Preschool Children with Special Educational Needs: Achievement, Retention, and Classification through Second Grade

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at George Mason University

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Fall Semester 2009
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Acknowledgements

I would like to thank my friends and family without whom I could never have completed this dissertation, especially my loving spouse, Ezra. My mentor and advisor, Adam Winsler, was an invaluable help. In addition, many thanks go out to my colleagues and fellow members of Winslab, for their tireless work doing data entry and related tasks, as well as to gone but not forgotten Winslab members Louis Manfra and Sue Hartman. I would also like to express my appreciation to Jerome Levitt of MDCPS for assistance with the follow-up data that made this research possible and would especially like to thank Roni Bader-Tables and Dolores Mendez for running such a fine early childhood program for children with disabilities and for their assistance on this project.

Data collection for this study was supported by the Early Learning Coalition of Miami Dade/Monroe (ELCMDM) and time for data analysis and writing was sponsored by the Children's Trust. The Children's Trust is a dedicated source of revenue established by voter referendum to improve the lives of children and families in Miami-Dade County. I would like to thank the dedicated staff at the Early Learning Coalition of Miami-Dade/Monroe, Miami-Dade County Child Development Services, and Miami-Dade County Public Schools, as well as the participating children, families, and teachers.

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Abstract

PRESCHOOL CHILDREN WITH SPECIAL EDUCATIONAL NEEDS: ACHIEVEMENT, RETENTION, AND CLASSIFICATION THROUGH SECOND GRADE

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Since the implementation of the Individuals with Disabilities Education Act and subsequent modifications (Public Law 108-446, 2004), millions of children have been enrolled in early special education programs as three and four year olds. Yet there continues to be a lack of empirical outcome studies of the outcomes for children who began their career in special education at such a young age. Comparisons with children who entered special education after preschool (kindergarten or first grade) are virtually non-existent. It is also acknowledged within the special education system that children experience many changes in services as they move through the system. The data for this dissertation came from the Miami School Readiness Project [MSRP] a longitudinal, collaborative project designed to improve the quality of child care in the county. Data available included assessment information from preschool special education programs, subsidized child care programs, and follow-up data from public elementary school in an

urban, ethnically diverse environment. Children enrolled in public school pre-kindergarten programs (*n* =359), community child care (*n* =284), and early childhood special education services (*n* =695) were assessed for overall development and socio-emotional protective factors in the fall and late spring of their pre-kindergarten year and then followed for several years in early elementary school. Children were assessed in the fall and spring of their pre-kindergarten year using the LAP-D (Nehring, Nehring, Bruni, & Randolph, 1992) or ELAP (Glover, Preminger, & Sanford, 2002), and the DECA (LeBuffe & Naglieri, 1999). Children with autism and developmental delays had the lowest developmental scores on average and showed the slowest rate of development in pre-kindergarten. There was significant movement of children both in and out of special education services and change from one primary exceptionality classification to another. Transitions out of special education in early elementary school, as well as changes in primary exceptionality classification were significantly related to pre-kindergarten assessment information. Children who left special education prior to second grade had lower scores on the cognitive and language portions of the LAP-D, and fewer behavior problems. Children with speech impairments often only spent one year receiving special education services, while children with autism, developmental delays, or emotional disturbances were likely to continue to receive special education services for all four years of the study. Children who were enrolled in pre-kindergarten special education had significantly higher grades and literacy skills as measured by kindergarten readiness tests, and were less likely to be retained in-grade in kindergarten or first grade than their peers who did not enroll in special education until early elementary school. Generally, even

children with severe disabilities showed positive gains in all areas over their pre-kindergarten year, and children appeared to benefit from pre-kindergarten special education. These children are being assigned fairly good grades and, as a group, just below average scores on school readiness assessments and standardized tests. It appears that most children in this jurisdiction with developmental disabilities are being identified, referred, and enrolled in special education services prior to elementary school.

1. Introduction

Millions of children have been enrolled in early special education programs, and yet there continues to be a lack of empirical study of the outcomes for these children. How much difference does that "extra" pre-kindergarten year or two of special education services make in the lives of individuals with disabilities? Comparisons between children who received early special education services and children who entered special education in kindergarten or first grade are non-existent. Research has shown that children who experience retention in grade and delayed kindergarten entry are more likely to be enrolled in special education services later on in school (Frey, 2005) – but what about children who have known disabilities as preschoolers? Are they more likely to enter kindergarten with their same-age peers or are they held back and given the "gift of time" before school entry? There is no research regarding the impact of retention in grade or transitions in and out of special education services, and yet the outcome studies that do exist indicate that these events do occur frequently in the lives of children with special needs (Jenkins et al., 2006.) This dissertation examines these questions within a population of children living in a diverse, urban area.

The argument supporting special educational services for preschool-aged children is the same basic idea supporting all early intervention programs: educational and therapeutic programs implemented in early childhood take advantage of early brain

plasticity and therefore are likely to compensate for some of the disabling effects of a developmental disability or other risky environmental condition (Farran, 2000). Growing acceptance of the idea that intelligence and adaptive functioning are not fixed genetic potentialities but are instead influenced greatly by environmental conditions has fed educational and social policy movements. These movements are aimed at helping those children born with developmental problems to have the highest possible quality of life and educational outcomes (Anastasiow & Nucci, 1994.)

As early as the 1890s, special programs were available in a few locations for children with hearing or visual impairments, and in the 1940s, nursery classrooms were established by the United Cerebral Palsy Association and other advocacy organizations to begin early therapy and socialization for children with physical disabilities (Safford, Sargent, & Cook, 1994.) For children with emotional or behavioral problems, educational activities were often seen (in special education) as ancillary to therapeutic treatments and mainly as a means for such children to form relationships with teachers, who in turn provided behavioral therapy (Safford et al., 1994). One important development was the conceptualization of specific learning disabilities as an inherently educational problem. The development of curricula for children with learning disabilities occurred in an educational context rather than a clinical one, but this diagnosis is not often used with preschool-aged children (Safford et al., 1994).

Emphasis on “mainstreaming” and “inclusion” in recent years has influenced a movement to integrate special services with general early childhood education programs (Safford et al., 1994). Widespread implementation of early childhood special education

programs in the 1980s and 1990s occurred at the same time as this emphasis. The more recent move toward universal pre-kindergarten in many states (Barnett, 2007) will likely further influence the implementation and accessibility of early childhood special education programs. Two groups of children are currently served in early childhood special education programs; children who are at risk of failing in school or being later enrolled in special education and children already diagnosed with a disability (Lerner, Lowenthal, & Egan, 1998). There are several important issues related to preschool special education that must be considered before examining the outcomes children enrolled in preschool special education experience later on in their educational careers. These issues include the history and context of preschool special education; curricula, services and therapies offered in preschool special education; access to services; identification, diagnosis and eligibility; and the prevalence of developmental delays and disabilities that render young children in need of such services. The next several sections will discuss these issues.

History and context of preschool special education

According to the United States Department of Education [USDE], during the 2001-2002 school year, 612,084 children ages 3-5 received special education services through Part B of IDEA in the 50 states and the District of Columbia (USDE, 2003). These children were served in a variety of contexts, within public school systems and with the cooperation of private agencies. These programs included early childhood programs, early special education preschool programs, home-based therapy programs, residential programs, inclusion programs, and reverse-mainstream programs (USDE,

2003). Home-based programs offer educational and therapeutic services to children who are either too medically fragile to attend a preschool program or when a home-based program is determined to otherwise be in the child's best interest, for example when a child has such severe behavioral difficulties that a group setting would be impossible. Children are placed in residential programs for similar reasons (Lerner et al., 1998). Reverse-mainstream programs and inclusion programs are both programs where children with special educational needs and children with typical educational needs are together in the same classroom. In a reverse-mainstream program, the majority of children in a classroom are children with special needs and a few "role model" children without special educational needs are placed in the class. In an inclusion classroom, a few children with special educational needs are placed into a typical preschool classroom (Safford et al., 1994). Similar to general early childhood educational curricula offered around the USA, these programs likely differ enormously in instructional model, therapeutic services offered, and other characteristics such as teacher training.

Historically, early childhood education and special education have had very different goals and purposes and so the integration of these has not been without complexity. Early childhood special education represents a unique place in the field of education (Odom & Wolery, 2003). Special education curriculum and instructional practices grew out of clinical influences and therefore focused on remediation of impairment whereas mainstream early childhood education practices focus on supplying socialization opportunities and preparing young children for more formal school (Safford et al., 1994.) This leads to differing assumptions and attitudes about the programs and

children in them by teachers, administrators, and other practitioners involved in the care and teaching of young children with and without special educational needs. Special education generally has a focus on impairment, and so teachers and other practitioners tend to focus on impairment as well. The Individual Education Plans [IEP] and Individual Family Service Plans [IFSP] mandated by IDEA (Public Law 108-446, 2004) reflect a deficit orientation in early childhood special education (Safford et al., 1994) that is not found in typical early childhood education programs.

Several ideas from special education policy and curriculum are important to consider in the context of early childhood special education because they may differ for preschool children. These include developmentally appropriate practices, least restrictive environments, and individualized instruction (Safford et al., 1994). NAEYC has developed guidelines for developmentally appropriate practice with typical preschool-aged children, and some early childhood special educators have identified a need for these guidelines to include the needs of children with disabilities (Lerner et al., 1998). Developmentally appropriate practices are defined as practices which follow the interests of young children as active learners (Lerner et al., 1998). Since there is little research examining the developmental differences between preschool-aged children with special educational needs and children without special educational needs, as well as such a huge variety of those needs within each group of children, it is very difficult to define "developmentally appropriate practices" for children with special educational needs. It may be the case that individualized instruction is even more important for preschool-aged children than for older children who have special educational needs. IDEA (Public Law

108-446, 2004) mandates that all children with special educational needs be placed in the least restrictive environment where they can be successful and this means that they must be given access to as much of the same educational opportunities and be integrated with non-disabled peers as much as possible given their own individual educational needs. Defining a least restrictive environment becomes difficult with a young child, because even typically developing preschool-aged children are not generally given a great deal of individual freedom of choice or environment.

Curriculum and program differences

Early childhood special education is different from both early childhood education and special education. It focuses more on family-centered services, special teaching approaches, and individualized educational goals than does traditional early childhood education. In addition, unlike special education practices for older children, early childhood special education focuses on the developmental skills children need later to thrive in school (Odom & Wolery, 2003). Current practice tends to be empirically based, and theoretically seated in a blend of behaviorist, cognitive-behavioral, and contextualism/behavior analytic thought (Odom & Wolery, 2003). In addition, similar to general early childhood education, instructional practices in early childhood special education borrow heavily from the ideas of Piaget and Vygotsky (Odom & Wolery, 2003). This has led to a unique integration of curricular and instructional practices.

In a study of pre-kindergarten outcomes for children enrolled in early childhood special education that compared instructional styles and parent-child interactions, Mahoney and his colleagues (Mahoney, Wheeden, & Perales, 2004) examined children's

development in three different types of classrooms, and parental interaction with the children. These researchers divided the participating classrooms up into three categories: didactic (structured activities, designed to help children master skills), developmental (child-initiated, child-centered, based on developmentally appropriate practices (Bredekamp, 1987)), and naturalistic (based on theories of intrinsic motivation and learning theory). These children were all enrolled in early childhood special education programs in non-inclusion classrooms within public schools. The mean age of the children was 50 months, and they were 62% male, and 82% Caucasian/18% African-American. These researchers did not compare children with different disabilities. Mahoney and his colleagues found that the children's developmental quotients were unchanged from the beginning to the end of the year (Mahoney et al., 2004) and that it made no difference what type of classroom the children were in. The only variable related to the children's development was parental sensitivity.

Another study followed 37 preschool-aged children enrolled in early childhood special education. In this study, half the children were in inclusion classrooms, half were in classrooms with only children with disabilities (Bruder & Staff, 1998). These children were assessed at 24, 30, and 36 months of age using a battery of developmental assessments, and were observed in the classroom and in a home visit. All of these children were in different classrooms, so there were no nested data. This study found little or no change in development over a one-year period – in other words, the children's gains did not change significantly academically or socio-emotionally after they were enrolled in special education (Bruder & Staff, 1998). These researchers speculated that

the developmental progress of these children was too subtle to be assessed accurately by the chosen instruments, and that this is why they found no statistically significant developmental change the year of the study (Bruder & Staff, 1998).

The problem with the above studies is that they were not designed to examine developmental change over time or growth trajectories during early childhood for children with disabilities. As a result they do little to inform us about this process – the study by Mahoney and colleagues was designed to compare curriculum differences and the study by Bruder and Staff was designed to compare the development of children in inclusion classrooms with children not in inclusion classrooms. Even if they tested the children twice or three times, they were using those assessments to test hypotheses about curriculum or classroom types and did not examine change over more than one year in a child's life. This lack of findings has important implications for this dissertation, because these researchers did not follow the children beyond the pre-kindergarten year, whereas this dissertation will examine both developmental change over the pre-kindergarten year as well as academic achievement in early elementary school for children in early childhood special education.

Identification, diagnosis and eligibility

Three major issues in the area of early childhood special education and early intervention are the proper and prompt identification of young children with, or at-risk for, disabilities, appropriate and timely diagnosis of those disabilities, and eligibility for special services. The heart of the problem is this: some areas of development are so linked in very young children, for example cognition and language, that testing skills in

those areas for diagnosis of a specific developmental disability may lead to inappropriate diagnoses (Anastasiow & Nucci, 1994). In an attempt to resolve this issue, the 1997 amendments to and reauthorization of IDEA (P. L. 105-17) included a new disability category in order to give children eligibility to receive services without forcing a specific diagnosis. Thirty-five states now use a term such as "developmental delay" or "early childhood disability" as a category for inclusion in preschool special education services and/or early intervention (Danaher, 2004). There are clearly problems with identification and referral of young children, as researchers have found that only 15% of children receiving special education services in elementary school received early intervention as toddlers or preschoolers (Wolery & Bailey, 2002).

Many different variables may help or hinder a family from accessing early intervention or early childhood special education services. Some identified by researchers include low-income status and participation in programs such as Early Head Start (Wall et al., 2005). Wall and her colleagues found that children attending Early Head Start programs in Iowa were more likely to access early intervention or early childhood special education services than peers who did not attend Early Head Start programs. They found that the key to this heightened level of access was the tireless work of Early Head Start staff, who helped families negotiate the complex bureaucracy and paperwork to get children referred and evaluated in a timely fashion (Wall et al., 2005).

In a study that randomly assigned eligible children either to receive Early Head Start services or a control group (Peterson et al., 2004), researchers found that 87% of the children who were enrolled in Early Head Start showed indicators of disability. These

indicators included four categories, the first was comprised of children who actually received Part C early intervention services (IDEA, P. L. 105-17). Part C early intervention services are designed to serve children with, or at-risk for, developmental delays during early childhood. The other three categories were as follows: children who had diagnosed conditions (these children should have been eligible for Part C early intervention services due to an already diagnosed condition), children who had suspected delays (via a developmental assessment or a parent who suspected a developmental delay), and children who had biological risks (such as pre-term birth or anoxia during labor) (Peterson et al., 2004). This is strong evidence that children from low-income families are at high risk for developmental delay, either through biological factors such as nutritional deprivation or prenatal teratogen exposure, or through environmental factors such as maternal depression. The study by Peterson and her colleagues was designed to examine the experiences of families with children with disabilities in Part C early intervention services and Early Head Start, and to create a picture of the children within those families. Although these researchers found that 87% of the children were likely eligible for early intervention, only 4.7% of the children were actually receiving such services. Another important finding from this study is that although the risk factors for developmental delay were the same in the control group and the Early Head Start group, the children who attended Early Head Start were much more likely to be referred and receive early intervention services. There was no follow-up mentioned after these children were older than 36 months (and no longer enrolled in Early Head Start.)

There is a great need for research examining the relationship between poverty and special educational needs, and one of the contributions of this dissertation is that the sample of children in the study is from an urban area with high poverty rates, high numbers of minority children and children with recently immigrated parents. This dissertation will also follow these same children through second grade and examine their academic outcomes and other variables.

Another issue related to eligibility for special education services is that of transitioning out of special education (declassification). Few studies have examined this phenomenon. One recent study (Daley & Carlson, 2009) found that 16% of preschool-aged children who were enrolled in pre-kindergarten special education services were declassified (no longer enrolled in special education services) after the first two years of the study. Daley and Carson outline findings from a number of publications and government reports detailing transitions out of special education services and show that a similar percentage of children tend to be declassified during the early elementary years, but note that this phenomenon is highly related to education policy and the policies of individual school districts (2009). Walker, Singer, Palfrey, Orza, Wenger and Butler (1988) also examined transitions out of special education services and found that 17% of the children in their study were declassified over a two-year period. This study (Walker et al., 1988) was not focused on pre-school aged children, and the children ranged in age from 5–12 years old. Both of the above studies found that transitioning out of special education was related to primary disability category, as well as a number of other demographic factors such as poverty status and race. In both studies, children with only

speech impairments were the most likely to leave special education. Daley and Carlson also found that high rates of behavioral problems were associated with staying in special education (2009). In this dissertation, transitions in and out of special education during pre-kindergarten and the first three years of elementary school are examined in detail.

Prevalence and stability of disabilities in preschool-aged children

Reported rates of disabilities in preschool-age children are highly variable, with a median overall rate of psychopathology in preschool children found to be 8% (Roberts, Attkisson, & Rosenblatt, 1998). It is very difficult to discuss general prevalence of all the disabilities which are eligible for special educational services, so what follows is a brief discussion of the prevalence of several diagnoses, including mental retardation [MR], autism spectrum disorders [ASD], communication disorders, and behavioral disorders. Many disorders prove to co-occur, complicating the question enormously. For example, the majority of children with autism spectrum disorder also are diagnosed with mental retardation, so when researchers attempt to estimate prevalence there is always a decision to be made regarding in which group to place children (Fombonne, 2003).

In a comprehensive review of research on behavioral problems in children aged 3-5 years across the general population, Qi and Kaiser found rates of 3-6%, with much higher rates (16-30%) reported in low-income children. Other researchers (Lavigne et al., 2001) found that although a behavioral disorder diagnosis of some kind was stable over the preschool and elementary school years, the diagnosis itself might change several times over that time period. Lavigne and his colleagues state that oppositional defiant disorder [ODD] is the most common diagnosis amongst preschool-age children (Lavigne

et al., 1996). In the 2001 (Lavigne et al.) study, children who were initially diagnosed with Oppositional Defiant Disorder were likely to simply have other diagnoses added (such as attentional deficit hyperactivity disorder [ADHD]), whereas children who were initially diagnosed with ADHD in preschool were likely to have a completely different diagnosis by the age of seven. In their 1996 study, Lavigne and his colleagues found that 2% of children aged 2-5 already had a diagnosis of ADHD, and it was always comorbid with another disorder, usually ODD. Another study that reviewed the rates of ADHD in children ages 2-5 found rates ranging from 2-6% in non-clinical samples, and up to 59% in clinical samples (Connor, 2002). Rates of behavioral disorders in preschool-age children are difficult to ascertain, due to problems diagnosing very young children with these disorders. The range of normal behavior in early childhood includes many oppositional behaviors, aggression, and other difficulties so many clinicians hesitate to diagnose young children with such disorders (Connor, 2002, Lavigne et al., 1996, Lavigne et al., 2001).

When estimating the prevalence of mental retardation in the general population, it is important to note that there are at least two distinct groups of individuals with mental retardation: those for whom there is a clear biological cause of the mental retardation and those for whom there is not a clear biological cause (Murphy, Boyle, Schendel, Decoufle, & Yeargin-Allsopp, 1998). A biological cause may be a defined disorder such as Downs Syndrome or a biological insult such as prenatal alcohol exposure. In theory, since MR is defined by a normal curve of intelligence, 3% of the population should have some form of MR and the majority of individuals with MR should have a mild form. However

research has found that this is not the case and that severe and pervasive forms of MR occur more frequently than would be predicted by the normal curve (Murphy et al., 1998). For young children (ages 0-4), the prevalence of MR has been estimated to be as low as 0.001% and as high as 0.1%, these differences are probably due to different diagnostic criteria for "adaptive functioning" (Murphy et al., 1998) as well as complications in diagnosis related to assessment of young children.

The median prevalence rate of autism spectrum disorders has been shown in several studies (CDC, 2007, Fombonne, 2003) to have risen significantly over the past several decades in part due to increased public awareness but also due to factors such as diagnostic substitution (children who in the past would have been diagnosed with something other than an ASD such as ODD or mental retardation), and increased diagnosis of children with mild forms of ASD such as Asperger's disorder (Wing & Potter, 2002). Current US estimates are that 0.7% of children under the age of 18 have been diagnosed with an ASD (CDC, 2007), and more conservative estimates from other research (Fombonne, 2003) places autism prevalence at 0.34% of the population.

Communication disorders are another common diagnosis in early childhood, and they are very heterogeneous. Again, studies of prevalence are complicated not only by the wide range of normal speech and language abilities in young children, but by differences in diagnostic criteria and comorbidity with disorders such as autism and mental retardation. Researchers have found prevalence rates ranging from 1.7% to 11.08% during early childhood (ages 3-8) depending on the criteria used and population studied (Pinborough-Zimmerman et al., 2007). In that same study, the prevalence of

communication disorders generally was found to be 6.3% across multiple sites and significant comorbidity with ASD, MR, and emotional/behavioral disorders was found. When children with autism spectrum disorders and intellectual disabilities were removed, the prevalence of communication disorders significantly decreased to 5.91%. A total of 12% of the children with communication disorders in this study had a comorbid emotional or behavioral disorder of some kind (eg: ADHD, conduct disorder, or OCD) (Pinborough-Zimmerman et al., 2007.)

