .062	P
Family Contact	-0.1866	0.0860	-0.0365	0.2490	-0.0772	-0.0093	0.0545	-0.1248	-0.0986	0.
	N = 134	N = 128	N = 130	N = 129	N = 125	N = 125	N = 125	N = 125	N = 125	N
	P = .031	P = .335	P = .680	P = .004	P = .392	P = .918	P = .546	P = .166	P = .274	P
Family Needs	0.0080	-0.2344	-0.0727	-0.0636	-0.1505	0.0233	0.0080	0.0329	0.0546	0.
	N = 135	N = 129	N = 131	N = 130	N = 126	N = 126	N = 126	N = 126	N = 126	N
	P = .927	P = .008	P = .409	P = .472	P = .093	P = .796	P = .929	P = .715	P = .544	P
Family Resources	-0.0676	-0.0276	0.1380	0.2039	0.0157	-0.1136	-0.0680	-0.1043	-0.0662	0.
	N = 130	N = 125	N = 127	N = 126	N = 122	N = 122	N = 122	N = 122	N = 122	N
	P = .445	P = .760	P = .122	P = .022	P = .863	P = .213	P = .457	P = .253	P = .469	P

Table 86

Factors Other Than Setting
Correlations of Developmental Indices Age Equivalencies with Social Status, Play Observation and Family Measures

Measure	PLS Total Scale AE	Peabody Total Scale AE	PLS Total Scale AE	Personal Social AE
SOCIAL STATUS				
Others sit near child during snack	0.3159 N = 135 P = .000	0.2295 N = 135 P = .007	0.3611 N = 135 P = .000	0.3525 N = 135 P = .000
Others share child's toys	0.2241 N = 136 P = .009	0.1824 N = 136 P = .034	0.2775 N = 136 P = .001	0.2454 N = 136 P = .004
Others are child's buddies	0.2747 N = 136 P = .001	0.2269 N = 136 P = .008	0.2704 N = 136 P = .001	0.3007 N = 136 P = .000
Others watch out for child	0.1606 N = 136 P = .062	0.0706 N = 136 P = .414	0.2629 N = 136 P = .002	0.2228 N = 136 P = .009
Others sit next to child in circle	0.3604 N = 135 P = .000	0.2378 N = 135 P = .005	0.4365 N = 135 P = .000	0.4037 N = 135 P = .000
Others sit near child during activities	0.3970 N = 136 P = .000	0.3080 N = 136 P = .000	0.4240 N = 136 P = .000	0.4271 N = 136 P = .000
Total Social Status Scale	0.3485 N = 134 P = .000	0.2494 N = 134 P = .004	0.4114 N = 134 P = .000	0.3935 N = 134 P = .000
PLAY OBSERVATION				
All Play	0.5824 N = 145 P = .000	0.5978 N = 145 P = .000	0.4676 N = 145 P = .000	0.5148 N = 145 P = .000
SOCIAL LEVEL				
Solitary Play	0.2057 N = 145 P = .013	0.2308 N = 145 P = .005	0.1449 N = 145 P = .082	0.1150 N = 145 P = .168
Parallel Play	0.5586 N = 145 P = .000	0.5648 N = 145 P = .000	0.4588 N = 145 P = .000	0.5133 N = 145 P = .000
Simple Social Play	0.3349 N = 145 P = .000	0.3524 N = 145 P = .000	0.2558 N = 145 P = .002	0.2970 N = 145 P = .000
Reciprocal Play	0.1536 N = 145 P = .065	0.1424 N = 145 P = .088	0.1099 N = 145 P = .188	0.1732 N = 145 P = .037

Table 86 (continued)

Measure	PLS Total Scale AE	Peabody Total Scale AE	PLS Total Scale AE	Personal Social AE
Group Play	0.1193 N = 145 P = .153	0.1098 N = 145 P = .189	0.0978 N = 145 P = .242	0.1276 N = 145 P = .126
COGNITIVE LEVEL				
Functional Play	-0.0104 N = 145 P = .901	-0.0331 N = 145 P = .693	-0.0082 N = 145 P = .922	-0.0284 N = 145 P = .734
Constructive Play	0.5655 N = 145 P = .000	0.5675 N = 145 P = .000	0.4584 N = 145 P = .000	0.5074 N = 145 P = .000
Dramatic Play	0.1345 N = 145 P = .107	0.1795 N = 145 P = .031	0.0783 N = 145 P = .349	0.1328 N = 145 P = .111
Games with Rules Play	0.0691 N = 145 P = .409	0.0878 N = 145 P = .293	0.0328 N = 145 P = .695	0.0472 N = 145 P = .573
NON PLAY BEHAVIOR				
Non Occupied	-0.3731 N = 145 P = .000	0.4040 N = 145 P = .000	0.2746 N = 145 P = .001	0.2918 N = 145 P = .000
Onlooker	0.3284 N = 145 P = .000	0.2388 N = 145 P = .004	0.3292 N = 145 P = .000	0.3611 N = 145 P = .000
Active Conversation	0.3985 N = 145 P = .000	0.2795 N = 145 P = .001	0.4737 N = 145 P = .000	0.4637 N = 145 P = .000
Exploratory	-0.1513 N = 145 P = .069	-0.0931 N = 145 P = .265	-0.1392 N = 145 P = .095	-0.1769 N = 145 P = .033
Family Support	-0.3364 N = 135 P = .000	-0.3494 N = 135 P = .000	-0.3515 N = 135 P = .000	-0.2882 N = 135 P = .001
Family Social Contact	-0.2754 N = 134 P = .001	-0.2496 N = 134 P = .004	-0.2788 N = 134 P = .001	-0.2211 N = 134 P = .010
Family Needs	-0.1174 N = 135 P = .175	0.0115 N = 135 P = .894	-0.1712 N = 135 P = .047	-0.1590 N = 135 P = .066
Family Resources	0.0372 N = 130 P = .674	-0.0054 N = 130 P = .951	-0.0989 N = 130 P = .263	0.0790 N = 130 P = .372

