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PREDICTING SCHOOL PLACEMENT OUTCOMES OF CHILDREN
WITH DISABILITIES WHO WERE ONCE ENROLLED
IN EARLY INTERVENTION

by

Mark Stanley Jesinoski

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Psychology

UTAH STATE UNIVERSITY
Logan, Utah

2006

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ABSTRACT

Predicting School Placement Outcomes of Children with Disabilities

Who Was Once Enrolled in Early Intervention

by

Mark S. Jesinoski, Master of Science

Utah State University, 2006

Major Professor: Mark Innocenti, Ph.D.
Department: Psychology

From longitudinal data from 223 children with disabilities in Utah, variables collected at entry into Part C early intervention and Part B early childhood special education services were used to differentiate between children and to predict placement outcomes in elementary school. Scores on the Battelle Developmental Inventory, Vineland Adaptive Behavior Scale, Parenting Stress Index, Social Skills Rating System, number of hours mothers worked outside the home, and fathers' education in years were differentiated between children who exited from and children who remained in special education. These same scores were also used to predict whether children would remain in or exit from special education services using discriminant analysis statistical procedures. The use of scores helped differentiate and predict placement for children who entered the original study in Part B preschool special education services.

(79 pages)

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Mark S. Jesinoski

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CHAPTER I

PROBLEM STATEMENT

The provision of services aimed at the remediation of disabling conditions in children from birth to age 5 has been federally mandated for two decades. These early intervention (Part C—birth to age 3) and preschool special education (Part B, Section 619—age 3 to 5) services, hereafter referred to as early intervention, have captured the attention of parents, professionals, and policymakers alike. Children born with or who develop disabling conditions in the United States enter into a world prepared to serve their needs with the goal of offering a future that, without these services, may not have been possible. The policy support, fiscal resources, professional organizational efforts, and family support for early intervention with children with disabilities is testament to its success from a public policy perspective. Even with this support, however, the concept of success in early intervention, as defined through research, remains an elusive topic.

The paragraphs to follow will elucidate the problem of concern by presenting a history of the legislative origins of early intervention, the arguments used to support its implementation, the methods used to evaluate it, and finally some areas of concern leading to the premise for conducting this study. As will be seen, the rationale for policy initiating federally mandated early intervention services for children with disabilities, while sound in principle, has not been followed with research. Research in this area, while providing volumes of positive findings through various evaluative

methods, has not been adequately used to support the idea that early intervention for children with disabilities will reduce the need for later special education services. A lack of (a) early intervention research using samples of children with disabilities, (b) longitudinal research connecting early intervention to elementary school, and (c) evaluative methods that place success in the context of a reduced need for services provides a rationale for this study. Accordingly, this study provides an alternative way of understanding success that uses a sample of children with disabilities, connects early intervention to elementary school, and understands success by not only looking at exits from services but also by predicting who will exit from services.

Legislation

Early intervention for children from birth through age 5 would not be possible without legislation supporting it at the federal level. Up until the mid 1980s, the law we refer to as the Individuals with Disabilities Education Improvement Act (presently IDEIA, PL 108-446) did not include services for children under 5 years of age (i.e., preschool and early intervention). Advocates for a preschool/early intervention component to IDEA (then PL 94-142) in 1986 argued that providing early intervention services to children would reduce the number of children needing later special education and accordingly reduce educational costs (Bruder, 1997; Early Childhood Outcomes Center [ECOC], 2005; Goetze & Price, 2000; Meisels & Shonkoff, 1990).

With the remedial benefits of early intervention as a platform, two decades of legislation (PL 99-457 in 1986, PL 101-476 in 1990, PL 102-119 in 1992, PL 105-17 in

1997, and PL 108-446 in 2004) paved the way for the future of early intervention in the United States. Accordingly, evaluating early intervention services provided to children from birth through age 5 has been a critical endeavor of many researchers over the past two decades.

The Population

Intervention services for children ages 5 and younger have historically been dichotomized into two loosely defined camps. On one side, children deemed at risk or disadvantaged, for example, because they were born premature, in economically impoverished settings, or to mentally disabled parents, are given services in hopes of preventing the occurrence of future delays. Intervention with these children is more of an exercise in prevention in that the services provided are intended to prevent the development of a disabling condition. Historically, literature demonstrating success in early intervention was derived from research using at-risk populations (Bruder, 1997; Casto & Mastropieri, 1986; ECOC, 2005; Guralnick, 1997).

On the other side are children with identified disabilities. Often these disabling conditions are present at birth and require intervention. These interventions aim to prevent further delay or even eliminate the disability. Children with disabilities represent a highly variable population. For instance, the population of children with disabilities in Utah schools alone represent 13 categories of disability. Each category represents children with varying degrees of severity of disability. This is problematic because these diverse children not only respond differentially to intervention and

classroom teaching, they also develop at different rates. Despite this variability, research has shown that providing early intervention for these children has the potential to reduce the effects of disabling conditions, and thereby promote developmental gains and better school and life outcomes (Bruder, 1997; Guralnick, 1997). Although these findings are positive, they do not directly support the arguments that were used to establish a rationale for policy.

Evaluating Early Intervention

The success of early intervention may be understood in many different ways. Public interest, belief systems, legislative support, economic analyses, and scientific research are all ways in which success is understood. However, success is not a stable concept and indicators of success have evolved somewhat over the last two decades. Prior to the implementation of PL 99-457 in 1986 success was largely evaluated by making comparisons between children receiving and those not receiving early intervention services. Meta-analyses of early intervention research up to this time revealed effect sizes of approximately one half to three quarters of a standard deviation for children with disabilities (Casto & Mastropieri, 1986; Guralnick, 1991; Shonkoff & Hauser-Cram, 1987). The results of these meta-analyses incited much attention by policymakers and researchers alike. Indeed the atmosphere induced by the research leading up to PL 99-457 was one of a positive belief that early intervention was worthwhile and worthy of federal funds to support it on a national level.

Following the policy changes in 1986, however, the ways in which researchers

defined success in early intervention began to change. Post PL 99-457 research, what Guralnick (1997) termed “second-generation research” found researchers evaluating early intervention by trying to understand what types of services worked for whom and when. No longer were researchers as concerned with broad generalizations of success because research had supported the idea that early intervention was effective. The passage of PL 99-457 instigated a plethora of research that most often evaluated the success of early intervention in quasi-experimental studies through gains in cognitive, language, affective, and motor development with specific populations in specific program settings (Guralnick).

More recent legislation (PL 105-17 in 1997; PL 108-446 in 2004) has prompted the U.S. Office of Special Education Programs (OSEP) to present the field with a new challenge—developing metrics tied to global indicators of children’s progress (ECOC, 2005; OSEP, 2005; Wolery & Bailey, 2002). In this way success is defined by positive gains indexed to typical development. This is an attempt to establish a system of accountability reminiscent of the original premises for establishing early intervention in the first place; providing services will reduce the need for later services and thereby save money. Despite this, as of 2004 there was still no system for regularly providing outcome information on children served in the Part B section 619 (ages 3 to 5) and Part C (ages 0 to 3) programs for IDEA (ECOC).

Summary and Contributions

Prior to federal mandates supporting early intervention on a national level,

research was often used to evaluate the success of early intervention by making broad comparisons across diverse populations of children. The results of this research contributed to the proposal that if money is provided for the implementation of early intervention, the remedial effects thereafter would yield cost savings by reducing the need for later special education services (Goetze & Price, 2000; Meisels & Shonkoff, 1990). This argument found fruition in the passage of PL 99-457 in 1986. This legislation forever changed the face of early intervention and prompted a significant body of research that evolved from making broad claims of efficacy to looking at specific program features and how they related to specific populations.

Despite the historical approaches to evaluating success in early intervention, few have looked at success according to the original premises leading to the passage of PL 99-457. Few studies have longitudinally evaluated the effects of early intervention. In addition, although a handful of studies have looked at changes in classification and/or placement of school-aged children with disabilities as an indicator of outcome (Bielinski & Ysseldyke, 2000; Carlson & Parshall, 1996; Hume & Dannenbring, 1989; Stile, Hudson, & Lecrone, 1991; Walker et al., 1988), studies have not examined placement outcomes for children in early intervention services, and later school placement outcome as an indicator of success. No study has attempted to examine child characteristics as they relate to changes in special education placement.

This study contributes to the concerns above by (a) following children longitudinally from early intervention into elementary school, (b) looking at placement over time, (c) making a connection between characteristics observed in early

intervention and later placement, and (d) offering an alternative measure of outcome.

The present study looked at longitudinal data gathered over a period of seven years by the Utah Early Intervention Project (UTEIP; Innocenti et al., 1999).

Characteristics of a sample of 223 children who qualified for disability status at entry into either Part C or Part B early intervention services were analyzed to evaluate success by asking:

1. What demographic, family, and child characteristics discriminate between children who were once enrolled in Part C and Part B early intervention services and are no longer receiving special education services.

2. What demographic, family, and child characteristics best predict whether a child will stay in or exit from services in elementary school using discriminant analysis procedures?

This data set included an initial data set of 150 children enrolled in Part B preschool special education services and 150 children enrolled in Part C early intervention services. Based on criterion for inclusion, and due to attrition, this original sample of 300 was narrowed down to a sample of 223 children who had established disabilities at the outset of the UTEIP study. In the seminal years of UTEIP, extensive data were collected on child/family contextual variables, descriptions of services, costs of services, transition activities, community involvement, services received outside the prescribed programs, and individualized plans for services/education. A report from this phase of the project describes the outcomes and areas examined (Innocenti et al., 1999). Following the initial three years of the UTEIP project, data on services,

classification, placement, transitions, and parent satisfaction were collected through annual parent and teacher surveys. It is a combination of this demographic, outcome, and longitudinal data that allowed for this study to take place.

CHAPTER II

REVIEW OF LITERATURE

The paragraphs to follow are intended to provide a rationale for this study by outlining policy and research contributing to the formation and evolution of early intervention with children with disabilities over the past three decades. The first section provides an overview of the history of law pertaining to the advent of federally mandated early intervention services for children birth to 5. I will then present research demonstrating how early intervention has been evaluated over the past two decades. I follow this with a brief summary statement followed by information highlighting some important areas in which evaluative research is lacking on children with disabilities. Next, I will present longitudinal studies with at-risk populations to show the potential for this type of research for children with disabilities. I will then present longitudinal research following disabled populations over time, as well as highlighting the relative lack of longitudinal research available on young children with disabilities.

