



Minn-LInK Child Welfare Special Topic Report No. 5

The Child Protection and Special Education Outcomes of Part C Participants

Anita M. Larson, M.A.
Daniel J. Stewart, M.A., J.D.

Center for Advanced Studies
in Child Welfare

© 2009 by the Board of Regents of the University of Minnesota.

All rights reserved.

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, color, creed, religion, national origin, sex, age, marital status, disability, public assistance status, veteran status, or sexual orientation.

This publication can be made available in alternative formats for people with disabilities. Contact Scotty Daniels at 612-624-7242, CASCW, 205 Peters Hall, 1404 Gortner Avenue, Saint Paul, MN 55108.

COLLEGE OF EDUCATION
+ HUMAN DEVELOPMENT

UNIVERSITY OF MINNESOTA



Acknowledgements

Thank you to the Minnesota Department's of Education, Human Services and Health for their ongoing support of the Minn-LInK Project and the Part C study. Thank you to Traci LaLiberte, PhD, Director of the Center for Advanced Studies in Child Welfare and Graduate Research Assistants Danielle Meehan and Mira Swanson for editing. Thank you also to Minnesota Department of Education staff Lisa Backer and Shivani Pandit, PhD for their review of the report for accuracy.

Minn-LInK

The Minn-LInK project at the Center for Advanced Studies in Child Welfare at the University of Minnesota School of Social Work relies on secondary administrative data obtained from statewide public programs. Minn-LInK provides a unique collaborative, university-based research environment with the express purpose of studying child and family well-being in Minnesota. The administrative data sets used in this descriptive analysis originate in the Minnesota Department of Human Services (utilizing the Social Services Information System, or SSIS) which oversees the state child protection system in Minnesota and student public school education records from the Minnesota Department of Education. All data use has been within the guidelines set by strict legal agreements between these agencies and the University of Minnesota that protect personal privacy.

Human service programs collect data for multiple purposes: program administration, compliance with federal and state reporting, fiscal management, and local outcome measures. Policy and practice research has rarely been the focus of either automated system development or data collection. While these realities do not prohibit the successful design, implementation, and completion of research, it does present researchers with unique challenges related to study design and time-frames for study group selection that do not occur when collecting and working with primary data. Instances in which data system conditions drove the structure of this study have been noted in this report.

Table of Contents

Executive Summary	1
Introduction.....	3
Background	3
Poverty, Child Distribution and Child Protection.....	3
Early Childhood and Early Intervention	6
Part C	9
Study Data and Design.....	14
The Data.....	14
Results.....	22
Special Education Use	22
Special Education Instructional Setting Intensity: Completers, Participants and Comparison Children.....	23
Transportation	27
Child Protection Reports.....	28
Child Protection: Determinations of Child Maltreatment.....	30
Regional Patterns: Child Identification, Local Practice and Eligibility.....	31
Limitations	36
Discussion.....	38
Appendix A.....	41
References.....	45

Tables and Figures

Table 1. Completor Group	16
Table 2. Completor Group – Original Part C Disability Coding	17
Table 3. Selection Consideration for Comparison Groups	20
Table 4. Special Education Use of Completors and Comparison Groups	22
Table 5. Special Education Instructional Setting Intensity Value	24
Table 6. Special Education Instructional Setting Intensity Value By Disability Type.....	25
Table 7. Special Education Instructional Setting Intensity Value By Disability Type And Demographics	26-27
Table 8. Child Protection Report Contact by Group.....	29
Table 9. Number of Child Protection Reports by Group.....	29
Table 10. Any Child Protection Determinations of Maltreatment Contact by Group.....	30
Table 11. Number of Child Protection Determinations of Maltreatment Events by Group.....	30
Table 12. Distribution of Study Children Eligible for Special Education by State Region.....	32
Table 13. Special Education Instructional Setting Intensity Value by Region and Disability Type.....	34

Figure 1. Matching Process.....	16
Figure 2. Proportion of Groups Not Needing Special Education by 3 rd Grade	23
Figure 3. Proportions of Groups with Transportation Services	28
Figure 4. ESCU Regions Used for Part C Data Analysis	32

Appendix A. Equivalence of Study Groups:

Table A1. Disability Proportions	41
Table A2. Disability Types	41
Table A3. Sex/Gender.....	42
Table A4. Meal Program Eligibility	42
Table A5. Race/Ethnicity.....	42
Table A6. Limited English Proficiency	43
Table A7. Geography of School Locations.....	43
Table A8. Grade Levels	43
Table A9. Gifted/Talented Status	43
Table A10. Study Group Comparison Summary.....	44

Executive Summary

Investments in early care and education in past decades have grown in recognition of the importance of preparing all children for school and there is substantial evidence that significant savings to taxpayers can be realized when investing early in children. Savings are manifested in reduced negative adult outcomes that improve the quality of life for all members of communities. Young children with developmental delays and disabilities constitute a subpopulation for whom early intervention is particularly important and federal and state governments have likewise invested in programs to meet the needs of these children and their families. Part C, with its emphasis on enhancing the capacity of communities and families to meet the needs of children with delays and disabilities is one such program intended to minimize the special education needs of children when they enter school.

This exploratory study, relying upon statewide administrative education and child welfare data, examined the special education use and child protection involvement of a cohort of children who received Part C services in Minnesota as infants and toddlers during the late 1990s. We explored this in two ways: by examining what proportion of Part C children did not need special education by elementary school, and; by selecting a series of comparison groups of children who did not receive Part C, but who may have had eligibility as infants and toddlers. Child welfare involvement was presumed to be an indicator of family functioning and since disabled children are disproportionately more likely to come into contact with that system, we chose to examine reports and substantiated maltreatment rates along with a variety of education outcomes to explore Part C effects. This study was particularly timely since in 2007 Minnesota implemented broadened eligibility criteria for Part C which, in combination with changes in 2003 to the federal Child Abuse Prevention and Treatment Act (CAPTA), were anticipated to increase the overall number of children referred to the program.

The study revealed that a significant number of children (32.7%) served by Part C did not need any special education by second or third grade. While not all of this difference can be attributed to Part C intervention, some proportion is surely due to the services these children and families received. Comparison child records were used to examine whether Part C children who did need special education in elementary school needed less of it than children who did not receive Part C. This was accomplished by examining the intensity of the special education setting of these groups of children by disability type. Differences between groups were mixed and definitive Part C effects were largely absent. This is likely due to a number of factors; variation in local identification practices that muddy

statewide results; imperfect comparison group construction; the bluntness of special education setting intensity codes as indicators of actual intensity; and the highly restrictive nature of pre-2007 eligibility criteria for Part C in Minnesota which identified infants and toddlers with only the most severe disabilities and delays. Differences in child welfare involvement of Part C and non-Part C children disappeared when we controlled for poverty and could not be attributed to Part C.

Given that the state's Part C eligibility criteria is now broader than in the late 1990s, the potential savings represented by the children who received Part C and who did not need special education in elementary school should be considered a minimum range of potential savings that taxpayers can expect. This study should be replicated when infants and toddlers who received Part C under the newer criteria enter elementary school in a few years to ascertain whether these savings persist. Findings from this study should also prompt discussions about local identification practices that could affect more nuanced savings such as the intensity of special education services as well as the important ways in which child welfare systems are now obligated to connect infants and toddlers to Part C services.

Introduction

The importance of young children entering school ready to learn is a local and national priority. A growing body of research is showing not only the academic benefits to children who enter school ready to learn, but also the economic benefits to tax payers for the investment of public dollars in quality early learning opportunities. This study sought to document benefits that result from early intervention investments that can translate to monetary savings, with a focus on the areas of child protection and special education, for children who participate in Minnesota's Part C programs and services. As will be shown, these results contribute to the emerging body of literature, coincides with important policy changes recently implemented in Minnesota, and provides exploratory findings that can support further research on this population.

Background

We focused on children with disabilities to demonstrate why and how early intervention programs may be particularly beneficial for this population. Children with disabilities are more likely to be involved in foster care and experience a number of adverse early developmental experiences that negatively affect human outcomes. Moreover, there is growing evidence that early intervention and prevention programs for all young children are more effective than reactive intervention programs.

Poverty, Child Disability, and Child Protection

Poverty, child welfare involvement, and childhood disability are correlated but the relationship is not causal. The 2003 National Longitudinal Transition Study found that although the proportion of households with annual incomes less than \$25,000 with students having disabilities declined by 33% between 1987 and 2001 (attributed primarily to the health of the economy), significantly more students with disabilities continue to live in poverty than those who do not (29% versus 16%) (Wagner, Cameto & Newman, 2003). Even when accounting for improved identification of childhood disability, which has increased the likelihood and number of children identified, children in families with incomes below poverty are much more likely to be represented among disability populations (Fujiura & Yamaki, 2000).

Poverty is associated with poor outcomes in children and until recently, the causal nature of this relationship was not clear. Through family stress and investment theories, it is possible to more fully

explain the reasons why children from resource-poor families may be more likely to face developmental challenges. Family stress theory describes the ways in which economic stress negatively impacts parent-child interactions (Yeung, Linver, & Brooks-Gunn, 2002). Investment theory focuses on the ability of the family to purchase the materials and resources necessary to meet the developmental needs of children (Yeung et al., 2002). It is within the framework of these two theories that the relationship between poverty, child disability, and child welfare involvement takes shape. The economic stress of poverty affects parenting and parents who are unable to meet their child's basic needs are likely to withdraw, resulting in neglect that is brought on by parental depression (DiLauro, 2004; Smith, Brooks-Gunn, Klebanov, & Kyunghhee, 2000). In 1996, 21% of women on the Aid to Families with Dependent Program (AFDC) in California had at least one child with a disability (Meyers, Lukemeyer, & Smeeding) and in 2001, 42% of families participating in the Early Intervention Longitudinal Study were receiving public assistance (Hebbeler, Wagner, Spiker, Scarborough, Simeonsson, & Collier, 2001). Reports of child neglect can also arise when working parents who cannot afford child care leave children alone inappropriately which then comes to the attention of a mandated child welfare reporter (Chase, Arnold, Schauben, & Shardlow, 2005; Kerrebrock & Lewit, 1999; Shook, 1999). The introduction of a child with a disability to this situation exacerbates parental stress further, particularly when parents lack adequate support systems.

Parents whose children have intellectual disabilities report high rates of stress (Hastings & Beck, 2004) and although there have been few studies that have examined the simultaneous effects of poverty and child disability on family functioning, the effects can be inferred by literature from a variety of fields. Parents of disabled children experience significant periods of adjustment when learning of and responding to their child's needs (Ziolko, 1991) and although divorce is not inevitable (Risidal & Singer, 2004) it is still the case that couples are at greater risk of separation when they have a disabled child (Gallagher, Beckman, & Cross, 1983; Ziolko, 1991). Single parents of disabled children have the added responsibility for medical care giving and reduced likelihood of respite from a spouse or partner. Overwhelmed single parents typically respond by becoming depressed, a potential precursor to child neglect (Lloyd & Rosman, 2005). Children with disabilities become disproportionately involved in the child protection system and those that are involved often require foster care (Gore & Janssen, 2007; Jonson-Reid, Drake, Kim, Porterfield, & Han, 2004; Knutson, Johnson, & Sullivan, 2004).

Surveillance effect accounts for some of the proportion of children in poverty who also appear in child welfare and occurs when children whose families are connected to public systems such as

public assistance have an increased likelihood of additional scrutiny by other public systems such as child protection (Chaffin & Bard, 2006). However, there is no question that being a poor, single parent of a child with a disability is a significant challenge and families in this situation are particularly prone to experience the stressors that lead to neglect when a variety of parent and family supports are not in place.

Family stressors like poverty are interrelated in complex ways to child maltreatment and child disability. Maltreatment is theorized to be both a cause and an effect of developmental disability and delay. It makes intuitive sense that maltreatment and neglect, related to family functioning and parent well-being, can influence the developing human brain. Infant brain development is largely experiential and throughout the early childhood years, lack of affection, stimulation, or nutrition can be associated with poor neurological outcomes. Using Magnetic Resonance Imaging (MRI), researchers have learned that the specific regions of the brain that regulate emotions (particularly anxiety and fear response) and the overall intracranial volumes of maltreated children are physically different when compared to non-maltreated children, and after controlling for socioeconomic status. These differences have an effect on a wide array of important areas of learning and functioning including IQ, developmental milestone achievement, moral development, behavior regulation, and incidence of personality disorder (DeBellis, 2001; Perry, Pollard, Blakley, Baker, Vigilante, 1995). If abuse and neglect does not directly cause developmental delay, it can result from or be worsened by the presence of disability. Disability is twice as common among maltreated children treated in hospitals compared to other hospitalized children (Sullivan & Knutson, 2000) and a meta analysis showed that, at the very least, numerous studies establish an important relationship between abuse and neglect and developmental disabilities, whichever came first (Johnson-Reid et al., 2004; Casaneuva, Cross, & Ringeisen, 2008).