Educational outcomes for children enrolled in special education programs

Studies examining the educational outcomes for children who are enrolled in special education have revealed a number of negative outcomes during later school years and into adulthood (Farran, 2000). A few studies examining outcomes for children with disabilities enrolled in early intervention services or preschool special education have been conducted. One important study followed children from age four to nineteen after a four-year intervention beginning in pre-kindergarten and ending in second grade (Longitudinal Comparison Project (Cole, Dale, Mills & Jenkins, 1993; Jenkins et al., 2006; Mills, Dale, Cole, & Jenkins, 1995). This was a small "boutique" type program, a model program designed to empirically compare curricula for preschool-aged children with special educational needs. The children were randomly enrolled into one of two different special education preschool curricula and then into classrooms within the programs, but all were eligible for state special education services. The two preschool programs were direct instruction, an academically based program, and mediated learning, a cognitive skills based program (Jenkins et al., 2006). Follow-up of these children during

the first few years after pre-school revealed that there were no differences in functioning related to the type of instruction, but rather there were instruction X aptitude interactions (Cole et al., 1993). Children who began the program with lower functioning showed more improvement in overall cognitive functioning if they were enrolled in the direct instruction program while the children with higher initial functioning showed more improvement if they were enrolled in the mediated learning program.

Of the original group of preschool-age children, 129 were followed through 19 years of age, collecting demographic information and conducting yearly assessments (Jenkins et al., 2006). At age 9, the best predictors of functioning were the early measures of language and cognition, assessments that occurred after the first 6-10 months of the intervention, not the initial pre-tests which were performed before the intervention began (Mills et al., 1995). These researchers found quite a bit of variability among the different disability groups at 19 years of age. Individuals who were no longer labeled with a disability had IQ scores right around the national norm. On the other hand, individuals diagnosed with mental retardation or multiple disabilities as preschoolers (such as co-morbid mental retardation and emotional disturbance) had scores markedly lower than all other groups at 19 years of age, with other disability classifications (learning disability, emotional disability, and health impairment) scoring in between. This indicates that educational outcomes are different for individuals with different types of disabilities. They also found that cognitive ability in preschool as measured with a standardized assessment of general intelligence was the best predictor of educational and quality of life

outcomes for young adults – as opposed to other predictors such as social or emotional abilities or scores on a standardized test in early elementary school (Jenkins et al., 2006).

These researchers (Jenkins et al., 2006) found a large amount of change in whether individual children were enrolled in special education services at any given moment during their educational careers. For example, 41% of the original preschool-aged group was no longer in special education at age 9 (Mills et al., 1995), whereas 40% of that same group of preschool-age children were no longer in special education at age 19. Different groups of children were enrolled in special education services at these two time points, but no one factor or specific constellation of factors described these groups. A total of 10 children within the original group of 129 had moved out of enrollment in special education by age 9, then back into special education by age 19. In addition, 23 children had been reclassified from one disability to another during that time period. All together, 82 children out of the original 129 (61% - all of whom were eligible for special education services when they entered school) were reclassified either as no longer needing special educational services (49) or with a different disability (33). Movement in and out of special education services was especially marked for children diagnosed with learning disabilities. There may be child-level variables that were not measured in this research that could explain mobility in and out of special education services.

Many different studies have examined longer-term outcomes for children enrolled in special education during elementary or secondary school. One such study found that individuals who had been enrolled in special education programs showed a high likelihood of being unemployed (34%) (Haring & Lovett, 1990). Another study of adult

outcomes for individuals who were enrolled in special education in elementary and secondary school revealed that 3-5 years after high school graduation, only 37% of these individuals were employed (Blackorby & Wagner, 1996). These same researchers found that only 14% of the individuals who had been enrolled in special education had received any kind of post-secondary education compared to 53% of the youth in the general population. Levy, Perhats, Nash-Johnson, and Welter (1992) found that adolescent girls with mild mental retardation had a higher rate of teen pregnancy than girls without a disability. Other research has found that post-school outcomes for individuals with disabilities vary widely by disability group, with individuals diagnosed with severe emotional disturbance having the most difficulty attaining and maintaining employment, getting access to post-secondary education, and being unlikely to be married when compared to their peers with other disabilities (Wagner, 1995). Preschool special education programs are less well studied. Despite many years of federally mandated educational opportunities for preschool-aged children (Public Law 108-446, 2004 [IDEA]) , it is not known how much difference those two extra years of pre-kindergarten education make in the lives of children with special educational needs.

The longitudinal study described by Jenkins and his colleagues above contributes greatly to our understanding of the outcomes experienced by children with mild or moderate developmental delays who were enrolled in a preschool special education program. They examined stability in special education enrollment and revealed that enrollment in special education changes markedly for children as they move through the primary grade school years. They also found that, unlike the findings in other studies of

early intervention programs designed for children who live in poverty or other risky environmental conditions, the effects of the preschool special education program did not fade over time. These children were still showing positive achievement effects at age 9 and at age 19, as their scores were higher than was predicted by initial testing in preschool (Jenkins et al., 2006.) Some limitations of this research include that the group of children was relatively small (129 participants), and the children all had mild or moderate disabilities and was therefore not representative of all children enrolled in preschool special education. The sample of children with disabilities in this dissertation includes children with a large range of disabilities; severe, moderate, and mild. This study was also a model program, and while it contributes greatly to our understanding of outcomes for children with special educational needs who attend early special education programs, it does not examine how children are gaining academically or otherwise in an ecologically valid, large scale, business-as-usual manner. This dissertation does just that, in that it examines developmental gains through pre-kindergarten and educational outcomes for children participating in a high-quality, pre-kindergarten special education program in a large urban school district.

School Readiness and Special Education

School readiness is an area of great debate within the educational community, and definitions vary from "the school system must be ready for the children that will enter it" to "individual children must be mature enough for formal schooling" (May & Kundert, 1997). A common finding in this research is that a variety of children's abilities at school entry are highly correlated with academic achievement (Snow, 2006). Programs and

polices that promote academic and social/emotional skills are becoming an important part of early childhood education (Duncan et al., 2007), and assessment for school readiness has become a part of many children's pre-kindergarten experience (Snow, 2006).

This is another area of research where there are few studies focusing on children with special educational needs. A search revealed only one article, and it was not an experimental article but rather an article examining the concept of school readiness and how it might be damaging to children with disabilities (Farran & Shonkoff, 1994). More and more school systems are requiring school readiness testing for children entering kindergarten (May & Kundert, 1997), and as such, it is important to learn whether or not children with disabilities are required to take these readiness assessments, and if so, how they are scoring on them. Since school readiness testing is purportedly used, ultimately, to reduce school failure, the question of whether or not such testing is at all appropriate for children with already-identified special educational needs is relevant and important (Farran & Shonkoff, 1994). This dissertation will examine school readiness testing and scores for children who were enrolled in pre-kindergarten special education.

Retention in-grade

Rates of retention in-grade for all children in the United States overall have been reported in various studies to be between 16-28% cumulatively for all grades, and tend to average around 20%. In the primary grades (K-3) similar retention rates are reported as for other grades – 16%-18% (Frey, 2005). Children who are from minority populations (Hispanic/Latino or African-American), who live in impoverished conditions, who are boys, and who have low parent involvement tend to be retained in higher numbers than

other children (Frey, 2005). Generally, the studies reviewed by Frey (2005) have found that retention in higher grades is not positive for children academically, seems to be damaging socially and emotionally, and is associated with higher school drop-out rates. Even as adults, individuals who were retained a grade in school earn lower wages and are less likely to attend college than individuals who were not retained in any grade (Frey, 2005). The National Center for Educational Statistics reports that in their study of the kindergarten class of 1998-1999, 5% of the children were retained in kindergarten (NCES, 2006). These studies do not discuss retention in-grade for children with special needs, but often state that after retention, children are statistically more likely to be retained again. In addition, a great deal of this research is examining retention for children in later grades and there is some indication that retention in kindergarten or first grade is not correlated with as many negative outcomes (Frey, 2005). In a large review of research on retention and academic redshirting, Frey (2005) predicts that with the advent of frequent high-stakes testing in more grades that this trend of increased retention in-grade will continue. One problem with this research, however, is that there is frequently no control group of children who were not retained in grade and therefore it is difficult to tell whether or not retention in grade caused these problems or was related to the reasons that the children were retained in the first place.

Delayed kindergarten entry

Related to retention is the issue of delayed entry into kindergarten, sometimes called academic redshirting or voluntary retention. Instead of a child being kept back a year once they have entered school, parents decide (sometimes after being strongly

encouraged by teachers) to keep them in preschool an extra year, to give a "gift of time." This is done for a myriad of reasons, but most parents cite immaturity or their child just being young for their age (Graue & DiPerna, 2000). Other reviews of this literature have found higher rates of voluntary delayed entry than Graue and DiPerna - of 9-10% (Frey, 2005, Stipek, 2002). Voluntary delayed entry into kindergarten is most often experienced by male children from affluent and middle-class families who have birthdates within a few months of the cutoff for entry into kindergarten (Stipek, 2002). In their study of 8,000 students in a sample of several school districts, Graue and DiPerna found that, overall, 7% of children had voluntary delayed school entry. They performed better academically than children who were retained in kindergarten or first grade, but similarly to children later retained in grade (after first grade), and were more likely to receive special education services than students who were not delayed in school entry. All children who were overage for their grade, whether through retention or academic redshirting, were more likely than typical-aged children to be enrolled in special education (Graue & DiPerna, 2000). This is an important finding because it may indicate one of two things: first that children with undocumented disabilities are often retained or red-shirted, and second that retention of any kind whether in-grade or prior to kindergarten may have negative effects for children.

Another study examined academic redshirting and whether or not it was related to later retention or enrollment in special education (May, Kundert, & Brent, 1995). The sample for this study was the 279 children who were found to have delayed school entry in one school district in 1991. The study was done with archival data from school files.

This study revealed that the children who had delayed kindergarten entry were less likely than their peers who entered kindergarten at the typical age to be retained in grade during grades K-5, but they were more likely than those same peers to be enrolled in special education services (May et al., 1995). It is an interesting question whether or not some children with disabilities are kept in a pre-kindergarten program an extra year before entering kindergarten, as this may explain partly why these children are statistically more likely to be enrolled in special education once they enter school. I could find no research examining this, but would speculate that it may be a fairly common practice. One notable problem in these studies is a lack of comparison groups. Most studies of retention and academic red-shirting are descriptive in nature and do not attempt to compare retained children with similarly functioning children who were not retained. This dissertation will examine retention and academic red-shirting for children who were enrolled in preschool special education programs as well as children enrolled in special education in kindergarten or first grade.

Retention and special education

Much of the research reviewed above indicated that children who are retained in grade are more likely to later be enrolled in special education services than children who are not retained in grade (Frey, 2005), but what about children enrolled in special education from the very beginning of school? There is no research to be found examining patterns of voluntary delayed entry into school or grade retention for children who are enrolled in special education before they first enter school. It may be the case that some children whose parents voluntarily delay their school entry actually have an

undocumented developmental disability or learning disability which is recognized by their parents only as immaturity but not yet diagnosed, leading to their being enrolled in special education services soon after entry into school. It may also be the case that some children with undiagnosed learning disabilities or behavioral problems are retained in the early grades before these disabilities are recognized or diagnosed and this is part of why children who are retained have higher rates of enrollment in special education. Again, this is speculation and highlights the need for research. Many questions remain regarding children who are enrolled in special education, rates of in-grade retention for these children, and other school transitions. These questions are important for policy, and from a pure research standpoint, they are part of a huge number of un-documented practices in education with very little empirical backing or examination.

Many gaps in our knowledge of the academic achievement and school experience for children with special educational needs remain. While we know that children who are retained in grade are more likely than their same-age peers to be enrolled in special education services, we know very little about overall patterns of retention and school transitions for children with special needs. Few studies have followed children with special educational needs from preschool through the early elementary school grades, and of those that have, the assessments used are clinical in nature and, as such, do not examine academic achievement like grades or standardized test scores. Arguably, outcomes like grades and scores on standardized achievement tests have much larger practical implications for children than do clinical assessments of intelligence or adaptive functioning. Some studies examine adult outcomes for children who were enrolled in

special education without much information about their school experience other than the most basic of information such as their diagnosis and that they received special education services. In addition, many of the described studies do not have an ethnically diverse sample or sample of children from a variety of socio-economic backgrounds. This dissertation is an attempt to get a complete picture of the experience and achievement for children who were enrolled in special education services in pre-kindergarten and the first few years of elementary school.

2. Study Overview

The data for this dissertation comes from the Miami School Readiness Project (Winsler et al., 2008) [MSRP]; a longitudinal, collaborative project including universities, state agencies, a public school system, and non-profit organizations. This project was designed to improve the quality of subsidized child care in the county through interventions, child assessment, and program evaluation. The population of children involved in the MSRP is large (N ≈ 50,000) and diverse (≈60% Latino/Hispanic, ≈30% African-American, ≈10% White/Other), allowing for detailed examination of sub-groups.

The children participating in this study all received special education services some time between pre-kindergarten and second grade, and can be divided into four groups based on their pre-kindergarten enrollment:

1) low-income children attending community-based child care centers via child care subsidies,

2) children attending a publicly funded public school pre-kindergarten program for typical children who's parents paid a fee,

3) children attending a public school pre-kindergarten program for typical children via Title 1 subsidy, and

4) children with identified special needs attending a special education preschool program implemented by the public schools.

The first and primary purpose of this dissertation was to examine achievement outcomes of children enrolled in special education in pre-kindergarten through second grade. This dissertation examines the pre-kindergarten achievement of the children enrolled in early special education programs, and their transition to kindergarten. In addition, the academic achievement of children with special educational needs through second grade is examined and compared with the same outcomes for children who entered special education services after preschool (in kindergarten or first grade). The second purpose of this dissertation is to examine the transitions children receiving early special education services experience in early elementary school. Transitions may be moving in or out of special education services (de-classification), changes in primary disability category (re-classification), and retention in grade. Research on in-grade retention and delayed entry into kindergarten for the general population has shown that these events are correlated with a variety of outcomes (Frey, 2005, Graue & DiPerna, 2000); however, there is no research on how these events may influence the lives of children already receiving special education services. This dissertation used an existing database of assessment information from preschool special education programs, subsidized child care programs, and follow-up data from public elementary school in an urban, ethnically diverse environment to examine outcomes for children receiving special education services.

3. Research Questions

1) How are children enrolled in a pre-kindergarten special education program gaining academically and socio-emotionally during their pre-kindergarten year, both overall and considered separately by primary disability category upon entry to special education?
2) How are children who were enrolled in a preschool special education program doing in early elementary school?
    a) How often do they have apparently voluntary delayed kindergarten entry?
    b) How do they perform on kindergarten school readiness tests, if they even take them?
    c) What primary disability categories are they placed in once they enter special education services in elementary school?
    d) How often are they retained in kindergarten, first, or second grade?
    e) What kind of grades do they receive?
    f) How do they perform on standardized tests in second grade?
        1. How many of them are exempted from taking standardized tests?
3) What kind of transitions do children enrolled in special education during pre-kindergarten or early elementary school experience?
    a) How many children exit special educational services in early elementary school?

1. Is exiting special education in early elementary school related to social/emotional, language, and/or cognitive assessment scores from their preschool years

b) Do children experience a change in primary disability category?

1. Are these changes related to social/emotional, language, and/or cognitive assessment scores from their preschool years?

4) Are there significant differences in pre-kindergarten assessment scores for language, cognition, social/emotional protective factors or behavioral concerns for children who were enrolled in pre-kindergarten special education and their peers who did not receive special education until early elementary school?

5) How do children who were enrolled in pre-kindergarten special education compare academically in the early grades with children with similar disabilities who entered special education services in kindergarten or first grade?

a) Are there differences in retention rates for children who were enrolled in preschool special education and children who did not begin to receive special education services until kindergarten?

b) Is the rate of voluntary delayed kindergarten entry different for children who were enrolled in special education during preschool than for same age children who were not enrolled in special education until kindergarten?

4. Method

Participants

The participants in this study consist of the cohort of children in the MSRP sample who were at least 4 years old on September 1, 2003. This grouping is not based on what grade they were enrolled in but that by the standard of the county they were eligible for enrollment in pre-kindergarten based on their age (age 4 on September 1, 2003, indicating that they were eligible for enrollment in kindergarten in September of 2004). Children in this group are referred to as Cohort B, because they were the second group of children eligible for kindergarten entry during the MSRP. Out of this overall group (Cohort B: N = 8,631), 1,338 received special education services at some point during pre-kindergarten, kindergarten, first, or second grade. This group of children from Cohort B, who were enrolled in special education services at some point during pre-kindergarten, kindergarten, first or second grade (N=1,338), is the core group of subjects for this dissertation and will be referred to as Cohort B-SE; the rest of the children from Cohort B who were not enrolled in special education services at any point during pre-kindergarten or early elementary school are not included in any analysis for this dissertation. The Cohort B-SE group can be broken up by their pre-kindergarten enrollment, and these are the numbers presented in Table 1. There are three major groupings presented in Table 1 based on pre-kindergarten enrollment: subsidized

community childcare (N = 284), public school pre-kindergarten (N = 359), and special education pre-kindergarten (N= 695). The children enrolled in subsidized community childcare attended a child care center, informal child care (such as a babysitter or kin care), or a family daycare via a voucher. Of the children who were enrolled in public school pre-kindergarten, 72% (of 359) attended a free Title 1 pre-kindergarten program, and the rest paid a fee for the same program at a non-Title 1 school. These numbers are also presented in Table 1. The children who were enrolled in special education pre-kindergarten are often separated from the rest of the Cohort B-SE children for analysis and will be referred to as Cohort B-ESE. In Table 1, the Cohort B-ESE group is further broken down based on their elementary school status. Some of the ESE children (10% of 695, N = 67) were not enrolled in special education services after pre-kindergarten and another 11% have no available elementary school data. Of the 1,338 children in the Cohort B-SE group, elementary school data are available for 1,261 children - 6% (77/1,338) of the pre-kindergarten participants either left the district, or were enrolled in private or parochial schools for elementary school. Children who did not enter into special education services until sometime in their first three years of elementary school will be referred to as Cohort B-ELSE (N = 643).

While the overall Cohort B group is 50% male, 71% of the Cohort B-SE children were male. This study took place in an urban area with a high percentage of recent immigration and poverty. Data about free or reduced lunch status in kindergarten were available for 1,141 (90%) of the 1,261 children who received special education services during elementary school. Of these children, 864 (76%) applied and were eligible for free

or reduced lunch in kindergarten. Similar numbers were found in first and second grade. In the MDCPS school district, 71% of all children (K-5th grade) applied and were eligible for free or reduced lunch. This indicates that similar numbers of children in the Cohort B-SE group live in poverty as in the overall district.

Another area that must be examined for this smaller group of children is the possibility of over-representation of African-American, American Indian, or Hispanic/Latino children in special education. It has been found (Coutinho & Oswald, 2000) that children from these ethnic groups tend to be over-represented in special education generally and specifically in the learning disability and emotionally disturbed diagnoses. This is not a research question being examined at length in this dissertation, but it is nonetheless important to note if this pattern is found in this group of children. In the overall group of children who received special education services at some point in pre-kindergarten, kindergarten, first or second grade (N=1,338) the percentages of each ethnicity (Hispanic/Latino 59%, African-American 30%, white/other 10%) are similar to that reported by the school district (2003-2004 Summary: Districtwide) for children in grades pre-k – 5 (Hispanic/Latino 59%, African-American 28%, White 10%, other 3%), so it would appear from this very superficial look at these demographics that the pattern of over-representation found in other studies is not taking place in this cohort of children in the Miami-Dade County Public School system.

Disability Classification

All children who were enrolled in special education services at any time were assessed within the school system for eligibility, and were assigned primary disability

categories for that purpose. The Miami-Dade county school system, at the time, used 17 primary disability classifications as follows: educable mentally handicapped, trainable mentally handicapped, orthopedically impaired, speech impaired, language impaired, deaf or hard of hearing, visually impaired, emotionally handicapped, specific learning disabled, hospital/homebound, profoundly mentally handicapped, dual-sensory impaired, autistic, severely emotionally disturbed, traumatic brain injured, developmentally delayed, and other health impaired. For the purposes of this dissertation, the children whose primary disabling conditions are orthopedic or sensory (such as children with a visual or hearing impairment), children with traumatic brain injuries, and children who were hospital or homebound are excluded from the analyses (total N= 38, they are not included in the numbers given above). The remaining groups are collapsed into seven groups, based on their primary disability category category at elementary special education entry, since many have very small numbers of children. The seven groups are as follows: developmentally delayed ([DD], N=99, educable mentally handicapped, trainable mentally handicapped, profoundly mentally handicapped, and developmentally delayed), learning disability ([LD], N=468), speech impaired ([SI], N=284), language impaired ([LA], N=55), emotionally disturbed ([ED], N =119, emotionally handicapped or severely emotionally disturbed), other health impaired ([OHI], N= 41), and autistic ([A], N=91). It is important to remember that these classifications are based on the primary disability category listed on each child's Individual Education Plan [IEP] upon entry into special education services in elementary school (kindergarten, first, or second grade), and as such, may be different from the clinical diagnosis a child would receive

from a psychiatrist or psychologist. The classifications are used by the school system to determine eligibility for special education services, so the primary disability category category on an IEP reflects this. It is important to bear in mind that it is likely that many of these children have a second or even a third clinical diagnosis which is not reflected in the IEP and unavailable for analysis because this information is not gathered by the school system. Children may experience a reclassification in their primary disability category based on their own changing needs or changes in the way the school system assesses eligibility for special education services.

Measures, Assessments, and Other Dependent Variables

Preschool assessments, During the MSRP, all children attending private subsidized child care and publicly funded pre-kindergarten programs in Miami-Dade County were assessed at least twice yearly at age four for both general development (cognitive, motor, and language abilities) and for socio-emotional protective factors and behavior problems. Some children attending special education preschool programs were assessed more often. The assessments used for analyses in the study are described in the following section. Table 2 contains numbers of children who received these assessments, as well as assessments from elementary school.

