

CONTRIBUTION OF RACE, PRIMARY LANGUAGE,
FAMILY STRUCTURE AND PRE-KINDERGARTEN
ATTENDANCE TO THE ODDS OF BEING
CLASSIFIED AS HAVING A SPECIFIC LEARNING
DISABILITY BY THE THIRD GRADE

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Abstract:

Many risk factors have been identified for children entering Kindergarten. Many at-risk children eventually get classified as having a Specific Learning disability. Some of these risk factors include having a primary home language other than English (Hosp & Reschly, 2004), having non-intact families (Pong, 1997), being of minority status (Losen & Orfield, 2002; Morgan, Farkas and Hibel, 2008) and not attending a quality pre-school (Lee, 2010).

This study analyzed ECLS-K data to examine the extent to which race, family composition, primary home language, and pre-kindergarten attendance predict the likelihood of children being classified with a specific learning disability (SLD) by spring of third grade. Four logistic regressions were completed: one which analyzed for the entire sample and three others which separately analyzed these predictive variables for students attending low, medium, and high poverty schools. When analyzing the entire model, these predictors were not found to have much power, however when each SES group were analyzed, interesting results were found.

In low SES schools, students who were minorities had odds twice as high as those who were White of being classified SLD, and those who did not speak English as their primary language had odds that were three times as high. Having attended Pre-K lowered these students' odds of being labeled. In middle SES schools, once again non-English as the primary language led to higher odds of being classified SLD, but race had an opposite trend, with White children having higher odds of being given this label. In the wealthiest schools, coming from a non-intact family actually led to lower rates of classification as SLD, as did not speaking English at home.

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CHAPTER I

INTRODUCTION

In 2004, the Federal government of the United States passed an updated version of the Individuals with Disabilities Education Act. This act was the culmination of 30 years of legislation which began in 1975 with the passing of Public Law 94-192 (the Education for All Handicapped Children Act). These measures were written with the intention of protecting children and youth, particularly those with special needs, from violation of their rights to a free and appropriate education.

In 1932, Marion Monroe introduced the idea of a significant discrepancy in achievement for children with reading difficulties. The prevalence of the SLD classification has tripled in the last 30 years with an average of 6% of all children in public education meeting criteria for this classification (Margai & Henry, 2003). By 2008, the number of children classified as Learning Disabled has increased to the point where it is now over 50% of the special education population (Kavale & Spaulding, 2008). Through the years there has been dissatisfaction with the conceptualization, method of diagnosis, and variation in IEP implementation strategies of the Specific Learning Disabilities diagnosis and label.

Legal Precedence in Special Education

The 14th Amendment of the Constitution of the United States entitles each citizen to equal protection under the law and to due process towards the attainment of their basic civil liberties (U.S. Const. amend. XIV). While it is not mandated by federal law that states provide public education, once a state has provided it, it cannot be taken away. While standardized cognitive abilities tests have been the norm in the placement of students into special education, there has been much debate over the validity of these measures across cultural and racial groups.

Response to Intervention

Another objection to the currently existing model of discrepancy in cognitive ability and academic functioning is the wide variance in prevalence of SLD classification and type of services rendered from state to state (Kavale & Spaulding, 2008). In 1991, Frank Gresham defined Response (or Resistance) to Intervention as the “lack of change in target behaviors as a function of intervention.” RtI is defined by three core features: (a) evidence based interventions, (b) appropriate assessment of level of performance using data-based practices and c) using these data-driven methods to make necessary educational decisions about students (Gresham, 2011). While RtI is a relatively new model, and many facets of the process are still being extensively researched, huge strides have been made to ensure that this is the most appropriate model for the treatment and understanding of student learning.

Vaughn and Fuchs (2003) posed the following strengths of the RtI model: (a) it does not imply that a student necessarily needs to have significant discrepancy between cognitive abilities and achievement which is particularly beneficial for students with lower cognitive abilities; (b) there is increased potential for earlier and more valid identification; (c) a lessening of bias on the part of teachers and evaluators as the data would be based on empirically sound interventions; and d) the clear alignment of identification with instructional demands of the classroom.

Factors Related to Classification

Looking back at the definition prescribed by IDEIA the following possible causes of low achievement must be ruled out, “environmental, cultural, or economic disadvantage.” The following factors are related to both environmental and economic circumstances which can adversely affect education.