Table 87

Factors Other Than Setting
Correlations of Family Measures with Social Status and Play Observation Measures

Measure	Family Support Scale Total	Family Social Contact Scale Total	Family Needs Scale Total	Family Resources Scale Total
SOCIAL STATUS				
Others sit near child during snack	-0.2179 N = 113 P = .020	-0.0447 N = 112 P = .640	-0.0107 N = 113 P = .910	-0.1192 N = 109 P = .217
Others share child's toys	-0.2187 N = 114 P = .019	-0.1992 N = 113 P = .034	0.0293 N = 114 P = .757	-0.0202 N = 110 P = .834
Others are child's buddies	-0.0572 N = 114 P = .546	0.0251 N = 113 P = .792	0.1009 N = 114 P = .285	-0.0418 N = 110 P = .665
Others watch out for child	0.0535 N = 114 P = .572	0.0953 N = 113 P = .316	0.0255 N = 114 P = .788	-0.0267 N = 110 P = .782
Others sit next to child in circle	-0.2603 N = 114 P = .005	-0.0840 N = 113 P = .376	0.0390 N = 114 P = .680	-0.0923 N = 110 P = .338
Others sit near child during activities	-0.3381 N = 114 P = .000	-0.1297 N = 113 P = .171	0.1342 N = 114 P = .154	-0.0964 N = 110 P = .316
Total Social Status Scale	-0.2098 N = 113 P = .026	-0.0598 N = 112 P = .531	0.0590 N = 113 P = .535	-0.0839 N = 109 P = .386
PLAY OBSERVATION				
All Play	-0.2959 N = 122 P = .001	-0.1853 N = 121 P = .042	0.0621 N = 122 P = .497	0.0119 N = 118 P = .898
Solitary Play	0.1369 N = 122 P = .133	0.1393 N = 121 P = .128	0.0090 N = 122 P = .922	0.1149 N = 118 P = .215
Parallel Play	-0.3841 N = 122 P = .000	-0.2465 N = 121 P = .006	0.0564 N = 122 P = .537	-0.0312 N = 118 P = .738
Simple Social Play	-0.0227 N = 122 P = .804	-0.0698 N = 121 P = .446	0.0716 N = 122 P = .433	0.0817 N = 118 P = .379

Table 87 (continued)

Measure	Family Support Scale Total	Family Social Contact Scale Total	Family Needs Scale Total	Family Resources Scale Total
Reciprocal Play	-0.0329 N = 122 P = .719	-0.0532 N = 121 P = .562	-0.0206 N = 122 P = .821	-0.0301 N = 118 P = .746
Group Play	-0.0255 N = 122 P = .780	-0.0067 N = 121 P = .941	-0.0670 N = 122 P = .463	-0.0083 N = 118 P = .929
COGNITIVE LEVEL				
Functional Play	-0.0034 N = 122 P = .971	0.0370 N = 121 P = .687	0.0312 N = 122 P = .733	-0.0672 N = 118 P = .469
Constructive Play	-0.2503 N = 122 P = .005	-0.1816 N = 121 P = .046	0.0306 N = 122 P = .738	0.0316 N = 118 P = .734
Dramatic Play	-0.1453 N = 122 P = .110	0.1026 N = 121 P = .263	0.2279 N = 122 P = .012	0.0540 N = 118 P = .561
Games With Rules	-0.1201 N = 122 P = .188	-0.2287 N = 121 P = .012	0.1344 N = 122 P = .140	0.0364 N = 118 P = .696
Non Occupied	0.2587 N = 122 P = .004	-0.0032 N = 121 P = .972	0.0899 N = 122 P = .325	0.0893 N = 118 P = .336
Onlooker	-0.0546 N = 122 P = .551	-0.1913 N = 121 P = .036	-0.0596 N = 122 P = .514	0.0114 N = 118 P = .902
Active Conversation	-0.1076 N = 122 P = .238	-0.2077 N = 121 P = .022	-0.1509 N = 122 P = .097	-0.0317 N = 118 P = .733
Exploratory	0.0344 N = 122 P = .707	0.1232 N = 121 P = .178	-0.1074 N = 122 P = .239	-0.0428 N = 118 P = .645

Table 88

Factors Other than Setting
Analysis of Covariance of Demographic Factors on Selected Child and Family Measures at Age 24 Mor

Child and Family Measure	One or Two Parent Households	Family Income	Education of Primary Caregiver	SES (Hollings
		Beta Weights (significance)		
Battelle Developmental Inventory Age Equivalence	.027	-.427	-.364	.302
Peabody Motor Scale	.054	-.481	-.318	.278
Preschool Language Age Equivalence	.091	-.395	-.329	.253
BDI Personal Social Subscale Age Equivalence	.009	-.403	-.359	.386
Social Status Scale Total	.240	-.190	-.604 (p=.006)	.586 (p=.04
Total Amount of Play Observed	-.254	-.174	-.161	.056
Family Support Scale Total	.058	.565 (p=.038)	.383	-.379
Family Contact Scale Total	-.349	.581 (p=.047)	.106	.001

Table 89

Factors Other than Setting
Analysis of Covariance of Demographic Factors on Selected Child and Family Measures at 24-42 Mont

Child and Family Measure	One or Two Parent Households	Family Income	Education of Primary Caregiver	SES (Hollings
	Beta Weights (significance)			
Battelle Developmental Inventory Age Equivalence	.113	-.489	-.238	.271
Peabody Motor Scale	.210	-.600	-.266	.313
Preschool Language Age Equivalence	.188	-.387	-.327	.226
BDI Personal Social Subscale Age Equivalence	.044	-.427	-.258	.291
Social Status Scale Total	.424	.009	-.912	.683
Total Amount of Play Observed	.153	-.004	-.366	-.24
Family Support Scale Total	.444	.090	-.008	.19
Family Contact Scale Total	.061	.123	-.321	.63