The Devereux Early Childhood Assessment (DECA) (LeBuffe & Naglieri, 1999) is a parent- and teacher-report instrument developed to assess resiliency by examining socio-emotional protective factors and behavioral concerns in preschool children. It is divided into four subscales: Initiative, Self-Control, Attachment, and Behavioral concerns. The first three scales can be collapsed into a Total Protective Factors score,

with larger scores indicating better social-emotional protective factors. The Behavioral Concerns scale is scored such that larger numbers indicate more behavior problems. The DECA is a 37-item questionnaire with responses ranging from zero ("Never") to four ("Very Frequently"). It was created as a screening device to identify children's individual social and emotional strengths and weaknesses. It has identical parent and teacher forms, and the forms were created in English and then translated into Spanish (LeBuffe & Naglieri, 1999). Little reliability or validity data are available about the Spanish form of the DECA. According to the DECA Technical Manual, DECA items were created through a careful analysis of literature on resilient children and discussion with focus groups of parents and teachers. The authors gathered concise behavioral descriptions related to positive outcomes and used the best functioning of those items on their rating scales. The DECA was standardized using careful sampling of children (N = 2,000) who closely represent the U.S. population on various demographic characteristics (LeBuffe & Naglieri, 1999). They constructed separate standards for scoring the parent and teacher scales, recognizing that the school and home environments are different, however, children of all ages (2-5) and genders use the same (parent or teacher) standardization table for the calculation of Z scores, T scores, and national percentiles. Internal consistencies reported in the DECA Technical Manual were all above 0.7, and many were above 0.9, indicating high internal consistency. Within this diverse sample of children, internal consistency reliability of the DECA scales is above 0.9 for all three protective factors (intiative, self-control, and attachment) both parent and teacher report), 0.72 for parent-reported behavior concerns and 0.81 for teacher-reported behavior

concerns, and did not vary for the Spanish and English forms, or as a function of rater (Winsler et al., 2008).

Parents and teachers of all of the children in this study were asked to complete the DECA (in English or Spanish – their choice) at the beginning of the academic year (September/ October), and parents and teachers completed it again at the end of the school year (May/ June). More parents (35%) than teachers (19%) chose to complete the DECA using the Spanish language version. One parent form went home with the children from the center and parents were asked to complete it within two weeks and return it to the center. Teachers completed the forms around the same time period. Raw scores will be used in the analyses below.

The children were also assessed using the Learning Accomplishment Profile-Diagnostic (LAP-D; Nehring, Nehring, Bruni, & Randolph, 1992). The LAP-D is a developmental and curriculum-based instrument that is divided into four domains, each domain in subdivided into two subdomains: Cognitive (matching and counting), Language (comprehension and naming), Fine Motor (writing and manipulation), and Gross Motor (body and object movement). The LAP-D is scored through analysis of tasks performed by the children. The purpose is to determine instructional and developmental milestones for children ages 36 through 72 months (Lidz, 2003). For the children attending private child care, the LAP-D assessments were performed individually by trained assessors who came into the child's classroom. The assessors all had masters degrees in social work, education, psychology, or a related field. For the children in pre-kindergarten special education, or who attended preschool programs

within public schools, the teachers performed their LAP-D assessments. The LAP-D raw scores were also given as equivalents to months of age, and were converted into standardized scores and percentile rankings (Nehring et al., 1992). The assessment was given in English (73%) or Spanish (27%) based on which language the child's teacher and the assessor believed was the child's strongest language.

The LAP-D was standardized using a sample of preschoolers (N = 792) selected to represent preschoolers according to the 1990 U.S. Census. Internal consistency for the LAP-D during standardization was confirmed for each subscale, alphas were significant and high in magnitude, ranging from $r = 0.76 - 0.92$. Content validity was established by a review panel of eight early childhood experts, and by administering several other established instruments. Correlations with domains in these instruments and the LAP-D were significant and moderately high in magnitude, ranging from $r = 0.68 - 0.80$ (Nehring et al., 1992). Internal consistency reliabilities for the LAP-D with the present sample ranged from 0.93 to 0.95 (Winsler et al., 2008).

Some children in the preschool special education program were assessed using the *Early Learning Accomplishment Profile* [ELAP] (Glover, Preminger, & Sanford, 2002), which is a version of the LAP-D providing a systematic method for measuring child functioning in all children up through age 36 months. It was used instead of the LAP-D for measuring development in all domains for children who may be functioning in the 0-36 month range. The ELAP is similar to the LAP-D, and measures six domains: gross motor, fine motor, cognitive, language, self-help, and social-emotional skills. It is a criterion-referenced instrument, and therefore does not yield the same results as a

standardized, norm-referenced test such as the LAP-D (Hardin & Peisner-Feinberg, 2001). The ELAP was chosen as an option by the school system because of it's similarity to the LAP-D so that children's developmental age scores can be compared over time. The test yields raw scores and approximate developmental age scores, however only developmental age scores are available for analysis for this study.

School readiness measures, During the early fall months of their kindergarten year, children were assessed in a statewide assessment program implemented by the state board of education to measure the school readiness of all kindergarteners. This program is called the School Readiness Uniform Screening System (SRUSS). Assessment is composed of two measures: the Early Screening Inventory (ESI-K) (Meisels, Marsden, Wiske, & Henderson, 1997) and two subscales of the Dynamic Indicators of Basic Literacy Skills (DIBELS) (Good & Kaminski, 2002). The school system has provided data on why some children were exempted from the school readiness assessments.

The ESI-K is a brief developmental screening instrument that identifies children who may need special education services to be successful in school. It assesses sensory, developmental, and behavioral concerns in three areas: visual motor/adaptive, language and cognition, and gross motor skills. The ESI-K provides a continuous score, with higher numbers indicating more school readiness skills, and based on these scores children are given a description of *Ready Now, Getting Ready, or Not Ready Yet.* The ESI-K was standardized with data collected on over 5000 children enrolled in 60 preschool classrooms in a large variety of classroom situations (Head Start, public and private preschools, etc.) in 10 states (Meisels et al., 1997).

The DIBELS assessment is composed of a set of standardized, individual administered measures of early literacy development. These measures were created to assess a child's development of phonological awareness, alphabetic understanding, and automaticity and fluency with text. For the SRUSS assessment, two of the DIBELS were included: Initial Sounds Fluency (ISF) – a child's skill to identify and produce the initial sound of a word, and Letter Naming Fluency (LNF) – a child's ability to name randomly arranged letters. Overall scores for each domain are given (bigger scores are better) based on the number correct and duration of response. Scores are also translated into four outcome categories for each domain: *Above average, Low risk, Moderate risk*, or *High risk* for not achieving early literacy benchmarks.

Elementary school grades, Grades in elementary school were measured using the average final grade given to students by their teacher across all subjects. During elementary school in this county, children are graded in 10 subject areas (art, music, physical education, math, science, social studies, reading, language arts, English as a second or other language [ESOL], Spanish, and handwriting.) In kindergarten, grades are assigned on a three point scale (not satisfactory = 1, satisfactory = 2, or excellent=3.) After kindergarten, grades are assigned on a typical 5-point scale (A=5, B=4, C=3, D=2, and F=1.) These grades were transformed into numbers, and averaged for children in each diagnostic category for kindergarten, first, and second grade.

Standardized testing, Children in this county do not take standardized tests during kindergarten or first grade (except for the school readiness assessments discussed above). The Stanford Achievement Test Series, 10th Edition (SAT-10, 2003) was utilized by the

state during the 2006-2007 school year for norm referenced testing in second grade. The SAT-10 is a multiple-choice assessment for objective measurement of achievement that is untimed and has 13 levels (kindergarten – Grade 12). Second graders take the reading and math portions of this test. Data on why children did not receive the standardized testing are not available, so examining this phenomenon is complex. Only children who have all other grade 2 data, but are missing SAT-10 scores will be considered, and percentages of typical children and children receiving special education services who are missing this score will be compared. This is because a number of children miss this assessment because they are absent the day of the test.

Retention in-grade and delayed kindergarten entry, The definition of "retention in-grade" and "delayed kindergarten entry" are important and more complicated than they may seem. A child was considered "retained in-grade" if they had two full years of data for the same grade, eg: kindergarten grades from the end of the school year for two years of kindergarten. A child was considered as having delayed kindergarten entry if they were eligible to enter kindergarten in a certain year (were 5 years old on or before September 1), had no kindergarten data for that year, and had full data for kindergarten the following year.

5. Results

Preliminary Analyses

The main purpose of this dissertation is to examine academic achievement in early elementary school for children who were enrolled in pre-kindergarten special education programs. In this dataset, we have available assessment data for 694 children who were enrolled in pre-kindergarten special education service, 11% (N=77) of those children do not appear at all later in the data provided by the school district for kindergarten, first grade, or second grade. Several one way ANOVAs were used to examine differences in group means for the children who appeared in the elementary data (N=617) and the children who did not (N=77), on the LAP-D and DECA given at the beginning of the children's pre-kindergarten year. These analyses revealed that there were no significant differences in the children's fine motor (manipulation: $F(1, 457) = 2.02$, $p = .16$, writing: $F(1, 457) = .07$, $p = .80$), language (naming: $F(1, 429) = 1.24$, $p = .27$, comprehension: $F(1, 418) = 1.42$, $p = .24$), or cognitive (matching: $F(1, 449) = .43$, $p = .51$, counting: $F(1, 436) = .06$, $p = .81$) skills. There were also no significant differences in teacher- or parent- reported DECA scores (Initiative (teacher: $F(1, 215) = .01$, $p = .91$; parent: $F(1, 178) = .81$, $p = .37$), Self-control (teacher: $F(1, 215) = .004$, $p = .95$; parent: $F(1, 178) = .85$, $p = .36$), Attachment (teacher: $F(1, 215) = .70$, $p = .41$; parent: $F(1, 178) = .05$, $p = .82$), or Behavioral concerns (teacher: $F(1, 215) = .21$, $p = .65$; parent: $F(1,$

178) = .52, p = .47)). All of the above indicates that there are no systematic differences in the developmental skills, social/emotional protective factors or behavioral concerns for the children who did not appear later in the information provided by the elementary schools. This also indicates that for children who receive special education services in pre-kindergarten, the choice to attend MDCPS (or not) is not related to child competence at age 4.

Research Question 1

How are children enrolled in a pre-kindergarten special education program gaining academically and socio-emotionally during their pre-kindergarten year, both overall and considered separately by primary disability category?

Overall pre-kindergarten special education group (Cohort B-ESE), The first part of research question 1 concerns developmental progress over the pre-kindergarten year for children who were enrolled in pre-kindergarten special education. Mean assessment scores from all children (all children with data for the fall assessment, and all children with data for the spring assessment, regardless of whether they are the same children) and from children who were assessed using the full LAP-D (or DECA) in both the fall and spring (repeated-measures sample) were very similar. First, an overall look at assessment scores was conducted, and then repeated-measures MANOVA was used to examine change over the pre-kindergarten year. Means and standard deviations on the LAP-D and DECA for all assessed children who were enrolled in pre-kindergarten special education can be found in Table 3.

Mean change scores for those children who were assessed in both the fall and spring indicate that children in pre-kindergarten special education have increased their raw LAP-D scores between the fall and spring assessment times in all domains. Figure 1 graphically represents the mean cognitive, language, and fine motor LAP-D scores for the repeated-measures sample and gives the means. Repeated-measures MANOVA was used to examine this change over time on the six subscale scores of the language, fine motor and cognitive domains of the LAP-D. Results indicate that the children who had full assessments during the fall and spring (N=353) had significant raw score gains on the LAP-D overall (Wilk's lambda = .193, $F(6,347) = 241.93$, $p < .001$). Univariate tests revealed that significant gains were made over the two time points for all six subdomains (language naming ($F(1, 352) = 449.58$) and comprehension ($F(1, 352) = 505.23$), cognitive matching ($F(1, 352) = 496.64$) and counting ($F(1, 352) = 340.75$), and fine motor writing ($F(1, 352) = 628.26$) and manipulation ($F(1, 352) = 468.90$) all $p < .001$.)

Repeated-measures MANOVA was also used to examine change over time on the teacher-reported DECA scales (Initiative, Self Control, Attachment and Behavioral Concerns). Figure 2 graphically represents change in teacher-reported DECA scores over the pre-kindergarten year for the repeated-measures sample and gives the means. Results indicate that the children with complete teacher-DECA questionnaires for both fall and spring (N=165) had significant gains on the DECA overall (Wilk's lambda = .601, $F(4, 318)) = 52.783$, $p < .001$). Univariate tests revealed that significant gains were made over those time points on all three protective factors scales (Initiative ($F(1, 164) = 66.20$),

Self-Control ($F(1, 164) = 45.30$), and Attachment ($F(1, 164) = 35.20$), all $p < .001$), as well as significant reductions in behavior problems ($F(1, 164) = 16.52$, $p < .001$).

Children who were unable to be assessed using the LAP-D were assessed using the ELAP (N=74 with at least one ELAP domain score at either time point). The LAP-D could not be used with these children because they were functioning below where it measures, a developmental age of 36 months. A highly variable number of children were assessed using the ELAP at each time point over the pre-kindergarten year, and this causes complex N problems for analysis. For most children who were assessed with the ELAP, only the Language and Cognitive domains were assessed (N=48). Very few children were assessed with the full ELAP at both the fall and spring time points (N=16). Table 4 contains means and standard deviations for all children assessed with the ELAP during their pre-kindergarten year. The numbers presented are developmental age equivalents as ELAP raw scores were not available. From these numbers, it appears that children assessed with the ELAP made almost no progress over their pre-kindergarten year, but a different pattern is revealed by repeated-measures analysis. Many children were only assessed with the ELAP at one time-point, so it important to consider the scores of children who were assessed with the ELAP at both time points.

To examine change over the pre-kindergarten year for these children who had the full ELAP at both time points (N = 16), a repeated-measures MANOVA was conducted. Figure 3 illustrates change over time for the children who were assessed with the full ELAP. Results indicate that on the ELAP overall, children made significant progress over the course of their pre-kindergarten year (Wilk's lambda = .31, $F(1, 15) = 3.75$, $p < .05$).

Univariate results revealed that significant gains were made over the two time points in the Gross motor ($F(1,15) = 17.23$), Fine motor ($F(1,15) = 8.92$), Cognitive ($F(1,15) = 10.74$), Language ($F(1,15) = 10.13$), and Self-Help ($F(1, 15) = 8.12$, all $p < .05$) domains but not the Social/Emotional domain ($F(1, 15) = 4.5$, $p = .05$).

Since such variable numbers of children were assessed on each domain of the ELAP, six separate repeated measures ANOVAs were conducted using each domain (cognitive, language, fine motor, gross motor, self-help and social-emotional) to gain a clearer picture of change over time for children assessed with the ELAP. Table 4 also contains means and standard deviations for these repeated-measures ANOVAs. For all but the social-emotional domain, repeated-measures ANOVAs indicated that children assessed with the ELAP show significant gains over their pre-kindergarten year (Cognitive: $F(1, 47) = 26.59$, $p < .001$, Language: $F(1, 55) = 44.08$, $p < .001$, Fine motor: $F(1, 17) = 8.65$, $p < .05$, Gross motor: $F(1, 16) = 20.49$, $p < .001$, Self-help: $F(1, 18) = 9.60$, $p < .01$, Social-emotional: $F(1, 15) = 4.54$, $p = .05$).

The above results indicate that children enrolled in pre-kindergarten special education make significant progress in all areas of development, and in their social-emotional protective factors as well as reducing behavioral problems. However, it is important to attempt to examine progress for children based on their primary disability category later on in school. The next section examines pre-kindergarten progress for children enrolled in pre-kindergarten special education, and splits up the children by diagnosis group.

Primary disability category groups, The next part of research question 1 examines pre-kindergarten assessment information for children who were enrolled in pre-kindergarten special education (Cohort B-ESE), divided by primary disability category group. Table 5 contains a simple breakdown of what primary disability category was assigned to children at each time point. It is presented this way (by chronological year, rather than grade) so that children who were retained in-grade or had delayed kindergarten entry are fully included. The numbers of children in each diagnosis category change from year to year, and these changes will be examined in detail in Research Question 3. This table simply presents numbers of children in each group at each time point, but the information relevant for our purposes here is contained in the first column. At all time points, the Learning Disability group is the largest, while the Other Health Condition group and Language Impairment group have the smallest number of children. Unless noted otherwise, in this research question, from here forward analyses are based on a child's primary disability category group at special education entry (PD-Entry). A number of children were not enrolled in special education services during kindergarten or first grade but entered at some point later, so the primary disability category assigned to a child whenever they began receiving special education services in elementary school is their group for these analyses (DD = 85, SI = 19, LA = 15, ED = 59, LD = 238, A = 86, OHI = 12). Some children from the Cohort B-ESE group were never enrolled in special education services after pre-kindergarten (but did continue on in MDCPS) and so it is impossible to tell what their primary disability category group should be and these children are assigned to a "No Diagnosis" group (ND, N = 67).

Means and standard deviations for the LAP-D, for all Cohort B-ESE children who were assessed with each sub-domain at any time point, broken down by PD-Entry (no collapsed groups), can be found in Table 6. To examine differences in LAP-D scores for children in different diagnosis groups, a series of MANOVAs was conducted. Because of the very small numbers of children in some groups who had these assessments, (SI, LI, and OHI), those groups are collapsed together for the following analyses. To clarify, the primary disability category groups used in the following analysis are as follows: 1. Developmental Delay, 2. Speech, Language, and Other Heath Impaired, 3. Emotionally Disturbed, 4. Specific Learning Disability, and 5. Autism. To examine differences in development over the pre-kindergarten as measured by the LAP-D, three separate repeated-measures MANOVAs were conducted. This is because of discrepancies in numbers of children who were assessed with the different domains, so in order to include the largest possible group of children, fine motor, language, and cognitive domains were separated into different MANOVAs. There are really two different questions here, first: are there group differences in functioning at age 4 (main effect for group) and second: are gains different over time for the different primary disability category groups (group X time interaction.)

Language, In the repeated-measures MANOVA examining differences in change over time for the different primary disability category groups in language (naming and comprehension), analysis revealed that there were significant main effects of time (Wilk's Lambda = .407, $F(2, 316) = 230.4$, $p < .001$) and primary disability category (Wilk's Lambda = .683, $F(10, 316) = 13.29$, $p < .001$), as well as a significant interaction

between time and primary disability category (Wilk's Lambda = .904, = $F(10, 632) = 3.27$, $p < .001$). Univariate tests revealed that this interaction was only significant for the language naming subdomain (F (5, 316) = 4.82, $p < .001$), and Figure 4 graphically illustrates the change over time for the different primary disability category groups in this subdomain. Holding time constant, the No Diagnosis group had significantly higher scores overall than all other groups except the Speech, Language, and Other Health Impairment group, and the Developmental Delay and Autism groups had significantly lower scores overall than all other groups. Post hoc LSD analyses revealed that the No Diagnosis group had a significantly higher increase in language naming scores over time than all other groups, while the Autism and Developmental Delay groups had significantly less change over time than the ND, Combined group (SI, LI, OHI), and LD group.

Cognitive, Similarly, the repeated-measures MANOVA for cognitive (matching and counting) abilities, revealed that there were significant main effects of time (Wilk's Lambda = .426, $F(2, 320) = 215.85$, $p < .001$) and primary disability category (Wilk's Lambda = .706, $F(10, 640) = 12.18$, $p < .001$), as well as a significant interaction between time and primary disability category (Wilk's Lambda = .915, = $F(10, 640) = 2.90$, $p < .001$). Univariate tests revealed that this interaction was only significant for the cognitive matching subdomain (F (5, 321) = 3.17, $p < .01$). Post hoc LSD revealed that the ND group had a significantly higher increase in cognitive counting scores over time than all other groups, while the Developmental Delay group had significantly less change over time than all other groups. A graph for this domain would look very similar to the graph

presented for the language domains. Holding time constant, the No Diagnosis group had significantly higher overall scores on both cognitive domains than all other groups except the Speech, Language, and Other Health Impairment group, and the Developmental Delay group had significantly lower scores than all other groups.

Fine motor, The repeated-measures MANOVA examining change over time by primary disability category group for fine motor skills (writing and manipulation) did not reveal as clear-cut results as for language and cognitive skills. Like in the other two domains, there were significant main effects of time (Wilk's Lambda = .387, $F(2, 346) = 273.84$, $p < .001$) and primary disability category (Wilk's Lambda = .702, $F(10, 692) = 13.38$, $p < .001$), as well as a significant interaction between time and primary disability category (Wilk's Lambda = .928, = $F(10, 692) = 2.62$, $p < .01$). Figure 5 graphically illustrates change over time for the fine motor writing sub-domain. Post hoc LSD tests revealed that for both fine motor sub-domains, the children in the No Diagnosis group started out with the highest scores in both the fine motor sub-scales but had slower gains than the combined Speech, Language, and Other Health Impaired group. The Developmental Delay group had the lowest scores at both time points and the slowest gains over time. When time was held constant, a different pattern was revealed here from in the language and cognitive domains - the No Diagnosis group had significantly higher scores than the Developmental Delay, Specific Learning Disability, and Autism groups. The Speech, Language and Other Health Impairment group had significantly higher scores than those same three groups. The Developmental Delay group had significantly lower overall scores than all other groups except the Autism group.

Social-emotional skills, Important differences in social-emotional skills and behavior problems would be expected between different primary disability category groups, so scores on the teacher-reported DECA, divided by primary disability category groups, are examined in this section. Means and standard deviations for the parent-reported and teacher-reported DECA for the overall group and all disability groups (no collapsed groups) at special education entry can be found in Table 7.