Disability Law

Prior to 1975, children with disabilities were often excluded from the public school system. Those who were included often did not receive an education appropriate to their respective needs. Schools only educated approximately 20% of children with disabilities and law often excluded certain categories of children with disabilities.

(Katsiyannis, Yell, & Bradley, 2001; OSEP, 2000)

The law we today term IDEA, or the Individuals with Disabilities Education

Improvement Act, has its legislative origins emerging from the civil rights movement of the 1950s and 60s. The decision that, “if a state provides an education to its citizenry, then it must do so for all its citizens on an equal basis,” in the 1954 court case *Brown v. the Board of Education* is an example of litigation contributing to the evolution of IDEA (Katsiyannis et al., 2001; Wrightslaw, n.d.). In this case it was argued that segregating children on the basis of race, with the sanction of the law, generated an inferior position for the minority race and subsequently negatively affected the educational experiences of the minority group. In the years following this case, litigation ensued in which advocates for the rights of students with disabilities began to sue states claiming unequal treatment of individuals with disabilities in educational settings (Katsiyannis et al.; Meisels & Shonkoff, 1990; Wrightslaw). We see during this time the judicial recognition of citizen’s 14th amendment rights establishing a foundation for the equal treatment of individuals in education settings. Underlying the issue of unequal treatment was the issue of funding. In both the civil rights movement and the later advocating for individuals with disabilities, it was argued that providing funding would set the stage for treatment and opportunity.

The funding issue was directly addressed in the 1965 Elementary and Secondary Education Act (ESEA, PL 89-10). This act was considered the earliest effort to provide funding for education at the federal level. Under the ESEA, moneys were allotted for educational establishments in areas of high concentrations of low-income children. This was based on the premise that less affluent children receive a less affluent education and, consequently, realize less benefit from their educational experiences.

The rationale was that following their education they contributed less to society, indicating a poor return on the investment of education. This was one of the first times that a connection between providing funding for unique educational support and later school success was recognized at a federal legislative level (Katsiyannis et al., 2001; Meisels & Shonkoff, 1990; Wrightslaw, n.d.)

The Education of the Handicapped Act (EHA) of 1970 expanded federal funds under ESEA (PL 89-10), becoming the first law to directly focus on students with disabilities. Under this law, grants were offered to institutions of higher education to develop programs to train teachers of students with disabilities. In addition, further amendments in 1974 required that, upon receiving grants under EHA, states adopt the goal of full educational opportunity for students with disabilities (Guralnick, 1997; Katsiyannis et al., 2001; Meisels & Shonkoff, 1990; Wrightslaw, n.d.)

In 1975, an additional amendment to the aforementioned EHA of 1970 was signed into law marking a significant moment in the history of the evolution of special education.

The Education for All Handicapped Children Act of 1975 (EAHCA, PL 94-142) was enacted to, ensure that children with disabilities received a free and appropriate education, protect the rights of students and their parents, and assist states and localities in their efforts to provide such services. Through this law, the federal government offered grants to states if they provided appropriate education programs for students with disabilities who were covered by the EAHCA. To receive funding under the EAHCA, states had to pass laws and prove that they were educating students with disabilities in accordance with the laws' principles. With the passage of the EAHCA, therefore, the federal government became a partner with states in educating students with disabilities. (Katsiyannis et al., 2001, p. 325)

Amendments to PL 94-142 in 1986 (PL 99-457) provided federal funding for

early intervention and preschool services for all children identified with disabilities from birth to age 5. This act implemented the Part H (now Part C) program for infants and toddlers and the Section 619 (under Part B) preschool grants program (Thiele & Hamilton, 1991). The Section 619 preschool grants program required preschool services for children ages 3-5 (referred to under part B of the 1997 reauthorization of IDEA) and gave incentives for states to provide early intervention services for children birth through age 2 (referred to under Part C of the 1997 reauthorization of IDEA). An underlying assumption of this legislative action was that funding and treating children identified with disabilities and at-risk for developmental delays in their early years would remediate their problems, enhance their ability to contribute to society, and generate dollar savings (Bruder, 1997; ECOC, 2005; Goetze & Price, 2000; Guralnick, 1991; Kavale & Forness, 1999; Meisels & Shonkoff, 1990).

More recent legislation (PL 101-476 in 1990, PL 102-119 in 1992, PL 105-17 in 1997, and PL 108-446 in 2004) has prompted OSEP to require states to provide data assessing progress in children receiving services. As will be seen from the literature reviewed below, the reason for this movement is a lack of measures linking participation in early intervention (EI) to indicators of success as intended by the law. Further, traditional measures of outcome like gains in IQ, achievement, and development or “change scores” capture progress in a parallel but not direct manner as required by the movement toward functional, clearly understood indicators. This has initiated a call for alternative measures that can perhaps measure progress in ways more conducive to understanding outcome (OSEP, 2005).

Throughout the evolution of legislation promoting early intervention there has remained a central theme. This theme can be stated as, if funds are made available to provide benefits to children with disabilities, they can realize higher developmental and achievement outcomes (Bruder, 1997; ECOC, 2005; Meisels & Shonkoff, 1990). With the passage of PL 99-457 in 1986 it was hoped that providing funds to pre-elementary children with disabilities would yield later cost savings in elementary school by reducing the need for special education. Although the strength of this premise has instigated support and much evaluation of early intervention, research actually making a connection between early intervention and later placement in elementary school has been limited.

Evaluation of Early Intervention

The following section will look at the varying ways that early intervention has been evaluated over the past two decades. It will begin with an overview of research employing economics as a way to evaluate early intervention. Next, research that helped establish early intervention as an effective pursuit prior to federal mandates for early intervention will be presented. This will be followed by the generation of research evaluating early intervention following the implementation of PL 99-457 followed by a summary statement. Next, longitudinal research with at-risk populations will help evince the need for this type of research on populations with disabilities. Finally, longitudinal research on children with disabilities will be presented along with a

summary statement regarding the lack of research in this area and the importance of this type of research to the future evaluation of early intervention.

Economic Evaluation

There are many ways to evaluate early intervention one of which is through economics. Barnett and Escobar (1990) have suggested that the unique perspectives economic evaluations have to offer is that they insist that policymakers attend to all of the resources consumed as well as the outcomes produced by alternative policy choices. Indeed, the arguments for the support and implementation of intervention programs for young children with disabilities have often been supported by the idea that the costs are outweighed by the benefits (ECOC, 2005; Goetze & Price, 2000; Meisels & Shonkoff, 1990; Spiker & Hopmann, 1997). Despite these arguments, studies looking at the costs and benefits of early intervention for children with disabilities are difficult to find. For this reason studies using at-risk samples will be included. These studies, while not ideal, are far more prevalent and have been studied more thoroughly.

Early intervention serves a wide variety of children and linking money spent to outcomes is a challenge. Studies of early intervention rarely follow children over extended periods of time. This makes understanding the benefits beyond the intervention difficult. Further, obtaining a thorough understanding of how benefits contribute to economic savings is a complex task. Many benefits are difficult, if not impossible to *monetize*. For instance, the satisfaction parents feel with the increased likelihood their child will achieve higher levels of functioning and participate more independently with peers, the benefits of developmental and IQ gains to the child and

those around him, the increase in life quality and/or long-term employment opportunities, and so forth, are all potential benefits of early intervention that are difficult to reliably plug into cost-benefit analyses (Kilburn et al., 1998; Meisels & Shonkoff, 1990).

When attempting to gain an understanding of costs and benefits in early intervention it is important to be aware that there have been many strategies employed. For instance, cost-effectiveness analyses look at costs and effects alone, without trying to estimate the monetary value of benefits. Cost-benefit analyses look at estimated monetary values both for the resources (costs) and the effects produced (benefits), thereby attempting to paint a more complete picture of the investment potential of early intervention. Cost savings analyses look strictly at the *monetizable* savings produced by early intervention (Barnett & Escobar, 1990; Guralnick, 1997).

Although surely not an exhaustive list, the three strategies above have all contributed to our understanding of the costs and subsequent benefits of early intervention. All three, however, have their limitations. For instance, cost-effectiveness analyses only look at costs, ignoring benefits (Barnett & Escobar, 1990). Cost-benefit analyses look at estimated monetary values for both the resources (costs) and the subsequent positive effects (benefits), ignoring many variables that are difficult to monetize (Barnett & Escobar; Schweinhart, Barnes, & Weikart, 1993). Cost savings analyses only look at those benefits that can be monetized, again ignoring many benefits. All three offer an economic evaluation of early intervention, but all three have their limitations.

The Perry Preschool Project (Guralnick, 1997; Schweinhart et al., 1993) is a frequently cited study following 123 African American children born into poverty and deemed at high risk of failing in school. The study followed the sample with very little attrition from preschool to age 41 with data collection occurring at ages 3-11 and again at 14, 15, 19, 27, and 39-41 (Schweinhart et al.). Results indicate that positive outcomes produce cost savings for tax payers. A cost-benefit analysis (Schweinhart et al.) indicated that the program yielded a cost-benefit ratio of 7.16 to 1. Saved costs in this analysis included: money saved by the potential victims of crimes never committed, reduced justice system costs, and money saved in schooling due primarily to reduced need for special education services (Schweinhart et al.). Although this study used an at-risk sample, these results are encouraging when translated into benefits provided by early intervention for children with disabilities.

Kilburn and colleagues (1998) offered a more conservative look at the benefits provided by early intervention by revisiting two prominent studies, the aforementioned Perry Preschool Project and the Elmira Prenatal/Early Infancy Project (PEIP). The conservative nature of this study is in the method used. They looked at savings to the government produced by benefits that are able to be monetized or quantifiable in dollars. This analysis ignored many benefits such as increases in IQ, parent satisfaction, and so forth. Kilburn and colleagues suggested early childhood intervention programs (based on the two studies they analyzed) generated four types of savings to the government: increased tax revenues; decreased welfare outlays; reduced expenditures for education, health, and other services; and lower criminal justice system costs.