Language Spoken at Home

Over the past 20 years the number of linguistically diverse children and families in the U.S. has greatly increased. The implications for educators and school psychologists are just beginning to be understood. From district to district there is much variability in the services that English Language Learner (ELL) students receive and whether or not their services are found under the special education umbrella. There is, however, an overrepresentation of ELL children in special education (Hosp & Reschly, 2004). One factor possibly contributing to the over-representation of language minority students in special education is the current method of diagnosis using the discrepancy model.

RtI, on the other hand, offers promising alternatives to this method of diagnosis, culturally and linguistically appropriate interventions and instructional techniques are still being researched (Xu & Drame, 2007). Previous research has found discrepancies in achievement across racial and ethnic groups, with African Americans and Latinos scoring substantially lower than their peers (Morgan, Farkas & Hibel, 2008).

Race and Ethnicity

In 1968, Dunn proposed in his classic article that the overrepresentation of minorities labeled as “mild mentally retarded” may lead to questioning of the validity of the current special education labeling model. Of the 1.5 million children categorized as mentally retarded, emotionally disturbed or learning disabled in 1998, over half were African American or Native American (Losen & Orfield, 2002). According to research by Morgan, Farkas and Hibel (2008) using the ECLS-K database (NCES, 2004), Hispanic and African American children entered Kindergarten with significantly lower reading scores than White children. It was also found by Lardner and Hammons (2001) that the

more urban a district is, the lower the percentage of minority students that are enrolled in special education programs.

Socioeconomic Status

Between 2000 and 2005, the number of children in the United States who were living below the poverty line increased by 9%, or 1.3 million (Howard, Dresser & Dunklee, 2009). A major challenge for both researchers and educators is distinguishing children who have an actual learning disability from those whose lack of achievement stems from social and economical disadvantage.

Single Parent Homes

According to the US Census in 1970, twelve percent of children in the U.S. lived in homes with only one parent. Students from non-intact homes have additional stressors and a generally lower SES standing than their in-tact family peers. Two major theories have developed as to why children from single parent families struggle more than their peers academically (Pong, 1997). One explanation, proposed by McLanahan in 1985, suggests that children from single parent families often experience strong economic deprivation. The second theory focuses instead on the lack of parental involvement generally found in single parent homes.

School Readiness and Pre-Kindergarten Attendance

The U.S. Department of Education's National Center for Education Statistics (2005) cited three factors as the primary cause for a lack of school readiness: (a) limited economic resources in the home, (b) low parental education levels and (c) single parenting. Even accounting for parental education and SES, there are significant differences in outcome for children whose home environment lends towards early exposure to educational materials. One common issue for educators is adapting and adjusting expectations for children from homes which are culturally diverse or of low SES.

There has been a dramatic rise in the expectations of early education teachers regarding children's school readiness levels since the passing of the No Child Left Behind Act of 2001 (P.L. 107-110, 2001). In recognition of the importance of school readiness for later academic outcomes,

the Head Start Program was started in 1965 to accommodate and serve children in poverty in hopes of improving their schooling careers (Lee, 2010). Studies of non-Head Start preschool programs have resulted in high variability in child outcomes due to highly differing educational standards at these programs. Not only do Head Start and other quality preschool programs have beneficial effects on school readiness upon entering Kindergarten, but recent research suggests that these effects are not moderated by gender or race (Zhai, Brooks-Gunn & Waldfogel, 2011).

Long-Term Effects of Labeling

Over the years, much research has investigated the harmful effects that labeling and categorization can have on patients and clients across the mental health spectrum.

A study of adults that were given the SLD label as children showed that very few still maintained the necessary discrepancy to meet that criterion. A less researched but very important area of the diagnosis and labeling system within the public schools' special education programs is the way that having a child who is labeled can affect the child's family.

Research Questions and Goals of this Study

This study sought to test the predictive value of each of these variables, which have been shown to adversely affect school achievement. It specifically targeted how these variables, which have been shown to be risk factors, determined the likelihood of being labeled as having a Specific Learning Disability. The research questions were as follows:

1. To what extent do the following four variables – (a) primary language spoken at home, (b) family intactness, (c) type of child care before Kindergarten, and (d) child's race – collectively explain the likelihood that public school children will be classified as meeting the criteria for SLD by the spring of their third grade year?
2. To what extent does each of the four predictor variables listed in Question 1 explain the likelihood that children will be classified as SLD by the spring of their third grade, over and above the other variables?