Repeated-measures MANOVA was used to examine change over time for the diagnosis groups on the teacher-reported DECA. This analyses revealed that there was significant change over time (Wilk's Lambda = .778, = $F(4, 131) = 9.34$, $p < .001$), and significant group differences on the DECA overall (Wilk's Lambda = .434, = $F(20, 435.4) = 6.23$, $p < .001$) , but that there was no significant interaction between time and primary disability category group. Univariate tests revealed that there was significant change over time for all four DECA scales (Initiative: $F(1,134) = 30.16$, Self-Control: $F(1, 134) = 21.70$, Attachment: $F(1, 134) = 18.30$, Behavioral Concerns: $F(1, 134) = 9.88$, all $p < .01$). Tests of between-subjects effects revealed that there were significant differences in scores for the different primary disability category groups for all four DECA scales (Initiative: $F(5, 134) = 17.65$, Self-Control: $F(5, 134) = 9.23$, Attachment: $F(5, 134) = 5.21$, Behavioral Concerns: $F(5, 134) = 14.00$, all $p < .001$). Recall that Figure 3 shows the mean scores on all four teacher-reported DECA scales at the Fall and Spring time points for the Cohort B-ESE group. Figure 6 graphically illustrates the differences in teacher-reported DECA scores on all four DECA scales, by primary disability category group, at the Fall assessment (a graph of the mean scores at the spring

time point would be very similar.) Post hoc tests revealed that the No Diagnosis group had significantly higher Initiative, Self-control, and Attachment scores than groups except the Speech, Language, and Other Health Impairment group. The Autism group had significantly lower scores on the Initiative, Self-control, and Attachment scales than all groups except the Developmental Delay group. Figure 6 also shows that the Emotionally Disturbed group had less Self-Control and more Behavioral Concerns than any other group. Post hoc tests also revealed that the Emotionally Disturbed group had significantly higher behavioral concerns than all other groups except the Autism group ($p < .01$).

Research Question 2

How are children who were enrolled in a preschool special education program (Cohort B-ESE) doing in early elementary school?

a. How often do they have apparently voluntary delayed kindergarten entry?
b. How do they perform on kindergarten school readiness tests, if they even take them?
c. What diagnosis do they receive at kindergarten entry?
d. How often are they retained in kindergarten, first, or second grade?
e. What kind of grades do they receive?
f. How do they perform on standardized tests in second grade?
    - How many of them are exempted from taking standardized tests?

Delayed kindergarten entry, Of the children enrolled in pre-kindergarten special education for whom elementary data were available (N= 617), 3 (0.04%) entered

kindergarten a year later than they were eligible. In the overall MSRP sample, 0.5% of the children entered kindergarten a year later than they were eligible. Delayed kindergarten entry appears to be a rather uncommon occurrence in the Miami-Dade county school system.

School readiness tests, Children in the Miami-Dade county school system are assessed for school readiness using the ESI-K and DIBELS during the first 30 days of their kindergarten school year. For a variety of reasons, some children do not take these school readiness assessments. Table 8 contains a breakdown of children who participated in the ESI-K and DIBELs, and numbers of scorable tests for each assessment. In the ESI-K, a non-scorable test is one where a child either did not attempt some parts of the test (N = 5) or who refused the assessment altogether (N = 3). The information provided by the MDCPS did not specify why some of the DIBELs assessments were not scorable, but presumably it was for similar reasons as the ESI-K, like child refusal.

For the children who were enrolled in pre-kindergarten special education services and had elementary school data (N=617), 65% (N = 399) had school readiness assessment data. Of those 399 children who have ESI-K data, 87 (22%) were non-participants the ESI-K, and 76 of these were non-participants because they were receiving special education services. Similarly, of the 399 children who had DIBELs data, 71 (18%) were non-participants in the DIBELs, and 65 of those were non-participants because they were receiving special education services. Overall, 312 children were assessed with the ESI-K, 328 were assessed with the DIBELS letter naming test, and 327 were assessed with the DIBELS initial sound fluency test, and had useable

scores. Table 9 contains average scores on these school readiness assessments, as well as percents of children in each risk category (for DIBELS) or readiness category (for ESI-K). In the ESI-K, 52% of the assessed children who were enrolled in pre-kindergarten special education were rated as being 'ready for school," compared to 87% of the overall Cohort B group. A z-test for two independent proportions revealed that these are significantly different ($z = 17.08$, $p < .05$). As for the two DIBELS tests, 50% of children were rated as above average or low risk on the letter naming test compared with 62% of children in the overall Cohort B group, and 34% were rated as average or low risk on the initial sound fluency test, compared with 45% of children in the overall Cohort B group. Again, z-tests for two independent proportions were conducted and revealed that these proportions of children rated as average or low risk were significantly different for both the DIBELs letter naming ($z = 4.31$, $p < .05$) and initial sound fluency ($z = 3.85$, $p < .05$) tests. Fewer children who were enrolled in pre-kindergarten special education are rated as being ready for school compared with the overall cohort of children.

Grades, Kindergarten children in Miami-Dade county are given grades on a 3-point scale (not satisfactory, satisfactory, excellent), and there are 10 subject areas graded in kindergarten. The mean grade across those 10 subjects for children who were enrolled in pre-kindergarten special education (Cohort B-ESE, N=481 with reported kindergarten grades) is 2.099 (sd = .41), a "satisfactory" grade. In the overall Cohort B group, the mean grade in kindergarten is 2.29 (sd = .41), and a t-test indicates that the overall Cohort B group had higher mean grades in kindergarten than the Cohort B-ESE group ($t = 10.37$, $p < .05$). After kindergarten, children are graded on a typical 5-point scale (A, B, C, D,

and F), these were converted into numbers (1-5). There are 11 subject areas graded in grades 1 and 2. The average grade across those subjects in first grade (Cohort B-ESE, N=470) for children who were enrolled in pre-kindergarten special education was 3.91 (sd =.60), and in second grade (Cohort B-ESE, N=423) was 3.89 (sd = .58). These means can be interpreted as a C+. The mean grades in first and second grade for the overall Cohort B group were 4.18 (sd = .65) and 4.07 (sd = .60) respectively. T-tests also revealed that the overall Cohort B group had significantly higher mean grades in both first (t = 8.78, p < .05) and second (t = 6.05, p < .05). Although children who were enrolled in pre-kindergarten special education are given satisfactory grades they are given significantly lower grades than the overall Cohort B group.

Repeated measures ANOVA was conducted to examine whether or not children enrolled in pre-kindergarten special education (Cohort B-ESE) had significant change in grades between grade 1 and grade 2. Analysis revealed that the children for whom grades are available during both years (N=405) did have significant change in mean grades between first grade and second grade (F(1, 404) = 10.23, p < .01). Mean grades in second grade were significantly lower (m = 3.89) than grades in first grade (m = 3.96). In the overall Cohort B group, grades were lower in second grade than in first grade, the same pattern as found in the Cohort B-ESE group.

Figure 7 illustrates grades for all children during kindergarten, first, and second grade divided by primary disability category at special education entry. One-way ANOVA was used to examine differences in kindergarten grades for the primary disability category groups. Analysis revealed that there were significant differences in

kindergarten grades that were related to the children's primary disability category (F (5, 475) = 5.79, $p < .001$). Post hoc analysis revealed that the No Diagnosis group had significantly higher grades in kindergarten than all other groups except the combined Speech, Language, and Other Health Impairment group. There were not significant differences in grades between the Developmental Delay, Emotionally Disturbed, Specific Learning Disability group, or the Autism groups, and all of these groups had significantly lower grades in kindergarten than the No Diagnosis and combined Speech, Language, and Other Health Impairment groups.

Repeated-measures ANOVA was used to examine differences in grades during first and second grade in the primary disability category groups. There are two separate questions here, first, were there significant differences in grades during first or second grade that were related to the children's primary disability category groups, and were there differences in change over time in these grades related to primary disability category. Multivariate tests revealed that there were significant differences over time (F(1, 399) = 15.09, $p < .001$) and a significant time X primary disability category group interaction (F (5, 399) = 6.36, $p < .001$). Univariate tests also revealed that there were significant differences in grades related to primary disability category (F(5, 399) = 16.10, $p < .001$). Figure 7 graphically illustrates the interaction between primary disability category and time. It is evident from Figure 7 that something interesting is going on here – the Developmental Delay group is the only group whose mean grades rise from first to second grade. All other groups have lower grades in second grade than they did in first grade. The mean grades of the combined Speech, Language, and Other Health Impaired

group, in particular, drop almost 0.5 points. In practical terms, this is a drop from a B- to a C+.

Retention in-grade, In the Cohort B-ESE group, 40 children were retained in either kindergarten or first grade - this is 6% of the group (*N*=617), 21 of those children were retained in kindergarten, and the remaining 19 were retained in first grade. Over half of the children who were retained in-grade (*N*=25, 63% of children retained) were from the Specific Learning Disability group. 11% of this group of children (*N*=238) were retained in kindergarten or first grade. There were children from every primary disability category group who were retained, except for the Other Health Impairment group.

Standardized testing, In second grade, children in the Miami-Dade county school system are required to take the reading and math portions of the SAT-10. There were 424 children from Cohort B-ESE still enrolled in the Miami-Dade county school system at the end of second grade, and 322 of these children took the SAT-10. The mean score on the math portion of the SAT-10 for children who were enrolled in pre-kindergarten special education was 556; this is the 36%ile. The mean score on the reading portion of the SAT-10 for this group of children was 573; this is the 34%ile. In the overall school district, second graders tested in the spring of 2007 (when this cohort of children was assessed with the SAT-10), scored on average in the 54th percentile for reading and the 55th percentile for math (Summary: Districtwide, 2006-2007). Children who were enrolled in special education services during pre-kindergarten have lower scores, on average, on the SAT-10 than the overall district.

Children who are eligible for special education services are sometimes exempt from taking this type of norm referenced test because it may not be an appropriate assessment for them. Of the 424 children from the Cohort B-ESE group for whom we have grade 2 grade information, indicating that they finished second grade, 102 (24%) did not take either portion of the SAT-10. It may be that some of these children simply missed the test due to illness or absence, but it is likely that most of them were exempt. Table 10 contains a complete breakdown of children who do not have SAT-10 scores, by primary disability category at special education entry. The vast majority of the children who did not take the SAT-10 had developmental delays (47%) or autism (45%).

Research Question 3

What kind of transitions do children enrolled in special education during pre-kindergarten or early elementary school experience?

a. How many children exit special educational services in early elementary school?
    - Is exiting special education in early elementary school related to social/emotional, language, and/or cognitive assessment scores from their preschool years
b. Do children experience a change in primary disability diagnosis?
    - Are these changes related to social/emotional, language, and/or cognitive assessment scores from their preschool years?

This question involves an in-depth examination of the transitions children make into and out of special education during early elementary school. Prior research (Jenkins

et al., 2006) has revealed instability in both diagnostic category and enrollment in special education. First, I will present findings on children's transitions into and out of special education, and then will concentrate on changes in diagnostic category. In order to do this, the children were collapsed together into groups based on time point, rather than grade. These time points are referred to by year (03-04, 04-05, 05-06, and 06-07). Another way to think of these time points is by year in school – pre-kindergarten, first year of elementary school, second year of elementary school, third year of elementary school. In this way, children who were retained in grade, or experienced delayed entry into kindergarten are included completely. To be clear, in this question, the transitions made by all children who were enrolled in special education at any point (Cohort B-SE, *N* = 1338) are examined – in the two previous questions, only children who were enrolled in pre-kindergarten special education (Cohort B-ESE) were included in analyses.

Transitions in and out of special education, Starting from the original group of children enrolled in early childhood special education (Year 03-04, N= 695), recall that 77 children did not appear at all after pre-kindergarten in the data provided by the school system. The numbers presented past this point are based only on children for whom elementary school data are available (N = 1,261), and each year of data is based on either having grades for that year, a primary disability category for that year or both. Table 11 contains detailed information about continuous or discontinuous enrollment in special education and enrollment in special education by time point, and discussion of these numbers follows. In Table 11, there are total numbers of children enrolled in special education services for each year of the study, as well as a graphic representation for the

children who were continuously enrolled. In addition, for each year, the number of children with discontinuous enrollment who were actually in special education during that year is given. Of the 617 children who were enrolled in pre-kindergarten special education, and for whom elementary school data were available, 381 (62%) received special education services throughout all four years in the study, 40 (6%) received special education services for only the first two years, and 47 (8%) received special education services for only the first three years. In all, 236 (38%) children who had been enrolled in pre-kindergarten special education either left the Miami-Dade county public school system or left special education prior to second grade. Of those 236 children, 77 left the school system before kindergarten, and 67 were not enrolled in special education at all after pre-kindergarten (but did continue in the Miami-Dade county school system).

Data are available for 644 children who began receiving special education services after pre-kindergarten. Of those children, 73 (12%) received special education services for only 04-05 and 05-06 (year 1 and 2 of elementary school), and 218 (34%) received special education services for all three elementary school years.

There were a number of children who left special education services at some point during the four years of the study, but returned after at least one year of school without special education. This is referred to as discontinuous enrollment. In total, 50 children experienced discontinuous enrollment in special education services during the 4 years of the study. This is 4% of the group of children for whom elementary school data were available (N = 1,261.) From the numbers presented in Table 11, it is evident that there is a great deal of change in which children are receiving special education services at any

given time, and that there is movement in and out of special education services by a number of children.

To further examine factors which may predict a child's exiting special education before second grade, discriminant analyses were conducted. For these analyses, the children were divided into two groups – those who were enrolled in special education services for all four years of the study (pre-kindergarten through second grade, Continued $N = 381$) and those who exited special education after pre-kindergarten but before second grade (Exited $N = 69$). For the following analysis, only children who were enrolled in the Miami-Dade county school system for all four years of the study are included. Children who simply left the public school system were not included because we do not know that they actually left special education services, because we have no further record of their schooling. In addition, children who exited and then re-entered special education services are not included in these analyses. First, a discriminant analysis was conducted using the LAP-D subdomains (Language comprehension and naming, fine motor writing and manipulation, and cognitive matching and counting) to predict whether a child continued in special education for all four years or exited at some point after pre-kindergarten. Table 12 contains means and standard deviations on the LAP-D and teacher-reported DECA for children who continued in special education and children who exited special education. Figure 8 graphically illustrates the differences in LAP-D and DECA scores for children who continued in special education for all four years and children who exited. This discriminant analysis revealed that group means on the LAP-D were significantly higher for children who exited special education prior to second grade

compared with children who did not (Wilk's Lambda = .848, $\chi^2 = 42.66$, $p < .001$), LAP-D assessment information correctly predicted whether or not a child would exit special education before second grade 76% of the time.

A second discriminant analysis was conducted to examine whether teacher-reported DECA scores from the beginning of a child's pre-kindergarten year would be useful to predict whether or not that child would still be enrolled in special education in second grade. This analysis also indicated that the group means on the four DECA scales (initiative, attachment, self-control and behavioral concerns) for the children who continued in special education services were significantly different from those who had exited special education prior to second grade (Wilk's Lambda = .829, $\chi^2 = 27.24$, $p < .001$). Recall that Figure 8 also graphically illustrates the differences in DECA scores for the children who exited special education prior to second grade and children who continued in special education services for all four years of the study. Teacher-reported DECA scales correctly predicted whether or not a child had exited special education prior to second grade 72% of the time. Children who exited special education services prior to second grade had more social-emotional protective factors and less behavior problems than children who continued in special education services, in addition, they had higher scores on assessments of fine motor, language and cognitive skills. This indicates that the children who leave special education services prior to second grade are, in general, higher functioning children than children who remain in special education continuously.

Another important way to examine which children remain in special education services for all four years of this study is by primary disability category. Of the children

who exited special education services prior to second grade, and for whom data are available for each of the four years (in other words, children who did not leave the school system, N = 69 (15% of 450)), 60% exited special education services after pre-kindergarten. Data regarding primary disability category are only available for those children who were enrolled in special education services in elementary school, so there is no way to know a diagnosis for these children who exited after pre-kindergarten and did not re-enter special education services. Table 13 contains a breakdown by primary disability category of the other 28 children who exited special education services after kindergarten but prior to second grade. The majority of children who exited special education services prior to second grade were from the Specific Learning Disability group (N = 15, 54%). It is important to remember, however, that the Specific Learning Disability group is the largest primary disability category group, and those 15 children are only 8% of the overall Specific Learning Disability group (N = 199 with data for all four years). The group with the largest percent of children exiting special education is the Speech Impaired group (27%, 4/15). A chi square test was conducted to test whether the different primary disability category groups had significantly different numbers of children exiting special education services. This test was significant ($\chi^2 = 19.64$, $p < .01$), indicating that a child's chance of exiting special education services prior to second grade is related to primary disability category. Children with a primary disability category of Speech impairment are most likely to exit special education prior to second grade, and children with a diagnosis of Autism or Developmental Delay are the least likely to exit special education services prior to second grade.

Changes in primary disability category, Part b of this research question examines changes in primary disability category over time for children enrolled in special education. This analysis is based on the whole Cohort B-SE group, not just the group of children who were enrolled in pre-kindergarten special education (Cohort B-ESE), however, children who were only enrolled in special education during pre-kindergarten are not included in this analysis because information about their primary disability category is not available. Changes in primary disability category are based on changes between the seven groups (Developmental delay, Specific learning disability, Speech impaired, Language impaired, Autism, Emotionally disturbed, and Other health condition). As in the above analysis examining transitions into and out of special education, I will refer to years of elementary school rather than grade level.

Overall, 78 (7%) children out of the 1,194 children enrolled in special education during elementary school experienced a change in primary disability category at some point during their first three years of school. Between the first and second year of elementary school, 34 children experienced a change in primary disability category and 36 children experienced a change in primary disability category between the second and third year of elementary school. There were eight children who experienced a change in primary disability category between their first and third year of elementary school, but who were not enrolled in special education during their second year of elementary school. No children experienced more than one change in primary disability category during their first three years of elementary school. I first created a categorical variable for all children

for whom data was available for all three years of elementary school (04-05, 05-06, and 06-07), this had two categories: yes or no for a change in primary disability category.

To investigate characteristics of children who experience a change in primary disability category, two discriminant analyses were conducted using the yes/no change variable, one using LAP-D assessment information to predict whether or not a child might experience a change in primary disability category and one using teacher-reported DECA scores. Table 14 contains means and standard deviations on the teacher-reported DECA and LAP-D for children who experienced a change in primary disability category and children who did not. The first discriminant analysis revealed that group means on the LAP-D were significantly lower for children who experienced a change in primary disability category prior to second grade compared with children who did not (Wilk's Lambda = .978, $\chi^2 = 17.57$, $p < .01$), LAP-D assessment information correctly predicted whether or not a child would experience a change in primary disability category before second grade 58% of the time. Group means were significantly different for the fine motor manipulation (F (1,782) = 9.31), fine motor writing (F (1, 782) = 10.0), cognitive matching (F (1, 782) = 11.96), language naming (F (1, 782) = 11.09), and language comprehension (F (1, 782) = 7.36, all $p < .01$) subscales of the LAP-D. Figure 9 graphically illustrates the differences in LAP-D and DECA scores for children who experienced a change in primary disability and children who did not. Children who experienced a change in primary disability category had lower scores on all LAP-D subscales than children who did not experience a change in primary disability category.

The second discriminant analysis was conducted to examine whether teacher-reported DECA scores from the beginning of a child's pre-kindergarten year would be useful to predict whether or not a child would experience a change in primary disability category prior to second grade. This analysis also indicated that the group means on the four DECA scales (Initiative, attachment, self-control and behavioral concerns) for the children who continued in special education services were significantly different from those who had exited special education prior to second grade (Wilk's Lambda = .980, χ^2 = 13.76, p <.01). Children who experienced a change in primary disability category had significantly lower scores of the Self-Control scale of the DECA (F (1,696) = 4.82), and significantly higher Behavioral Concerns (F (1, 696) = 9.4, both p < .01) than the children who did not experience a change in primary disability category. Scores on the Initiative and Attachment scales of the DECA were virtually the same. Recall that Figure 9 graphically illustrates differences in DECA scores for children who were reclassified and children who were not. Teacher-reported DECA scales correctly predicted whether or not a child had experienced a change in primary disability category 65% of the time.

To do further analysis, I created two variables to represent specific changes in primary disability category. These variables represent a child's first primary disability category and second primary disability category, this is to consolidate these changes, since some happened between the first and second year of elementary school, some between the second and third year of elementary school, and some happened with a break in-between. Children who were only enrolled in special education services during one year of elementary school, who did not appear in the elementary school data at all, and

who were not enrolled in special education during elementary school (N = 391) are excluded from these analyses.

Table 15 contains detailed numbers of children who changed primary disability category – both their original primary disability category and how many changed to a new primary disability category. In Table 15, first there is a column with how many children in each primary disability category group changed, in total, then the percent of the total number of children who changed. For example, there were 17 children in the Specific Learning Disability group who changed diagnosis (44% of those in that group). Of those 17 children, one each changed to the Developmental Delay group and the Language Impairment group, two to the Speech Impairment group, seven to the Emotionally Disturbed group, and six to the Autism group. In Table 15, there are 2 columns of percents, the first column represents the % of children from each primary disability category group who experienced a change in primary disability category, and the second column represents the % of children who experienced change who were from that primary disability category. A chi square test was conducted to test whether there were significant differences in numbers of children with changed primary disability category in the original primary disability category group, this test was significant (χ^2 = 62.21, $p < .01$), indicating that there were differences in numbers of children who changed diagnosis related to their original group. Out of the 78 children who experienced a change in primary disability category, 44% (17/78) were originally in the Specific Language Impairment group. The primary disability category group with the highest number of children who experienced a change in primary disability category was the

Language Impairment group, 21% (9/43) of the children with that diagnosis originally experienced a change. The group with the lowest number of children to experience a change in primary disability category was the Autism group, only 2% (2/82) experienced a change in primary disability category.

The analyses done in Research question 3 indicate that there were significant numbers of transitions both in and out of special education services, and in between primary disability category groups. These types of changes have important implications for the lives of children who are enrolled in special education services.

Research Question 4

Are there significant differences in pre-kindergarten assessment scores for language, cognition, social/emotional protective factors or behavioral concerns for children who were enrolled in pre-kindergarten special education and their peers who did not receive special education until early elementary school?