Entry into the foster care system is disruptive to families and as children with disabilities age, they continue to need supportive services. Foster care youth have disproportionate rates of special education use when compared to non-foster care adolescent populations. In Minnesota in any given year, between 12 and 14% of the general public school population receives special education (Minnesota Department of Education, 2008). Among foster care populations, special education eligibility ranges between 28% and 52% (Weinberg, Zetlin, & Shea, 2001), many times higher than the non-child welfare population (Evans, Scott, & Schultz, 2004; Vig, Chinitz, & Shulman, 2005). While special education is not the same as disability, disabled students, if their needs have been identified, will appear within special education populations. A descriptive study of the high school graduation

rates of Minnesota adolescents who had prior contact with the child protection system showed that non-graduating seniors had more than three times the rate of special education eligibility than did seniors who graduated and had no contact with child protection (Larson & Jefferys, 2006). Two years after examining their graduation rates, the earnings of these same students were examined and those who graduated earned significantly higher wages than those that did not, consistent with other studies of the poor economic outcomes of young adults who do not graduate from high school (Baker, Sigmon, & Nugent, 2001; Doland, 2001; U.S. Census Bureau, 2002). The protective nature of high school graduation has been repeatedly reinforced by research on a variety of educationally vulnerable students, including those with disabilities (Anctil, McCubbin, O'Brien, Pecora, & Anderson-Harumi, 2007; Child Trends, 2006; Jozefowicz-Simbeni & Allen-Meares, 2002; Wall, 1996; Blum, 2004).

The juvenile and adult consequences of under-supported or unidentified disabilities is reflected in high rates of disability, learning disability, and illiteracy in juvenile and adult incarceration populations. Some studies have shown that up to half of incarcerated youth have disabilities (Bullis & Walker, 1995; Kenny, Lennings, & Nelson, 2007; Morris & Morris, 2006; Rutherford & Nelson, 2005) and that an even higher proportion of inmates (up to 70%) have unidentified disabilities and disorders with high rates of co-morbidity (Rogers, Pumariega, Atkins, & Cuffe, 2006). If not addressed, these conditions continue and can worsen into adulthood. To be clear, having a disability does not *cause* poor adult outcomes, rather, individuals with disabilities appear disproportionately among populations of students and adults with poor life outcomes, particularly as they become involved in other, more punitive systems such as child protection and the justice system.

Early Childhood and Early Intervention

Today, most parents work outside the home. Any child who spends significant amounts of their preschool years in sub-standard or even harmful non-parental early care may enter elementary school without the necessary skills to succeed and may be at risk for long-term academic lags that can persist over many years, resulting in school failure. The roles that early learning and intervention (defined here as services or programs for children ages 0-5) play in the outcomes of young children has been well researched. Early problems can persist as young children with elementary school attendance problems are more likely to become disengaged from school later on, increasing the likelihood of having future attendance problems; a precursor to school drop-out. A retrospective study of high school dropouts showed that having attendance problems as early as first grade accurately predicted later school disengagement (Lehr, 2004). Research on early learning outcomes acknowledges that

quality early learning environments help *all* children to succeed and enter school ready to learn but some of the most dramatic positive outcomes are observed for children who are most at-risk of school failure and the benefits can last into adulthood (Barnett & Masse, 2007; Karoly, 2005; Peisner-Feinberg, Burchinal, Clifford, Yazejian, Culkin, Zelazo, Howes, Byler, Kagan, & Rustici, 1999; Schweinhart, 2004). Some of the oldest early care and intervention programs were intended to meet the needs of broad populations of children that faced particular educational challenges, in part due to a recognition of the moral obligation of society to assist them. Head Start and Early Head Start are examples of such programs and are intended to assist low-income children since poverty is so strongly associated with an increased risk of school failure.

Young children with disabilities, including those with developmental delays, constitute a sub-population of children particularly at risk for school failure, academic delay at school entry, and who often need additional services, such as special education, once they enter elementary school. Young children with disabilities who are poor face even more obstacles and risks but with the help of successful programs the individual and community benefits can be significant.

What Works and Generates Long-term Savings

Early care and education programs have been evaluated for the general population of children and show promising results. Specific benefits have been documented from the Chicago Child-Parent Center programs in the areas of higher levels of school readiness and standardized test scores, lower rates of grade retention and special education placement, higher parent participation in learning, lower rates of child maltreatment in families, lower juvenile delinquency rates, and higher overall education attainment (Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2003; Reynolds, Temple, Robertson, & Mann, 2001; Reynolds, Ou, Topitzes, 2004).

Other research has also confirmed benefits resulting from specific types of early intervention programs. For example, in a review of the protective nature of early care for poor children who face family-based risk factors, high quality early care was consistently found to produce positive child outcomes (behavior, physical health, and cognitive development) and poor quality care programs produced poor outcomes (Shonkoff & Phillips, 2000). A meta-analysis of 11 early care programs showed consistent program cost-effectiveness with positive outcomes (lower rates of behavior problems, law enforcement involvement, or incarceration) producing considerable projected savings to taxpayers (Karoly et al., 2005). Generally, there is a strong link between early intervention and positive

early outcomes in school including kindergarten readiness, fewer behavior problems, and better standardized test scores.

Reynolds discusses two critical elements of the long-term benefits of effective early intervention programs: 1) consistent production of benefits to participating children and 2) the provision of consistent services to children as early as possible over an extended duration (2005). Further, Reynolds notes that programs that attend to developing a child's "cognitive/scholastic" abilities along with family involvement that also improves broader school quality, tend to be more beneficial than other programs. At least one study has demonstrated that preschool early intervention programs that fit these criteria are more effective than similar programs that serve children after they start kindergarten and that positive effects are more evident where there are significant problems in the community where the programs operate (Campbell & Ramey, 1995; Clements, Barfield, Kotelchuck, Lee, & Wilber, 2004; Reynolds, 2005). The ability of an early care program to provide important resources to families that the community lacks can be very beneficial. Jozefowicz-Simbeni and Allen-Meares (2002) note the success of programs that integrate early care with health, social, and family educational services as well as the important understanding that, in spite of lacking a number of important human capital assets, many poor children are absolutely able to be academically successful.

In four well-documented and researched early childhood programs, Ou (2005) identified the programmatic mechanisms that were most critical to explaining the positive effects of programs. Five "pathways" to positive effects were found to emerge from:

1. cognitive advantage
2. family support
3. motivational advantage
4. social adjustment
5. school support.

These five pathways were operationalized and used to evaluate the Chicago Parent Child Center program. Ou (2005) determined that the cognitive advantage, family supports, and school support mechanisms were most influential but that parent involvement alone is positively correlated with children's educational outcomes (Clements et al., 2004). These studies suggest that programs that have consistent services, incorporate family involvement and include some or all of Ou's five pathways are more likely than those that do not, to be successful.

Evaluations of early care programs increasingly include cost-benefit analyses. These analyses quantify costs to the investments in early care in relation to the savings that result from improved human outcomes. Savings are realized when more expensive intervention or support services are not

needed later on in life. These services include services such as prison, drug treatment, or remedial education services. Work from Heckman (2007) notes the importance of taking into account all interventions with which children might interact and cost and benefits quantified for the Abecedarian and Perry Preschool programs take a wide array of long-term human outcomes into account such as earnings, earnings for future generations, maternal earnings, cost-savings from public schooling, improved health outcomes, welfare use, and higher education costs and have provided guidance for other subsequent evaluations (Barnett & Masse, 2007; Temple & Reynolds, 2007). Long-term studies of Abecedarian and the Chicago Longitudinal Study estimate a range of taxpayer savings of \$4 - \$7 for every one dollar spent, respectively (Campbell et al., 2003; Grant, 2005) and that these programs give higher returns than other types. These studies continue to be used to refine cost and benefit analyses of similar programs and even after making adjustments for 2002 dollars, Barnett found significant benefits-to-costs for Perry (nine dollars to every one dollar spent), Abecedarian (2.5 dollars to every one dollar spent) (Barnett et al., 2007), and Temple and Reynolds have found that the cost-benefit advantages to the Chicago Parent-Child Centers, from which cohorts have been studied into early adulthood, range from \$5.98 - \$10.15 for every dollar spent (2007).

Part C

In 1975 Congress passed and the President signed the Education for All Handicapped Children Act (EHA), later renamed the Individuals with Disabilities Education Act (IDEA), Part H of the act was intended to support students with disabilities and delays. In 1986 it was significantly amended and the portion of the act pertaining to school-age students was named Part B, legislating services to children ages 3 to 21. In 1990 the act was again amended with Part C, to extend services to children ages 0-2. Legislation articulated Part C's intent as:

“...[the minimization of] the later need for special education and institutionalization of infants and toddlers with developmental delays by enhancing the capacity of communities to serve these children and their families through early intervention services.” (United States Department of Education, 2008)

Part C's commitment to family involvement is consistent with the theory and practice of effective early intervention programs noted by research.

In part to determine whether Part C services are similar to other early intervention programs that are intended to reduce higher-cost services later on, Ou's (2005) five operationalized pathways are

aligned with Part C program components in this study. These pathways are intertwined and Part C services are similarly intended to support the child and family holistically through the Individualized Family Service Plan (IFSP). These alignments are summarized briefly below.

1. Cognitive Advantage

Cognitive advantage is most easily described as the enhancement of intelligence and learning which in turn, positively affects educational attainment. High quality early learning environments have the explicit intent of improving the learning readiness and ability of young children to transition to school. Part C specifically refers to the programmatic focus on cognitive development and education that “promotes school readiness and incorporates pre-literacy, language, and numeracy skills” (20 USC 1432, Sec. 632, 5B (ii)(1)).

2. Family Support

Ou’s (2005) family support hypothesis revolves around the role that programs play in positively influencing parenting and enhancing parent involvement in school. In this area, Part C likely extends beyond the scope of many programs serving young children. Part C enhances “the capacity of families to meet the special needs of their infants and toddlers with disabilities” through a variety of means including “family training, counseling, and home visits (20 USC 1436 (a)(2) and (d)(2)).

3. Motivational Advantage

Motivational advantage is defined as the positive behavioral result of children who have enhanced sense of self-efficacy in learning which can increase motivation through improved persistence and competence. While Part C program components do not explicitly address motivational advantage, the implicit result of a child with developmental delays or disability having greater success in school is that they would feel more engaged and positive about school and learning.

4. Social Adjustment

Educational attainment rests upon the social and emotional well-being of children and programs that have an influence on how well children adjust socially and emotionally are structured to influence positive social adjustment. Children with certain disabilities may face additional challenges either resulting from the disability or from stigma associated with a disability (or both) in integrating with non-disabled peers. Part C addresses this in three ways: 1) advancing the social or emotional

development of the individual child (20 USC 1432 4 C (iv), 20 USC 1436 (d)(1); 2) attempting to maximize the potential for living independently in society; and 3) by attempting to integrate the child in “natural environments, including the home, and community settings in which children without disabilities participate” (20 USC 1432 4 G). This latter aspect is commonly called “mainstreaming”. In addition, this requirement is a mandate of the overall, or statewide Part C system (20 USC 1435 (a) (16)) as well as the IFSP (20 USC 1436 (d)(5)).

5. School Support

School support is defined as the interaction between the early intervention program and the child’s subsequent school attendance that will increase the likelihood of positive long-term educational achievement. The increased probability that children will attend school and maintain stable attendance is believed to be related to participation in high quality early programming. Part C does not articulate a school support goal, but it mandates parental involvement which directly influences school support. Critical features of parental involvement in IDEA include parent and public awareness programs, notice provisions, periodic review requirements, and evaluation. Services must be consistent and states may choose to continue Part C services under these terms, until the child enters elementary school (20 USC 1435 (c)).

In practice, the local implementation of Part C-funded and directed programs may vary in quality, scope, and commitment. However, these programs have core legal and practice structures that, in form and intent, are consistent with research on the components of successful early learning intervention programs.