Subsequently, research questions 3 and 4 were explored by informally comparing the results of each of the previous analyses across levels of school population SES. School population SES is defined as the percentage of students who are eligible for free lunch within a school.

3. How much of an impact does school population SES have on the ability of these four variables together to explain the likelihood that children will be classified as SLD by the spring of their third grade?

4. How much of an impact does school population SES have on the ability of each of these four variables to explain the likelihood that children will be classified as SLD, over and above the other variables?

CHAPTER II

REVIEW OF THE LITERATURE

The Education for All Handicapped Children Act and Learning Disabilities

In 2004, the Federal government of the United States passed an updated version of the Individuals with Disabilities Education Act. This legislation was designed to align with the No Child Left Behind Act (NCLB) which President George Bush signed into law in 2001. These measures were written with the intention of protecting children and youth, particularly those with special needs, from violation of their rights to a free and appropriate education.

This act was the culmination of 30 years of legislation which began in 1975 with the passing of Public Law 94-192 (the Education for All Handicapped Children Act). Before this landmark legislation, only about 1 in every 5 children with disabilities were served by public education. Many states had laws explicitly stating that students with disabilities (particularly deaf, blind, emotionally disturbed or mentally retarded) should not be educated with their non-disabled peers (United States Department of Education, 2000). It is estimated that before the passing of EHA, over 1 million students in the United States were completely denied of access to education with another 3.5 million were educated in extremely segregated and inappropriate settings. In 2006, after the passing of IDEA (1997) and IDEIA (2004), more than 6 million children in the United States receive special education services (National Council on Disability, 2000).

With the passing IDEIA (2004), the following definition was given to the category of Specific Learning Disability (SLD):

"The term 'specific learning disability' means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which disorder may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations...Such term does not include a learning problem that is primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage."

According to the Child Trends Data Bank (2007), the average cost of educating a student in general education was \$7,552. The average cost, per student for special education is more than double that at \$16,921. While education is by far the largest expenditure of states, with an average of 46% of states' budget going towards elementary, secondary and higher education, many states are struggling to balance their budgets and education spending is often one of the first cuts made (Center on Budget and Policy Priorities, 2011). With the high cost of special education, and widespread cuts to state's educational programs, it is important that placement in special education be made based on valid and appropriate evaluation and placement.

History and Recent Research

In 1932, Marion Monroe introduced the idea of a significant discrepancy in achievement for children with reading difficulties. By 1977, the U.S. Office of Education deemed that SLD should be defined as a severe discrepancy between achievement and intellectual ability (Hallahan & Mercer, 2002). In the 80 years since 1932 this model has been the generally accepted standard for the diagnosis of learning disability.

In the years between 1977 and 1995, the number of children classified as needing special education increased 47%, and of those diagnosed, almost 25% were labeled with a Specific Learning Disability. In 1977 there were 796,000 children labeled as learning disabled. By 2003

that number had risen to nearly 3 million (Howard, Dresser & Dunklee, 2009). The prevalence of the SLD classification has tripled in the last 30 years with an average of 6% of all children in public education meeting criteria for this classification (Margai & Henry 2003). By 2008, the number of children classified as Learning Disabled has increased to the point where it is now over 50% of the special education population (Kavale & Spaulding, 2008).

Through the years there has been dissatisfaction with the conceptualization, method of diagnosis, and variation in IEP implementation strategies of the Learning Disabled diagnosis and label. This frustration with the SLD categorization model stems not as much from a lack in belief in the validity and maybe even prevalence of such a disorder, but from the complete lack of consistency in identification and method of diagnosis across schools, districts and states. One major objection to the discrepancy model is the lack of treatment validity (McKenzie, 2009). The implication of this complaint is that while having a low score on a formal assessment of academic achievement may be a necessary component of diagnosis, it does not aid in outlining specific goals or measureable outcomes for the child in question. For example, having an overall cognitive abilities score of 99 and a reading achievement score of 72 may qualify the student for special education services through a learning disability label, but the scores would not point to any meaningful ways to assist the child in catching up or ways to intervene on this lack of skills.