Barnett and Escobar (1990) looked at economic studies of both children with disabilities and children at-risk. They demonstrated that the costs of early intervention ranged from approximately \$1,500 to \$9,000 per child per year, depending upon type of service provided, duration of service, and intensity of service. It seemed much variability existed in the number of hours per day and the intensity of service, but “home-based” programs tended to cost less than “center-based” programs. Another source of variability in this data resided in the source of the information. Most of the studies reviewed used at-risk or “disadvantaged” samples. Studies evaluating early intervention for children with disabilities from an economic perspective were limited. Despite these limitations Barnett and Escobar provide a rare glimpse at the economics of early intervention for children with disabilities. Their findings were encouraging; the actual costs of early intervention were outweighed by the benefits (Barnett & Escobar; Bryant & Maxwell, 1997; Meisels & Shonkoff, 1990)

Early intervention is often supported by the benefits it provides directly to children and their families. These benefits, although meaningful, would not be realized without financial support. Early intervention has often been supported by arguing for its thrift. Funding is provided for early intervention services with the rationale that a positive return will be realized in the form of money saved for the government and society as a whole (Barnett & Escobar, 1990; Bruder, 1997; Kilburn et al., 1998). Research has demonstrated that providing money for early intervention services for children at-risk is associated with positive gains (economic, developmental, societal,

and familial). This is an encouraging indicator of success; however, more research is needed on children with disabilities in this area.

Early Intervention Research: Children with Disabilities

Looking beyond the scope of economics, the literature has much to say regarding the success of providing services to children with disabilities from birth to age 5. Because of the variety of children served, intervention modalities, and changes in research over time, the studies that follow are an attempt to capture the essence of how success has been evaluated in early intervention services provided to children with disabilities from birth to age 5 over the last two decades. As will be seen, the question of whether or not services with this population are successful or beneficial has frequently been supported by research. In addition, the ways in which researchers have chosen to evaluate early intervention have not always been in accordance with the rational supporting policy. Due to the large amount of research in this area, and the widely diverse populations considered, the information that follows will focus on popular and comprehensive reviews of the literature that will ensure inclusion of frequently cited and frequently supported studies as well as provide a more comprehensive understanding of a widely diverse area.

Varying Evaluation Methods

Guralnick (1997) labeled research prior to 1986 first-generation research because of the heterogeneous nature of samples, the lack of information conducive to promoting decisions surrounding the implementation of early intervention, and the lack

of randomized experimental designs. Research in the two decades following 1986 has been called second-generation research because of a focus on a contribution to applicability (i.e., which features of early intervention will promote positive outcomes for children and families served). The following research will be presented in chronological order and separated out by *first- and second-generation* early intervention research on children with disabilities.

First-Generation Research

Given the wide variety of programs and children with disabilities served by early intervention, research syntheses turned to the meta-analysis in an attempt to gain a more global understanding of the effects of early intervention. Meta-analyses integrate the available literature and transform the outcomes of a body of studies into a common metric, thereby yielding an overall quantitative result (Casto & Mastropieri, 1986). The common metric or, effect size (*ES*), is a measure of the magnitude of a treatment effect. Unlike significance tests, effect sizes are independent of sample size (Casto & Mastropieri). *ES* can be measured by looking at the standardized difference between two means, or as the correlation between the independent variable classification and the individual scores on the dependent variable. This correlation is called the “effect size correlation” (Rosnow & Rosenthal, 1996). Typically, *ES* estimates are interpreted in two ways. One way is to rely on commonly accepted benchmarks that differentiate small, medium, and large effects. Perhaps most well-known are those benchmarks presented by Cohen (1988) for interpreting Cohen’s *d*, whereby 0.2 equates to a small effect, 0.5 equates to a medium effect, and effects larger than 0.8 equate to large effects.

Meta-analyses have pros and cons. A big advantage is that data from many small studies can be used to gain better understanding in an area of research, while examining within-topic issues such as a wide diversity of populations and locations. In addition, the combination of effects from many studies can demonstrate patterns that would not necessarily be deduced from single studies with small sample sizes (Shonkoff & Hauser-Cram, 1987). Reviews of the literature consistently reveal researchers' tendency to rely on the results of meta-analyses to evaluate the success of early intervention.

White and Casto (1985) conducted an extensive meta-analysis of early intervention literature from the years 1937-1984. Studies were separated based on experimental/control, A versus B, and single-subject designs. In total, 1,121 *ESs* were calculated for experimental/control studies, 984 for A versus B studies, and 76 for single-subject studies. IQ was the most frequently measured outcome; outcomes were most often measured immediately following intervention. The majority of studies were with disadvantaged children, followed by "handicapped" children (children with disabilities), and finally medically at-risk children. Overall results were interpreted with caution due to pervasive methodological concerns. However, when these concerns were controlled for, findings demonstrated early intervention yielded immediate benefits to the magnitude of .4 of a standard deviation for children with disabilities. Several concerns were raised by this review. Well-designed studies using children with disabilities were limited, most studies focused on immediate and not lasting benefits, the majority of samples used at-risk or disadvantaged children, and outcome was often

restricted to increase in IQ points. Nevertheless, this review supported the idea that early intervention was a productive pursuit for children with disabilities.

Casto and Mastropieri (1986) conducted what is probably the most widely cited meta-analysis in the early intervention literature. At the time this study was conducted, Casto and Mastropieri saw a need to integrate what was known about early intervention with disabled populations because many claims regarding the efficacy of early intervention were derived from at-risk populations. The results yielded 215 *ES*s from 74 research studies focusing on early intervention with children with disabilities from ages 0-5. Their overall conclusions supported the idea that early intervention was successful in producing benefits across a “wide variety of children, conditions, and types of program” (Casto & Mastropieri). Average *ES* ranged from .68 for all studies, .40 for “only good-quality studies,” and .43 for “only good quality studies with immediate posttest.” With an *ES* of .68 a child enrolled in an early intervention program could be expected to gain about 25 percentile ranks on a variety of IQ, motor, language, and academic achievement outcome assessments (Kavale & Forness, 1999).

Shonkoff and Hauser-Cram (1987) provided another frequently cited meta-analysis. This study used data from Casto and Mastropieri (1986). Analyses were restricted to 31 studies on children with disabilities from birth to age 3. Results indicated that overall early intervention promoted developmental progress beyond what would be expected by children not receiving services. More specifically, the mean effect of early intervention services was .62. The majority of outcome variables were based on a measure of IQ or a developmental quotient. Cautions were raised regarding

testing effects due to a penchant for using the same or a parallel instrument to measure children on more than one occasion. Despite a narrow scope of understanding outcome as well as other concerns, this study contributed to the belief that early intervention was a worthwhile and beneficial pursuit for children with disabilities.

Second-Generation Research

In a review of reviews, Guralnick (1997) presented the state of early intervention research following 1986. What follows is an overview of the review findings pertaining to children with disabilities. It is hoped that these reviews will offer a comprehensive yet efficient look at a movement from global evaluations of early intervention to more specific evaluations of what types of interventions are working for what types of children. Additionally it is hoped these reviews will show what is lacking in the area of evaluating early intervention for children with disabilities.

Reviews in Guralnick (1997) sought to examine the research that pertained to one of the following areas of disability: Down syndrome (Spiker & Hopmann, 1997), autism (Dawson & Osterling, 1997), cerebral palsy and related motor disabilities (Harris, 1997), communication disorders (McLean & Woods Cripe, 1997), conduct problems (Webster-Stratton, 1997), deaf or hearing loss (Calderon & Greenberg, 1997), and visual impairments (Davidson & Harrison, 1997).

Spiker and Hopmann (1997) showed that research on children with Down syndrome has taken several positive steps toward focusing on areas specific to this population such as prelinguistic communication, language development, and parent-child interactions. Dawson and Osterling (1997) found that programs focusing on

children with autism were effective in fostering positive school outcomes, significant developmental gains, and gains in IQ points of up to 20 points; the programs reviewed yielded significant gains for most children involved. One study (McEachin, Smith-Tristram, & Lovaas, 1993) found that the positive effects of intervention were maintained into elementary school.

Harris (1997) reviewed early intervention research from 1986 and after with children with Cerebral Palsy and related motor disabilities. Specific forms of early intervention identified through this review were therapeutic exercise, a combination of therapeutic exercise and functional or behavioral programming, a more intensive physical therapy approach called conductive education, and environmental adaptations. This review identified five specific areas of research focus with this population since 1985: (a) the effectiveness of therapeutic exercise, (b) experimental analysis of a neurobehavioral motor intervention, (c) efficacy of conductive education versus traditional special education, (d) effectiveness of special environmental adaptations, and (e) research on the intensity of therapy (Harris). An encouraging finding of this review was the use of randomized experimental designs and associated positive findings of early intervention. These findings are even more positive when considered alongside Harris' observation that popular meta-analyses such as the aforementioned Shonkoff and Hauser-Cram (1987) study have shown that the least positive results of early intervention were found with motor outcomes and with children with orthopedic impairments. Not only was early intervention shown to be a worthwhile pursuit with this population, but it was worthwhile with even the most obdurate of disabilities.

McLean and Woods Cripe (1997) reviewed 56 studies evaluating the effectiveness of early intervention for children with communication disorders. Their findings suggested that even with wide variability in levels of severity with these children early intervention demonstrated effectiveness in either completely eliminating or at least reducing the effects of communication disorders. This study identified several child, family, and program variables that were specific to this population of children such as: chronological age; severity and type of program used; parents as interventionists; and program intensity, duration, and setting.

These reviews helped demonstrate that following 1986 the ways researchers conceptualized success in EI began to change. These changes represent a movement toward evaluating early intervention according to second-generation standards. This research has contributed to the belief that early intervention is a worthwhile pursuit with all types of children, displaying all levels of severity, and types of disability.

Longitudinal Research

A pervasive criticism of early intervention research, particularly with children with disabilities, is the lack of information regarding the duration of early intervention effects. Longitudinal research is an extension of the research presented above. It gives an indication of the duration of effects and provides a way to answer both the arguments presented in 1986 and help establish a system of accountability by developing metrics tied to indicators of children's progress. The only way to answer whether early intervention is reducing the need for services and the only way to look at progress is by studying these children longitudinally.