Research question 4 concerns developmental and social-emotional differences between the children who entered special education in pre-kindergarten and their peers who did not enter special education until kindergarten or first grade as measured during their pre-kindergarten year. MANOVA was used to examine differences between the children's scores on the language and cognitive domains of the LAP-D and (separately) the initiative, self-control, attachment and behavioral concerns scales of the teacher-reported DECA from the fall of their pre-kindergarten year. The children were divided into three groups: children who entered special education services in pre-kindergarten (N=694), children who entered special education services in elementary school and

attended public school pre-kindergarten (N=379), and children who entered special education services in elementary school and attended child care in the community via subsidies (N=265). Children in public school pre-kindergarten and private child care were assessed differently, so it is important to separate these groups. All children in public school pre-kindergarten programs (including early special education programs) were assessed by their teachers, whereas children attending community child care centers were assessed by trained clinicians from a community agency.

The MANOVA examining differences in LAP-D scores revealed that there were significant differences between the scores of children who entered special education in pre-kindergarten (*N*=392), public school pre-kindergarten children who entered special education services in elementary school (*N*=254), and private child care children who entered special education services in elementary school (*N*=247) (Wilk's lambda = .915, $F(4, 1774) = 10.09$, $p < .001$). Table 16 contains the means and standard deviations for this analysis. Post hoc tests revealed that the public school pre-kindergarten children who entered special education services in elementary school had significantly higher scores in all four LAP-D scales than both the children who were enrolled in community child care who later enrolled in special education services in elementary school and children enrolled in pre-kindergarten special education. The children from community child care centers had significantly higher language comprehension scores then the children who attended pre-kindergarten special education programs. Really, however, there is much complexity here because of the confounding factors for these groups – socio-economic status, and type of pre-kindergarten program. Recall that some of the children enrolled in

public school pre-kindergarten programs were enrolled via a Title 1 childcare subsidy and other (non-poor children) paid a fee, while all the children who were enrolled in a private child care center were enrolled via a subsidy. This means that all of the children enrolled in private child care centers were living in poverty. In addition, enrollment in pre-kindergarten special education was not contingent on income in any way, so those children came from a variety of socio-economic backgrounds. This is likely part of the reason for the difference revealed by the above analyses. In addition, it is known that, in the MSRP sample generally, the children enrolled in public school pre-kindergarten programs score higher than the children enrolled in private child care centers (Winsler et al., 2008).

The MANOVA examining differences in DECA scale scores revealed that there were significant differences between the scores of children who entered special education in pre-kindergarten (N=215) versus those who entered in kindergarten or first grade after attending public school pre-kindergarten (N=349) or community childcare (N= 185) (Wilk's lambda = .909, $F(8, 1488) = 9.10$, $p < .001$). Table 17 contains the means and standard deviations for this analysis. Post hoc tests revealed that the teachers of the children who entered special education in pre-kindergarten rated those children as having less initiative and self control and more behavioral concerns than the children who entered special education in early elementary school and attending public school pre-kindergarten. There were no significant differences in scores on the Attachment scale of the DECA. Post hoc tests also revealed that the teachers of children who were enrolled in community child care and entered special education in elementary school rated them as

having significantly more behavior problems than did teachers of the children in public pre-kindergarten or children in pre-kindergarten special education. These are also similar to findings in the overall MSRP sample (Winsler et al., 2008). The above analyses indicate that children who were enrolled in pre-kindergarten special education have more problems with language comprehension than children who were enrolled in special education later. Children who were enrolled in pre-kindergarten special education had more reported behavior problems than children who were enrolled in public school pre-kindergarten programs, but less than children who were enrolled in private child care centers, but as noted above, this may be an artifact of poverty rather than special education status.

Research Question 5

How do children who were enrolled in pre-kindergarten special education compare academically in the early grades with children with similar disabilities who entered special education services in kindergarten or first grade?

a. Are there differences in retention rates for children who were enrolled in preschool special education and children who do not begin to receive special education services until kindergarten?
b. Is the rate of voluntary delayed kindergarten entry different for children who were enrolled in special education during preschool than for same age children who were not enrolled in special education until kindergarten?

Research question 5 examines differences in the academic achievement and in-grade retention between children who were enrolled in special education during pre-

kindergarten (N = 617) and their same age peers who were not enrolled in special education services until sometime during their first three years of elementary school (N = 644.) The following sections give information regarding differences in school readiness assessment scores, grades in kindergarten, first, and second grade, in-grade retention, and standardized testing done in second grade.

Grades, A series of one-way ANOVAs was conducted to test whether or not children who entered special education services in pre-kindergarten (Cohort B- ESE) had significantly different grades than children who entered special education services in kindergarten, first or second grade (Cohort B- ELSE). These ANOVAs were only conducted using grades of children who were in each grade when they were expected to be – children retained in-grade and who experienced delayed kindergarten entry are excluded. In kindergarten, one-way ANOVA revealed that the Cohort B-ESE (m = 2.09, (sd = .41)) and Cohort B-ELSE (m = 2.06, (sd = .39)) did not have significantly different mean grades. In contrast, grades were significantly different for these 2 groups in both first and second grade. In first grade, Cohort B-ESE had significantly higher mean grades (m = 3.91, (sd = .60)) than Cohort B-ELSE (m = 3.73 (sd = .73), (F(1, 975) = 16.04, p < .01). Similarly, children in Cohort B-ESE (m = 3.89, (sd = .58)) had significantly higher mean grades in second grade than children in Cohort B-ELSE (m = 3.75 (sd = .60), F(1, 831) = 11.26, p < .01).

School readiness tests, All children entering public school in MDCPS are assessed for school readiness using the ESI-K and two of the DIBELs tests (Initial Sound Fluency and Letter Naming.) One-way ANOVA was used to examine differences in

group means for these tests, following by chi square tests to see if there were significantly different numbers of children from Cohort B-ESE and Cohort B-ELSE placed in the risk categories for these assessments.

ESI-K, The ANOVA comparing group means on the ESI-K total score revealed that the children who entered special education services in elementary school (Cohort B-ELSE, m = 20.00 (5.01)) had significantly higher scores than the children who entered special education services in pre-kindergarten (Cohort B-ESE, m = 18.50(5.60), $F(1, 894) = .001$). The ESI-K also places children into categories for school readiness: Ready, Getting ready, and Not ready. Figure 10 graphically illustrates how many children were placed in each category based on when the children were enrolled in special education services. A chi square test ($\chi^2 = 25.23$, $p < .001$) indicated that significantly more Cohort B-ELSE children were rated as ready for school (66%, 383/585) compared to Cohort B-ESE children (52%, 163/311).

DIBELS, The ANOVA comparing group means on the DIBELs Letter Naming total score revealed that children who were enrolled in special education during pre-kindergarten (Cohort B-ESE, m = 13.71 (16.10)) had significantly higher scores than children who were enrolled in special education in elementary school (Cohort B-ELSE, m = 10.31 (14.77), $F(1, 908) = 10.37$, $p < .01$). The DIBELs Letter Naming categories are Above average, low risk, moderate risk, and high risk. Figure 11 illustrates the percentages of children in each of these categories separately by when the children were enrolled in special education services. A larger percentage of children who were enrolled in pre-kindergarten special education were rated as being Above average (Cohort B-ESE,

36%) compared with their peers who were not enrolled in special education until elementary school (Cohort B-ELSE, 23%). Children who were enrolled in pre-kindergarten special education appear to be more ready for school, in terms of letter naming ability, than children enrolled in public school or private pre-kindergarten. A chi square test was conducted and revealed that the children's DIBELs Letter Naming risk category was related to when they entered special education ($\chi^2 = 16.79$, $p < .01$).

The ANOVA comparing group means on the DIBELs Initial Sound Fluency test was non-significant ($F(1, 796) = .935$, $p = .334$), indicating that the children's understanding of initial sounds in words was not related to when the entered special education services. Similarly, a chi square test revealed that nearly identical percentages of children were placed into each risk category for the Initial Sounds Fluency test for each group.

Retention in-grade, In the overall Cohort B-SE group with elementary school data (N=1,261), thirteen (1.03%) children entered kindergarten a year later than they were eligible according to their birth date, 92 (7.3%) children were retained in kindergarten, and 88 (7.0%) children were retained in first grade. Overall, 180 (14.3%) of this group of children enrolled in special education services sometime in pre-kindergarten, kindergarten, first or second grade were retained in kindergarten or first grade. Of the 180 children who were retained in-grade, 40 (22% of all children retained in-grade, and 3% of the overall Cohort B-SE, N=1,338) of those children were enrolled in pre-kindergarten special education. Table 18 contains a breakdown of the children retained in-grade – separately for children in overall Cohort B, Cohort B-ESE, and Cohort B-ELSE. A higher

percentage of children in the Cohort B-ELSE group were retained in grade (22%) compared to overall Cohort B (6%) and Cohort B-ESE (7%). Table 18 lists the total number of children in each group, and who were retained in-grade. Children who were enrolled in special education services at some point during the pre-k through second grade make up 31% (180/591) of the all the children in Cohort B who were retained in kindergarten or first grade.

To further examine in-grade retention in this group of children who were enrolled in special education services between pre-kindergarten and second grade, a series of chi square tests was conducted. A chi square test was conducted to examine whether significantly more children who were enrolled in special education prior to entering elementary school were retained in grade in kindergarten or first grade. This test ignores the type of pre-kindergarten program the children were enrolled in and is only concerned with when they entered special education services. The test revealed that significantly fewer children who were enrolled in pre-kindergarten special education were retained in grade than their peers who entered special education in kindergarten or first grade ($\chi^2 = 59.94$, $p < .001$). Table 19 contains the percents and N's for this test. Out of the Cohort B-ESE group, 7% of children ($N = 40$, out of 617) were retained in-grade, while in the Cohort B-ELSE group, 22% of the children ($N = 140$, out of 644) were retained in grade. Children who were not enrolled in pre-kindergarten special education, but were enrolled after beginning elementary school are more likely to be retained in kindergarten or first grade than children who were enrolled in pre-kindergarten special education.

Standardized testing, In MDCPS, children are tested using a norm-referenced test in second grade. One-way ANOVA was used to examine whether or not children who were enrolled in special educations services in pre-kindergarten (Cohort B-ESE) had significantly different scores on the math (m = 556, sd = 43.36) or reading (m = 573, sd = 43.72) portions of the SAT-10 from children who were enrolled in special education after entry into elementary school (Cohort B-ELSE; math m = 559, sd = 44.44, reading m = 572, sd = 39.62). Tests revealed that these groups of children did not differ significantly on the reading or math portions of the SAT-10.

Primary disability category, Another important area where entry into special education may be important is primary disability category. To examine whether children with different primary diagnoses enter special education services at a different point, a chi square test was conducted. Table 20 contains numbers and percents for this test. Chi square testing revealed that there were significant differences in when a child was enrolled in special education services related to a child's primary disability category upon entry into special education ($\chi^2 = 344.56$, $p < .001$). Figure 12 illustrates the percentages of each primary disability category group that entered special education in pre-kindergarten and those who entered in early elementary school. Figure 12 shows that children from the Speech impairment group were very likely to enter special education services after entry into elementary school, 93% of this group began receiving special education services after entry into elementary school. Children from the Language Impairment (73% entered in elementary school) and Other Health Impaired (71% entered in elementary school) groups were also quite likely to enter special education services in

elementary school. Children from the Emotionally Disturbed and Specific Learning Disability groups were equally likely to begin receiving special education services in pre-k or after entry into elementary school (50% entered in pre-k for both of these groups). Children from the Autism (95% entered in pre-k) and Developmental Delay (86% entered in pre-k) group were likely to enter special education services prior to elementary school.

6. Discussion

Millions of children are enrolled in special education services in pre-kindergarten and early elementary school in the USA. This dissertation was an attempt to create a picture of the developmental progress through pre-kindergarten and early elementary school achievement of children who received special education services in pre-kindergarten or early elementary school in one large, ethnically diverse, urban county. Broadly, I have found that children who were enrolled in special education services during pre-kindergarten show significant positive growth over their pre-kindergarten year and are performing fairly well academically in early elementary school. Many children who were enrolled in pre-kindergarten special education continue to receive special education services throughout their early years in elementary school. Assessment information from pre-kindergarten was predictive of transitions in and out of special education, and changes in primary disability category. There were differences in grades which were related to a child's primary disability category, as well as differences in retention rates.

Firstly, it must be noted that these children who receive special education services do show gains in all areas over their pre-kindergarten year and that in terms of socio-economic status and race, the group of children receiving special education services over this 4-year period (pre-kindergarten through second grade) is very similar to the same-age population in Miami-Dade County. This may seem trivial to note, but it is important to

start out by highlighting significant positive growth in language, cognitive, and fine motor skills for all children. Even the children who were most delayed (those who had to be assessed with the ELAP) showed significant positive growth in approximate developmental age over their pre-kindergarten year. The children in this group (Cohort B-ESE) also made significant gains overall in social-emotional protective factors, and reduced behavioral concerns over their pre-kindergarten year. This is positive and hopeful, that these children who are not only likely to be living in poverty, and in a high-crime urban area, but who also have disabilities ranging from emotional disturbances to severe mental retardation, show positive and significant growth in all areas of development in pre-kindergarten.

This is in contrast to some previous studies. For example, in the study by Mahoney and his colleagues (Mahoney et al., 2004), the children had the same "developmental quotient" at the beginning of the year as they did at the end of the year. These children were of a similar age and, like the children participating in the study for this dissertation, were diagnosed with a variety of disabilities. One major difference between the participants in that study and in this one is demographic – the majority of the children in Mahoney's study were white, and most came from rural or suburban areas. This might indicate that early special education makes a bigger difference in the development of children from impoverished urban areas than for children from suburban or rural areas. It might also indicate that the pre-kindergarten special education program in Miami-Dade county is of a higher quality than the program(s) in the Mahoney study. The other study examined in the introduction (Bruder & Staff, 1998) also showed that

children had very little developmental change over the year of the study. The sample in that study was very small (N=37) and the children were younger than the children in this study. These two studies were designed to compare different types of pre-kindergarten special education programs or different curricular approaches, not to examine developmental change in preschool-aged children with disabilities.

After this initial look at pre-kindergarten assessment scores for the overall Cohort B-SE group, differences in assessment scores and change over time broken down by primary disability category was examined. As we might expect, children in the Autism and Developmental Delay group showed the slowest gains over time in the language, cognitive, and fine motor domains. Also, as might be expected, the children who were no longer enrolled in special education services after pre-kindergarten (the No Diagnosis group), consistently showed the highest scores in all LAP-D domains. They did not, however, always have a faster rate of growth compared with the other groups. In the fine motor domain, the No Diagnosis group actually had a slower rate of growth over the pre-kindergarten year than the combined Speech, Language, and Other Heath Impaired group.

In the social-emotional assessments, findings were as one might expect – the children with autism, developmental disabilities, and emotional disturbances were the ones who had the least social-emotional protective factors and the most behavior problems. The important point here is that the children whose primary disability category is Emotionally Disturbed are, in fact, the children who are showing the most behavioral problems and lack of self-control, and that the other groups who show a lack of social-

emotional protective factors and high behavioral concerns (the DD and A groups, specifically) are children who would be expected, according to those diagnoses, to show those problems. It would be interesting, and possibly somewhat disturbing, if the emotionally disturbed group showed similar behavioral difficulties as other groups such as the Specific Learning Disability groups, because it has been suggested in the literature that children with these different diagnoses are more similar than they are different (Sabornie, Evans, & Cullinan, 2006). Similarly, the children who no longer receive special education services once they enter elementary school (the No Diagnosis group) do not show problems with social-emotional protective factors or behavioral concerns, compared to the children who do receive special education services, again indicating that children with problems (or who are perceived by their teachers as having problems) are the ones receiving special education services early on.

The next section of analysis examined how these same children, who were enrolled in pre-kindergarten special education, are performing in early elementary school. In summary, compared with the overall cohort group, significantly fewer children who were enrolled in pre-kindergarten special education were rated as being ready for school using the ESI-K or DIBELs. This same group of children (Cohort B-ESE) was assigned satisfactory grades in kindergarten, and on average, C+ grades in first and second grade. They are, however, given significantly lower grades than the overall cohort group (all children in the MSRP who entered kindergarten during this same year). Children who were enrolled in pre-kindergarten special education also scored lower on the math and reading portions of the SAT-10 in second grade. It is important to note that these children

who were enrolled in pre-kindergarten special education are, however, performing relatively well in early elementary school. They do have lower grades, and lower average scores on standardized tests, but they are not failing in school as a group or scoring so low as to skew test results for the overall district or for individual schools. These are concerns expressed by educators and other concerned individuals (parents, administrators, policymakers) since the advent of the No Child Left Behind Act (Perner, 2007). There were a number of children who did not take the standardized testing at the end of second grade, but it appears that this exclusion was appropriate, since 92% of the children excluded were from the autism or developmental delay groups.

When separated by primary disability category group, it becomes clear that there are differences in academic achievement that are related to primary disability category. In a perfect world, children with different primary diagnoses would likely end up with the same average grades across each group, as each child would be given an individual education plan which would take into account the challenges related to their disability. In this perfect world, children's individual education plans would take into account their abilities, and grades would reflect this. However, analyses revealed that there were significant differences in grades which were related to primary disability category. The children who were no longer enrolled in special education after pre-kindergarten (the No Diagnosis group) and the children with speech, language, and other heath impairments had significantly higher grades in kindergarten than the children with developmental delays, emotional disturbances, learning disabilities, or autism. A similar pattern is seen in the first and second grade grades, but changes over time were also examined for these

two years. The only group whose grades were higher in second grade than in first was the Developmental Delay group, all other groups' grades stayed nearly the same or dropped – the combined Speech, Language, and Other Health Impairment group had a significantly larger drop in grades from first to second grade, from a B- to a C+. It is important to remember, however, that these grade differences may be related to differences in the way children with disabilities and IEPs receive grades from teachers over time. Since many children in special education with severe disabilities may not be expected to make typical academic year progress in subjects like reading or mathematics, it is common for teachers to use the attainment of individual student goals from their IEP for assigning grades. Thus, interpretation of these results should be done with caution. As was mentioned above, there is no reason to have expected these differences in grades between the primary disability category groups. It is important to note, however, that this pattern of slightly lower grades in second grade, compared with first grade, is the general pattern in the school district.

Research by Jenkins and his colleagues (Jenkins et al., 2006) noted instability in diagnostic category and enrollment in special education in early elementary school (and over a child's entire school career.) An in-depth examination of these changes was conducted with this group of children who were enrolled in special education services during pre-kindergarten and/or early elementary school. The majority of the children in this group (62%) stayed in special education for their first four years of school (pre-kindergarten through second grade.) A number of children left special education then re-entered after at least a one-year break. Most of these children have the same primary

disability category over the four years of the study, but 7% (78) experienced a change in that primary disability category. As further research is conducted with this, or similar, groups of children, it will be important to note if the patterns found in these changes and outlined below are common in the special education system.

Overall, 381 children stayed in special education services for all four years of the study - through second grade. Of the children who definitely stayed in the Miami-Dade County school system, 154 (29% of 535) children who had been enrolled in pre-kindergarten special education services exited those services and did not return prior to second grade. Jenkins and his colleagues (2006) found that 41% of the children in their sample of children who had been enrolled in pre-kindergarten special education were no longer receiving special education services by age nine. Comparing these numbers is difficult, because of the age difference (age 7 versus age 9) – it seems possible that if research were done with this same sample of children in fourth grade that a 10% more children would have left special education services. In addition, the subjects in the Jenkins study were less ethnically diverse than the children in the MSRP, which also makes comparisons less than perfect. Statistics about the timing and duration of special education services for children who begin receiving those services in pre-kindergarten do not seem to be available, however, the National Center for Educational Statistics reports that 49% of children who receive special education services beginning in kindergarten or first grade are no longer receiving services by third grade (NCES, 2007). In this cohort of children, 141 (34% of the children for whom complete data are available, N = 498) of the children who began receiving special education services in kindergarten or first grade

exited special education services prior to second grade. These are not exactly comparable numbers since the grades examined are slightly different, but it is notable that there is such a difference - 49% versus 34%. It would seem from these numbers that a certain proportion of children exit special education services by age nine, rather than by second grade and so it is important that the cohort of participants in the current study be followed as they move through school.

Children who exited special education prior to second grade had significantly higher language, cognition, and fine motor assessment scores, as well as higher social-emotional protective factors and fewer behavioral problems at age four. Children with a primary disability category of Speech Impairment are most likely to exit special education prior to second grade, and children with a diagnosis of Autism or Developmental Delay are the least likely to exit special education services prior to second grade. This is almost identical to the findings of the study by Walker and her colleagues (Walker et al., 1988), who also found that children with speech impairments were the most likely group to exit special education services over a two-year period, and children with developmental delays rarely exited special education services. This is as might be expected, since most children with speech impairments do not have other disabilities which might lead to their continuing to need special education services over a long period of time, while children with developmental disabilities such as mental retardation or autism rarely experience a complete cessation of problems.

Jenkins and his colleagues (2006) also noted instability in primary disability category among the children in their study who had been enrolled in pre-kindergarten

special education programs, and instability was found in the group of children in the current study as well. Out of the overall group of children who were enrolled in special education services between pre-kindergarten and second grade, 78 (7% of 1194) experienced a change in primary disability category during their first three years of elementary school. Interestingly, children who experienced a change in primary disability category had lower scores, on average, in language, cognition, fine motor skills, and the self-control scale of the DECA than children who did not experience a chance in primary disability category. They also had significantly higher teacher-reported behavioral concerns. Children originally in the Language Impairment and Specific Learning Disability groups were the most likely to experience a change in primary disability category while children in the Autism group were the least likely. Most of the children from the Language Impairment group who experienced a primary disability category transition changed to Specific Learning Disability (7/9, 78%) whereas in the Specific Learning Disability group, most children who experienced a change change to a more specific type of primary disability category (13/17, 76%), such as autism or emotional disturbance. This is a different finding than that of Walker and her colleagues (Walker et al., 1988). In that study, children with speech impairments and children who were labeled "physically or multiply handicapped" were the most likely to experience a change in primary disability category. Since the primary disability category classification groups used in the study were considerably different, however, it is difficult to make a direct comparison.