Access & Service to Part C

Because the success of Part C services depends in large part upon accurate identification of children with needs and services provided, the processes by which families are able to access the program are important to consider. There are important variations in service provision and service delivery that are based on national guidelines and state options to implement Part C. We review a few of the most important variations here.

Part C is a state-optional program, but all states and territories in the United States participate. States have some latitude to establish their eligibility criteria and early intervention systems and, although the federal government, through the Office for Special Education Programs (OSEP), reviews and oversees the Part C efforts of the states, each state or territories’ program is unique, rendering

cross-state service population comparisons a challenge (Scarborough, Spiker, Mallik, Hebbeler, Bailey, & Simeonsson, 2004). The process by which children and families are identified is called Child Find and involves various professionals who interact with families to actively identify those who may be at risk and benefit from services. Child Find is a federally mandated process, but state and local educational agencies that provide services have discretion in developing and implementing their own specific Child Find procedures.

Infants and toddlers are referred for early intervention services when a suspected developmental delay or disability is identified. Referrals often (but not always) come from a medical professional. In most states, delay is identified through the relationship between functional delay relative to chronological age. States may choose to include infants and toddlers who are at risk for delay and risks factors may be biological, environmental, or psychosocial emotional. Another important means by which referrals to Part C occur is through the child welfare system. The Child Abuse Prevention and Treatment Act (CAPTA) was amended in June of 2003 to include requirements that states provide procedures and processes for referrals to Part C programs for children under the age of three who are involved in substantiated cases of abuse or neglect. It is only recently that the overlaps between child welfare and Part C programs in the wake of these new mandates have begun to be examined (Stahmer, Sutton, Fox, Leslie, 2008) and commensurate Part C enrollment increases estimated. Using 2003 data, these increases are estimated to produce an additional 96,327 children referred, or an average of a 44.3% increase in enrollment nationwide (Derrington & Lippitt, 2008).

Once a child is identified as appropriate for Part C, services are coordinated by a team that establishes an Individualized Family Services Plan (IFSP). The IFSP contains the services to which the family and child are entitled as well as incorporates the goals parents have for the child. The county agency is responsible for identifying the type of services, frequency and duration, and is reimbursed for half of costs by the state (Grant, 2005).

Although the structure of Part C services, to which children are referred by an appropriate expert in the community who has taken into account the delays exhibited by the child, appears to meet essential program effectiveness characteristics, research has noted critical problems. For example, parents can face significant hurdles in accessing Part C services. Hendrickson, Baldwin & Allred (2000), note that parents often seek help from doctors to determine whether their children have developmental concerns but doctors may not have adequate information about available programs (including Part C), may not make an accurate determination of need for services and/or may encourage the family to wait until the child is at least three years old to be screened for school by the district. The

authors also noted family discord or denial as barriers as well as the need for families to have perseverance to obtain Part C services. Further, there is still considerable stigma associated with having a disability. Research has noted lower access to Part C programs by different ethnic and cultural groups including Latinos (Buisse, Castro, West, & Skinner, 2005), African Americans in Minnesota (Chan & Ohnsorg, 1999), and other sub-groups including military and uninsured families in some states (Shapiro & Derrington, 2004). Additional concerns about Part C include differences in the perceptions of parents and administrators regarding structural or programmatic issues, including coordination and transition between Part C and Part B services as students age (Danaher, Shackelford, & Harbin, 2004), and interagency coordination (Harbin, Bruder, Adams, Mazarella, Whitbread, Gabbard, & Staff, 2004).

Specific to Minnesota, Chan & Ohnsorg (1999) reviewed significant county-level variations in levels of Part C utilization (then called Part H) and in attempting to explain the variations, the authors found evidence related to a county's level of "abnormal conditions" identified at birth; lower levels of access by African American families; lower levels of access in rural counties; and lack of collaboration between service providers. In addition, there have been practice changes in recent years driven by rule changes which have had influence on which children are eligible. In particular, pre-2007 eligibility rules stated that children had to exhibit overall delays in more than one developmental area which was highly restrictive (and out of federal compliance). This criteria resulted in a pool of Part C children whose disabilities and delays were very obvious or typically presented early, in contrast to the array of delays that are likely to present as children age. In 2007 the state's criteria was expanded to include children who exhibit delays in one or more developmental area as well as children who are born with a condition that has been known to hinder development or has a high probability of hindering development are now eligible for Part C services in Minnesota.

Study Data and Design

The intent of this study is to explore the use of special education services and child protection involvement during the early elementary grades of children who participated in Part C services, compared to retrospectively constructed groups of children who had similar disabilities and attributes but who did not participate in Part C services. Special education use and child protection involvement constitute two of the most expensive public services received by children with disabilities and delays. Child protection involvement can have significant negative effects on families in terms of stigma, stress, and disruption. Taxpayer savings in either of these two service areas would have significant policy implications. The study attempts to take into account likely outcomes of children in light of Minnesota's recently changed Part C screening criteria and changes to CAPTA. We attempt to identify how children look under old practice, speculate on how they will look different under the new practice, and discuss the implications for long-term savings through changes in the use of special education services. For this study, the time period for Part C receipt falls within the period during which Minnesota utilized the more restrictive definition of Part C screening eligibility. Findings may affirm the action to expand eligibility to include more children with less obvious needs, with a consideration of the potential impacts on other intervention and supportive services that children may utilize later on (such as Early Childhood Special Education which serves children ages three to five).

The Data

Part C data for participation years 1996, 1997, and 1998 were selected for study from the Minnesota Department of Education. These particular years were chosen in part to coincide best with the available K-12 education data sets on file at the Minn-LInK Project at the University of Minnesota since one main objective of the study was to examine Part C children years later, when they entered the public schools. Education data was available for 2001-2004. Data from the child protection system in Minnesota (Social Services Information System, or SSIS) were also accessed in order to determine whether or not children had contacts with child welfare. The SSIS system was launched in 2000, when this population of Part C children were approximately 2-4 years old.

Part C Participation and Education Matches

Part C Group Identification: Completer and Participant Groups

Records for infants (age 0) and one year-old children who participated in Part C during 1996 – 1998 (N=932) were examined for this study. The ages of children varied but only narrowly, since program participation rules govern ages of participation. During the years of participation, over half (54.8%) were age one, and the balance were infants.

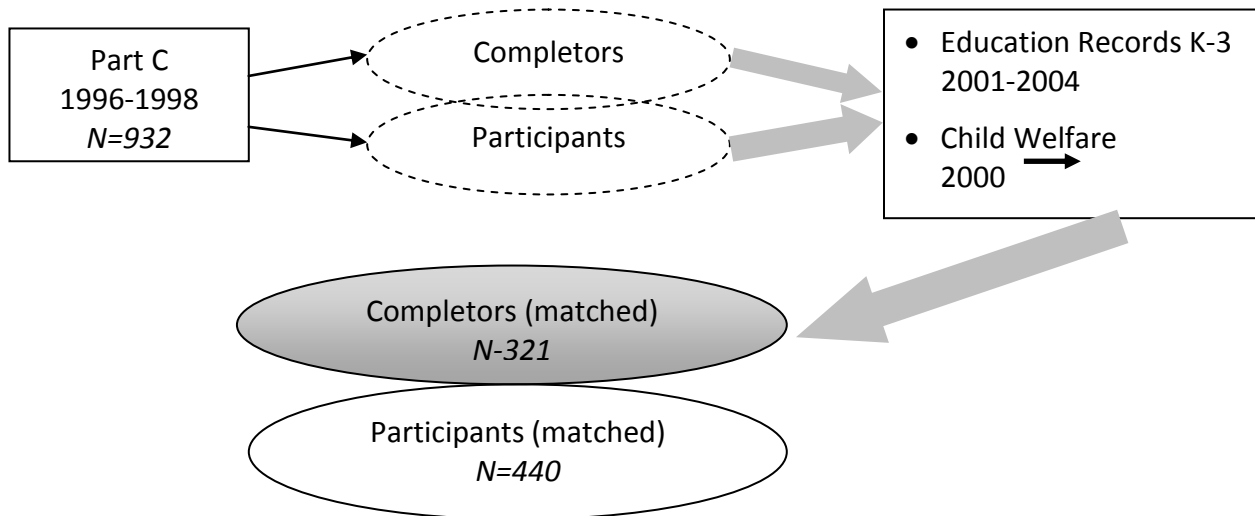
These children formed two study groups based on Part C receipt. The first was comprised of children whose IFSP plan goals were met prior to program exit with the expectation that upon school entry they would either need no special education or their special education needs will be minimized. This group constitutes children who were known to have received a full set of Part C services and were consequently labeled Completers (N=518).

The second group of the Part C program data was comprised of children who received some Part C services and may or may not have met plan goals at some point in time (this is in part because the data pool represents a snapshot in time of program participation). Some of these children may have continued with Part C until reaching the exit age, or may have met their program goals later, thus their ultimate Part C program outcome is uncertain. This group was labeled Participants (N= 611).

Education and Child Welfare Record Match

The next step after identification of study children who received Part C was to locate their K-3 education records. Because of varying ages and mobility, it was not realistic to expect that all children could be expected to be located in the K-3 education record files. Of the original 932 Part C children, 321 Completer children matched to education records, and of Participants, 440 had records that matched to one or more of the four academic school years for which public education data was available (i.e. 2001 - 2004 school years). Child welfare records were similarly obtained by matching to available records starting with January, 2000.

Figure 1. Matching Process: Construction of Study Data Groups



For the sake of determining potential benefits of Part C early intervention, the special education status of children was obtained for grades 1-3. By the second and third grades in particular, the eligibility of children for support programs such as special education is usually thoroughly assessed. For this reason, the portion of the original Completor group that was comprised of kindergarten students during the 2003-2004 school year was excluded from study, along with another 70 students whose records could not be matched. To begin our examination of special education use by elementary school, we focused on Completor children. We include Participant children in some comparative analysis but there is evidence that they may be different from Completor children in significant ways.

Table 1. Completor Group

Grade Level	N
Grade 1	92
Grade 2	132
Grade 3	97
Total	321

Disability Comparisons Over Time

Joining the elementary records to the Part C Completors allowed for an initial review of the disability status of children by the time they were in school. This was important for the overall basic assumptions of the potential early intervention benefits of Part C but in informing the creation of comparison groups. An examination of the original Part C disability coding (1996-1998) compared to

the disability codes for these children in the 2003-2004 school year provides an illustration of how disability codes change with time (Table 2).

Table 2. Completor Group – Original Part C Disability Coding ('96, '97, '98) Compared to Coding by 2003-2004 School Year

Elementary Education Disability Code, 2003-2004 (School-Age)	Part C Disability Code, 1996, 1997, 1998 (Ages 0-3)							Totals
	Not reported	Speech/ Language	Physical	Deaf-Hard of hearing	Visual	Other	Developmental Delay	
Non-disabled	4	24					67	95
Speech/Language	1	10					19	30
Mentally: Mild-Moderate					2		31	33
Mentally: Moderate-Severe			1				16	17
Physical							20	20
Deaf-hard of hearing				6			5	11
Visual							1	1
Specific Learning Disability		1		1			36	38
Emotional Behavioral Disorder		1					10	11
Deaf-Blind				1			1	2
Other		2			1	1	21	24
Autism Spectrum Disorder		1					19	20
Developmental Delay							6	6
Traumatic Brain Injury							2	2
Severely Multiply Impaired					1		9	10
504							1	1
Totals	5	39	1	8	3	1	264	321

The majority of children served by Part C (1996-1998) were identified with developmental delays at the time of program participation. By the time they entered elementary school (2003-2004) more refined identifications of specific conditions had occurred. In particular, a high proportion of those coded with developmental delay during Part C years were later identified as having specific learning disabilities ($N=36$, or 14%), mild to moderate mental disabilities ($N=31$, or 12%), speech and language disabilities, or autism spectrum disorder ($N=19$, or 8% each). Four children received Part C, met plan goals, and were coded with unknown (not reported) disabilities in the Part C program record (and their original disability for entry is unknown, although they received services). A significant proportion of Part C children with developmental delays or speech and language disabilities have no disability coded by the time they are in elementary school ($N=95$, or 29.5%).

Creation of the Completor Comparison Groups

Multiple challenges were faced when creating comparison groups. First, establishing criteria for potential retrospective eligibility involved consideration of the characteristics of children who *may* have been eligible for Part C services as infants and toddlers (but who did not receive Part C) at the time they entered the early elementary grades. This was challenging for a number of reasons. First, by elementary school, it is likely that some Completor children did or did not receive special education *in some part due to the Part C intervention services* they received five to six years earlier. Second, it is unknown what portion of children's status by elementary school can be attributed to Part C and in fact, answering this question is one of the goals of this study.