Table 90

Factors Other than Setting
Analysis of Covariance of Service Characteristics on Selected Child and Family Measures at Ages 24-36

	Beta Weights (significance)							
Child and Family Measures	Number of Services Received	Hours of Specialized Instruction per Week	Hours of Therapy per Week	Percent of Therapy Received at EI Center	Percent of Therapy Received in Group	Mean Years Experience Classroom Staff	Percent of Class Time in Free Play	A Refe E Inter
Battelle Developmental Inventory Age Equivalence	-.212	-.382	-.424 (p=.013)	.103	-.698 (p=.001)	-.429 (p=.021)	-.478 (p=.009)	.
Peabody Motor Scale	.063	-.364	-.367 (p=.022)	.135	.623 (p=.001)	.248	.440 (p=.010)	.
Preschool Language Age Equivalence	-.036	-.201	-.308	.191	.542 (p=.026)	.366	.253	-
BDI Personal Social Subscale Age Equivalence	.255	-.278	-.404 (p=.045)	.043	.635 (p=.007)	.524 (p=.020)	.364	.
Social Status Scale Total	.090	.155	-.200	-.180	.169	.531 (p=.046)	.200	-
Total Amount of Play Observed	-.084	-.248	-.098	-.075	.751 (p=.003)	.224	.584 (p=.088)	.
Family Support Scale Total	.800	-.393	-.384	-.123	-.505	.498	.077	
Family Contact Scale Total	-.226	.404	.235	-.140	-.387	-.076	-.045	-

Table 91

Analysis of Covariance of Service Characteristic Factors on Standardized Residuals Predicting Develo
Age Equivalences at Age 42 Months

Developmental Measure	Number of Services Received	Hours of Specialized Instruction per Week	Hours of Therapy per Week	Percent of Therapy Received at EI Center	Percent of Therapy Received in Group	Mean Years Experience Classroom Staff	Percent of Class Time in Free Play	Re Int
Battelle Developmental Inventory Age Equivalence	.565 (.020)	-.525 (.003)	-.618 (.005)	.058	.354	-.129	.188	
Peabody Motor Scale	.066	-.330	-.077	-.125	.241	-.010	.145	
Preschool Language Age Equivalence	.275	-.259	-.396	-.219	.419	-.037	-.158	
BDI Personal Social Subscale Age Equivalence	.555 (.025)	-.491 (.006)	-.560 (.012)	.098	.428 (.032)	-.039	.283	

Table 92

Factors Other Than Setting
Analysis of Battelle Total Age Equivalence, Family Support and Family Contact as Covariates Predict Selected Other Child and Family Variables, Ages 24-36 months

Child and Family Measure	Battelle Total Score	Family Support	Family Contact
		Beta Weights of Covariates	
Battelle Developmental Inventory Age Equivalence		-.073	-.160
Peabody Motor Scale		-.189	.036
Preschool Language Age Equivalence		-.110	-.185
BDI Personal Social Subscale Age Equivalence		.003	-.222
Social Status Scale Total	.262	.003	.456
Total Amount of Play Observed	.799 (.000)	-.746 (.031)	.378
Family Support Scale Total	-.159		
Family Contact Scale Total	-.247		