In this cohort of children, there was a significant amount of movement in and out of special education services, as well as movement from one primary diagnosis category to another. The effects of this instability, positive or negative, are unknown. It will be important in the future to follow children who experience these changes, as these changes represent more than just labels on a page, but the actual services a child receives in school. This is especially true since the children who experienced a change in primary disability category were children who had significantly lower scores in many areas of development – it may be the case that these children could have benefitted from different intervention or more intervention at an earlier age. The impact of these types of changes is entirely unknown and may be very powerful in a child's life, as they may be an indicator of instability in a child's overall educational experience. It is also unknown exactly why these changes take place. There are many questions yet to be fully addressed regarding these transitions in special education such as: are these children misdiagnosed to begin with? Are "problem children" moved around from teacher to teacher or classroom to classroom, or are these changes simply an appropriate reaction to the changing needs of children as they move through early elementary school? Daley and Carson (2009) also note this lack of research, and note that there are wide differences in practice between school districts. A great deal of work needs to be done to completely understand de-classification and re-classification in special education, as well as the effect of these changes.

The rest of the analyses in this dissertation examined differences between children who were enrolled in special education pre-kindergarten and their same-age peers who

were not enrolled in special education services until early elementary school. There is complexity here due to environmental influences not related to special education enrollment in any way. Analysis revealed that children with disabilities who were originally enrolled in public school pre-kindergarten programs (non-special education programs) scored higher than both the children in special education programs and children with disabilities who were enrolled in community child care centers via a subsidy at age four. This can be explained in part because some of those children were from less impoverished families than the children in community child care centers, and because even the children who were in public school pre-kindergarten who were enrolled there via a subsidy had parents who chose that type of program. There were also curricular differences between the community child care centers and public school prekindergarten programs. In addition, the teachers in the public school pre-kindergarten programs had more education than the teachers in community child care centers. Broadly, because of these complexities of socio-economic status and program differences unrelated to special education, this analysis revealed only two things clearly: children who are enrolled in pre-kindergarten special education score lower on tests of language comprehension and self-control, and have more behavioral problems than their peers with similar disabilities who do not enter special education services until early elementary school. This similarity in assessment scores for children already enrolled in pre-kindergarten special education and children later enrolled in special education enrolled during pre-kindergarten in community child care suggests that more work needs to be

done in this community to identify children in community child care who are in need of special education services.

Differences in academic achievement and other school factors like retention were also examined for children who entered special education in pre-kindergarten and their peers who entered in early elementary school. More children who were enrolled in pre-kindergarten special education were rated as being not ready for school than their peers who entered special education later, however, children who were enrolled in pre-kindergarten special education services scored higher on the DIBELs letter naming test. Grades in kindergarten were not significantly different for these groups, but in first and second grade, children who were enrolled in pre-kindergarten special education had significantly higher grades than their peers who did not enter until early elementary school. This indicates that while the children who were enrolled in pre-kindergarten special education may start out slightly less ready for school, over time they appear to perform better than their peers who were not enrolled in special education until later in elementary school. This could conceivably be because they had better literacy skills prior to kindergarten than their peers as indicated by the DIBELs. Other research has related early literacy and phonological awareness as measured by the DIBEls to reading acquisition (Burke, Hagan-Burke, Kwok, & Parker, 2009) and early literacy to academic achievement (Diamond, Gerde, & Powell, 2008). As was noted earlier, these findings must be interpreted with caution because of the complex nature of grading children with severe disabilities, and how those children's grades may relate to their individual IEPs.

Another significant difference between the children who were enrolled in pre-kindergarten special education and their peers who did not enter special education until early elementary school is in rates of retention in-grade. Children who were enrolled in pre-kindergarten special education were significantly less likely to be retained in grade, in fact, in this county and group of children, they have almost the same rate of retention in kindergarten and first grade as the entire county (6% in the county, 7% for Cohort B-ESE). In contrast, twenty-two percent of children who enter special education after pre-kindergarten are retained in kindergarten or first grade. Along with lower grades, and lower scores on the DIBELs letter naming test, this indicates that children with special needs who get that "extra" year of pre-kindergarten special education are perhaps better prepared for school than children with special needs who do not get pre-kindergarten special education. This is, of course, the point of early special education and more generally, early intervention broadly speaking (Wolery & Bailey, 2002). The implication here is that in this community, early special education services in pre-kindergarten are improving academic outcomes for children with disabilities.

There were also important differences in the type of children who entered special education services in pre-kindergarten versus in early elementary school related to primary disability category. Most children with speech impairments (95%) began receiving special education services in elementary school. This may be simply because the problems that children have with speech which necessitate special services do not appear until after age 5 or 6 – because prior to that those speech difficulties are within the range of normal. Two other groups (Language Impairment and Other Health Impaired)

also mostly entered special education after pre-kindergarten. Again, this is probably mostly due to the disabilities these children are diagnosed with and when the symptoms become problematic and/or obvious. Children from the Autism and Developmental Delay groups were highly likely to begin receiving services in pre-kindergarten (95% and 86 % respectively), which is a good sign because some prior research has shown that children living in poverty are diagnosed later on in childhood with autism or developmental delay than peers from higher socio-economic status (Mandell, Maytali, & Zubritsky, 2005). Since we know that the majority of these children were eligible for free or reduced lunch, we can infer that most of them do live in poverty, and they are receiving special education services in pre-kindergarten.

Limitations This study has significant limitations. First and foremost, it was not a controlled experimental study. There was no random sampling or random assignment to experimental conditions. However, the Miami-Dade School Readiness Project [MSRP] provides a powerful naturalistic examination of the school achievement of children from a variety of pre-kindergarten programs in a large, diverse geographic area. Having groups of children who entered special education services at different points in time the same community provides a quasi-experimental comparison group for this dissertation. However, this can also be seen as a strength since the participants in this study consist of the entire consenting population and therefore the study has a great deal of ecological validity.

Another limitation of this study is due to missing or unavailable data. Data about teacher demographics, assessor demographics, and detailed family information were not

available for analyses, and would have been an important addition. Data about socio-economic status were available for some of the children, in the form of knowledge of their free or reduced lunch status, or their pre-kindergarten enrollment via a subsidy or Title 1 school, but not for all the children in this sub-sample. In addition, these types of measures of poverty are not the most comprehensive, such as an income-to-needs ratio or more complex measures of a family's financial situation. All this having been said, it must be noted that the available data are unique and valuable even without family variables and/or information about teachers and assessors.

While this dissertation is highly descriptive in nature, it sets the stage for a great deal more detailed examination of this group of children who receive special education services. For example, the issue of disproportionate representation of minority groups was not examined in any detail in this study. It will be important to examine the children labeled with specific learning disabilities and emotional disturbances and to reveal if there do appear to be ethnic disparities in which children are in these groups and their individual characteristics compared with other prior research (Cotinho & Oswald, 2000). In Miami-Dade County, there are a large number of families who are recent immigrants to the United States, as well as a large number of children who are English language learners; and these are two other issues that this dissertation did not touch upon. Bilingual children are sometimes inappropriately placed in special education (Macswan & Rolstad, 2006). In the future, examination of language differences and diversity within children enrolled in special education services is highly recommended.

Further examination within specific primary diagnosis groups is also highly recommended within this group of children as well as in other studies. Although analysis of development and academic achievement in children with special educational needs as a group is important, it is also important to conduct these same analyses within primary diagnosis categories. In the future, follow-up with these children as they move through the rest of elementary and secondary school is important, not only to help remedy the lack of longitudinal research with children with special educational needs, but also because of the unique nature of the participants. This dissertation can provide the basis for other research to move forward to detailed examination of these issues.

In conclusion, the results of this dissertation show that children who enter special education in pre-kindergarten are different in many ways to begin with than their peers who enter in early elementary school. They are more likely to have a disability such as an autism spectrum disorder or mental retardation. They have lower language comprehension skills, lower self-control, and higher rates of behavioral problems in pre-kindergarten. In this cohort of children who received special education services at some point during their first four years of school (pre-k through 2nd grade), on average, all children showed significant, positive growth in overall development, as well as gains in social skills over their pre-kindergarten year. These children are also getting fairly good grades and are not failing as a group on school readiness assessments or standardized tests. It appears that most children in this jurisdiction with developmental disabilities are being identified, referred, and enrolled in special education services prior to elementary

school. These are all positive findings, and information which may be used to improve education and early intervention for children with special educational needs.

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Appendix: Tables and Figures

Table 1

Breakdown of children who received special education services at some point Pre-k through Grade 2

Group	**Pre-kindergarten enrollment**		**N**
Cohort B-ELSE	Subsidized community childcare		284
	Public school pre-kindergarten		359
	Title 1-supported program	257	
	Fee-supported program	102	
Cohort B-ESE	Special education pre-kindergarten [ESE]		695
	Elementary special education	551	
	No elementary special ed.	67	
	No elementary data	77	
	Overall total		1,338
	Total children with elementary data		1,261

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Table 2

Numbers of children who were assessed using the LAP-D, DECA, ELAP, ESI-K, DIBELS, and SAT-10

Time point / Assessment	Pre-K Fall	Pre-K Spring	Kindergarten	Second Grade
LAP-D	1006	1006		
ELAP	33	28		
DECA-parent	660	664		
DECA-teacher	751	766		
ESI-K			896	
DIBELs –Letter naming			910	
DIBELs – Initial sounds			908	
SAT-10				720

Table 3

Means and standard deviations on the LAP-D and DECA scales for children enrolled in pre-kindergarten special education

	Time point	Fall		Spring	
LAP-D		N	M (sd)	N	M (sd)
	Fine motor manipulation	459	21.2 (3.9)	541	22.3 (3.6)
	Fine motor writing	466	14.6 (6.3)	549	18.9 (7.0)
	Cognitive matching	451	14.8 (4.2)	532	17.6 (3.8)
	Cognitive counting	438	13.9 (4.9)	541	16.9 (5.9)
	Language naming	431	11.6 (4.5)	515	15.0 (5.8)
	Language comprehension	420	12.7 (5.0)	498	15.9 (4.7)
DECA Teacher report					
	Initiative	217	22.4 (8.3)	288	25.1 (8.2)
	Self-control	217	17.2 (6.0)	288	19.2 (5.6)
	Attachment	217	21.6 (6.1)	288	23.4 (5.8)
	Behavioral concerns	217	12.7 (6.5)	288	11.3 (5.8)
DECA Parent report					
	Initiative	180	25.8 (7.1)	237	26.8 (7.1)
	Self-control	180	17.9 (5.5)	237	18.7 (5.4)
	Attachment	180	25.0 (5.5)	237	25.5 (5.7)
	Behavioral concerns	180	13.3(6.2)	237	12.8 (6.0)

Table 4

Mean and standard deviation for developmental age scores on the ELAP for all children assessed and for children assessed at both the fall and spring time points for each domain

		Overall group		
		Fall		**Spring**
Actual mean age in months		**56**		**61**
Scale	**N**	**M (sd)**	**N**	**M (sd)**
Cognitive	61	20 (6.8)	51	21 (7.5)
Language	69	19 (6.6)	60	20 (7.1)
Fine Motor	31	22 (9.6)	20	23 (11.4)
Gross Motor	29	22 (9.8)	19	22 (10.8)
Self-help	28	23 (9.9)	21	26 (14.5)
Social/emotional	25	25 (12.7)	18	25 (13.9)
		Repeated Measures by domain		
Cognitive	48	19 (6.7)	48	21 (7.7)
Language	56	18 (6.2)	56	20 (7.1)
Fine Motor	17	21 (11.0)	17	23 (11.5)
Gross Motor	17	18 (9.3)	17	22 (10.7)
Self-help	19	22 (10.6)	19	27 (14.4)
Social/emotional	16	24 (13.7)	16	26 (13.8)

Table 5

Primary disability category groups for each year and upon entry into special education, for Cohort B-ESE group

	Entry to special education	04-05	05-06	06-07
Developmental Delay	85 (15%)	81 (17%)	69 (16%)	59 (14%)
Speech Impaired	19 (3%)	17 (4%)	13 (3%)	13 (3%)
Language Impaired	15 (3%)	15 (3%)	10 (2%)	8 (2%)
Emotionally Disturbed	59 (10%)	56 (12%)	55 (12%)	53 (12%)
Specific Learning Disability	238 (41%)	222 (46%)	217 (48%)	202 (47%)
Autism	86 (15%)	84 (17%)	79 (17%)	82 (19%)
Other Health Condition	12 (2%)	10 (2%)	11 (2%)	8 (2%)
No diagnosis	67 (12%)	--	--	--
Totals	581	485	454	425

Table 6

Means and standard deviations for the LAP-D domains, by elementary entry diagnosis group

Group	**No elementary diagnosis**				**Developmental Delay**			
Time point	**1**		**2**		**1**		**2**	
	N	M(sd)	N	M(sd)	N	M(sd)	N	M(sd)
Fine motor manipulation	52	22.6(3.7)	63	24.1(3.3)	34	15.5(4.8)	40	17.9(3.9)
Fine motor writing	52	19.1(6.4)	62	23.0(6.1)	34	8.9(3.9)	41	10.9(4.7)
Cognitive matching	51	18.1(4.1)	61	19.6(3.)	30	9.9(3.5)	37	12.4(3.6)
Cognitive counting	49	16.9(5.5)	62	20.4(5.9)	31	10.4(3.6)	39	12.1(4.1)
Language naming	43	15.8(5.7)	55	19.8(6.0)	29	9.0(2.4)	35	10.3(3.0)
Language comprehension	44	16.4(4.7)	55	19.1(3.6)	30	9.8(4.2)	36	12.2(3.8)
Group	**Autism**				**Specific learning disability**			
Time point	**1**		**2**		**1**		**2**	
	N	M(sd)	N	M(sd)	N	M(sd)	N	M(sd)
Fine motor manipulation	33	17.3(3.4)	40	19.2(3.6)	184	20.3(2.9)	214	22.6(2.8)
Fine motor writing	34	11.4(6.1)	41	15.0(7.3)	184	14.3(5.6)	213	19.0(6.1)
Cognitive matching	32	13.3(3.6)	40	15.1(3.7)	179	14.7(3.9)	204	17.9(3.3)
Cognitive counting	30	11.2(5.8)	39	14.4(6.4)	176	13.4(3.9)	209	16.3(4.8)
Language naming	32	9.6(3.3)	40	11.3(4.7)	177	10.5(3.3)	208	14.1(4.5)
Language comprehension	32	9.1(5.7)	39	11.7(6.0)	174	12.1(4.2)	203	15.5(3.9)
Group	**Speech impaired**				**Language impaired**			
Time point	**1**		**2**		**1**		**2**	
	N	M(sd)	N	M(sd)	N	M(sd)	N	M(sd)
Fine motor manipulation	17	22.6(2.9)	17	24.2(2.3)	13	21.6(3.0)	15	24.1(2.4)
Fine motor writing	17	18.5(5.1)	17	22.6(4.7)	13	17.0(6.1)	15	21.9(5.6)
Cognitive matching	15	17.5(3.4)	17	19.6(2.7)	13	17.0(3.5)	15	19.3(3.0)
Cognitive counting	16	17.6(4.0)	17	19.9(4.8)	12	15.5(5.3)	15	19.9(5.8)
Language naming	10	17.2(5.2)	11	20.9(5.6)	12	13.3(4.4)	12	17.3(3.8)
Language comprehension	10	17.3(3.7)	11	19.0(2.4)	10	14.5(4.2)	11	18.0(5.5)
Group	**Emotionally disturbed**				**Other health condition**			
Time point	**1**		**2**		**1**		**2**	
	N	M(sd)	N	M(sd)	N	M(sd)	N	M(sd)
Fine motor manipulation	43	21.2(3.3)	52	23.5(3.0)	8	22.9(2.7)	10	23.4(4.3)
Fine motor writing	43	14.8(5.8)	53	19.7(6.7)	8	18.4(7.8)	10	22.5(8.1)
Cognitive matching	43	15.2(3.9)	53	18.4(3.4)	9	16.6(5.7)	10	18.9(4.5)
Cognitive counting	41	14.5(4.2)	53	18.4(5.2)	8	17.6(7.9)	10	20.8(6.8)
Language naming	43	13.9(5.4)	53	17.2(6.2)	9	13.7(6.7)	10	19.4(7.3)
Language comprehension	43	14.2(5.0)	53	17.3(4.8)	8	17.5(4.1)	10	18.3(5.3)

Table 7

Means and standard deviations on the parent- and teacher-reported DECA by disability group

	Group	**No elementary diagnosis**				**Developmental Delay**			
Assessor	**Time point**	**1**		**2**		**1**		**2**	
		N	M(sd)	N	M(sd)	N	M(sd)	N	M(sd)
Teacher	Initiative	19	29.1(6.5)	26	32.9(6.3)	30	18.3(8.2)	40	19.3(7.3)
	Self Control		21.4(4.4)		22.0(5.7)		15.4(5.4)		17.1(5.6)
	Attachment		24.3(4.8)		26.4(4.3)		21.0(5.4)		22.6(4.7)
	Behavioral Concerns		7.5(5.3)		6.4(5.3)		14.3(5.7)		13.7(4.7)
Parent	Initiative	17	31.7(6.9)	20	22.6(6.8)	24	23.4(5.9)	32	22.9(5.2)
	Self Control		20.1(4.5)		22.1(4.7)		16.7(4.2)		16.6(5.3)
	Attachment		27.1(3.7)		28.7(3.3)		24.2(4.5)		24.4(3.9)
	Behavioral Concerns		11.1(4.6)		10.7(4.3)		14.4(4.2)		13.4(4.5)
Group		**Autism**				**Specific learning disability**			
Assessor	**Time point**	**1**		**2**		**1**		**2**	
		N	M(sd)	N	M(sd)	N	M(sd)	N	M(sd)
Teacher	Initiative	24	15.3(6.1)	25	17.7(4.6)	78	23.5(7.3)	104	26.3(7.5)
	Self Control		14.3(5.6)		16.4(4.6)		18.7(5.6)		19.7(4.9)
	Attachment		18.6(5.5)		20.7(4.7)		230(6.6)		23.9(7.1)
	Behavioral Concerns		20.0(3.9)		15.5(5.6)		11.4(5.4)		10.3(5.2)
Parent	Initiative	21	19.9(3.9)	19	18.9(4.8)	58	26.5(5.9)	89	26.3(6.5)
	Self Control		13.8(3.7)		15.6(4.3)		19.4(5.1)		19.5(5.0)
	Attachment		23.2(3.8)		23.9(4.2)		25.9(6.7)		26.0(7.5)
	Behavioral Concerns		13.5(3.4)		15.1(3.4)		14.1(8.3)		13.3(8.0)
	Group	**Speech impaired**				**Language impaired***			
Assessor	**Time point**	**1**		**2**		**1**		**2**	
		N	M(sd)	N	M(sd)	N	M(sd)	N	M(sd)
Teacher	Initiative	7	30.9(3.9)	8	32.8(7.5)				
	Self Control		22.4(3.2)		21.6(3.9)				
	Attachment		25.0(2.5)		24.9(5.5)				
	Behavioral Concerns		8.1(2.8)		7.1(2.9)				
Parent	Initiative	7	29.6(9.3)	8	30.6(5.8)				
	Self Control		20.6(7.0)		21.4(5.8)				
	Attachment		27.4(4.5)		28.8(4.5)				
	Behavioral Concerns		10.0(5.1)		8.5(4.2)				
	Group	**Emotionally disturbed**				**Other health condition***			
Assessor	**Time point**	**1**		**2**		**1**		**2**	
		N	M(sd)	N	M(sd)	N	M(sd)	N	M(sd)
Teacher	Initiative	22	21.9(5.3)	23	24.4(6.3)				
	Self Control		12.0(4.9)		13.6(3.9)				
	Attachment		19.2(4.8)		21.0(4.3)				
	Behavioral Concerns		19.2(6.7)		16.8(4.9)				
Parent	Initiative	19	24.6(9.3)	21	27.2(7.5)				
	Self Control		15.4(6.6)		15.7(5.4)				
	Attachment		22.7(7.1)		24.3(3.9)				
	Behavioral Concerns		16.2(6.6)		14.6(3.9)				

Note. * Indicates that there were = or >3 children in a group and therefore means are not reported.