To be sure, children with certain types of disabilities were coded consistently as having that disability over time. But for other types, it is reasonable that by elementary school they no longer required accommodation and were coded as "non-disabled". Still others will have received a more refined assessment of their disability later on that occurred because of normal developmental changes in the child that made better identification possible, or improved assessments by practitioners.

Childhood disabilities are not equally likely to be identified at all stages of child development and in an effort to intervene as early as possible, researchers are continuously searching for the earliest possible markers of particular disabilities and delays. Ease of identification changes, depending upon the typical presentation of some disabilities in early childhood and over the course of child development and although a thorough examination of the timing of the presentation of disabilities in early childhood is beyond the scope of this paper, some examples of typical identification challenges are offered here. For example, certain birth characteristics such as low birth weight and the presence of two or more birth risks show promise in predicting developmental delays (Clements, Barfield, Kotelchuck, Lee, & Wilber, 2006). Because interventions for children with Autism Spectrum Disorder (ASD) have been shown to be most effective if they begin before age 3 (McGee, Morrier, & Daly, 1999) researchers have attempted to assess the degree to which there are measurable characteristics of ASD during toddlerhood. Some common assessments were shown to identify the presence of delays generally, but could not distinguish between ASD and developmental delay at age 2 (Wetherby, Woods, Allen, Cleary, Dickenson, & Lord, 2004). And while motor delays in young children are commonly assessed between 18 months and age 4 (Tieman, Palisano, & Sutlive, 2005) there are challenges to accurately assessing emotional or behavior disorders in infants and toddlers. The prediction of emotional and behavioral problems in young children has been attempted by examining regulation disorders in infancy (Degangi, Breinbauer, Roosevelt, Porges, & Greenspan, 2000) and

determining whether they are correlated with language proficiency in toddlers (Tervo, 2009). Because there continues to be recognition of the negative experiences of students with under-identified or underserved emotional and behavioral needs, better means of early identification continue to be pursued (Bradley, Doolittle, & Bartolotta, 2008).

In the selection of comparison children for this study it was important to balance what is known about the early presentation of disability alongside the demographic factors that are consistently associated with disability status in education such as disability and gender. Three comparison groups were formed through a randomized aggregate matching process. Aggregate matching employs specific criteria by which groups are randomly formed in stages (Rossi, Lipsey, & Freeman, 2004). Education data for the 2003-2004 school year was first prepared for random selection by removing study child records to prevent the possibility that they would be selected as comparison children. Comparison groups were selected based on different rationale with the intent to control for other important factors through statistical tests.

Comparison Group 1 (Gender, Grade Level, Poverty)

The construction of the first comparison group began with a random selection of males and females in proportions that mirrored the Completer group from a pool of non-Part C children who had disabilities (of any type). After selecting for gender, students were randomly selected by grade level to attempt to control for developmental stage, again in proportions similar to the Completer group. Finally, to allow for some consideration of economic status, children were randomly selected by eligibility for free and reduced price school meals. This group comprised Comparison group 1.

Comparison Group 2 (Disabled and non-Disabled)

A second comparison group was constructed that gave no deliberate attention to demographics, but selected proportions of disabled and non-disabled children as reflected in the Completer group (of any type of disability). This group was likely to capture a different distribution of children by gender and income as well as race and ethnicity. While this structure gave less weight to other factors that are often highly correlated with disability, it gave more weight to the actual proportions of children who were and were not disabled. This second comparison group was called Comparison 2.

Comparison Group 3 (Disability type)

Finally, in case Part C interventions are highly relevant to specific types of disabilities, a comparison group was selected that preserved the proportions of disabled children in the Completer group, by type of disability. With no selection criteria related to gender, income, or geography, this group was similar to Comparison 2 in terms of differences in these attributes compared to the

Completor group. This group was labeled Comparison 3. Table 3 summarizes the attributes of the three comparison groups in terms of selection method.

Table 3. Selection Consideration for Comparison Groups

Criteria	Comparison 1 N=321	Comparison 2 N=321	Comparison 3 N=226*
Demographics	Yes	No	No
Disability Y/N	Yes	Yes	No
Disability Exact	No	No	Yes

* This comparison group is smaller (N=226) because it was constructed to mirror the exact disability types observed in the Completor group, therefore, no non-disabled children were selected.

Among the three comparison groups (N=868), eleven students were randomly selected for membership in more than one comparison group based on their attributes: six students were randomly selected for Comparison groups 2 and 3 and five for groups 1 and 3.

The availability of the three comparison groups selected using different criteria offers multiple opportunities to analyze the degree to which and how consistently Part C services make a measurable difference in outcomes for children. A finding that occurs regardless of the manner in which comparison children were selected should strengthen the argument that Part C services make a difference in that specific area of child outcome. For a description of all study groups and how they compare by various demographic factors, see Appendix A.

Data Analysis & Outcomes

This study focused on the following outcomes:

1. elementary school eligibility for special education;
2. if special education is received, the intensity of the special education setting;
3. use of transportation services specific to disability; and
4. contacts the child had with the child protection system in Minnesota (both reports and substantiated maltreatment outcomes) over the period of time for which data is available.

There is a gap in the availability of child protection data between births (1995, 1996, and 1997) and the first year of statewide data availability which is 2000. Therefore, the child protection data covers a period beginning when these children were between the ages of three and five, just prior to entering kindergarten.

Study outcomes relate to important short- and long-term developmental and educational outcomes for children as well as the costs associated with particular services. Outcome variables are of discrete and ordinal type and the significance of group differences were examined using Univariate Analysis of Variance (ANOVA). All analyses were conducted using Statistical Package for the Social Sciences (SPSS), version 12.0. Each set of outcomes was examined in group pairs, using the Completor group as the intervention group and later in the report, Participant children aggregated with Comparison for broad Part C and Comparison (non Part C) pools.

Results

Special Education Use

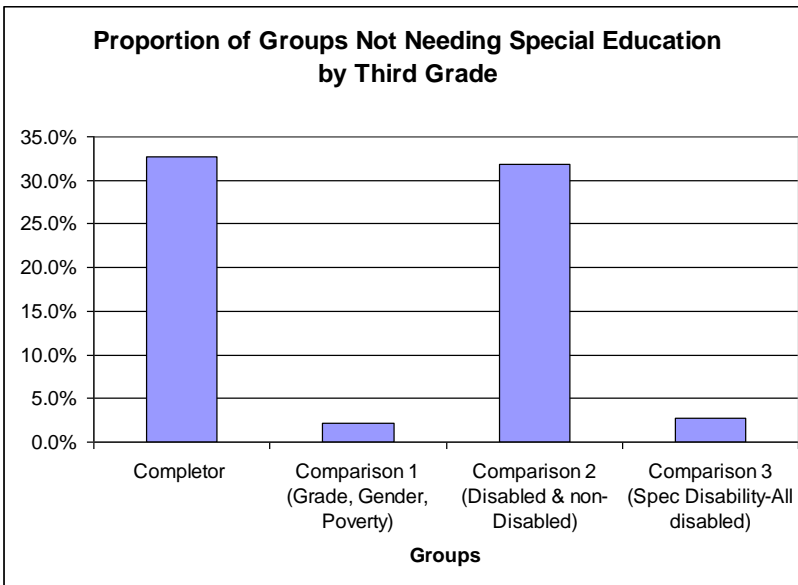
Special education use was measured as a binary variable, with a status of “yes” or “no” for students who had any special education eligibility during the year including the completion of an Individualized Educational Plan (IEP) or a determination of need for special education services without receipt. Only students who either did not require a special education evaluation or whose evaluation revealed that they did not need special education were coded “no” for this variable.

The direct correlation between a child’s disability status and their likely use of special education has important implications for the interpretation of results from the use of the comparison groups. Recall that Completers are students who had used Part C services as infants and toddlers and met their plan objectives and a portion of these students (N=95, or 29.6%) are not coded as disabled by elementary school (see Table 2).

Table 4. Special Education Use of Completers and Three Comparison Groups

Study Group	Special Ed Eligibility 2003-2004				Total
	Yes		No		
	N	%	N	%	
Completor – All	216	67.3	105	32.7	321
<i>Completor – Disabled Only</i>	216	95.6	10	4.4	226
Comparison 1 – All	314	97.8	7	2.2	321
<i>Comparison 1 – Disabled Only</i>	314	97.8	7	2.2	321
Comparison 2	219	68.2	102	31.8	321
Comparison 3 (Disabled Only)	220	97.3	6	2.7	226

While Table 2 depicts the disability coding of Completor children, Table 4 shows the special education eligibility of Completor and Comparison children. Among all Completor children – both disabled and non-disabled – 105, or 32.7% were not eligible for special education by elementary school. Among Completor children, ten (4.4%) are coded with disabilities but did need special education.

Figure 2.

While there are differences in the rates of special education use for children in comparison groups compared to Completors, differences are not statistically significant. By sub-populations, results indicate that girls in the Completor group had significantly lower rates of special education use than girls in all three comparison groups ($\chi^2 = 8.902_{(4)}$; $p < .01$) and that Completors whose schools were located in non-Metro area counties also had significantly lower rates of special education use compared to the comparison groups ($\chi^2 = 14.254_{(4)}$; $p < .001$).

Special Education Instructional Setting Intensity: Completors, Participants, and Comparison Children

The intensity of the special education instructional setting is an indicator of the amount of specialized support the child needs who is receiving special education services. Setting intensity refers to the physical location where the student obtains special education services. These locations can range from the regular classroom, to a variety of separate rooms or facilities. While the first assumption of Part C early intervention services is that it will eliminate the need for special education for some children entirely, there is also the potential to reduce the intensity of special education services for those students who continue to need it. It is equally important to remember that some disability types will require the same special education eligibility and setting intensity regardless of early intervention services and some nuances of instructional settings (e.g., the presence of aides) cannot be detected by the setting coding.

Special education instructional setting intensity is also a reflection of program costs. There are eight levels of special education intensity coded in Minnesota education records: 00, non-disabled; 01, regular classroom; 02, resource room; 03, separate class; 04, public separate day school facility; 05, private separate day school facility; 06, public residential facility; 07, private residential facility; and 08, homebound/hospital placement. (Although the Department of Education has recently begun to cost out instructional settings by disability type, costs were not available for the 2003-2004 school year at the time of this report.)

These eight intensity levels were collapsed into four: 1) 00, non-disabled, 2) 01, regular classroom, 3) 02, resource room and 03, special classroom, and 4) any separate facility (codes 04-08). These four groups were assigned numerical code values with the lowest intensity (non-disabled) equal to 0 and the highest (codes 04-08) equal to 4.0. This coding scheme allowed for use of Analysis of Variance which requires interval or ordinal variables types (Howell, 2002).

Table 5. Special Education Instructional Setting Intensity Value (Only Children receiving Special Education)

	Mean Instructional Setting Value	N	Std Dev
Completor	1.838	216	.923
Participant	1.952	402	.956
Comparison 1	1.898	314	.828
Comparison 2	1.808	219	.829
Comparison 3	1.654	220	.859

To maximize our view of setting intensity, we included Participant children in this analysis. Recall that Participant children are those that received services, but we are less sure of their completion outcomes (e.g. discontinued services or completed plan goals). Table 5 shows that there are significant differences in the intensity of special education instructional settings by group ($F=4.376_{(4)}$, $p < .001$) with Participant children having the highest instructional setting intensity, some evidence that they may be different from Completor children. Next highest are children in the Comparison 1 group (the group selected by demographic factors) with Comparison 3 children (selected by specific disability type) having the lowest mean intensity value. Instructional setting intensity was examined by a number of attributes to determine whether some sub-populations of children with disabilities were in less intensive settings than others depending upon whether or not they received Part C. Completor children

were consistently in equally or more intensive special education settings than Comparison children when controlling for race, meal program receipt (poverty), and geography.

Setting Intensity by Disability Type

A reconstruction of the comparison groups was next used to determine whether differences were consistent across all comparison groups or if there were exceptions among sub-populations. Because initial results implied that there were potentially significant differences between special education setting intensity and specific types of disabilities, the study file was split and recoded to separate child records by disability type. This also allowed for the creation of larger pools of children from particular disability sub-groups.