List of Figures

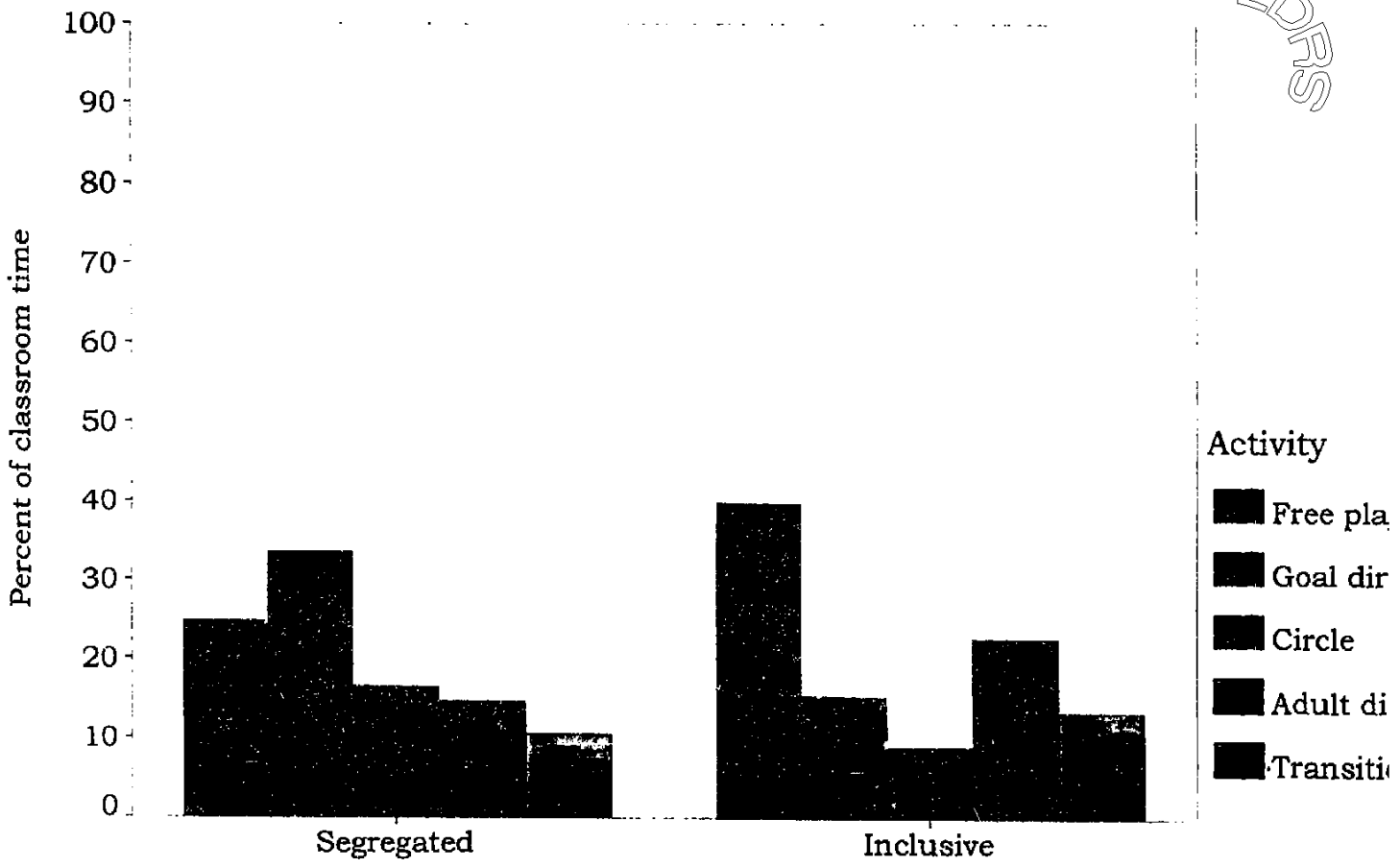

Figure 1. Comparing Toddler Settings -- Classroom Activities

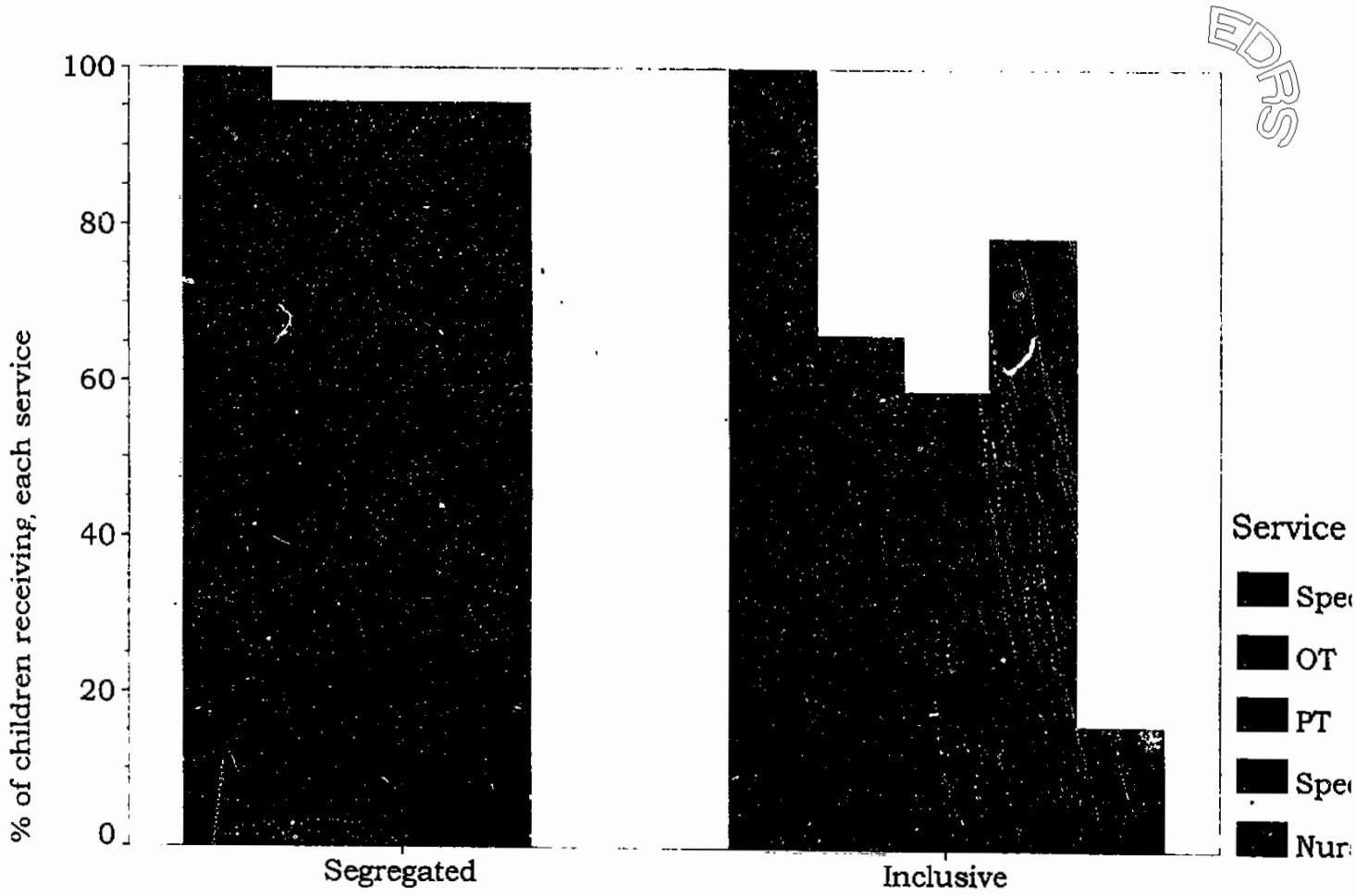