In their meta-analysis of the early intervention research up to that time, Casto and Mastropieri (1986) reported that there was simply not enough longitudinal research with disabled populations to answer questions regarding the maintenance of benefits realized through early intervention services. Although almost two decades old, these claims can still be made today. Conducting a literature search with the purpose of finding research that has followed children with disabilities from early intervention into elementary school yields a mixture of loosely tied studies with varying populations, varying purposes, varying designs, and often varying results (Bennet, 1992; Bielinski & Ysseldyke, 2000; Carlson & Parshall, 1996; Goetze & Price, 2000; Hume & Dannenbring, 1989; Innocenti & Price, 2003; Innocenti et al., 1999; McEachin et al., 1993; Stile et al., 1991; Walker et al., 1988; White & Mott, 1987; Wybranski, 1997). The reality is that there has been extensive longitudinal research showing very positive results with at-risk populations (Schweinhart et al., 1993); however, very few studies follow children with disabilities beyond the end of early intervention services.

What follows is an overview of studies found pertaining to longitudinal research following children from early intervention into and sometimes through elementary school. These studies are prevalent with at-risk populations and scarce with disabled populations. The first studies are of at-risk populations. These were included because they are excellent examples of longitudinal research with children participating in early intervention services and will serve to elucidate the potential benefits of using longitudinal research with disabled populations to evaluate early intervention success. This will be followed by one longitudinal study that used children with disabilities who

participated in early intervention and looked at their later placement and outcomes in elementary school. Finally this section will conclude with a statement regarding the lack of information in this area.

The Perry Preschool Project (Schweinhart et al., 1993) is probably one of the most widely cited studies in the early intervention literature. This is likely due to the fact that a sample of 123 children born into poverty have been followed with very little attrition from age 3 to age 41. This study used a randomized experimental design and followed children over an extended period of time, which answers many of the methodological concerns reported earlier. Results have shown that children receiving services have higher graduation rates and college attendance, improved rates of employment and self-support, and reduced rates of crime, teen pregnancy, and welfare utilization (Guralnick, 1997; Schweinhart et al.). As was mentioned earlier several researchers have used this data to show the economic benefits of early intervention as well (Schweinhart et al.).

The Carolina Abecedarian Project (Ramey & Campbell, 1984) was a study of the benefits of early intervention on a sample of high-risk, low-income children. One hundred eleven children were randomly assigned to either treatment or control group. Children were assessed several times throughout their education, and were followed up with more assessment in 2002. Results show that individuals who received services had significantly higher scores on measures of cognitive development as children, higher intellectual and academic scores as children and adults, participated in more years of

total education, were more likely to pursue a four-year degree, and had a reduced tendency to become pregnant during their teenage years.

Goetze and Price (2000) provided one of the few longitudinal studies that provide a description of children with disabilities who received Part C services and their later educational services. This was also one of few studies that attempted to provide information to shed light on whether children who participated in early intervention were at a reduced need for later special education services. Accordingly this was one of the only studies that attempted to understand success in early intervention according to the arguments that helped establish PL 99-457. They contributed to this area by describing the number and percent of students who, following early intervention services, either received regular education services or special education services, and comparing these children on variables such as family SES, parenting stress, parent occupation, and student characteristics. Of an overall sample of 323 youths who received Part C services, 72.1% were classified as disabled at 6 and 10 years, 5.3% were classified at 6 years but not at 10 years, 5.9% were not classified at 6 years but were at 10 years, and 16.7% were not classified at 6 or 10 years. Factors associated with later special education placement included living with two caregivers, mothers' occupation, developmental level as measured by the Battelle Developmental Inventory (BDI), and child-related stress from Parenting Stress Index (PSI) scores (Goetze & Price). When compared to their regular education peers at age 6, children receiving special education services more often lived with one caregiver, had lower BDI scores,

had mothers with lower occupational ratings despite nearly identical education, and had parents who experienced clinical levels of stress.

There remains a dearth of early intervention literature following children with disabilities from early intervention into elementary school and using that information to help inform program decisions throughout the service process, as well as to better understand the outcome of children with disabilities participating in early intervention services. Longitudinal studies contribute unique findings that go beyond the immediate benefits of early intervention so often found in the literature. Children with disabilities develop slowly over time and so systems of measurement designed to determine the effectiveness of early intervention should look at effectiveness over time (Hume & Dannenbring, 1989). In addition, with the advent of PL 99-457 in 1986 came the expectation that early intervention services would yield cost savings by eliminating or reducing the need for special education services once children reach elementary school age. Few studies have provided longitudinal data to either support or refute this claim.

Summary

The passage of federal laws concerning early intervention was initially fueled by the premise that providing funding will reduce the need for later special education services, and generates savings and benefits for the government, society, and children involved. Research evaluating early intervention by looking at costs and subsequent benefits, particularly for at-risk children, demonstrates early intervention is capable of producing savings and benefits to the government who funds it, the society involved,

and the children served. Cost and benefit research is, however, quite limited in demonstrating effects with disabled populations, and does not adequately capture the benefits of early intervention—as many benefits are not easily monetized. Evaluative methods looking at developmental outcomes demonstrate the positive impacts of early intervention on a broad scale, and with specific disabled populations, however, lack longitudinal validation and do not provide an indication of progress.

Conclusion

Current pressure stemming from the OSEP's interpretation of recent IDEIA legislation has established a national call for simple, functional accountability. The issue of accountability is closely related to the evaluation of early intervention. Accountability requires new metrics that will help provide an indication of children's progress. No studies have established a predictive relationship between child characteristics at the beginning of early intervention services, and subsequent placement in elementary school. The ability to predict placement can add an additional index of progress. The current study adds to the research by using data gathered on a sample of children at the outset of services to predict placement in elementary school. This information will serve to differentiate between children based on characteristics observed at the beginning of the study as well as predict whether children would stay in or exit from services 7 years later.

CHAPTER III

METHOD

Sample

Extant data from UTEIP was used for this study. UTEIP was conducted by the Early Intervention Research Institute (EIRI) at Utah State University and collected longitudinal data on a sample of children recruited from the State of Utah Part C and Part B early intervention systems beginning during the 1995/96 school year. Five sites were selected by state agency and EIRI staff as representative of Utah's geographical areas, population demographics, and service delivery models. Sites were selected such that rural and urban settings were represented, although more subjects were ultimately selected from the larger urban sites. In addition, efforts were made to obtain numbers of participants at each site that were approximately proportionate to their representation in the state population, however it was necessary to slightly increase the population of rural participants above the statewide proportion so that this subgroup was sufficiently large for analysis purposes. Additional efforts were made to have Hispanic, Native American, and a mixture of other cultures represented as well (Innocenti et al., 1999)

The original UTEIP sample consisted of two cohorts. The first cohort consisted of 150 children who entered the birth to 3 early intervention program (referred to as Part C in this report) in the state of Utah during the 1996 calendar year. The second cohort consisted of 151 children who entered the 3-5 early childhood special education program (referred to as Part B in this report) during the fall of 1996 (Innocenti et al.,

1999). Longitudinal data collected on these children from the beginning of the study through the 2003-2004 school year was used for this project. Following attrition the final n for this study was 223 individuals. Descriptive information can be found in Table 1. Full details on the enrollment of these children and the first phase of the UTEIP study can be found in the UTEIP report (Innocenti et al.).

Instrumentation

This study used two types of data from the UTEIP study. The first was data from a battery of assessments administered at entry into the original UTEIP study. The second was data collected annually between the 1995-1996 and 2003-2004 school years through parent and teacher surveys. Descriptions for both types of data follow.

Assessment Data

Data gathered on children entering UTEIP that was used for this study included: child age, child gender, income, mothers' age, number of years of education for the mother, number of hours mother worked outside the home, fathers' age, number of years of education for the father, number of hours father worked outside the home, BDI (Newborg, Stock, Wnek, Guidubaldi, & Svinicki, 1988), Vineland Adaptive Behavior Scales total adaptive score (Sparrow, Balla, & Cicchetti, 1984), PSI total stress score (Abidin, 1990), Social Skills Rating Scale (for Part B only; Gresham & Elliott, 1990), and Family Support Scale (Dunst, Jenkins, & Trivette, 1984). See Table 2 for a description of each measure.

Table 1

Descriptive Statistics on Children and Families Available for the Study by Receipt of Part C and Part B Services

Variable	Part C frequency (<i>n</i> = 104)	Part B frequency (<i>n</i> = 119)
Child		
Gender		
Female	42	38
Male	62	81
Ethnicity		
African American	2	1
Caucasian origin	91	110
Hispanic origin	8	5
Native American	1	2
Other	2	1
Home Language		
English spoken in home	100	118
Spanish spoken in home	4	1
Mother occupation type		
Unemployed	47	62
Blue Collar	31	25
Tech/manager	10	19
Professional	9	7
Mother ethnicity		
African American	1	2
Asian American	5	1
Caucasian	89	109
Hispanic	5	7
Native American	2	0
Other	1	0
Father occupation type		
Unemployed	4	5
Unskilled	2	0
Blue collar	61	55
Tech/manager	12	30
Professional	18	26

(table continues)

Variable	Part C frequency (<i>n</i> = 104)	Part B frequency (<i>n</i> = 119)
Father ethnicity		
African American	2	1
Asian American	4	0
Caucasian	86	105
Hispanic	7	8
Native American	2	1
Other		1
Primary caregiver		
Mother	82	97
Father	2	1
Grandmother	2	0
Mother and father	14	17
Other	3	4

Table 2

Description of Measures

Measures	Description
Child	
Vineland Adaptive Behavior Scale (Sparrow et al., 1984)	This instrument assesses communication skills, daily living skills, motor skills, and socialization skills and was completed by interview with the parent.
Battelle Developmental Inventory (BDI) - Cognitive Scale (Newborg et al., 1988)	This instrument is a direct measure of a child's cognitive skills.
Social Skills Rating System (SSRS; Gresham & Elliott, 1990)	This questionnaire evaluates child social skills (filled out by parent).
Family	
Family Information Survey (Early Intervention Research Institute, 1995)	This questionnaire collects demographic information on general child and family characteristics (e.g., mother/father education and occupation, income level, number of children in the household, etc.).
Parenting Stress Index –Short Form (PSI; Abidin, 1990)	This instrument examines perceived parental stress, in general, and specific to the child.
Family Support Scale (FSS; Dunst et al., 1984)	This instrument measures perceived support received by the family.