The first step in this process was to speculate upon which types of disabilities Part C services would have the greater likely impact in terms of reducing the intensity of special education settings. Certain types of disabilities present early or are very obvious to caregivers or medical providers. Less obvious disabilities or those that are likely to present later on in a toddler's development are often behavioral or emotional disability types. One assumption is that, if identified as early as possible, Part C should have a greater positive effect on social and emotional conditions in particular. This positive effect would be manifested in reductions in supportive services (i.e., special education and instructional setting intensity) needed in school. Using this logic, child records were divided by grouping four disability types (speech and language impairments, specific learning disabilities, emotional and behavioral disorders, and autism spectrum disorder) into a broad group of Social and Emotional Disabilities to investigate whether there were differences in special education instructional setting intensity depending upon whether or not these children received Part C. With the new groupings, Completers and Participants became Part C children, and Comparison groups 1-3 became Non-Part C children. Combining all possible study groups increased the study pool and increased the likelihood that differences, if any, could be detected.

Table 6. Special Education Instructional Setting Intensity Value
(Only Children receiving Special Education and Having Social and Emotional Disabilities)

	Mean Instructional Setting Value	N	Std Dev
Part C	1.465	159	.769
Non-Part C	1.511	219	.786
Total	1.492	377	.778

Table 6 shows that the mean instructional setting intensity is slightly higher for children who did not receive Part C who had emotional and social disabilities but the differences are not statistically significant.

Setting Intensity by Disability Type and Demographics

Next, setting intensity was examined by sub-groups within the Social and Emotional Disabilities group: race, meal program eligibility, geography, child protection involvement, and gender. Significant differences in instructional setting intensity were observed for geography, child protection involvement, and gender (see Table 7).

			Mean Instructional Setting Value	N	Std Dev
Race	Non-Part C	Am Ind/Alask Nat	1.333	-	.577
		Asian/Pac Is	1.555	-	.881
		Hispanic	1.750	-	.500
		Black/not Hisp	1.727	11	1.00
		White/not Hisp	1.495	192	.779
	Part C	Am Ind/Alask Nat	1.500	-	.755
		Asian/Pac Is	1.000	-	.000
		Hispanic	1.473	19	.841
		Black/not Hisp	1.900	20	.968
		White/not Hisp	1.394	109	.707
Meal Program	Non-Part C	Ineligible	1.460	148	.777
		Reduced Price	1.785	14	.975
		Free	1.579	57	.755
	Part C	Ineligible	1.407	81	.721
		Reduced Price	1.454	11	.820
		Free	1.537	67	.822
Geography	Non-Part C*	Metro county**	1.506	89	.814
		Non-Metro county**	1.515	130	.770
	Part C*	Metro county**	1.588	102	.848
		Non-Metro county**	1.245	57	.544

Table 7 (continued). Special Education Instructional Setting Intensity Value
(Only Children receiving Special Education and Having Social and Emotional Disabilities)

Child Protection Contact	Non-Part C	No ⁺	1.452	177	.753
		Yes	1.762	42	.878
	Part C	No ⁺	1.379	124	.705
		Yes	1.771	35	.910
Gender	Non-Part C	Female ⁺⁺	1.340	53	.677
		Male	1.566	166	.812
	Part C	Female ⁺⁺	1.302	53	.638
		Male	1.547	106	.818

* Part C receipt and county of school combined $F_{(1)} = 4.481$, sig. .035 $p < .01$

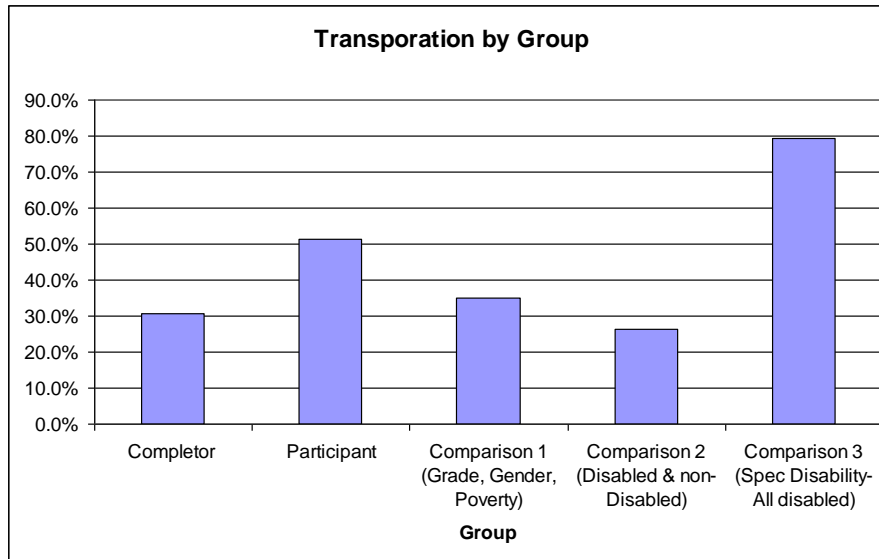
**County of school $F_{(1)} = 3.998$, sig. .046 $p < .01$

+Child protection contact (yes or no), $F_{(1)} = 12.640$, sig. .000 $p < .01$

++Gender (females), $F_{(1)} = 6.988$, sig. .009, $p < .01$

Transportation

Disability-related transportation services are coded in education records for children who require accommodation. The code represents additional costs that the district incurs to transport children. Study children were coded as requiring some form of disability-related transportation if at any point during the school year they'd received this type of assistance. While the proportion of children requiring transportation assistance was greater for Completers than for either Comparison group 1 or 2 children, it was significantly higher for Comparison 3 children (recall that Comparison group 3 was selected to mirror the specific disability types of Completer children) ($\chi^2 = 197.093_{,4}$, $p < .001$) (see Figure 3).

Figure 3. Proportions of Groups with Transportation Services

Child Protection: Reports

One goal of Part C early intervention services is the improvement of family functioning and a lessening of the likelihood that children with disabilities, who are disproportionately maltreated, will come in contact with the child protection system. One challenge to using child protection data in public program outcome analyses is that there is always the likelihood that results will be subject to surveillance bias (Olds, Eckenrode, & Kitzman, 2005). Surveillance bias occurs when children being served by one public system have an increased likelihood of coming to the attention of other public systems, such as child protection. Children who have received Part C in the past or who are connected to the public schools and special education services may have an increased chance of coming to the attention to child welfare officials. Child protection data used here covered the period of time study children were between the ages of three to five and the start of kindergarten.

Completor children were not significantly more or less likely to have been reported to the child protection system when compared to children in Comparison groups 2 or 3. Recall that these comparison groups were selected based on disability proportions and disability type, respectively. However, both Completor and Participant children were significantly less likely to have experienced a child protection intervention based on acceptance of a child maltreatment report than those children in Comparison group 1, who were selected based on disability status as well as demographic factors, who were also slightly poorer (See Table 8).

Table 8. Child Protection Report Contact by Group (All Children)

	No	Yes	Total N
Completor	79.1%	20.9%	321
Participant	81.1%	18.9%	440
Comparison 1	71.7%	28.3%*#	321
Comparison 2	81.3%	18.7%	321
Comparison 3	83.2%	16.8%	226

$\chi^2 = 4.836_{(1)}$, $p < .01$ (differences between Comparison and Completor groups)

$\chi^2 = 9.468_{(1)}$, $p < .001$ (differences between Comparison and Participant groups)

In addition to the relationship between whether or not there had been any accepted child maltreatment reports for the children in each group; a variable was created that quantified the number of accepted child maltreatment reports associated with each child. Analysis of variance was run for each Comparison group-Completor pair, for only children in each group who were special education-eligible during the school year to eliminate the influence of children who either had no disabilities or children whose disabilities did not require special education in which case their instructional setting value would equal zero (Table 9).

Table 9. Number of Child Protection Reports by Group (Only Children receiving Special Education)

	Mean Number of Child Protection Reports	N	Std Dev
Completor	2.149	67	1.83
Participant	2.458	83	2.80
Comparison 1	2.868*	91	3.15
Comparison 2	2.550	60	2.30
Comparison 3	2.500	38	2.21

* $F_{(1)}=2.79$, $p<.01$

Children in Comparison group 1 are significantly more likely to have had more accepted child maltreatment reports than those in the Completor group. Given the strong relationship between poverty and child welfare involvement, however, the relationship between the Completor and Comparison 1 groups was explored further to identify the origin of this difference. Univariate analysis with meal program eligibility (a proxy for poverty) as a random effect revealed non-significant differences in values, essentially eliminating the effects of study group membership on child maltreatment report

rates and the clarification that the observed differences were indeed due to the influence of poverty and not the receipt of Part C.

Child Protection: Determinations of Child Maltreatment

Reports to child protection are assessed and those deemed appropriate through determination by county staff move on to investigation. When the investigation results in a determination of maltreatment, it is considered “determined”. While examining reports accepted by child protection tells something about the conditions under which children and families come to the attention of the public child welfare system, counts of determinations of maltreatment indicate the degree of harm actually determined to have occurred. As was the case with accepted reports, children in study groups were first examined for whether or not there had been any determinations of child maltreatment occurrence over the study time period (see Table 10). Participants were included in this analysis.

Table 10. Any Child Protection Determinations of Maltreatment Contact by Group (All children)

	No	Yes	Total N
Completor	90.0%	10.0%	321
Participant	93.9%	6.1%	440
Comparison 1	89.7%	10.3% [#]	321
Comparison 2	92.5%	7.5%	321
Comparison 3	92.0%	8.0%	226

[#] $\chi^2 = 4.388$ (1), $p < .01$ (differences between Comparison and Participant groups)

Comparison 1 children (selected in part by poverty status) again had a higher proportion of children experiencing determinations of maltreatments.

Table 11. Number of Child Protection Determinations of Maltreatment Events by Group (Only Children receiving Special Education)

	Mean Number of Determinations of Maltreatment Events	N	Std Dev
Completor	.709	55	.831
Participant	.365	74	.631
Comparison 1	.565	92	1.030
Comparison 2	.533	60	.891
Comparison 3	.718 [#]	39	1.07

[#] $F_{(1)} = 4.838$, $p < .01$ (differences between Comparison and Participant groups)

With regard to determinations of child maltreatment events, differences between Completer and Comparison groups were not significant. Participant children had significantly fewer determinations of child maltreatment events compared to Comparison 3 children, however, this could be due to a number of factors including differences in the types of disabilities present in the Comparison 3 group as well as demographics.

Regional Patterns: Child Identification, Local Practice and Eligibility

Findings for special education setting intensity indicate that there may be some differences in outcomes for children served by Part C in relation to metro and non-metro county geographic patterns. While this shows differences between urban and rural communities, it does not indicate what particular areas of the state have differential outcomes. Local community practices of identification are also relevant and may be reflected in these results. In particular, if non-Part C children with social and emotional disabilities have a higher mean special education intensity setting than similarly disabled children who received Part C, we might conclude a possible program effect. In contrast, if non-Part C children who have more severe and early presenting disabilities have lower mean special education intensity settings than similarly disabled children who received Part C, this might be a reflection of identification practices. Given that social and emotional disabilities are less obvious and present later, these types of disabilities may provide a better assessment of Part C's efficacy in reducing special education use.

Additional analyses were conducted by geographic regions of the state based on Educational Cooperative Service Unit (ESCU) regions. There are eleven ESCUs in the state of Minnesota and they are responsible for performing educational planning on a regional basis for children with special needs. ESCUs are also sometimes referred to as Service Cooperatives (see Figure 4 and Table 12).