Figure 2. Comparing Toddler Settings -- Service Prevalence

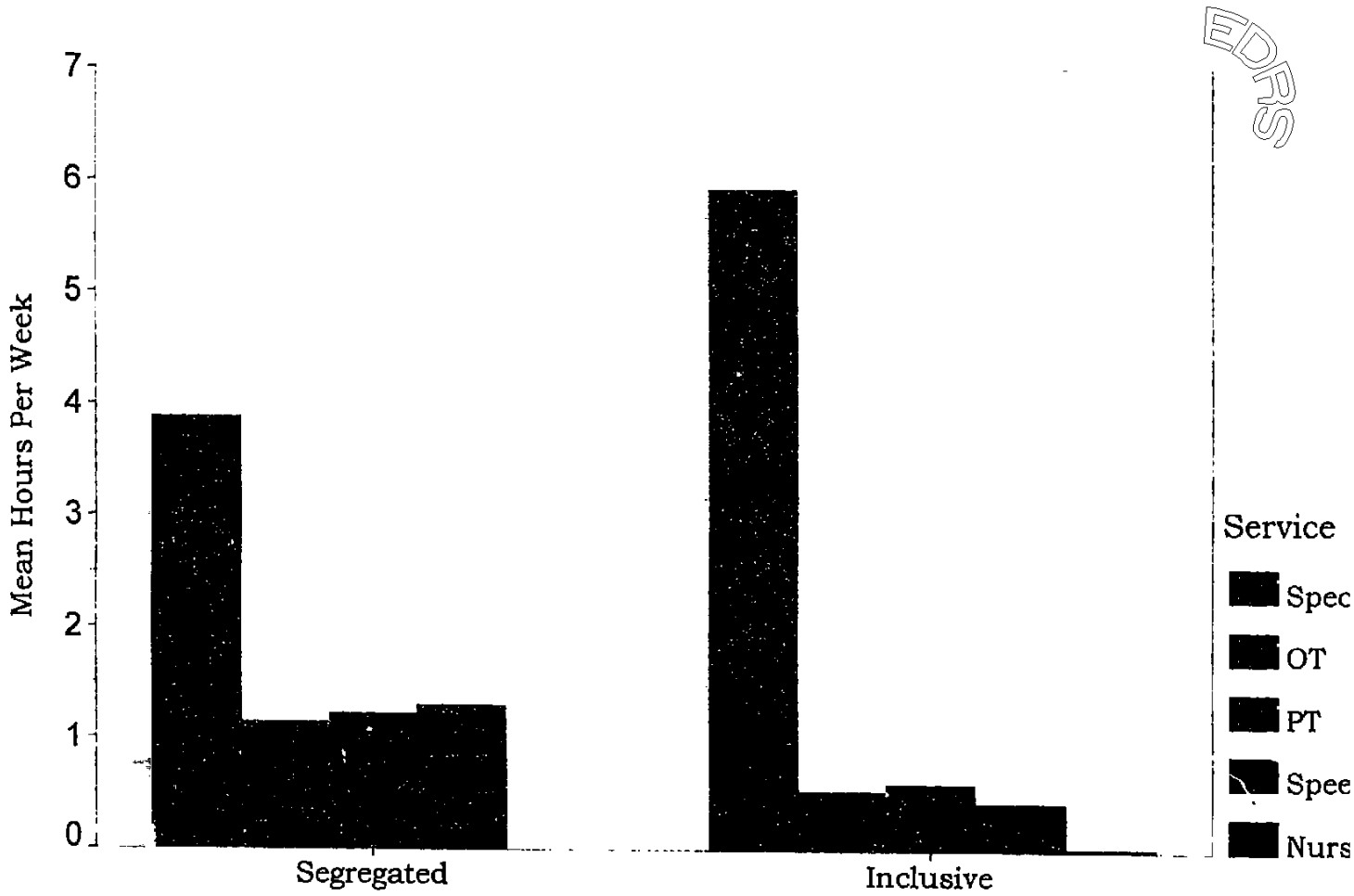

Figure 3. Comparing Toddler Settings -- Service Intensity

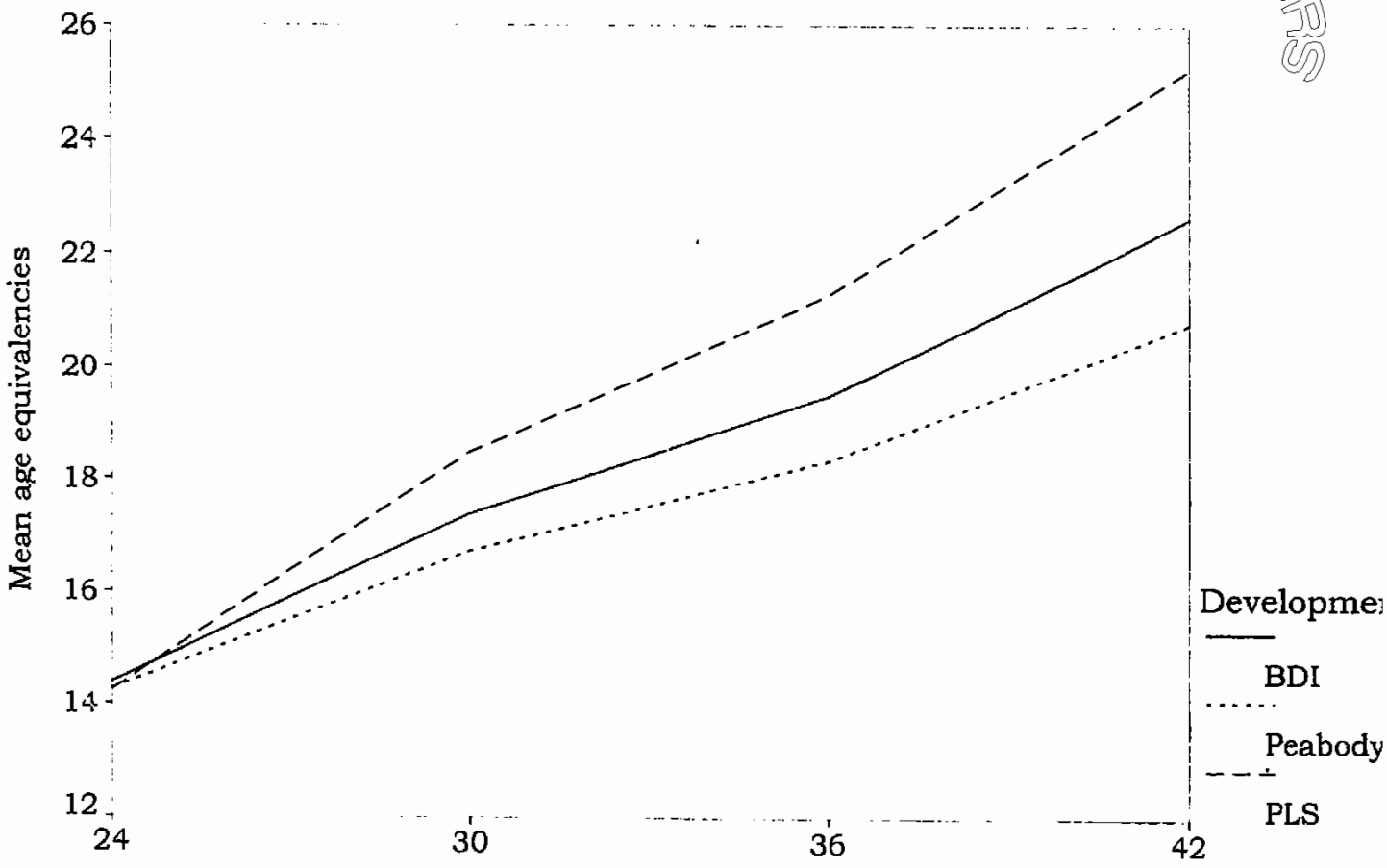