Survey Data

Between the years of 1996 and 2004 annual parent phone surveys were collected using graduate students trained to gather information regarding status of child's school, grade, academic placement, disability classification (if child was classified), service use, changes in classification and service use, and parent perception of satisfaction with child academic performance and services received. For children who were classified as having a disability and receiving services, annual teacher surveys were obtained in addition to parent surveys. For this study the only information used from the surveys was year in kindergarten and annual placement information (i.e., whether the child was receiving Part C, Part B, or school-age special education services, or whether he had exited from services and joined his regular education peers).

Procedures

A master file was created for each child participant such that each child had a profile that included the information gathered at UTEIP entry (see Table 1) and annual service placement as specified by annual survey information. The data set was put together in three stages. The first stage consisted of creating profiles for children based on survey information. The second stage consisted of adding the assessment data collected at UTEIP entry. The final stage consisted of grouping the sample for analysis.

Criterion for Inclusion

1. *A given child's kindergarten year served as the anchor by which all other academic years (preschool and elementary) were referenced. This was necessary*

because of the variability in the age at which subjects entered the study (i.e., from birth through age 4). The goal was to document services prior to, during, and after kindergarten. A valid kindergarten year had to be established for each child participant. If kindergarten year was unknown the child was excluded. Survey data provided this information (see description below).

2. A minimum of three years of data prior to and after kindergarten and no more than one year of missing data in a row. Some children attrited early and/or data were not provided consistently across all children. Accordingly, at a minimum 3 years of data were required and no more than a single year gap in data could exist. If less than 3 years of data were available and/or if 2 or more consecutive years of missing data existed, the child was excluded from the study. Based on the above criterion for inclusion, 77 children were excluded resulting in an *N* of 223 individuals.

Stage One

Disability classifications were used to construct child service profiles. These classifications were taken from the Utah Department of Education Guidelines and were as follows: hearing impairment, speech and language impairment, mental retardation, serious behavior disorder, multiple disabilities, traumatic brain injury, orthopedic impairment, other health impairment, visual impairment, deaf/blindness, autism, developmentally delayed, specific learning disability, and parent said no disability. Where parent did not reply, did not know classification, reported child received services but did not know classification, or where a survey was not available for a given year,

the following labels were used: “parent doesn’t know classification,” “parent didn’t answer,” “receiving services,” “no survey,” and “pre-UTEIP.”

In some instances parents gave informed consent for participation but UTEIP staff were unable to reach them by phone during the data collection period. In all instances where consent was given by parents of a child eligible for services it was standard procedure to send a teacher survey to the child’s school as well. Where parent data was not collected teacher data was often available to fill in gaps in children’s profiles. In some instances gaps in data existed where no parent or teacher survey had been obtained. In these instances the overall profile was analyzed and a decision was made regarding what the most probable label would have been for the missing year. For instance, if a child had a label of “speech and language impairment” for 2 years, followed by a gap in data, followed by an additional 2 years of “speech and language impairment,” the gap was filled in with the same label. Similarly, if a child had a label of “parent said no disability” followed by a gap in data followed by an additional label of “parent said no disability,” the gap would be filled with the “parent said no disability label.” *In instances where a gap in data existed for more than one year, a child was excluded from the sample.*

Data collected by phone survey over the 2003-2004 school year were incorporated in June of 2004. Unlike other survey years, the 2003/2004 survey only required parents to specify whether their child was or was not receiving services. This means that for 2003/2004, specific disability classifications were not obtained. This information was entered into SPSS as either “in SPED 0304” or “not in SPED 0304.”

The procedures outlined above resulted in a final data set of 223 individuals. This means that 78 youths from the original UTEIP study were not included because either a kindergarten year could not be established, there were gaps in data for more than 1 consecutive year, or a minimum of 3 years of data were not available.

Stage Two

Following completion of profiles based on survey information, the original assessment data (data gathered at UTEIP entry) was incorporated into the SPSS file for each child. Once the master file was complete, the decision was made to restrict analyses to special education placement patterns over time. The reason to ignore children's disability classifications was based on the possibility that schools may not classify children consistently. There would be no way to account for possible confounds in classification variability based on the available data (assessment data that was consistently obtained across the sample at UTEIP entry may not be able to reliably predict group outcome because classification decisions may subjectively vary by district). Therefore, the decision was made to analyze relationships between predictor variables (data gathered at UTEIP entry) and group special education placement outcome in elementary school.

Stage Three

Children's profiles were analyzed based on placement over time. Analyses took place for the entire sample and separated by either entry into the original study in Part C or Part B services (see Figures 1-3). Children were grouped for analyses based on

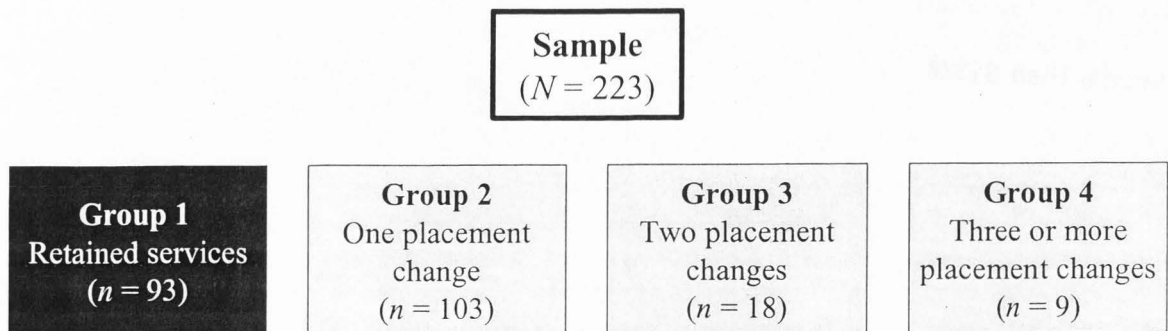


Figure 1. All child participants.

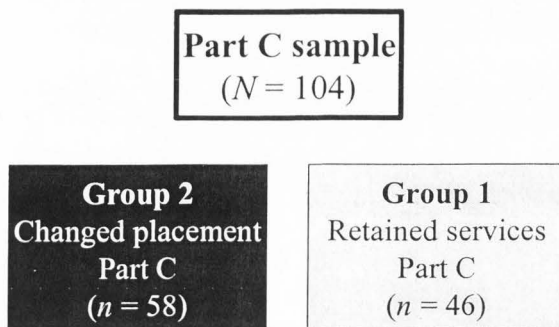


Figure 2. Children entering original study in Part C.

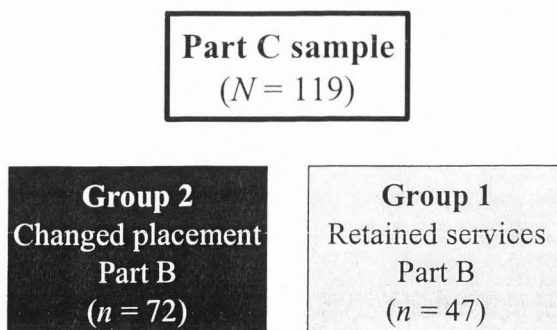


Figure 3. Children entering original study in Part B.

placement history. First, children were divided based on whether they had exited special education services or remained in services. Children who exited services at least once were defined as the *changed placement group*. Children who retained services throughout UTEIP data collection (never exited services) were defined as the *retained services group*. This created two groups consisting of 130 in the changed placement group and 93 in the retained services group, respectively. The changed placement group was further defined by the amount of placement changes a child had experienced. This process divided the changed placement group into three distinct groups: those who changed placement once (those who exited services and remained in regular education), those who changed placement twice (exited and returned), and those with three or more placement changes.

Statistical Analyses

The grouping strategy outlined above established a plan for answering research questions. Descriptive statistics were run according to the program children entered at UTEIP entry (Part C, Part B). Bivariate correlations were run to help examine relations between single variables (data gathered at UTEIP entry) such as income and placement. A *t* test was run between children entering in Part C and Part B to see if any significant differences, besides age and developmental level, emerged. One-way analyses of variance were run between groups 1-4 using key variables to determine if significant differences emerged between groups. Results of the ANOVAs and subsequent post-hoc analyses demonstrated that significant differences were mainly between group 1

(retained services), and a combination of groups 2-4 (changed placement group). Small n 's in groups 3 and 4 additionally influenced the decision to combine groups 2-4. A t test compared group 1 to the combined changed placement group on the key variables. A t test also compared group 1 to the combined changed placement group for children entering the original study in Part C. Another t test compared group 1 to the combined placement group for children entering the original study in Part B. Finally a series of discriminant analyses were conducted (see Table 3). It should be noted that prior to discriminant analyses 1-6 it was observed in a preliminary discriminant analysis that only 180 of 223 participants were being included in the analysis. The reason for this was that in discriminant analysis, if even one point of data is missing on one key variable for a given participant, that participant will not be included in the analysis. This prompted mean replacement on points of data that were missing for key variables.

Table 3

Descriptions of Discriminant Analysis Statistical Procedures

Analysis no.	Description of statistical procedures
Discriminant analysis 1 ($N = 223$)	Included entire sample and used all predictor variables.
Discriminant analysis 2 ($N = 223$)	Included entire sample and used only the predictor variables that yielded significant findings from discriminant analysis 1.
Discriminant analysis 3 ($N = 104$)	Included Part C sample and used all predictor variables.
Discriminant analysis 4 ($N = 104$)	Included Part C sample and used only the predictor variables that yielded significant findings from discriminant analysis 3.
Discriminant analysis 5 ($N = 119$)	Included Part B sample and used all predictor variables.
Discriminant analysis 6 ($N = 119$)	Included Part B sample and used only the predictor variables that yielded significant findings from discriminant analysis 5.

A criterion was set that if more than 5 points of data were missing for any given key variable, that variable would not be included in the analysis. Following mean replacement the overall sample that qualified remained at 223.