Figure 4. ESCU Regions Used for Part C Data Analysis

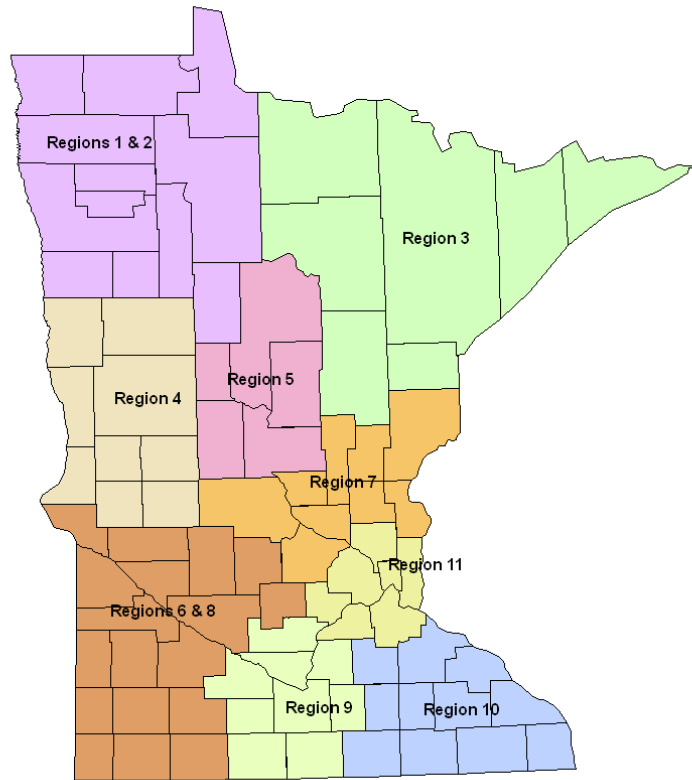


Table 12. Distribution of Study Children Eligible for Special Education, by State Region

ESCU Region	N	Percent
1 & 2	26	2.1
3	57	4.7
4	52	4.3
5 & 7	53	4.4
6 & 8	75	6.2
9	54	4.4
10	127	10.5
11	768	63.4
	1,212	100.0

Mean Special Education Setting Intensity by Region and Disability Type

The mean special education setting intensity was calculated for all regions, by whether or not children received Part C, for all types of disabilities. Disability types were then grouped into Social and

Emotional disability types and all other disabilities. Setting intensity was examined by these disability groups, region, and Part C receipt.

Table 13. Special Education Instructional Setting Intensity Value by Region and Disability Type (Only Children receiving Special Education)

Region	Part C Status	Mean Instructional Setting Value	N	Std Dev	Disability Type (Grouped)	Mean Instructional Setting Value	N	Std Dev
1 & 2	Part C	1.58	12	.668	Social Emotional	1.00	2	.000
	Non-Part C	1.42	14	.756	Other	1.70	10	.675
3	Part C	1.80	20	.894	Social Emotional	1.00	5	.000
	Non-Part C	1.86	37	.751	Other	2.06	15	.884
4	Part C	2.16	24	1.05	Social Emotional	1.25	8	.423
	Non-Part C	1.82	28	.723	Other	2.03	29	.731
5 & 7	Part C	2.10	10	.994	Social Emotional	1.25	4	.500
	Non-Part C	1.81	43	.732	Other	2.35	20	1.040
6 & 8	Part C	1.84*	31	.860	Social Emotional	1.33	6	.516
	Non-Part C	1.50*	44	.549	Other	1.95	22	.722
9	Part C	1.33	18	.594	Social Emotional	1.50	4	1.00
	Non-Part C	1.67	36	.828	Other	2.50*	6	.837
10	Part C	2.07	45	.986	Social Emotional	1.57	7	.535
	Non-Part C	1.99	82	.949	Other	1.86*	36	.762
11	Part C	1.96*	393	.981	Social Emotional	1.22	9	.441
	Non-Part C	1.84*	375	.892	Other	2.09*	22	.867
					Social Emotional	1.37	16	.500
					Other	1.57*	28	.572
					Social Emotional	1.00*	8	.000
					Other	1.60	10	.699
					Social Emotional	1.83*	12	1.029
					Other	1.58	24	.713
					Social Emotional	1.00	3	.000
					Other	2.14	42	.977
					Social Emotional	1.57	19	.902
					Other	2.11	63	.935
					Social Emotional	1.55	109	.832
					Other	2.11*	284	.991
					Social Emotional	1.57	109	.854
					Other	1.94*	266	.886

Regions 6 & 8: $F_{(1)}=4.328, p<.01$ Region 11: $F_{(1)}=3.662, p<.01$ Regions 5 & 7: $F_{(1)}=3.527, p<.01$ Regions 6 & 8: $F_{(1)}=6.467, p<.01$ Region 9: $F_{(1)}=5.143, p<.01$ Region 11: $F_{(1)}=4.803, p<.01$

When examining setting intensity in relation to type of disability (social emotional and other) Part C children usually had higher mean intensity rates than Non-Part C children with similar disabilities and in the case of three regions (5&7, 6&8, and 11) these differences were statistically significant. Instances in which Non-Part C children had higher mean setting intensities were fewer and only in Region 9 was this difference statistically significant with Non-Part C children with social and emotional disabilities in more intensive settings (mean= 1.83) than Part C children with social and emotional disabilities (mean=1.0).

Limitations

There are a number of limitations to the study data and design that bear mentioning because of potential effects upon findings and for future research. In particular,

- 1. Child protection data time frames are limited.** Considerable research on child protection and child age show that there are two particularly important developmental stages in a child's life during which they are more likely to come in contact with child protection, early childhood (infancy and toddler-hood, roughly between the ages of 0 and four) and again during teen age years (13-15) (Wulczyn, Hislop, & Harden, 2002). The child protection data used here missed the majority of the first age span of potential high child welfare contact, only allowing for a review of the data when children were between the ages of approximately four and seven. If the anticipated positive family functioning effects of Part C should occur within the first year or two after participation, these data essentially missed the window of greatest measurement opportunity, particularly if the effects of Part C fade with time.
- 2. Child Protection contact is a result of multiple factors.** Whether or not a family comes to the attention of the child protection system at all is dependent upon a number of factors that are state and county-dependent including reporting practices, implementations of screening guidelines, staffing, how reports are triaged in the agency when received, and the caseload sizes of social workers. Nationwide, it is estimated that there are up to 18 times as many incidents of child harm that occur than come to the attention of child welfare agencies (Gallup, 1995). Relying on child welfare contacts as an indicator of family and child well-being always has important limitations.
- 3. The special education instructional setting does not convey enough information about the actual level of intensity of services received.** The special education instructional setting code tells *where* the child is receiving special education services. While this is an important indicator, it provides only a rough indication of service intensity and says nothing about the activities within the setting that occur and influence actual intensity of services. In particular, the setting location tells us nothing about the presence one-to-one aides or the specific hours the child requires those services. Children might also be receiving supportive services outside the K-12 education system that have an impact on academic performance. Further, the strength of parental advocacy cannot be detected in the data – particularly if successful advocacy for

inclusion has resulted in a regular classroom placement, but the child has a 1:1 para professional aide in that classroom.

- 4. Parent perspective on family functioning is not available.** While the absence of child protection contacts and maltreatment findings are considered an indicator of family functioning, it is deficit-based and imperfect. An ideal family functioning indicator would take into account actual observed family interaction and parent perspective and measure positive effects as well as whether or not the family's functioning deteriorates sufficiently to come to the attention of the child welfare system.
- 5. The specific proportion of Part C recipients whose elementary school special education needs were alleviated by Part C services is unknown.** Although this study identified a significant proportion of Part C children (both Completers and Participants) who did not need special education by the time they entered elementary school, it could not determine what exact proportion of this group would have needed special education had they not received Part C services. Six percent of Participant children (who may have had more severe conditions and may or may not have eventually met their plan objectives) did not require special education by elementary school. It is the answer to this question that would provide the clearest indication of cost-benefit savings.
- 6. Costs of Part C services were not available for the year of study.** Had the costs of Part C services been available for the 2003-2004 school years, some attempt at cost-benefit analysis of Part C services could have been completed.
- 7. Participant children may be significantly different.** In this exploration, we sometimes excluded and included Participant children in analyses but there is some evidence that Participants are a different group of children from Completers. These differences may affect results but because Participant children, in some respects, appear to have slightly higher needs than Completer children, they may in fact be diluting positive program effects of Part C when combined with Completers in outcome comparisons.

Discussion

This exploratory study examined a set of long-term outcomes related to children who participated in Part C early intervention services as infants and toddlers using differently constructed comparison groups. The outcomes examined have child and public investment outcome implications, as Part C services are in part intended to prevent more expensive use of public services later on. Because Part C is child and family-centered, there is the expectation that, in addition to eliminating or reducing the need for special education services once the child reaches elementary school, there is also the potential to help parents improve their ability to support their child's development. Helping families meet the unique needs of their children should reduce family stress and prevent families from coming to the attention of child welfare – a system where children with disabilities and delays are overrepresented.

One goal of this study was to provide context for the current Part C-eligible populations that are being served which is relevant in light of Minnesota's recent broadening of eligibility criteria for Part C. At the same time, recent changes to the Child Abuse Prevention and Treatment Act (CAPTA) has created a mandate for young children involved in child welfare to be referred to Part C. These changes will likely result in an expansion of the population served by Part C, including children who, under the prior eligibility rules and previous years would not have been considered appropriate for services. An examination of the effectiveness of Part C in reducing the need for special education is timely.

There is strong preliminary evidence from this exploration that Part C is eliminating the need for some children to require any special education by the early elementary years. In the data examined here, a significant portion (33%) of the children who met their Part C plan goals were not using special education by the time they were in elementary school. It is possible that not all of the elimination of special education need can be attributed to Part C but this initial finding gives us a sense of the range of possible savings.

Another expectation of the study was that differences in special education setting intensity would be observed for those children who received Part C services with particular disabilities (emotional and behavioral in particular) compared to similarly disabled children who did not receive Part C. The assumption was that the effects of Part C in ameliorating special education needs later on would be detectable in data on setting intensity. This expectation was not borne out by the data and in fact, in some cases Part C children were in more intensive settings than non-Part C children. These unexpected findings drove a reconsideration of how and which children become connected to Part C

services, particularly under the older, more restrictive Minnesota criteria, which is intertwined with eligibility criteria and the obviousness of disabilities in young children.

In particular, children with social and emotional disabilities who did not receive Part C generally had lower instructional setting intensity values (i.e. less restrictive settings) than similarly disabled children who received Part C. While this finding challenged our assumption that Part C should reduce the intensity of settings for similarly disabled children, it may again reflect identification and eligibility practices. If only the children with the most severe and visible needs were being connected to Part C, their special education settings should not be compared to children whose needs were less overt or not at all obvious when they were infants and toddlers. The importance of identification and eligibility criteria in this regard is reinforced by the differences in setting intensity observed for children with social and emotional disabilities in Region 9. If local identification practices are significantly different in this region it makes sense that setting intensity will be different than in other regions.

Rates of disability transportation services required by Part C children were lower only when compared to children with similar types of disabilities (comparison Group 3) which may imply some additional cost savings. The child protection involvement of Part C families was mixed in relation to non-Part C children. One of the comparison groups, Group 3, which was selected based on an exact disability type match had significantly higher numbers of substantiated maltreatment events. However, differences disappeared when we controlled for poverty, a finding that is consistent with considerable research on child welfare involvement and poverty. While we approached this study with the expectation that the data would show differences in public system involvement (child welfare and special education specifically) for children who received Part C services compared to those who did not, but who might have been eligible as infants and toddlers, we learned that only special education differences can be detected. These differences may be significant simply when comparing the Part C group to itself – that is, when examining what proportion of them did not need special education by elementary school and did not have disabilities. That other anticipated differences were not dramatic or consistent (setting intensity, transportation needs, and child welfare involvement) implies that there are a number of limitations to our approach. Administrative data may be too blunt an instrument to use to detect some effects, identification and eligibility practices controlling which children access Part C have too great an effect on the level of services that are received during our study time frame, or that comparison groups selected could not control for enough other intangible factors to provide adequate comparisons, or all three.

Part C is an important early intervention program and represents a significant public investment. The preliminary findings from this study suggest that further study is warranted to confirm savings related to reduced special education use as well as improved quantification of savings using a more rigorous design. In particular, this study should be replicated using a population of students whose Part C eligibility was determined under the newer, broad category. The implications of Minnesota's new criteria and new requirements from the child welfare system in the context of these findings are that the potential savings are likely to be even more significant as more children are being identified earlier.