Table 8
Breakdown of children assessed with ESI-K: participants, non-participants, and non-scorable assessments

Assessment			
ESI-K			
Total children with assessment data	399		
Participants	320	Non-participants	87
Not scorable	8	Reason	
Reason		Late entry	2
No attempt	5	Already screened	1
Child refused	3	No translator	7
		Not specified	2
		ESE	76
Total scorable assessments	312		
DIBELs Letter Naming			
Total children with assessment data	399		
Participants	336	Non-participants	71
		Reason	
Not scorable	8	Late entry	1
		Already screened	
		No translator	2
		Not specified	3
		ESE	65
Total scorable assessments	328		
DIBELs Initial Sound			
Total children with assessment data	399		
Participants	336	Non-participants	71
		Reason	
Not scorable	9	Late entry	1
		Already screened	
		No translator	2
		Not specified	3
		ESE	65
Total scorable assessments	327		

Table 9

Scores on the ESI-K and DIBELs for Cohort B-ESE children who participated in school readiness testing in kindergarten

Measure	N	Categories		Average total score	(sd)
ESI-K	312	Ready now	52%	18.50	(5.59)
		Getting ready	22%		
		Not ready	26%		
DIBELs					
Letter naming	328	Above average	36%	13.73	(16.08)
		Low risk	14%		
		Moderate risk	18%		
		High risk	32%		
Initial sound	316	Above average	19%	4.56	(4.21)
		Low risk	15%		
		Moderate risk	25%		
		High risk	41%		

Table 10

Children who did not take the NRT, by primary disability category at special education entry

Primary disability category	**No NRT scores**
No Diagnosis	0
Developmental Delay	48
Speech Impaired	0
Language Impaired	0
Emotionally Disturbed	2
Specific Learning Disability	6
Autism	46
Other Health Impaired	0
Total	102

Table 11

Breakdown of children ever receiving special education services by time point

Group	**Time point (includes all children)**			
	1[a]	**2**	**3**	**4**
Year	**03-04**	**04-05**	**05-06**	**06-07**
Total Children in Special Education	617	849	883	898
Total Children not in Special Education	644	412	378	363
Enrolled only in Year 1	104			
Enrolled in Years 1 & 2	40	→		
Enrolled in Years 1, 2, & 3	47	→	→	
Enrolled in Years 1, 2, 3, & 4	381	→	→	→
Enrolled only in Year 2		68		
Enrolled in Years 2 & 3		73	→	
Enrolled in Years 2, 3, & 4		218	→	→
Enrolled only in Year 3			29	
Enrolled in Years 3 & 4			110	→
Enrolled only in Year 4				140
Discontinuous enrollment[b]	45	22	25	49

a. Year 1 is the pre-kindergarten year for all children in the Cohort B group, for most children year 2 is the kindergarten year, year 3 is the first grade year, and year 4 is the second grade year.

b. Discontinuous enrollment is defined as leaving special education services at some point during these four years, but re-entering special education services after a break of 1 or 2 years.

Table 12

Means and standard deviations on the LAP-D and teacher-reported DECA for children who continued in special education services for all four years and children who exited prior to second grade

	Continued in Special education	**Exited Special education**
LAP-D scale	**M (sd)** **N = 219**	**M (sd)** **N = 44**
Fine motor manipulation	19.73 (3.74)	22.49 (3.22)
Fine motor writing	13.62 (5.98)	18.05 (6.13)
Cognitive matching	14.40 (4.26)	17.18 (3.24)
Cognitive counting	13.14 (4.54)	16.84 (4.91)
Language naming	11.04 (4.00)	15.57 (5.60)
Language Comprehension	12.19 (4.71)	16.64 (3.83)
DECA scale	**N = 128**	**N = 21**
Initiative	21.53 (7.65)	29.19 (6.37)
Self-Control	16.65 (5.82)	21.29 (4.88)
Attachment	21.32 (5.08)	24.95 (4.09)
Behavioral Concerns	13.74 (6.20)	7.29 (5.26)

Note: Children who exited special education had significantly higher scores on all LAP-D subscales, significantly higher scores on all three DECA protective factors scales, and significantly lower reported behavioral concerns (all $p < .01$),

Table 13

Breakdown of children who continued in special education services for all four years or exited prior to second grade by primary disability category

Primary disability category group	**Continued in Special Education** N (% of PD group)	**Exited Special Education** N (% of PD group)
Developmental Delay	62 (97%)	2 (3%)
Speech Impairment	11 (73%)	4 (27%)
Language Impairment	10 (77%)	3 (23%)
Emotionally Disturbed	42 (96%)	2 (4%)
Specific Learning Disability	184 (93%)	15 (8%)
Autism	64 (99%)	1 (2%)
Other Health Impairment	8 (90%)	1 (11%)

Table 14

Means and standard deviations on the LAP-D and teacher-reported DECA for children who experienced a change in primary disability category and children who did not

	Change in PD	**No Change**
LAP-D scale	**M (sd)** **N = 54**	**M (sd)** **N = 730**
Fine motor manipulation	19.44 (3.20)	20.99 (3.64)*
Fine motor writing	12.69 (6.03)	15.32 (5.90)*
Cognitive matching	13.09 (3.43)	15.15 (4.26)*
Cognitive counting	13.15 (4.11)	14.31 (4.77)
Language naming	10.07 (3.88)	12.29 (4.78)*
Language Comprehension	12.15 (4.54)	13.92 (4.64)*
DECA scale	**N = 51**	**N = 647**
Initiative	23.68 (8.06)	23.48 (8.12)
Self-Control	16.65 (7.05)	18.64 (6.18)*
Attachment	21.61 (5.47)	21.40 (5.05)
Behavioral Concerns	15.08 (6.88)	12.17 (6.51)†

Note: * Children who did not experience a change in primary disability category had higher mean scores than children who did, $p < .01$.

† Children who did not experience a change in primary disability category had significantly less reported behavior problems than children who did, $p < .01$.

Table 15

Changes in primary disability category, type and number

Primary disability category Original PD				**New PD**							**Total in Original PD**
	Δ in PD	% of PD	% of Δ	**DD**	**SI**	**LA**	**ED**	**LD**	**A**	**OHI**	
DD	15	6%	5%		1	1	2	5	5	1	87
SI	27	11%	5%	1		2	3	18		3	245
LA	9	21%	5%	1	1			7			43
ED	4	5%	17%					1	3		87
LD	17	5%	44%	1	2	1	7		6		377
A	2	2%	18%					1		1	82
OHI	4	15%	6%	1			1	2			26
Total Δ	78			4	4	4	13	34	14	5	
Total in New PD				76	222	38	96	394	94	27	

Note. Shaded cells indicate no change. Abbreviations are as follows: DD = Developmental delay, LD = Specific learning disability, SI = Speech impaired, LA = Language impaired, ED = Emotionally disturbed, A = Autistic, and OHI = Other health impairment

Table 16

Means and standard deviations of MANOVA for special education entry and scores on the language, cognitive, and fine motor domains of the Fall time-point LAP-D

Special education entry	**Pre-kindergarten**		**Elementary (PS pre-k)**		**Elementary (Private pre-k)**	
	N=392		**N=254**		**N=247**	
LAP-D scale	**Mean**	**(sd)**	**Mean**	**(sd)**	**Mean**	**(sd)**
Language naming	11.68	(4.88)	13.94[a]	(5.25)	11.39	(4.23)
Language comprehension	12.74	(4.97)	15.55[a]	(4.29)	13.72[b]	(4.09)
Cognitive matching	14.69	(4.17)	16.01[a]	(4.21)	14.60	(4.22)
Cognitive counting	13.71	(4.88)	15.38[a]	(5.06)	14.07	(4.27)

Note: a = Average score is significantly higher than both other groups.
b = Average score is significantly higher than Pre-K entry group.

Table 17

Means and standard deviations of MANOVA for special education entry and scores on the Fall time-point teacher-reported DECA

Special education entry	**Pre-kindergarten**		**Elementary (PS pre-k)**		**Elementary (Private pre-k)**	
	N=215		**N=349**		**N=185**	
DECA scale	**Mean**	**(std)**	**Mean**	**(std)**	**Mean**	**(std)**
Initiative	22.55*	(8.29)	24.40	(7.83)	23.34	(8.68)
Self-Control	17.21*	(5.96)	19.51	(6.06)	18.19	(6.53)
Attachment	21.48	(5.33)	21.64	(4.97)	21.14	(5.20)
Behavioral Concerns	12.70*	(6.51)	10.89	(6.15)	14.17+	6.04)

Note: * = Pre-K entry had significantly lower score than Elementary entry, PS pre-K group.
+ = Elementary entry, Private pre-k, had significantly higher reported behavior concerns than both other groups.

Table 18

Breakdown of children with delayed kindergarten entry, and retained in grade, for overall Cohort B group, and children enrolled in special education services (Cohort B-ESE and Cohort B-ELSE)

Group	**Group N**	**Retained In-grade**	**% of children retained**	**% of group N**
Cohort B*	7290	411	(69%)	6%
Cohort B-ESE	617	40	(7%)	6%
Cohort B-ELSE	644	140	(25%)	22%
Total	8551	591	(100%)	7%

*Note. Numbers for the Cohort B group do not include children enrolled in special education services.

Table 19

Chi square for entry into special education services and in-grade retention in kindergarten or first grade

		In-grade retention		
Entry into Special education		**Not retained**	**Retained in K or G1**	**Total**
Pre-kindergarten enrollment		577	40	617
	% in Entry group	94%	7%	
Elementary enrollment		504	140	644
	% in Entry group	78%	22%	
Total	**N**	1081	180	1261
	% of Total	86%	14%	

Note. $\chi^2 = 59.94$, $p < .001$.

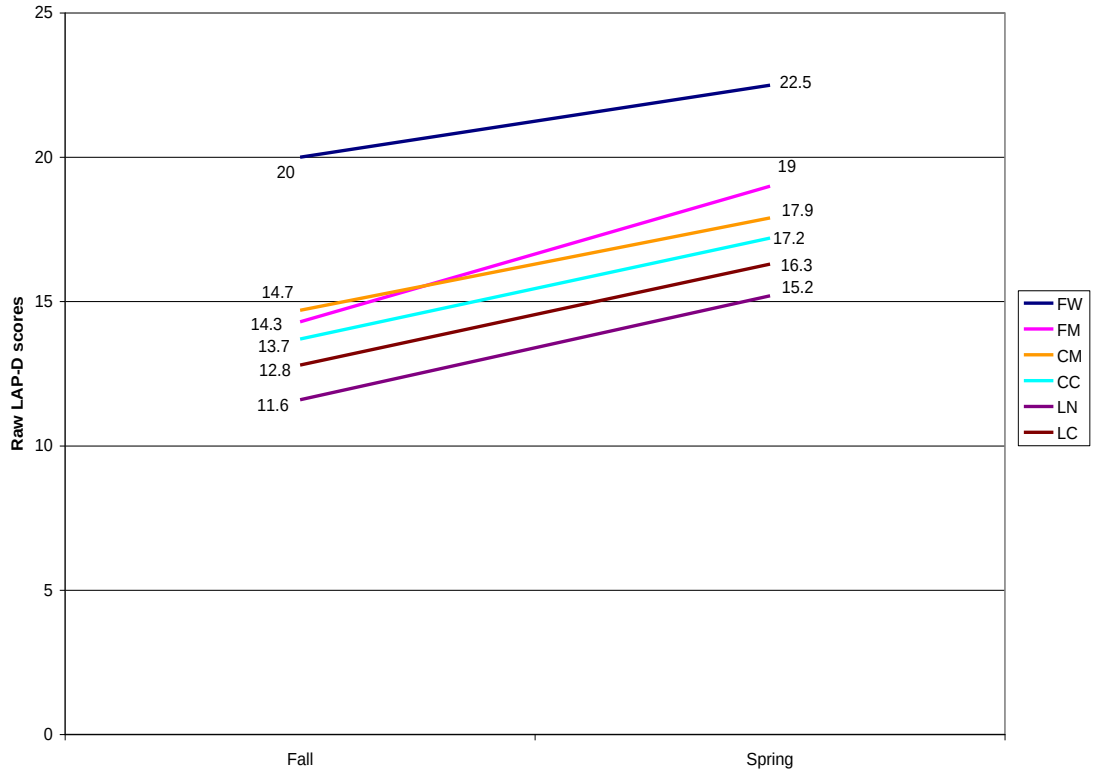
Table 20

Chi square for enrollment in special education and primary disability category

	Time of Entry into Special Education Services			
Primary disability category	Pre-kindergarten	% of PD group	Elementary school	% of PD group
DD	85	86%	14	14%
SI	19	7%	265	93%
LA	15	27%	40	73%
ED	59	50%	60	50%
LD	238	51%	230	49%
A	86	95%	5	5%
OHI	12	29%	29	71%

Note. $\chi^2 = 344.56$, $p < .001$.

Figure 1

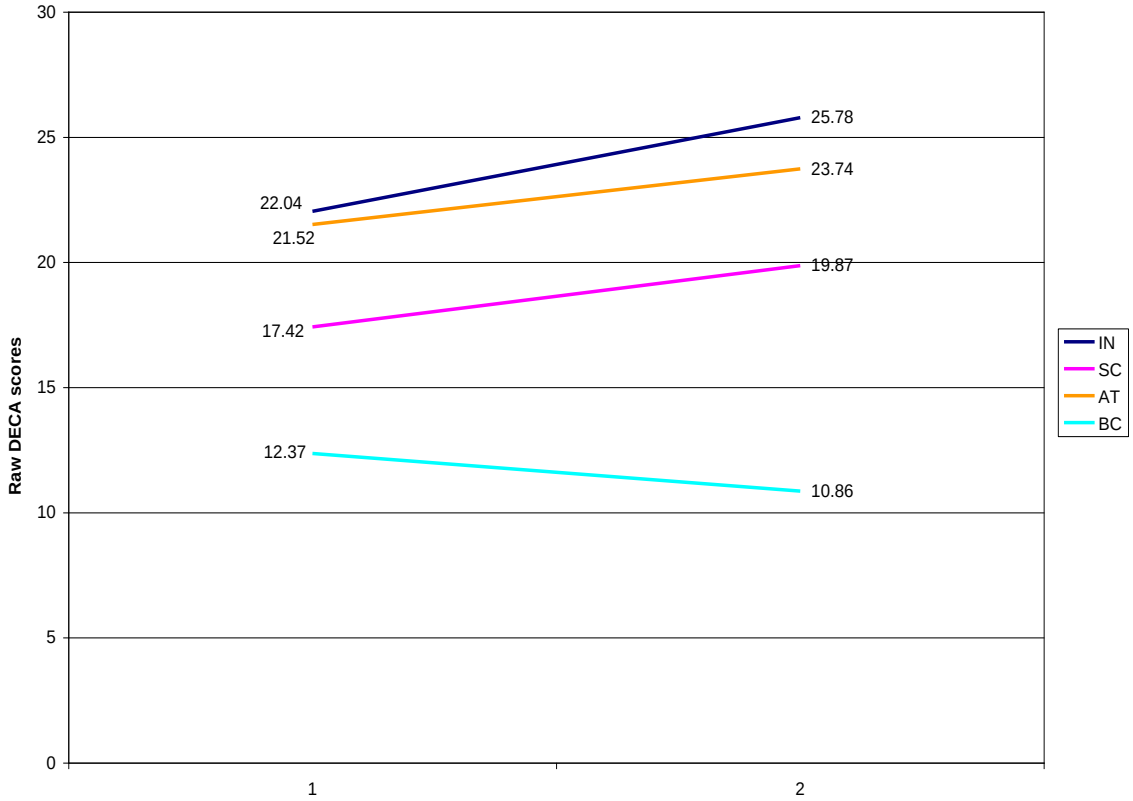


Mean LAP-D scores for repeated-measures MANOVA, all children with complete assessments at both the fall and spring time points

Legend For LAP-D Scales

Abbreviation	LAP-D Scale
FM	Fine Motor Manipulation
FW	Fine Motor Writing
LN	Language Naming
LC	Language Comprehension
CM	Cognitive Matching
CC	Cognitive Counting

Figure 2

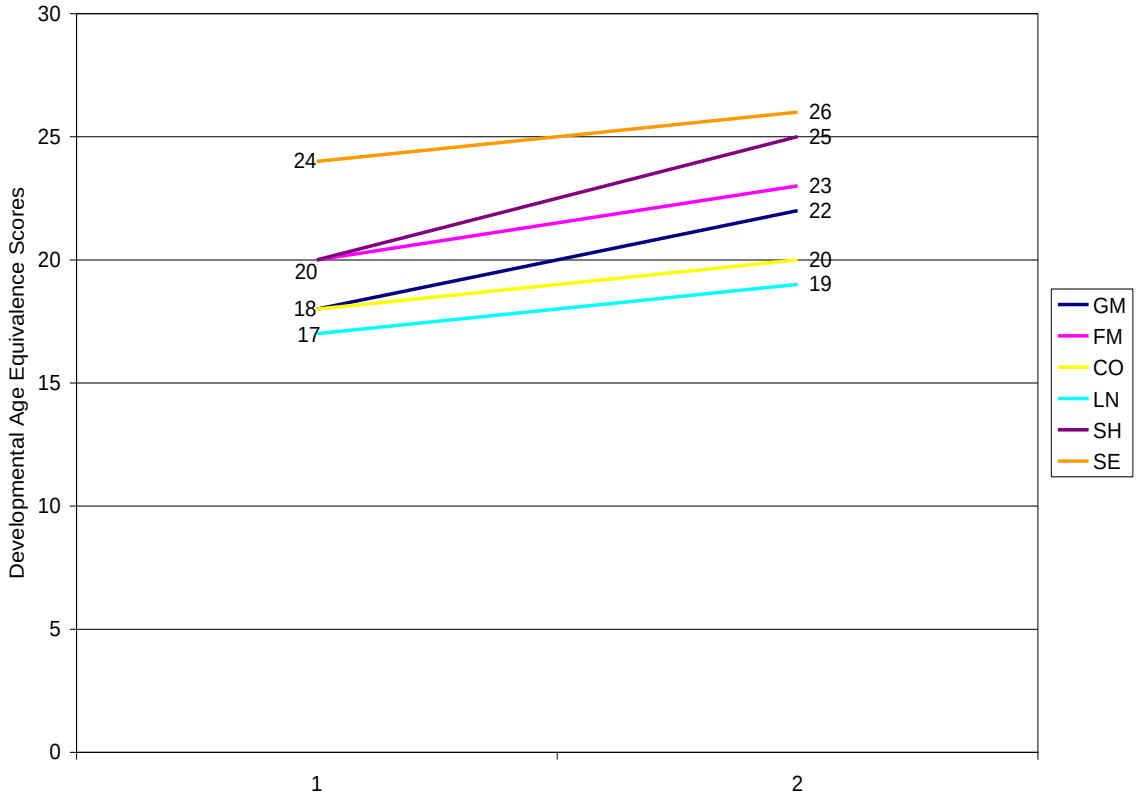


Mean teacher-reported DECA scores for repeated-measures MANOVA, all children with complete assessments at both the fall and spring time points

Legend for DECA Scales

Abbreviation	DECA Scale
IN	Initiative
SC	Self-Control
AT	Attachment
BC	Behavior Concerns

Figure 3

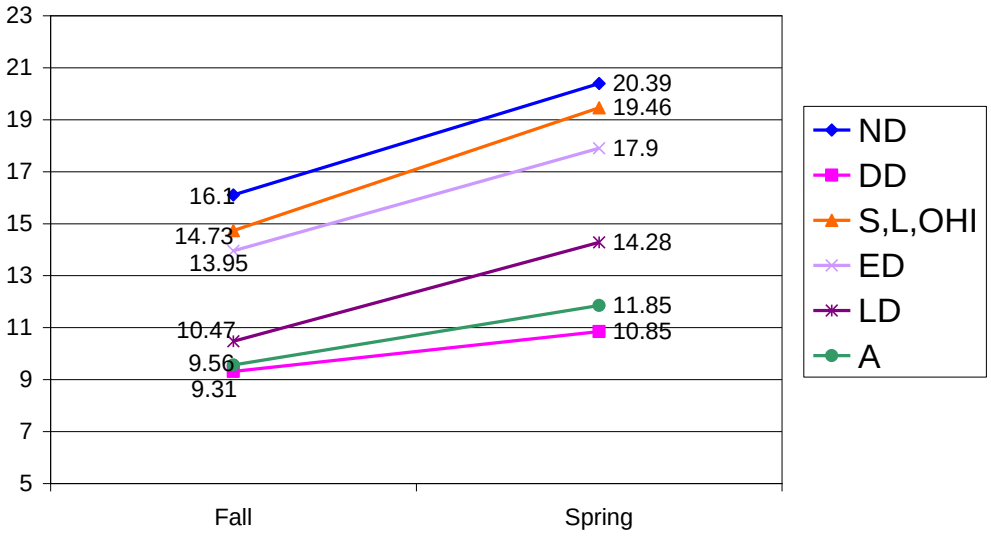


Mean developmental age equivalence scores for all children assessed at both time points with the full ELAP

Legend for ELAP Scales

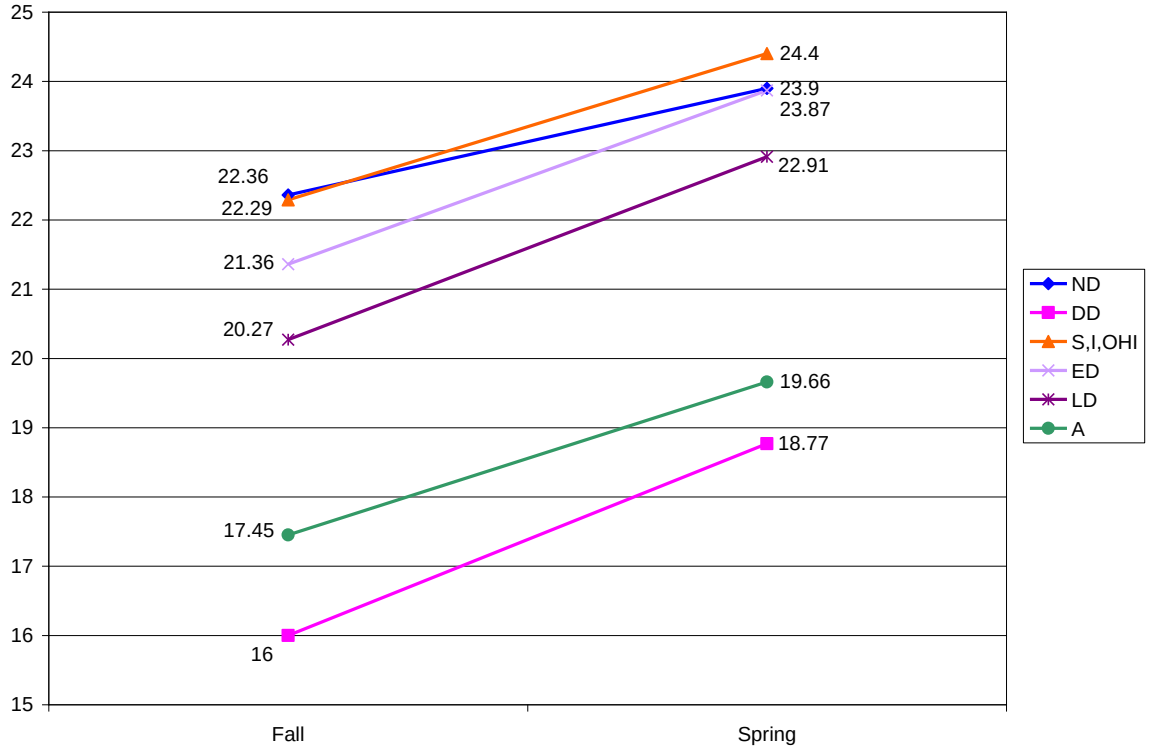
Abbreviation	ELAP Scale
GM	Gross Motor
FM	Fine Motor
CO	Cognitive
LN	Language
SH	Self-Help
SE	Social Emotional