Discriminant analysis is useful for situations where you want to build a predictive model of group membership based on observed characteristics of each case. The procedure generates a discriminant function (or, for more than two groups, a set of discriminant functions) based on linear combinations of the predictor variables that provide the best discrimination between the groups. The functions are generated from a sample of cases for which group membership is known. Results for the Discriminant Analysis are presented through the Wilks' Lambda, and the Standardized Canonical Discriminant Function Coefficients. Wilks' Lambda is a measure of how well each function separates cases into groups. It is equal to the proportion of the total variance in the discriminant scores not explained by differences among the groups. Smaller values of Wilks' Lambda indicate greater discriminatory ability of the function. The Standardized Canonical Discriminant Function Coefficients are similar to the beta weights in a regression analysis. The standardized coefficients allow you to compare variables measured on different scales. Coefficients with large absolute values correspond to variables with greater discriminating ability (SPSS, 2004, 1993).

CHAPTER IV

RESULTS

The goal of this study was to determine if information gathered on children at the outset of services could differentiate between children and predict group inclusion several years later. The results of this study are presented as follows. The first section includes basic descriptive data and bivariate correlations. The second section includes analyses of variance on groups 1-4 and a subsequent *t* test between group 1 and a combination of groups 2-4. Two additional *t* tests were run between group 1 and the combined group 2-4 for Part C and Part B children independently. The third section includes six discriminant analyses for the entire sample, and independently for children entering the original study in either Part C or Part B services.

Descriptive Statistics

Overall 223 children were included in these analyses. The children that were included fulfilled a criterion for inclusion that data had to be available for the kindergarten year and that data could not be missing for more than one consecutive year (minimum of 7 years of data were available). Overall children were Caucasian and English speaking. Part C children were 40% female and 60% male. Part B children were 32% female and 68% male. Mothers were generally the caregivers, spending more time at home, working less outside the home, and having fewer years of education than fathers. Fathers were the primary breadwinners, working full time outside the home as blue collar workers and reaching higher levels of education than mothers. A *t*

test between Part C and Part B children on child and family demographic characteristics did not yield any statistically significant findings. See Table 1 in the Sample section for more detailed descriptive statistics.

Correlational Analyses

Correlations were also run with the entire sample to illustrate relationships between key variables (see Table 5 later in this chapter). Note that although some statistically significant correlations did exist, most were modest in magnitude. Statistically significant correlations included: Mothers' education with income (.297) and fathers' education (.304). Fathers' education additionally correlated significantly with the number of hours per week fathers' worked outside the home (-.202). Total adaptive behavior and the developmental quotient showed a significant correlation (.503). Total stress also correlated significantly with total adaptive behavior (-.234). Standard social skills correlated significantly with total stress (-.499), adaptive behavior (.576), and the developmental quotient (.444). Standard problem behaviors correlated significantly with mothers' education (-.237), fathers' education (-.272), total stress (.577), and standard social skills (-.333). Finally total support correlated significantly with total stress (-.300).

In summary, the correlational analyses showed no statistically significant correlations between demographic and outcome measures except for parent education with child problem behaviors. Statistically significant correlations among demographic and among outcome measures were consistent with past research (see Table 4 for correlation matrix).

Table 4

Correlations Among Demographic and Outcome Variables (n = 223)

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Income	-										
2. Mothers' education in yrs	.297**	-									
3. Hours/wk. mother works outside home	-.081	-.075	-								
4. Fathers' education in yrs.	.310**	.304**	-.132	-							
5. Hours/wk. father works outside home	.060	.095	-.108	-.202**	-						
6. Developmental quotient (BDI)	-.071	-.004	.107	.067	.030	-					
7. Vineland—Total adaptive behavior composite	-.053	.027	.093	.016	.000	.503**	-				
8. Total stress score (PSI)	-.107	-.093	.034	-.095	-.081	-.065	-.234**	-			
9. Standard social skills (SSRS)	.022	.154	-.043	.145	.008	.444**	.576**	-.499**	-		
10. Standard problem behaviors (SSRS)	-.021	-.237**	.026	-.272**	-.008	-.015	-.157	.577**	-.333**	-	
11. Total support (FSS)	.129	.129	-.065	.014	.079	.021	.066	-.300**	.086	-.131	-

Analyses for Question One

The first step in this analysis was to compare groups 1-4 on key variables. Analyses of variance (ANOVA) demonstrated statistically significant differences between groups on the overall developmental quotient on the BDI, the total adaptive behavior composite from the Vineland Adaptive Behavior Scales, and the standard social skills on the SSRS (only administered to Part B subjects because of age limitations). Results including means, standard deviations, F values, and p values appear in Table 5.

Post-hoc analyses revealed significant differences were largely between group 1 and groups 2-4. Given this finding and given the relatively low n 's of groups 3 ($n = 18$) and 4 ($n = 9$), the decision was made to combine groups 2-4 into one *changed placement group* ($n = 130$). After collapsing these groups independent sample t tests were conducted to determine if there were significant differences between group 1 (children with no placement change) and the collapsed group 2 (changed placement group). Results were similar to the above ANOVA findings with the added significant finding of number of hours mothers worked outside the home. Mothers in group 1 worked fewer hours than those in the changed placement group (see Table 6 for results).

The next step was a t test between group 1 and the combined group 2 on children who entered the original study in Part C. Results demonstrated significant differences between groups on number of hours mothers worked outside the home and fathers' education in years (see Table 7 for results).

A t test was also run between group 1 and the combined group 2 on children

Table 5

Analysis of Variance Among Groups 1, 2, 3, and 4 on Demographic and Outcome Variables (Part C and Part B)

Variable	No exit (n = 93)		One placement change (n = 103)		Two placement changes (n = 18)		≥ Three placement changes (n = 9)		F	P-value
	M	SD	M	SD	M	SD	M	SD		
Child age at pretest	2.52	1.48	2.74	1.30	2.66	.97	2.91	.92	.551	.648
Age in Sept. 03	9.44	1.34	9.67	1.26	9.60	.85	9.83	.88	.737	.531
Income	\$35,513	\$41,467	\$34,965	\$28,398	\$36,717	\$22,614	\$33,644	\$11,719	.022	.996
Mothers' education in yrs.	13.55	1.99	13.68	2.26	13.94	2.25	13.44	1.59	.199	.897
Hours/week mother worked outside home	10.78	16.20	15.15	17.55	20.69	17.84	21.25	22.95	2.438	.066
Fathers' education in yrs.	14.66	6.53	14.06	2.61	14.12	2.55	14.78	2.33	.285	.836
Hours/week father worked outside home	41.64	13.93	42.63	12.26	40.67	14.38	38.33	16.58	.361	.781
Mom age at pretest	30.63	6.97	30.46	5.97	31.85	7.58	27.20	3.33	1.041	.375
Father age at pretest	32.96	9.89	32.54	5.94	33.76	9.14	31.18	5.26	.237	.870
BDI developmental quotient	69.99	24.80	83.75	17.99	77.16	15.94	82.64	15.38	7.240	.000***
Vineland total adaptive behavior composite	79.11	14.30	89.02	13.14	86.44	14.30	94.33	22.02	9.521	.000***
PSI total stress	80.77	20.27	75.01	19.41	79.67	12.96	79.33	21.30	1.503	.215
SSRS standard social skills ^a	77.26	13.02	89.97	16.96	90.67	18.66	83.20	22.04	6.025	.001***
SSRS standard problem behaviors ^a	108.13	12.60	105.09	12.72	102.00	13.21	101.00	6.52	1.120	.344
Total support year 1, higher = more	27.32	10.82	28.61	10.40	27.67	6.57	31.11	14.60	.504	.680

^a Part B only; SSRS not administered to Part C subjects.

*** $p < .001$.

Table 6

Analyses of t Tests Comparing Children with No Placement Change (Group 1) to Children Experiencing Change in Placement (Combined Group 2; Part C and Part B)

Variable	No placement change		Placement change		<i>t</i>	<i>p</i> -value
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Child Age at Pretest	2.52	1.48	2.74	1.23	-1.176	.241
Age in Sept. 03	9.44	1.34	9.69	1.18	-1.422	.157
Income	\$35,513	\$41,467	\$35,107	\$26,711	.087	.931
Mothers' education in yrs.	13.55	1.99	13.70	2.21	-.487	.627
Hours/week mother worked outside home	10.78	16.20	16.30	17.96	-2.313	.022*
Fathers' education in yrs.	14.66	6.53	14.12	2.57	.817	.415
Hours/week father worked outside home	41.64	13.93	42.05	12.84	-.216	.829
Mom age at pretest	30.63	6.97	30.42	6.11	.240	.811
Father age at pretest	32.96	9.89	32.60	6.36	.319	.750
BDI-Developmental Q.	69.99	24.80	82.76	17.59	-4.258	.000***
Vineland total adaptive behavior composite	79.11	14.30	89.03	14.02	-5.168	.000***
PSI total stress	80.77	20.27	75.95	18.75	1.830	.069
SSRS standard social skills ^a	77.26	13.02	89.58	17.34	-4.420	.000***
SSRS standard problem behaviors	108.13	12.60	104.42	12.41	1.586	.116
Total support year 1, higher = more	27.32	10.82	28.65	10.24	-.931	.353

^a Part B only.

* $p < .05$.

*** $p < .001$.

who entered the original study in Part B. Results demonstrated significant differences between groups on fathers' education in years, BDI-DQ, Vineland total adaptive behavior, PSI total stress, and the SSRS standard social skills (see Table 8 for results).

Summary for Question One

Analyses for question one revealed that significant differences were between children who remain in services and children who exit from services on the outcome

Table 7

Analyses of t Tests Comparing Part C Children with No Placement Change (Group 1) to Children Experiencing Change in Placement (Group 2)

Variable	No placement change		Placement change		<i>t</i>	<i>p</i> -value
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Income	\$31,908	\$21,934	\$31,990	\$31,039	-.015	.988
Mothers' education in yrs.	13.73	1.88	13.32	2.37	.951	.344
Hours/week mother worked outside home	10.52	15.67	19.09	18.04	-2.475	.015*
Fathers' education in yrs.	15.98	9.03	13.32	2.91	2.015	.047*
Hours/week father worked outside home	40.84	11.75	41.02	14.68	-.066	.948
BDI developmental quotient	73.62	28.29	80.00	20.26	-1.289	.201
Vineland total adaptive behavior composite	85.63	12.25	89.17	13.64	-1.375	.172
PSI total stress	77.02	21.91	74.66	19.06	.589	.557
Total support year 1, higher=more	28.30	10.58	29.88	10.35	-.763	.447

* $p < .05$.

variables BDI-DQ, Vineland total adaptive behavior, and the SSRS standard social skills, and on the demographic variable number of hours mothers worked outside the home. When the same analyses were done on the two groups but separated out by program at entry into UTEIP (Part C, Part B) results indicated that Part B children accounted for the majority of the variance observed. Part B children who experienced a change in placement had more educated fathers, a higher developmental quotient, higher adaptive behavior, higher parent stress, and higher social skills than their nonplacement-changing peers. Part C children who experienced a placement change had mothers who worked more hours outside the home and fathers with a lower education than their nonplacement-changing peers.