APPENDIX A

Equivalence of Study Groups

Table A1. Disability Proportions

	Completers		Participants		Comparison 1		Comparison 2		Comparison 3	
	N	Perc	N	Perc	N	Perc	N	Perc	N	Perc
Disabled	226	67.3%	386	87.7%	321	100%	100	68.8%	226	100%
Non-disabled	95	29.6	54	12.3			221	31.2		
Total	321	100	440	100	321	100	321	100	226	100

Table A2. Disability Types

	Completers		Participants		Comparison 1		Comparison 2		Comparison 3	
	N	Perc	N	Perc	N	Per	N	Per	N	Per
Specific Learning Disability	38	16.8%	22	5.7%			5	2.3%	38	16.8
Mentally: Mild-Moderate	33	14.6	83	21.5	161	50.2%	85	38.5	33	14.6
Speech/Language Impaired	30	13.3	24	6.2			2	.9	28	12.4
Other	25	11.0	28	7.3					23	10.2
Physical	20	8.8	62	16.1					19	8.4
Autism Spectrum Disorder	20	8.8	17	4.4	61	19.0	55	24.9	20	8.8
Mentally: Moderate-Severe	17	7.5	87	22.5	36	11.2	29	13.1	17	7.5
Emotional Behavioral Disorder	11	4.9	1	.2					11	4.9
Deaf-hard of hearing	11	4.9	24	6.2	45	14.0	21	9.5	10	4.4
Severely Multiply Impaired	10	4.4	26	6.7			6	2.7	11	4.9
Developmental Delay	6	2.7	1	.2	9	2.8	11	4.9	7	3.1
Traumatic Brain Injury	2	.9	4	1.0			1	.4	2	.9
Deaf-Blind	2	.9	1	.2	2	.6	2	.9	2	.9
Visually	1	.4	6	1.6	7	2.2	4	1.8	1	.4
Total Disabled	226	100	386	100	321	100	221	100	226	
Non-disabled	95		54				100		3	1.3
Group Total	321		440		321		321		229	

Table A3. Sex/Gender

	Completers		Participants		Comparison 1		Comparison 2		Comparison 3	
	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent
Male	187	58.3%	232	52.7%	190	59.2%	186	57.9%	148	65.5%
Female	134	41.7	208	47.3	131	40.8	135	42.1	78	34.5
Total	321	100	440	100	321	100	321	100	226	100

Table A4. Meal Program Eligibility

	Completers		Participants		Comparison 1		Comparison 2		Comparison 3	
	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent
Ineligible	157	48.9%	297	67.5%	148	46.1%	179	55.8%	136	60.2%
Reduced Price	33	10.3	28	6.4	24	7.5%	29	9.0	10	4.4
Free	131	40.8	115	26.1	149	46.4%	113	35.2	80	35.4
Total	321	100	440	100	321	100	321	100	226	100

Table A5. Race/Ethnicity

	Completers		Participants		Comparison 1		Comparison 2		Comparison 3	
	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent
American Indian/Alaskan Native	10	3.1%	11	2.5%	15	4.7%	10	3.1%	5	2.2
Asian/Pacific Islander	18	5.6	13	3.0	12	3.7	17	5.3	13	5.8
Hispanic	33	10.3	18	4.1	11	3.4	16	5.0	9	4.0
Black/Not Hispanic	52	16.2	17	3.9	40	12.5	36	11.2	23	10.2
White/Not Hispanic	208	64.8	381	86.6	243	75.7	242	75.4	176	77.9
Total	321	100	440	100	321	100	321	100	226	100

Table A6. Limited English Proficiency

	Completers		Participants		Comparison 1		Comparison 2		Comparison 3	
	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent
Yes – LEP	23	7.2%	7	1.6%	11	3.4%	25	7.8%	13	5.8
No	298	92.8	433	98.4	310	96.6	296	92.2	213	94.2
Total	321	100	440	100	321	100	321	10	226	100

Table A7. Geography: County of Elementary School Location

	Completers		Participants		Comparison 1		Comparison 2		Comparison 3	
	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent
Metro	252	78.5%	229	52.0%	159	49.5%	169	52.6%	104	46.0
Non-Metro	69	21.5	211	48.0	162	50.5	152	47.4	122	54.0
Total	321	100	440	100	321	100	321	100	226	100

Table A8. Grade Levels

	Completers		Participants		Comparison 1		Comparison 2		Comparison 3	
	N	Perc	N	Perc	N	Perc	N	Perc	N	Perc
Grade 1	92	28.7%	63	14.3%	92	28.7%	111	34.6%	71	31.4%
Grade 2	132	41.1	234	53.2	130	40.5	108	33.6	76	33.6
Grade 3	97	30.2	143	32.5	99	30.8	102	31.8	79	35.0
Total	321	100	440	100	321	100	321	100	226	100

Table A9. Gifted and Talented Status

	Completers		Participants		Comparison 1		Comparison 2		Comparison 3	
	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent
Yes	11	3.4%	2	.5%	1	.3%	5	1.6%	5	2.2%
No	310	96.6	438	99.5	320	99.7	316	98.4	221	97.8
Total	321	100	440	100	321	100	321	100	226	100

Table A10. – Study Group Composition - Summary

	Completor	Participant	Comparison 1	Comparison 2	Comparison 3
Part C status	Met plan goals	May or may not have met plan goals (participated)	Did not receive Part C	Did not receive Part C	Did not receive Part C
Group selection basis			-disability status (100%) -disability type -gender -grade level -income	-proportional disability status to Completor group (portion non-disabled)	proportional disability status to Completor group (by disability type)
Total number of children	321	440	321	321	226 (to reflect disabled portion of Completor group)

Compared to Completor group*:

<i>Gender</i>	More females (5.6%)	Similar	Similar	More males
<i>Race (White/Non-white)</i>	Over representation of White children (21.8%)	Over representation of White children (10.9%)	Over representation of White children (10.6%)	
<i>Disability status</i>	Greater proportion disabled (20.4%)	Greater proportion disabled (32.7%)	Similar	
<i>Disability types (grouped)</i>	More children who have both social/emotional/behavioral as well as physical/sensory	More children with social/emotional/behavioral	More children with social/emotional/behavioral	
<i>Age/Grade</i>	Children in higher grades during 2003-2004	Similar	Children in lower grades during 2003-2004	
<i>Family Income</i>	Less poor with higher proportion ineligible for meals (18.6%)	More families eligible for free meals (5.6%)	Less poor with more families ineligible for meals (5.6%)	
<i>LEP</i>	Fewer LEP (5.6%)	Fewer LEP (3.8%)	Similar	
<i>Metro/Non-Metro County</i>	Fewer children from Metro area counties (26.5%)	Fewer children from Metro area counties (29.0%)	Fewer children from Metro area counties (25.9%)	

* "Similar" demographics are those that are within 2% of Completor group proportionally. Where proportional differences are greater than 2%, that percentage difference is given.

References

- Adams, G., Rohacek, M. (2002) More than a work support? Issues around integrating child development goals into the child care subsidy system. *Early Childhood Research Quarterly*(17), 418-440.
- Ancil, T., McCubbin, L., O'Brien, K., Pecora, P. & Anderson-Harumi, C. A. (2007). Predictors of adult quality of life for foster care alumni with physical and/or psychiatric disabilities. *Child Abuse & Neglect*(31), 1087-1100.
- Baker, M. Sigmon, J., & Nugent, M. (2001). Truancy reduction: Keeping students in schools. *Office of Juvenile Justice and Delinquency Prevention, U.S. Department of Justice, Washington, D.C.* Retrieved February 9, 2009 from http://www.ncjrs.org/html/ojjdp/jjbul2001_9_1/contents.html.
- Bailey, D., Hebbeler, K., Scarborough, A., Spiker, D., Mallik, S. (2004) First experiences with early intervention: A national perspective. *Pediatrics*,113(4), 887-896, 0031-4005.
- Barnett, W.S., & Masse, L. N. (2007). Comparative benefit-cost analysis of the Abecedarian program and its policy implications. *Economics of Education Review*, 26, 113-125.
- Birenbaum A. (2002) Poverty, welfare reform, and disproportionate rates of disability among children. *Mental Retardation*, 40(212), 21
- Blum, R. (2004). Risk and protective factors affecting adolescent reproductive health in developing countries. *World Health Organization, Department of Child and Adolescent Health Development, Family and Community Health, Geneva.* ISBN 92 4 159227 3. Retrieved November 1, 2006 from http://www.who.int/child-adolescent-health/New_Publications/ADH/ISBN_92_4_159365_2.pdf
- Bradley, R., Dootlittle, J., & Bartolotta, R. (2008). Building on the data and adding to the discussion: The experiences and outcomes of students with emotional disturbance. *Journal of Behavioral Education*, 17(4), 4-23.
- Bullis, M., & Walker, H.M. (1995). Characteristics and causal factors of troubled youth. In C.M. Nelson, B.I. Wolford, R.B. Rutherford (Eds.), *Comprehensive and collaborative systems that work for troubled youth: A national agenda* (pp. 15-28). Richmond, KY: National Coalition for Juvenile Justice Services.
- Buysee, V., Castro, D. C., West, T., & Skinner, M. (2005). Addressing the needs of Latino children: A national survey of state administrators of early childhood programs. *Early Childhood Research Quarterly* 20, 146-163.
- Campbell, F., Ramey, C., Pungello, E., Sparling, J., & Miller-Johnson, S. (2002). Early childhood education: Young adult outcomes from the abecedarian project. *Applied Developmental Science*, 6, 42-57.

- Casaneuva, C., Cross, T., & Ringeisen, H. (2008). Developmental needs and individualized family service plans among infants and toddlers in the child welfare system. *Child Maltreatment, 13*(3), 245-258.
- Chaffin, M., & Bard, D. (2006). Impact of intervention surveillance bias on analysis of child welfare report outcomes. *Child Maltreatment, 11*(4), 301-312.
- Chan, B., & Ohnsorg, F. (1999). Issues of Part H program access in Minnesota. *Infants and Young Children, 12*(1), 82-90.
- Chase, R., Arnold, J., Schauben, L. & Shardlow, B. (2005). *Child care use in Minnesota-2004 statewide household child care survey*. St. Paul, Minnesota: Wilder Research.
- ChildTrends (2006). *Young adults at greater risk for depressive symptoms*. ChildTrends Databank Indicator: Depressive Symptoms Among Young Adults. Retrieved on January 15, 2009 from http://www.childtrendsdatabank.org/pdf/101_PDF.pdf Washington, D.C.
- Clements, K.M., Barfield, W.D., Kotelchuck, M., Lee, K.G., & Wilber, N. (2006) Birth characteristics associated with early intervention referral, evaluation for eligibility, and program eligibility in the first year of life. *Journal of Maternal and Child Health, 10*,433-441.
- Danaher, J., Shackelford, J., & Harbin, G. (2004). Revisiting a comparison of eligibility policies for infant/toddler programs and preschool special education programs. *Topics in Early Childhood Special Education, 24*(2), 59-67.
- DeBellis, M. (2001) Developmental traumatology: The psychobiological development of maltreated children and its implications for research, treatment, and policy. *Development and Psychopathology, 13*, 539-564.
- Degangi, G., Breinbauer, C., Roosevelt, J. D., Porges, S., Greenspan, S. (2000). Prediction of childhood problems at three years in children experiencing disorders of regulation during infancy. *Infant Mental Health Journal, 21*(3), 156-175.
- Derrington, T. M., & Lippitt, J. (2008). State-level impact of mandated referrals from child welfare to Part C early intervention. *Topics in Early Childhood Special Education, 28* (2), 90-98.
- DiLauro, M. (2004). Psychosocial factors associated with types of child maltreatment. *Child Welfare, 83*(1), 69-99.
- Doland, E. (2001). *Give yourself the gift of a degree*. Employment Policy Foundation. Retrieved on February 9, 2009 from http://www.dropoutprevention.org/stats/quick_facts/econ_impact.htm .
- Evans, L., Scott, S., Schultz, E. (2004) The need for educational assessment of children entering foster care. *Child Welfare, 83*(6), 565-581.
- Fujiura, G., and Yamaki, K. (2000). Trends in demography of childhood poverty and disability. *Exceptional Children* (66), 187-199.