Figure 4. Identified Measure of Change -- Developmental Indices

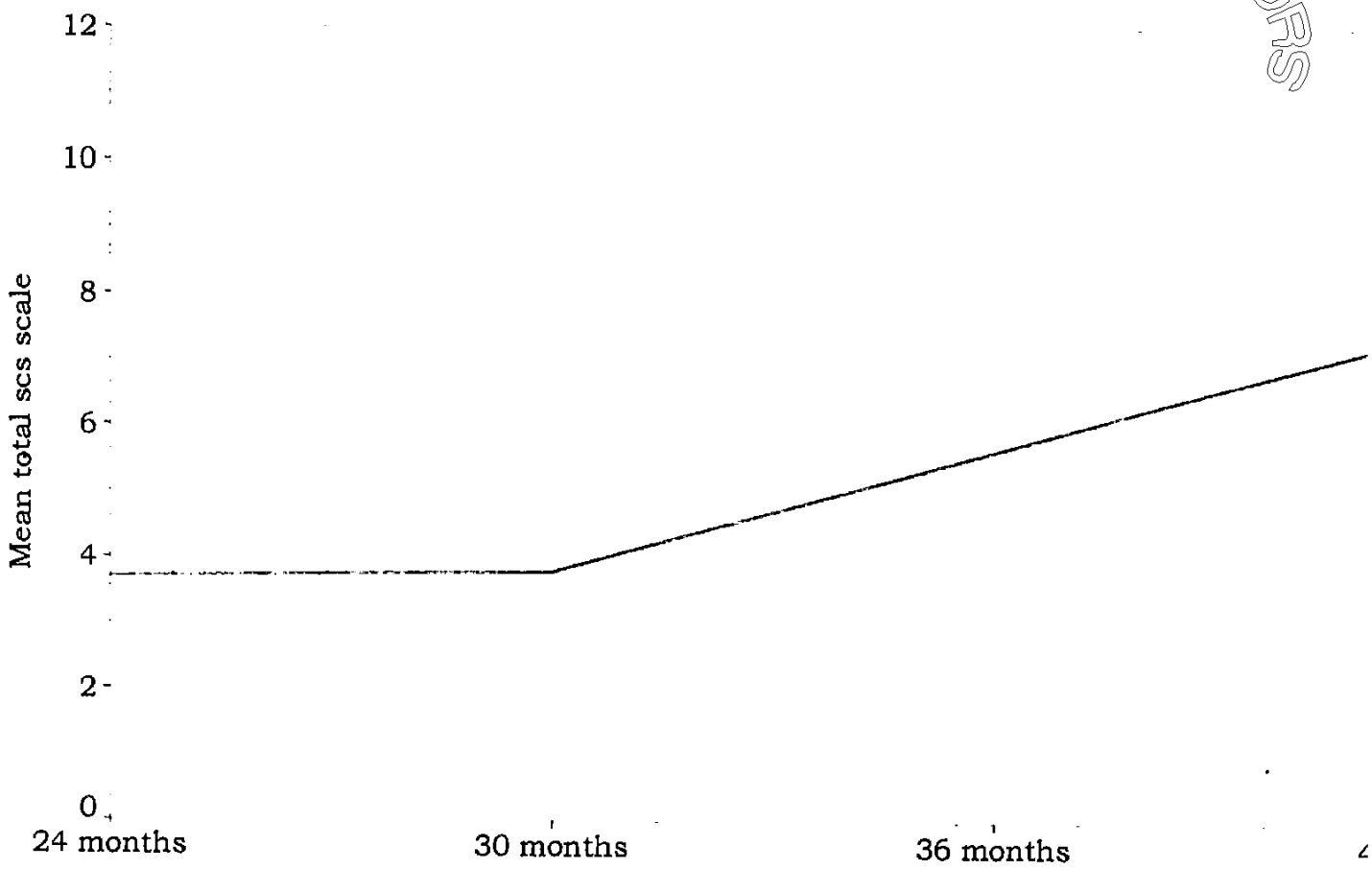

Figure 5. Identified Measures of Change -- Social Status Scale