Figure 4



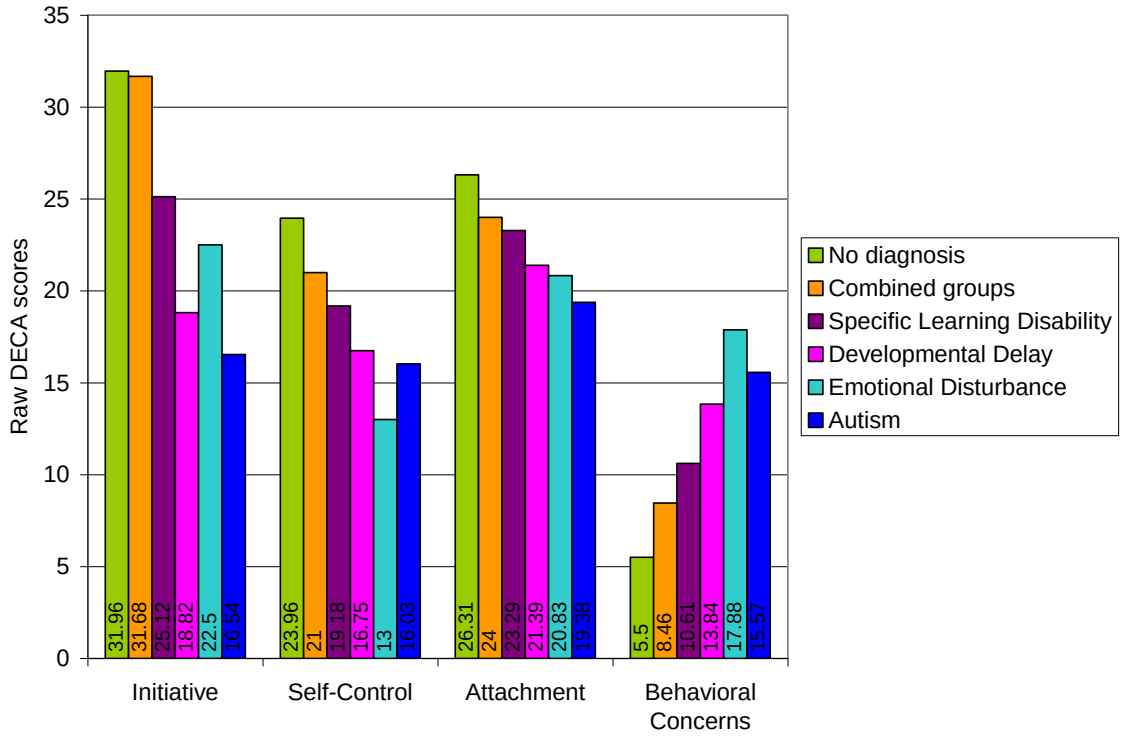
Change over time by primary disability category group (PD-Entry) in Language naming

Figure 5



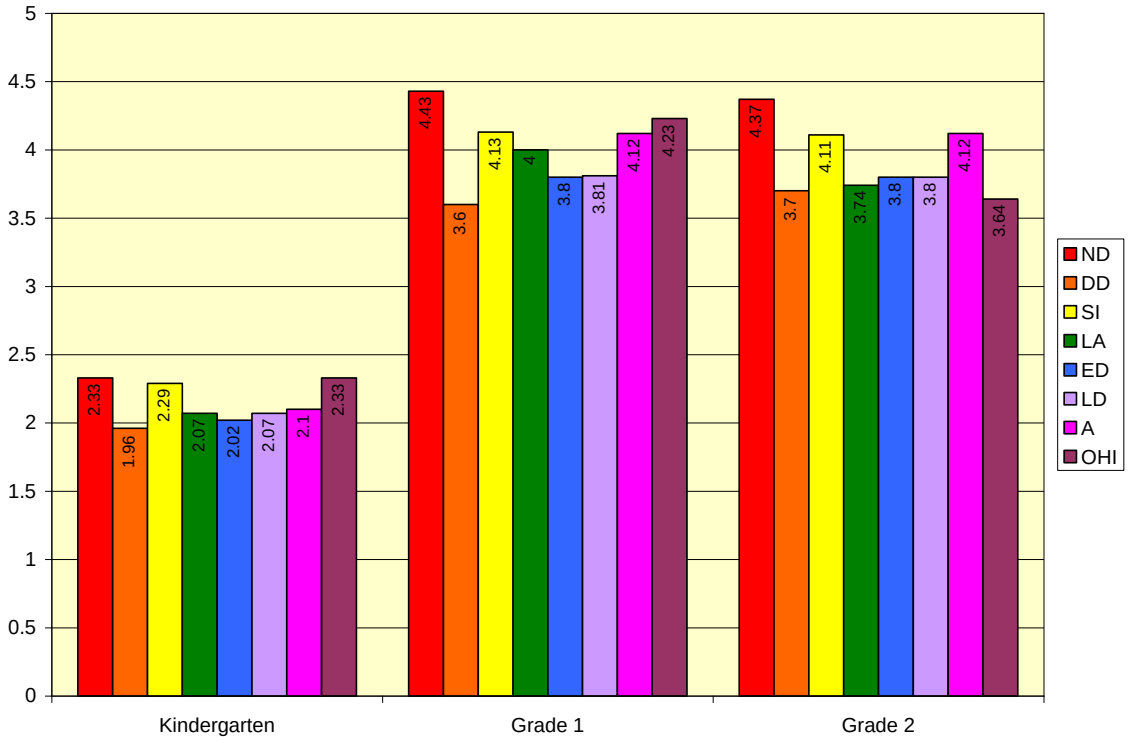
Change over time in fine motor writing, by primary disability category groups

Figure 6



Teacher-reported DECA fall raw scores, by primary disability category groups

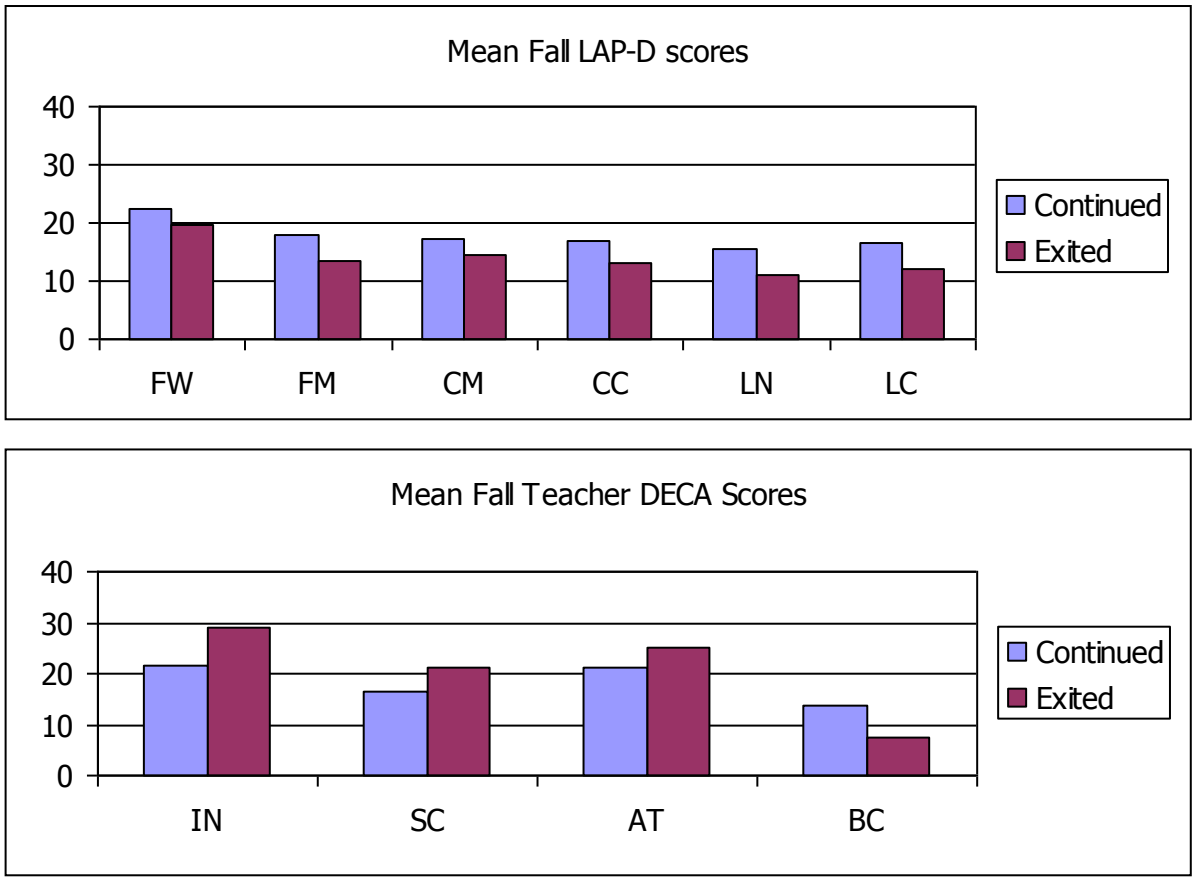
Figure 7



Kindergarten, First, and Second grade mean grades, by primary disability category at special education entry

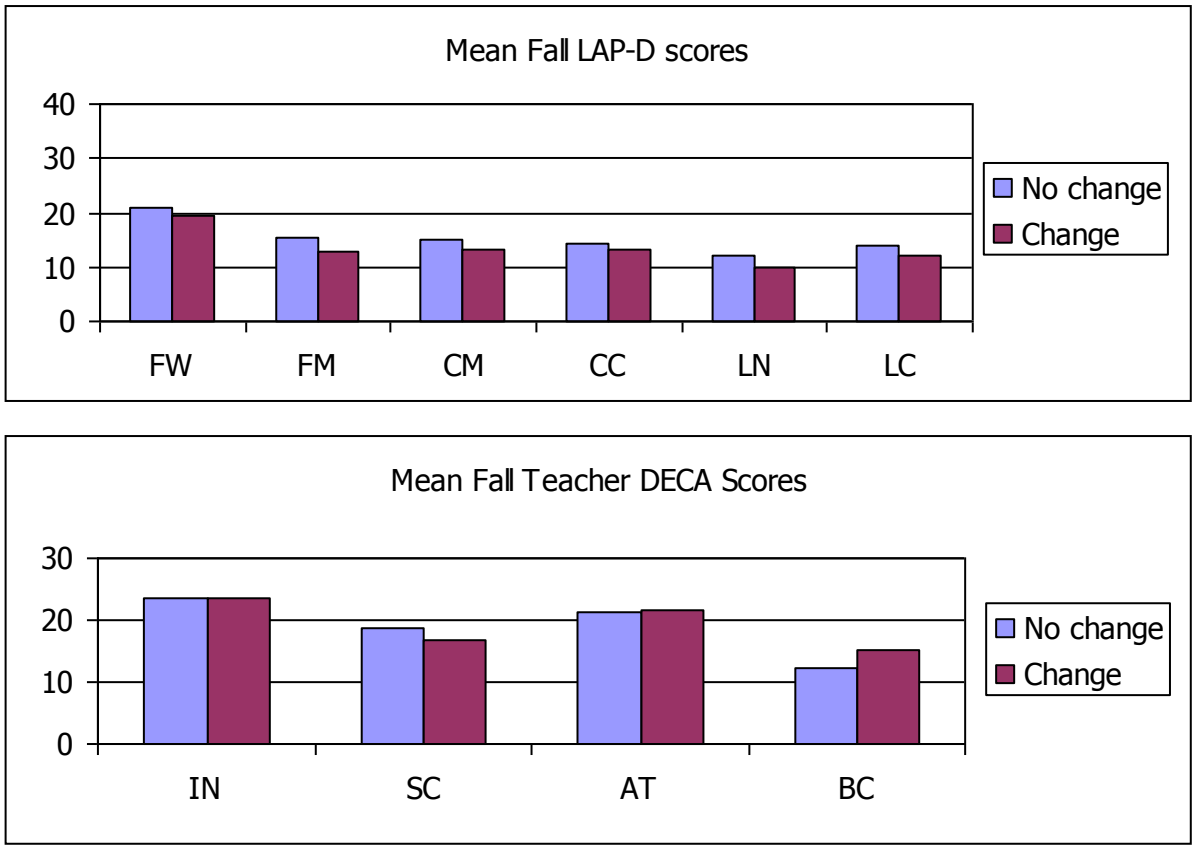
Note: Kindergarteners are graded on a 3-point scale, first and second graders on a typical 5-point (A, B, C, D, F) scale.

Figure 8



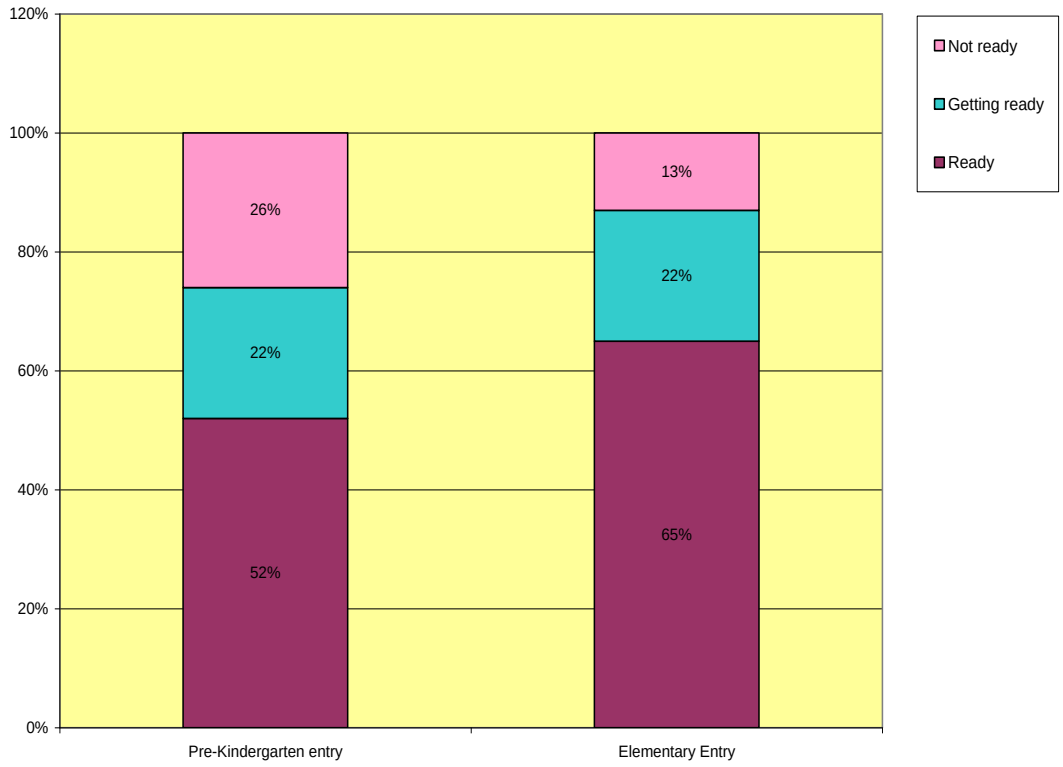
Who stays and who goes? Mean fall LAP-D and Teacher DECA scores for children who continued in special education for all four years and children who exited prior to second grade

Figure 9



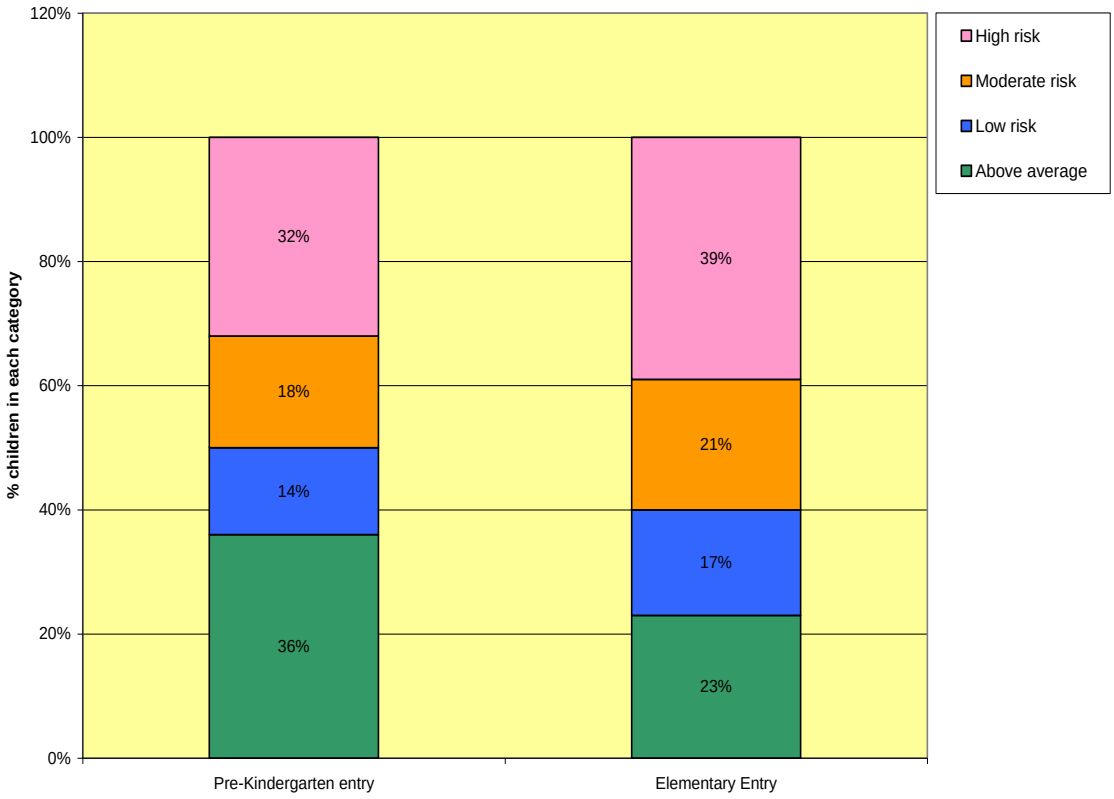
Who experiences a change in primary disability category? Mean fall LAP-D and Teacher DECA scores for children who experienced and change in primary disability category and children who did not

Figure 10



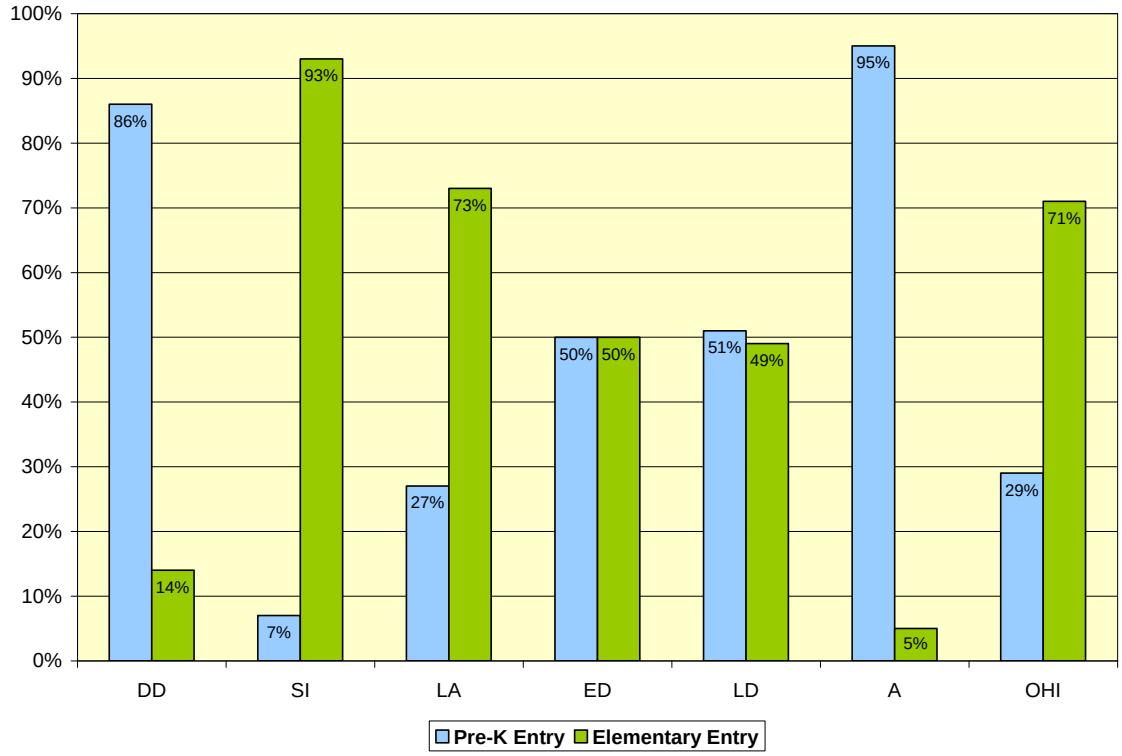
Children in each ESI-K readiness category, divided by entry into special education services

Figure 11



Children in each category for DIBELs Letter Naming risk category, divided by entry into special education services

Figure 12



Time of entry into special education services, divided by primary disability category groups

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Curriculum Vitae

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