- Gallagher, J., Beckman, P., & Cross, A. (1983). Families of handicapped children: Sources of stress and its amelioration. *Exceptional Children*, 50(1), 10-19.
- Gallup Poll. (1995). The Gallup Organization polled parents nationwide and concluded that child maltreatment is far more prevalent than the official data suggests. Gallup estimated some 3 million children were victims of physical abuse alone--18 times greater than the number of children identified by authorities as victims of physical abuse in 2002. Report summary available at http://www.ndacan.cornell.edu/NDACAN/Datasets/Abstracts/DatasetAbstract_106.html
- Gore, M., and Janssen, K. (2007). What educators need to know about abused children with disabilities. *Preventing School Failure*, 52(1), 49-55.
- Grant, R. (2005) State strategies to contain costs in the early intervention program: Policy and Evidence. The Children's Health Fund. *Topics in Early Childhood Special Education*, 25(4), 243-250.
- Harbin, G. L., Bruder, M., Adams, C., Mazarella, C., Whitbread, K., Gabbard, G., & Staff, I. (2004). Early Head Start: Identifying and serving children with disabilities. *Topics in Early Childhood Special Education*, 24(2), 89-97.
- Hastings, R. P., and Beck, A. (2004). Practitioner review: Stress intervention for parents of children with intellectual disabilities. *Journal of Child Psychology and Psychiatry*, 45 (8), 1338-1349.
- Hebbeler, K., Wagner, M., Spiker, D., Scarborough, A., Simeonsson, R., & Collier, M. (2001). *A first look at the characteristics of children and families entering early intervention services*. The National Early Intervention Longitudinal Study. SRI International. Retrieved on January 15, 2009 from <http://www.sri.com/neils/pdfs/FormAreport.pdf>
- Heckman, J. (2007). The economics, technology, and neuroscience of human capability formation. *Proceedings of the National Academy of Sciences*, 104(33), 13250-13255.
- Hendrickson, S., Baldwin, J.H., & Allred, K. W. (2000). Factors perceived by mothers as preventing families from obtaining early intervention services for their children with special needs. *Children's Health Care*, 29(1), 1-17.
- Hernandez-Josefowicz, D., & Allen-Meares, P. (2002). Poverty and schools: Intervention and resource building through school-linked services. *Special Issue: Children & Schools*, 24(2), 123-136.
- Hildyard, K., Wolfe, D. (2002) Child Neglect: developmental issues and outcomes. *Child Abuse and Neglect* (26), 679-695.
- Hodapp, R. M., & Krasner, D. V. (1995). Families of children with disabilities: Findings from a national sample of eighth-grade students. *Exceptionality*, 5(2), 71-81.
- Howell, D.C. (2002). *Statistical Methods for Psychology*, 5th Ed. Pacific Grove, CA: Duxbury.

- Jonson-Reid, M., Drake, B., Kim, J., Porterfield, S., Jan, L. (2004) A prospective analysis of the relationship between reported child maltreatment and special education eligibility among poor children. *Child Maltreatment*, 9(4), 382-394.
- Jozefowicz-Simbeni, D., & Allen-Meares, P. (2002). Poverty and schools: Intervention and resource building through school-linked services. *Children & Schools*, 24(2), 123-136.
- Karoly, L., Kilburn, R., Cannon, J. (2005) *Early Childhood Interventions – Proven Results, Future Promise*. RAND Corporation, Labor and Population. Retrieved on January 14, 2009 from <http://www.cgi.rand.org/pubs/monographs/MG341/>.
- Kenny, D., Lennings, C., & Nelson, P. (2007). The mental health of young offenders serving orders in the community: Implications for rehabilitation. *Journal of Offender Rehabilitation*, 45(1/2), 123-148.
- Kerrebrock, N., Lewit, E. (1999). *Children in self-care*. No. (9). Washington D.C.: The Future of Children.
- Knutson, J. F., Johnson, C.R., and Sullivan, P.M. (2004). Disciplinary choices of mothers of deaf children and mothers of normally hearing children. *Child Abuse & Neglect*, (28), 925-937.
- Larson, A. (2006) *High school graduation and child welfare: A description of the education status of older Minnesota adolescents in the academic year after substantiated child maltreatment findings*. University of Minnesota, Minn-LInK Child Welfare Special Topic Report No. 1. Retrieved February 5, 2009 from <http://cehd.umn.edu/SSW/cascw/attributes/PDF/minnlink/HSReport1.pdf>
- Lehr, C., Sinclair, M., Christenson, S. (2004) Addressing student engagement and truancy prevention during the elementary years: A replication study of the Check & Connect model. *Journal of Education for Students Placed at Risk*, 9 (3), 279-301.
- Lloyd, C., and Rosman, E. (2005). Exploring mental health outcomes for low-income mothers of children with special needs: Implications for policy and practice. *Infants & Young Children*, 18(3), 186-199.
- Meyers, M. K., Lukemeyer, A., & Smeeding, T.M. (1996). Work, welfare, and the burden of disability: Caring for special needs children in poor families. *Income Security Policy Services, Paper No. 12*, Syracuse, NY. Retrieved on December 8, 2008 from <http://www.cpr.maxwell.syr.edu/incomsec/abstr12.htm>
- McGee, G., Morrier, M. & Daly, T. (1999). An incidental teaching approach to early intervention for toddlers with autism. *Journal of the Association for Persons with Severe Handicaps*, 24, 133-146.
- Minnesota Department of Education. (2008). *Minnesota Education Statistics Summary 2007-2008*. Retrieved on February 9, 2008 from <http://education.state.mn.us/mdeprod/groups/InformationTech/documents/Report/034788.pdf>.

- Morris, K., and Morris, R., (2006). Disability and juvenile delinquency: issues and trends. *Disability & Society*, 21(6), 613-627.
- Olds, D., Eckenrode, J., & Kitzman, H. (2005). Clarifying the impact of the nurse-family partnership on child maltreatment: response to Chaffin (2004). *Child Abuse & Neglect*, 9, 229-233.
- Ou, S. (2005). Pathways of long-term effects of an early intervention program on educational attainment: Findings from the Chicago longitudinal study. *Applied Developmental Psychology*, 26, 578-611.
- Paro, K., Olsen, K., Pianta, R. (2002) Special education eligibility: Developmental precursors over the first three years of life. *Exceptional Children*, 69(1), 55-66.
- Peisner-Feinberg, E., Burchinal, M., Clifford, R., Yazejian, N., Culkin, M., Zelazo, J., Howes, C., Byler, P., Kagan, S., Rustici, J. (1999) *The children of the Cost, Quality, and Outcomes study go to school*. University of North Carolina at Chapel Hill. Retrieved on December 10, 2008 from <http://www.fpg.unc.edu/~ncedl/PDFs/CQO-es.pdf>
- Perez, C., Widom, C. (1994) Childhood victimization and long-term intellectual and academic outcomes. *Child Abuse & Neglect*, 18(8), 617-633.
- Reynolds, A., Temple, J., Robertson, D., & Mann, E. (2001). Long-term effects of an early childhood intervention on educational achievement and juvenile arrest. *Journal of the American Medical Association*, 285(18), 2339-2347.
- Reynolds, A., Ou, S., & Topitzes, J.A. (2004). Paths of effects of early childhood intervention on educational attainment and delinquency: A confirmatory analysis of the Chicago Child-Parent centers. *Child Development*, 75(5), 1299-1328.
- Reynolds, A. J. (2005). Confirmatory program evaluation: Applications to early childhood interventions. *Teachers College Record*, 107(10), 2401-2425.
- Risdal, D., & Singer, G. (2004). Marital adjustment in parents of children with disabilities: A historical review and meta-analysis. *Research & Practice for Persons with Severe Disabilities*, 29(2), 95-103.
- Robinson, C., Rosenberg, S., Teel, M., Stainback-Tracy, K. (2003) *Interagency collaborative guidebook: A strategic planning tool for child welfare & Part C agencies*. JFK Partners in Early Education Project, University of Colorado at Denver and Health Sciences Center. Retrieved on February 5, 2009 from <http://www.jfkpartners.org/Content/PDF/InteragencyGuidebook.pdf>
- Rogers, K., Pumariega, A., Atkins, L., & Cuffe, S. (2006). Conditions associated with identification of mentally ill youths in juvenile detention. *Community Mental Health Journal*, 42(1), 25-40.
- Rossi, P.H., Lipsey, M. W., & Freeman, H.E., (2004). *Evaluation, A Systematic Approach*, 7th Ed. Thousand Oaks, CA: Sage Publications.

- Rutherford, R., & Nelson, M. (2005). Disability and involvement with the juvenile delinquency system: Knowing versus doing. *Exceptionality, 13*(2), 65-67.
- Scarborough, A., Spiker, D., Mallik, S., Hebbeler, K., Bailey, D., Simeonsson, R. (2004) A national look at children and families entering early intervention. *Exceptional Children, 70*(4), 469-483.
- Schweinhart, L., (2004) *The High/Scope Perry Preschool study through age 40. Summary, Conclusions, and Frequently Asked Questions*. High/Scope Educational Research Foundation. Retrieved on January 4, 2009 from http://www.highscope.org/file/Research/PerryProject/3_specialsummary%20col%2006%2007.pdf
- Shapiro, B. J., Derrington, T. M. (2004). Equity and disparity in access in services: An outcomes-based evaluation of early intervention Child Find in Hawai'i. *Topics in Early Childhood Special Education, 24*(4), 199-212.
- Shook, K. (1999). *Does the loss of welfare income increase the risk of involvement with the child welfare systems?* Ann Arbor, Michigan: University of Michigan Poverty Research Center, School of Social Work.
- Shonkoff, J., Phillips, D. (2000) From Neurons to Neighborhoods: The science of early childhood development. Committee on Integrating the Science of Early Childhood Development, Board on Children, Youth, and Families. *National Academies Press, Institute of Medicine*. Retrieved on January 8, 2009 from <http://books.nap.edu/openbook.php?isbn=0309069882>
- Smith, J., Brooks-Gunn, J., Klebanov, P. K., & Kyunghee, L. (2000). Welfare to work: Complementary strategies for log-income women? *Journal of Marriage & Family, 62*(3), 808-822.
- Stahmer, A., Sutton, D. T., Fox, L., & Leslie, L. (2008). State Part C agency practices and the Child Abuse Prevention and Treatment Act (CAPTA). *Topics in Early Childhood Special Education, 28*(2), 99-108.
- Sullivan, P.M., & Knutson, J. F. (2000). Maltreatment and disabilities: A population-based epidemiological study. *Child Abuse & Neglect, 24*(10), 1257-1273.
- Temple, J. A., & Reynolds, A. J. (2007). Benefits and costs of investments in preschool education: Evidence from the Child-Parent Centers and related programs. *Economics of Education Review, 26*, 126-144.
- Tervo, R. C. (2009). Language proficiency, development, and behavioral difficulties in toddlers. *Clinical Pediatrics, 46*, 530-539.
- Tieman, B., Palisano, R. J., & Sutlive, A. C. (2005). Assessment of motor development and function in preschool children. *Mental Retardation and Developmental Disabilities Research Reviews, 11*, 189-196.

- U.S. Census Bureau. (2002). The big payoff: Educational attainment and synthetic estimates of work-life earnings. *Special Studies*, U.S. Department of Commerce and Statistics Administration, Washington, D.C. Retrieved February 9, 2009 from <http://www.census.gov/prod/2002pubs/p23-210.pdf>.
- U.S. Department of Education. (2008). *Infants and Toddlers with Disabilities Served Under IDEA, Part H*. 19th Report to Congress, Part II, Retrieved on October 20, 2008 from <http://www.ed.gov/offices/OSERS/OSEP/Research/OSEP97AnlRpt/pdf/section2.pdf>
- Vig, S., Chinitz, S., & Shulman, L. (2005). Young children in foster care. *Infants & Young Children: An Interdisciplinary Journal of Special Care Practices*, 18(2), 147-160.
- Wagner, M., Cameto, R., & Newman, L. (2003). *Youth with disabilities: A changing population*. Menlo Park: CA. SRI International. Retrieved on February 5, 2009 from http://policyweb.sri.com/cehs/publications/nlts2_report_2006_07.pdf.
- Wall, C. (1996). Homeless children and their families: Delivery of educational and social services through school systems. *Social Work in Education*, (18),135-144.
- Weinberg, L.A., Zetlin, A., and Shea, N.M. (2001). *Literature review on the education needs of children involved in family and juvenile court proceedings*. San Francisco, CA: Judicial Council of California, Center for Children, Families and the Court. Retrieved on April 11, 2008 from www.nhas-la.org.
- Wetherby, A. M., Woods, J., Allen, L., Cleary, J., Dickinson, H., & Lord, C. (2004). Early indicators of Autism Spectrum Disorders in the second year of life. *Journal of Autism and Developmental Disorders*, 34(5), 473-493.
- Wulczyn, F., Hislop Brunner, K., & Harden Jones, B. (2002). The placement of infants in foster care. *Infant Mental Health Journal*, 23(5), 454-475.
- Yeung, W., Linver, M., & Brooks-Gunn, J. (2002). How money matters for young children's development: Parental investment and family process. *Child Development*, 73(6), 1861-1879.
- Ziolko, M.E. (1991). Counseling parents of children with disabilities: A review of the literature and implications for practice. *Journal of Rehabilitation*, 57(2), 29-34.