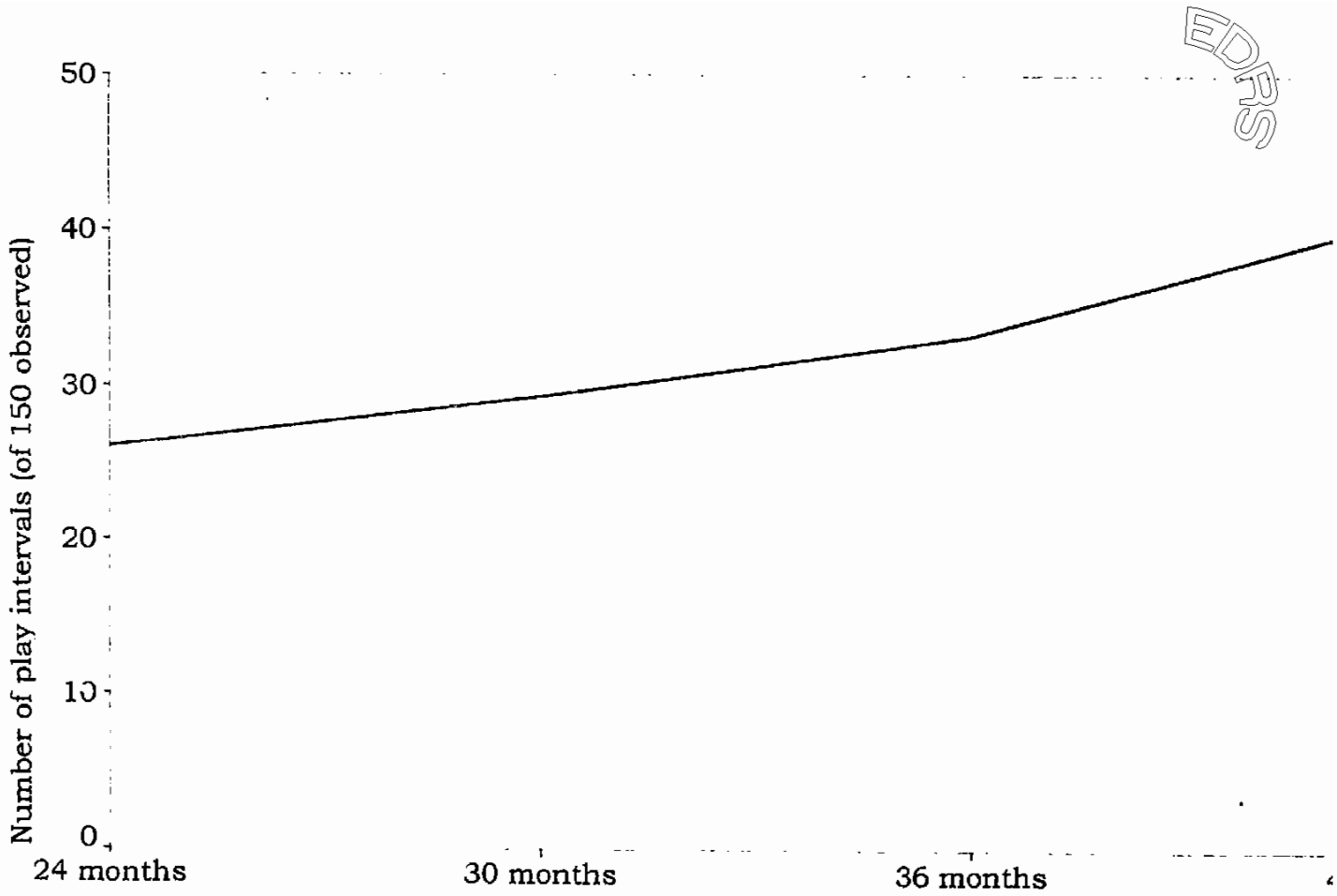

Figure 6. Identified Measures Of Change -- Observed Play

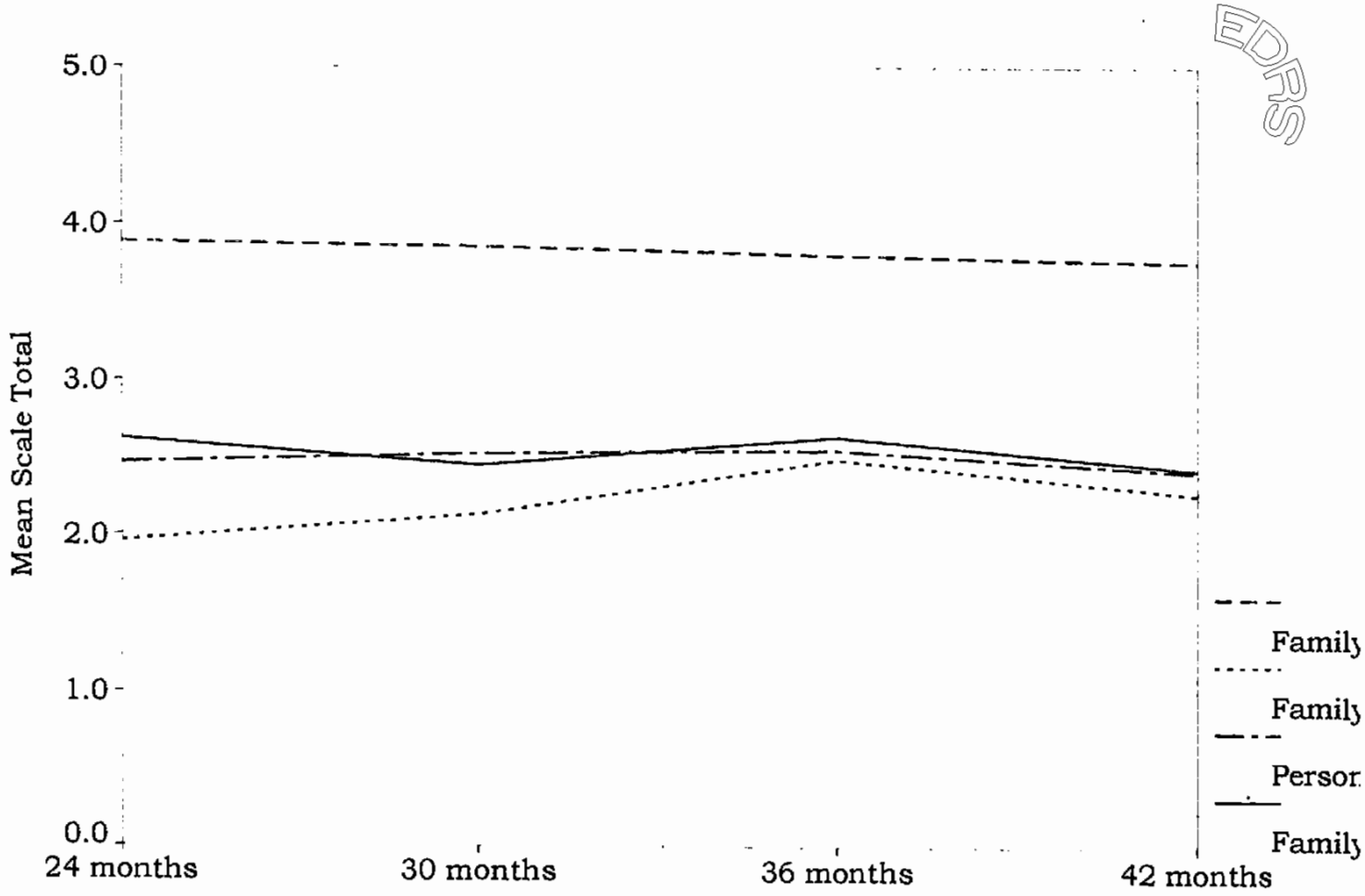