Table 8

Analyses of t Tests Comparing Part B Children with No Placement Change (Group 1) to Children Experiencing Change in Placement (Combined Group 2)

Variable	No placement change		Placement change		<i>t</i>	<i>p</i> -value
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Income	\$38,961	\$54,002	\$37,683	\$22,433	.175	.861
Mothers' education in yrs.	13.38	2.09	13.99	2.05	-1.559	.122
Hours/week mother worked outside home	11.02	16.83	14.06	17.71	-.912	.364
Fathers' education in yrs.	13.42	2.02	14.74	2.08	-3.34	.001***
Hours/week father worked outside home	42.43	15.87	42.88	11.20	-.172	.864
BDI developmental quotient	66.44	20.52	84.98	14.87	-5.71	.000***
Vineland total adaptive behavior composite	72.72	13.35	88.92	14.41	-6.168	.000***
PSI total stress	84.45	18.01	77.00	18.56	2.16	.032*
SSRS standard social skills ^a	77.26	13.02	89.58	17.34	-4.42	.000***
SSRS standard problem behaviors ^a	108.13	12.60	104.42	12.41	1.59	.116
Total support year 1, higher = more	26.36	11.07	27.65	10.12	-.651	.516

^a Part B only.

* $p < .05$.

*** $p < .001$.

Analyses for Question Two

The next objective in this study was to look at variable groupings between the two major groups. Discriminant analysis statistical procedures were used to predict group membership from key variables. Discriminant analysis is a statistical technique that examines whether a set of predictor variables can reliably predict group inclusion. The predictor variables were selected from demographic and child-functioning information gathered at the outset of the UTEIP study and can be viewed in Table 9. The discriminant analyses were used to determine what variables discriminated most effectively between groups.

Discriminant Analyses for Entire Sample

The discriminant function for the entire sample with 10 predictor variables produced a Wilks' Lambda of .842 ($df = 10, p < .001$) indicating that the discriminant function did better than chance at separating groups. The function correctly classified 67.3% of the cases into their respective groups. Of the 10 variables number of hours the mother worked outside the home, $F = 5.214, p < .05$, the BDI DQ, $F = 20.243, p < .001$, and the Vineland total adaptive behavior composite, $F = 26.712, p < .001$ were statistically significant. Standardized canonical discriminant function coefficients for the first discriminant analysis are shown in Table 9.

Table 9

Standardized Canonical Discriminant Function Coefficients Using All Predictor Variables (Analysis 1)

Predictor variable	Coefficient
Income	.019
Child gender	.218
Mothers' education in yrs.	.112
Hours/week mother worked outside home	.292*
Fathers' education in yrs.	-.236
Hours/week father worked outside home	-.020
BDI developmental quotient	.453*
Vineland total adaptive behavior	.583*
PSI total stress	-.174
Total support (higher score = more support)	.071

*statistically significant predictors, $p < .05$.

Based on significance levels and relative elevations of the standardized canonical discriminant function coefficients in analysis 1, the number of hours mother worked outside the home, the BDI DQ, and the Vineland adaptive behavior composite, were used as predictor variables in another discriminate analysis. When looked at this way the variables produced a Wilks' Lambda of .859, $df = 3$, $p < .001$, indicating that the discriminant function did better than chance at separating groups. The function correctly classified 65.5 % of the cases into their respective groups. Of the three variables the BDI DQ, $F = 20.243$, $p < .001$, and the Vineland total adaptive behavior composite, $F = 26.712$, $p < .001$, were the most successful at predicting group inclusion. Standardized canonical discriminant function coefficients for the second discriminant analysis can be viewed in Table 10.

Discriminant Analyses for Part C Sample

The discriminant function for the Part C sample with nine predictor variables produced a Wilks' Lambda of .878, $df = 9$, $p > .05$, indicating that the discriminant function did no better than chance at separating groups. The function correctly

Table 10

Standardized Canonical Discriminant Function Coefficients for Discriminant Analysis Using Three Predictor Variables (Analysis 2)

Predictor variable	Coefficient
Hours per week mother worked outside home	.323
BDI developmental quotient	.433
Vineland total adaptive behavior	.647

classified 61.5 % of the cases into their respective groups. Of the nine variables number of hours the mother worked outside the home, $F = 5.909$, $p < .05$, and the fathers education in years, $F = 4.06$, $p < .05$, were statistically significant. Standardized canonical discriminant function coefficients for discriminant analysis three can be found in Table 11.

The two statistically significant predictor variables were used in a second discriminant analysis. With two predictor variables the Wilks' Lambda was .919, $df = 2$, $p < .05$, indicating that the discriminant function did better than chance at separating groups. The function correctly classified 60.6 % of the cases into their respective groups. The number of hours mothers worked outside the home, $F = 5.909$, $p < .05$, was the strongest of the two predictors. The fathers' education in years was also significant, $F = 4.06$, $p < .047$. Standardized canonical discriminant function coefficients for discriminant analysis four can be found in Table 12.

Table 11

Standardized Canonical Discriminant Function Coefficients for Part C

Analysis Using All Predictor Variables (Analysis 3)

Predictor variable	Coefficient
Income	.220
Mothers' education in years	-.255
Hours/week mother worked outside home	.625*
Fathers' education in years	-.513*
Hours/week father worked outside home	-.034
BDI developmental quotient	.338
Vineland total adaptive behavior	.293
PSI total stress	.004
Total support (higher score = more support)	.160

*statistically significant predictors, $p < .05$.

Table 12

*Standardized Canonical Discriminant Function Coefficients for Part C**Analysis Using Only Two Predictor Variables (Analysis 4)*

Predictor variable	Coefficient
Hours per week mother worked outside home	.746
Fathers' education in years	-.591

Discriminant Analysis for Part B Sample

The discriminant function with 11 predictor variables produced a Wilks' Lambda of .644, $df = 11$, $p < .001$, indicating that the discriminant function did better than chance at separating groups (the reason why there were 11 predictors in this analysis was due to the Social Skills Rating Scale being administered only to Part B children at the beginning of the original study). The function correctly classified 80.7% of the cases into their respective groups. Of the 11 variables the fathers' education in years, $F = 10.97$, $p < .01$, the BDI-DQ, $F = 32.62$, $p < .001$, the Vineland total adaptive behavior composite, $F = 38.04$, $p < .001$, the total stress score, $F = 4.69$, $p < .05$, and the SSRS standard social skills, $F = 17.35$, $p < .001$, were statistically significant. The fathers' education in years and the BDI DQ were the strongest predictors. Standardized canonical discriminant function coefficients for discriminant analysis 5 can be found in Table 13.

The five statistically significant predictor variables were used in a second discriminant analysis. With five predictor variables the Wilks' Lambda was .652, $df = 5$, $p < .001$, indicating that the discriminant function did better than chance at

Table 13

*Standardized Canonical Discriminant Function Coefficients for
Analysis Using All Predictor Variables for Part B Only (Analysis 5)*

Predictor variable	Coefficient
Income	-.062
Mothers' education in years	-.175
Hours/week mother worked outside home	.094
Fathers' education in years	.655*
Hours/week father worked outside home	.029
BDI developmental quotient	.479*
Vineland total adaptive behavior	.433*
PSI total stress	-.003*
SSRS standard social skills	.132*
SSRS standard problem behavior	-.020
Total support (higher score = more support)	.077

*statistically significant predictors, $p < .05$.

separating groups. The function correctly classified 79% of the cases into their respective groups. Again fathers' education in years, $F = 10.97$, $p < .01$, and the BDI DQ, $F = 32.62$, $p < .001$, were the strongest predictors; however, all five were statistically significant. Standardized canonical discriminant function coefficients for discriminant analysis six are shown in Table 14.

Summary for Question Two

Results for question two demonstrated a similar pattern to those of question one. Discriminant analyses procedures were better at predicting group inclusion (no placement change versus placement change in elementary school) for children who entered the UTEIP study in Part B services. Group inclusion for Part C children was

Table 14

*Standardized Canonical Discriminant Function Coefficients for Part B**Analysis Using Five Predictor Variables (Analysis 6)*

Predictor variable	Coefficient
Fathers' education in years	.543
BDI developmental quotient	.504
Vineland total adaptive behavior	.442
PSI total stress	-.008
SSRS standard social skills pretest	.114

only predicted at a statistically significant level by the demographic variables number of hours mothers worked outside the home, and fathers' education in years. Group inclusion for Part B was predicted at a statistically significant level by the demographic variable fathers' education in years, and the outcomes of developmental level, adaptive behavior, social skills and parent stress. Overall, characteristics observed in children at a Part B age (3-5) are better at predicting whether children will remain in or exit from services in elementary school than those observed in children at a Part C age (birth to 3).

CHAPTER V

DISCUSSION

This study builds on research evaluating success in early intervention by using data gathered on children at either Part C or Part B entry to (a) determine what demographic, family and child characteristics differentiate between children who were once enrolled in Part C and Part B early intervention services; and (b) what demographic, family, and child characteristics best predict whether a child will stay in or exit from services in elementary school using discriminant analysis statistical procedures? By answering these questions the data provided by this study offers a connection between early intervention and elementary school, looks at placement change over time as an indicator of success, and accordingly offers an alternative way of understanding the outcomes of providing early intervention services to children with disabilities.

The placement histories of children in this study reveal that two groups emerge. The first is comprised of children who have consistently remained in services throughout data collection. The second is comprised of children who have changed placement (a movement from special education to regular education or *visa versa*) at least once, and sometimes several times.