Figure 7. Measures With Little Age Related Change -- Family Status

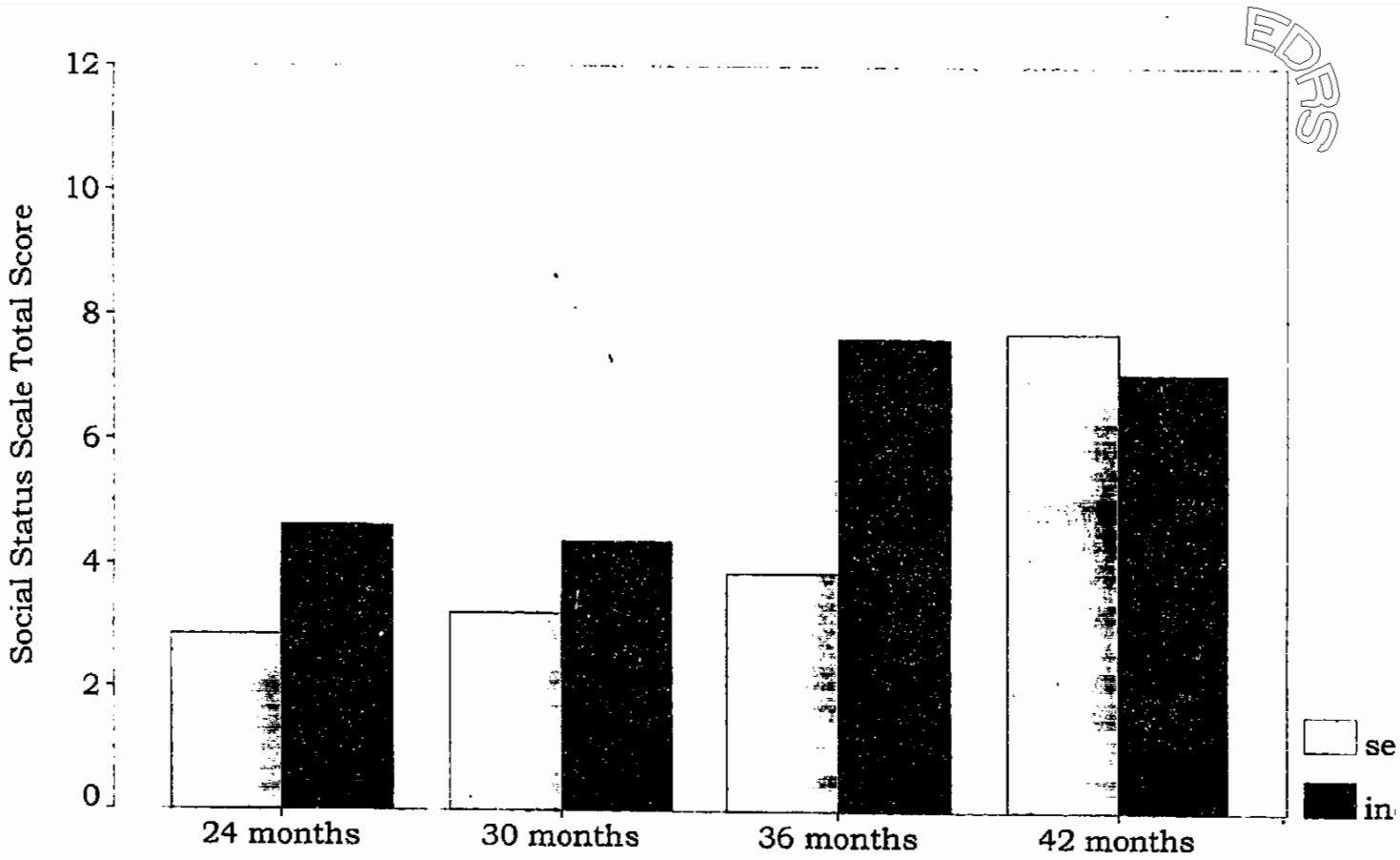

Figure 8. Comparison of Segregated and Inclusive Toddler Settings Social Status