The findings of this study indicated that differences observed in some characteristics of children entering Part C and Part B services predicted whether children remained in or exited from special education services in elementary school. In addition, findings suggested that differences observed in children entering part B

services were better at differentiating later placement than differences observed in children entering Part C services and therefore Part B placement at the end of data collection was more accurately predicted. In order to reach these findings children were separated into groups based on placement history over time (e.g., remained in special education services or exited from services) and compared on demographic and outcome variables gathered at the outset of data collection.

The results of analyses on children entering the UTEIP study in Part B offered support that children who remained in services could be differentiated from children who exited services using demographic, family, and child variables. Significant differences were found in the number of years fathers were educated, in parent stress, and the child variables of developmental level (quotient), adaptive behavior, and child social skills. Conversely children entering the study in Part C, when compared by the same two groups, could only be differentiated by two demographic variables: the number of hours mothers worked outside the home, and fathers' education in years. These results indicate that characteristic differences observed at the beginning of services were better at differentiating between Part B children than Part C children.

These same patterns emerged when exploring question two: can demographic, family and child characteristics gathered at the outset of services predict placement outcome at the end of services? With Part B children five significant predictors emerged: fathers' education in years, developmental quotient, adaptive behavior, parent stress, and social skills. With Part C children however only two variables emerged as significant predictors of group inclusion: the number of hours mothers worked outside

the home and the fathers' education in years. Again, data gathered on Part B children at the outset of services was better at predicting placement than data gathered on children at the outset of Part C services.

These findings could be attributed to the fact that there are different criteria for inclusion in Part B and Part C services. Children can be deemed eligible for Part C services according to professional opinion, which can therefore increase the probability of false positives or negatives. Children entering Part B services on the other hand must be eligible according to objective criteria, thereby ensuring more delineation between those who qualify and those who do not. In addition, the measurements used could very likely have been more stable with the older, or more developed, children entering Part B services (Gresham & Elliott, 1990; Newborg et al., 1988; Sparrow et al., 1984). This is supported by Casto and Mastropieri (1986) who found that early intervention services were actually more effective for children above the age of three (Casto & Mastropieri). This could speak to a better match between services and children, to the idea that children are more developed by the age of three, or likely from a combination of development, measurement, and less false positives or negatives.

Discussing Findings

The creation of PL 99-457 in 1986 was supported by the argument that providing early intervention services would reduce the need for later special education services (Goetze & Price, 2000; Guralnick, 1997; Innocenti & Price, 2003; Meisels & Shonkoff, 1990; Ramey & Ramey, 1998). In this way successful early intervention was

understood as reducing the need for later services by promoting development, which would additionally result in savings for the government and society (Goetze & Price; Kilburn et al., 1998). Research evaluating the success of early intervention has most often been restricted to demonstrations of gain using isolated standardized scores and only obtaining these scores during or directly after intervention (Casto & Mastropieri, 1986; Guralnick; Ramey & Ramey; Shonkoff & Hauser-Cram, 1987). This type of research has led to broad claims of success in early intervention as well as more specific claims of what types of services work best for whom. This type of research has put to rest the question of whether or not early intervention is worthwhile and produces benefits. What has been lacking in this research is an evaluation of success that extends beyond the early intervention process and into elementary school and which more closely approximates supporting the original arguments made in 1986. Up to this point, no research has followed children with disabilities from early intervention into elementary school and looked at the relationship between characteristics of children entering services and how well they predicted if children remained in or exited from services. In more recent years, organizations like the Early Childhood Outcome Center (ECOC- <http://www.fpg.unc.edu/~eco/>) have indicated a need for research that looks at progress over time. Accordingly this study builds upon this need by using a different measure of outcome that provides coherence between children's placement in early intervention and later in elementary school, and that provides concrete data demonstrating not only that children are leaving services, but what characteristics of children are likely to predict if they will leave services.

Although only alluded to briefly in the introductory statements to this study, there are a handful of studies in the literature that look at rates of declassification and stability of children participating in special education and/or children who fluctuate between special education and regular education, and use that information as an indicator of outcome (Bielinski & Ysseldyke, 2000; Carlson & Parshall, 1996; Hume & Dannenbring, 1989; Stile et al., 1991; Walker et al., 1988). The data from this study support pursuing this area further by showing that there are groups of children who either tend to remain in services consistently, tend to exit and remain declassified, or tend to go back and forth between receiving and not receiving services. In addition, this study builds on the previous research in this area because it is the first to not only look at placement from early intervention into elementary school as an indication of performance, but also to predict placement (whether a child will remain in or exit from services) using information gathered at the beginning of services. Another important contribution of this study is that the data show that the biggest differences observed are between children who remain in services and those who exit—regardless of whether or not those who exit return at a later date.

The finding that mothers of children who did not exit special education services were more likely to spend less time working outside the home has been supported by other research. Barnett and Boyce (1995) looked at the extent to which the presence of a child with “mental retardation” might alter the daily activities of families. Findings supported the notion that having a child with mental retardation in the household did have an effect on the ability of mothers to work outside the home. This finding is also

supported by Goetze and Price (2000), who found that mothers of children with disabilities had lower occupational ratings than mothers of children in regular education, despite having similar education.

The findings that children who remain in services, or who have more severe disabilities have lower developmental quotients, adaptive behavior, and social skills have also been supported in the literature. Goetze and Price (2000) indicated that children who received lower BDI scores were more likely to be classified in special education, while children with higher scores tended to be classified in regular education. Note both groups are still classified but children with relatively low scores are not in the regular education setting. In addition, Guralnick (1997) and Meisels and Shonkoff (1990) have provided evidence that children with more severe disabilities or children who tend to respond less to intervention (i.e., children who do not exit from services) also tend have lower social skills and adaptive skills.

Limitations

There are some limitations with the ability to use the information from this study to generalize to the population of children with disabilities in the United States who have received or are receiving early intervention services. All participants in this study were recruited in the state of Utah in the mid-1990s. Given the wide variability associated with children with disabilities who receive early intervention services it is conceivable that findings from this study may not be applicable to vastly different populations who live under differing circumstances. In addition, given that the

responsibility of implementing early intervention services is a state by state, and further a district by district pursuit, variability may derive from different approaches to interpreting and implementing policy.

Another limitation to be aware of is that this sample is mostly made up of Caucasian children and families, with middle- or working-class income from the state of Utah. In addition, the sample was not selected randomly as attempts were made to include ethnic minorities at a rate approximating the Utah percentages.

It is also important to note that variability exists in the amount of data that was gathered on children who participated in the study. Although the study extended from 1996 to 2004, several children who met criteria for inclusion (see methods) were not present for the entirety of the study. It is not possible to know what placement changes these children would have experienced had data been gathered for a longer period of time.

Future Directions

This study has highlighted several important areas that are presently of national concern. Wolery and Bailey (2002) have indicated that part of the difficulty in measuring outcome with children receiving early intervention is that children have varying disabilities, varying needs, and varying severities; infants, toddlers, and preschoolers are developmentally different; and early intervention focuses on both children and families.

Based on reports from the ECOC (2005), as of 2004 there was still no system for

regularly providing outcome information on children served in the Part B section 619 (ages 3 to 5) and Part C (ages 0 to 3) programs for IDEIA. This is in part due to the difficulties in measuring outcomes with this population described above. The ECOOC (2005) stated in an overview of their mission:

The ECO Center seeks to promote the development and implementation of child and family outcome measures for infants, toddlers, and preschoolers with disabilities. These measures can be used in local, state, and national accountability systems.

This statement summarizes one of the important directions current research evaluating early intervention is going; finding ways to effectively evaluate early intervention that are both sensitive to the diverse populations served and that speak to the issue of accountability.

This study contributes to these present concerns. It does seem possible that if extensive information on predictor variables was collected on samples of children with disabilities participating in early intervention services a predictive model of outcome could be created. This model could contribute another way to evaluate early intervention. For instance, a child with a BDI score of 60, a Vineland Adaptive Behavior score of 70, and a mother who works 10 hours per week outside the home could be plugged into a predictive model to assess the likelihood that the child will stay in or exit from services. This can help provide outcome information on both present and future performance, guide program decisions, and hold educators accountable for the child's performance.

Expanding on this, if a child already receiving services in special education performs in a manner contradictory from what a predictive model would suggest, the

child's case could be identified for review. Again this could help contribute to an understanding of present and future performance, it could help guide decisions that are tailored to the child's needs and it could hold educators accountable. Of course a model like this would require extensive research with more nationally representative samples.

This also highlights another important concern. How do we define success for more severe children who will likely never exit from services? As has been indicated, progress or success in early intervention and early childhood special education has traditionally been measured through gains in cognitive, language, affective, and motor development (Guralnick, 1997), and success in elementary school has often been measured through standardized assessments and achievement. Many children experiencing more severe levels of disabling conditions will likely never reach normal levels of functioning on these types of measures. Establishing statistical models that predict different types of placement options may allow for another measure of program effectiveness and accordingly help support current calls for accountability.

This study also highlights important concerns regarding using the label of special education and how it may affect an individual even following services. Legislation such as The Education for All Handicapped Children Act of 1975 (PL 94-142) and subsequent legislation was designed to ensure children with disabilities receive a free and appropriate education. These laws were designed to ensure equal opportunity for children with disabilities. While the positive implication of this type of legislation is demonstrated by the success of early intervention, the downside is often overlooked. A position statement by the National Association of School Psychologists

(n.d.) indicated:

Some children who may not be truly disabled are labeled and placed in special education inappropriately because of: (a) a lack of general education options designed to meet the needs of children with diverse learning styles; (b) at times, a lack of understanding of diverse cultural and linguistic backgrounds; and (c) inappropriate application of measurement technologies that focus on labels for placement rather than on information to improve instruction and learning.

Because receiving funding and services are contingent upon classification for a label, children with mild disabilities who are served in the regular education setting and who only need mild services must be labeled before they can receive such services. While there are obvious positives to a child receiving services, the long-term impact of a special education label with respect to social as well as occupational concerns is often overlooked. Given that many of the children served in special education fit into this more “mild” category, it seems appropriate to rethink how children are classified, labeled, and served.

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