Legal Precedence in Special Education

The 14th Amendment of the Constitution of the United States entitles each citizen to equal protection under the law and to due process towards the attainment of their basic civil liberties (U.S. Const. amend. XIV). This has been challenged in the arena of special education through a variety of cases, a significant number of which have made it to the Supreme Court of the United States. The first and possibly most prominent was the Supreme Court ruling in *Brown v. Board of Education* (1954), which stated that students were to receive equal protection and access to public education and the opportunities that ensures. While this particular ruling addressed desegregation of public education on the basis of race, it has been used as a precedent to ensure

the rights given to each citizen are applied in the educational setting. This has come to include the right of each student to be allowed to acquire the English language so as to succeed in the public education setting. In 1974, this became mandated through a Supreme Court ruling in the case of *Lau v. Nichols*, which stated that special instruction must be given by a district if it is necessary for the child to be able to participate in the general education setting (Zirkel, 2009).

While it is not mandated by federal law that states provide public education, once a state has provided it, it cannot be taken away. The amendment states that a state cannot act in a way which would deprive a citizen of their life, liberty or property interest without due process under the law. The Supreme Court in *Goss v. Lopez* (1975) stated that depriving minors of their access to education violates this amendment in the following ways: a) students have 'property' interest in public education which should be constitutionally protected and b) their liberty could be at stake if lack of access education would cause interference with future education and employment due to government action (Zirkel, 2009).

While standardized cognitive abilities tests have been the norm in the placement of students into special education, there has been much debate over the validity of these measures across cultural and racial groups. In 1996 the American Psychological Association published a report on human intelligence which stated that while the mean test scores of African Americans differ as much as a standard deviation (15 points) from those of Whites, cognitive abilities tests should still be seen as accurate predictors of achievement; moreover, they noted that the gap in scores was diminishing (Neisser et al, 1996). It is likely that this is a factor in overrepresentation of minority students in special education which will be discussed at length later. Rulings by the Supreme Court have indicated that the disproportionate impact of these measures is not the primary concern of the equal protection clause of the 14th Amendment; however it should be considered a factor in their continued use. If racial discrimination is seen as a motivating factor in the decision, then the 14th amendment would be considered by the courts to be violated

(Arlington Heights v. Metropolitan Housing Development Corporation [1977] and Washington v. Davis [1976]).

Lastly, in Board of Education v. Rowley (1982), Free and Appropriate Education was defined more clearly by saying that the Rehabilitation Act of 1973 was meant to “open the door to, rather than provide a floor for, publicly provided education of disabled children” (Zirkel, 2009). This has been used as a precedent to define the limits of FAPE for the last 30 years.

Response to Intervention

Another objection to the currently existing model of discrepancy in cognitive ability and academic functioning is the wide variance in prevalence of SLD classification and type of services rendered from state to state (Kavale & Spaulding, 2008). One possible contributor to the dramatic increase in SLD identification over the past 30 years is a lack of consistency across districts and states in the way that IDEIA is interpreted and implemented. At The United States Department of Education’s Office of special education’s summit entitled *Specific Learning Disabilities: Finding Common Ground* in 2002, the participants agreed that the discrepancy model is “neither necessary nor sufficient for identifying children with SLD” (Bradley et al., 2002). In 2008 it was found that almost 50% of children with current SLD diagnoses in the United States did not meet the required discrepancy criterion (Kavale & Spaulding, 2008).

In 1991, Gresham defined Response (or Resistance) to Intervention as the “lack of change in target behaviors as a function of intervention.” He outlined this model as not finding the appropriate or predicted discrepancy between baseline and post-intervention functioning, which can therefore be used as evidence of a learning difficulty (Gresham, 1991). As this model has grown in the past 20 years, both in research and practice, and has been applied to all types of school based behaviors and interventions (Gresham, 1991, 2004; Duhon, Mesmer, Gregerson & Witt, 2009; Sullivan & Long, 2010). Many researchers are of the opinion that RtI is the superior model for diagnosis and placement in special education services (Gresham, 2011). For school

psychologists and other educational practitioners, it is vital to have an appropriate understanding of this theory and its potential for the school systems.

RtI is defined by three core features: (a) evidence based interventions, (b) appropriate assessment of level of performance using data-based practices and (c) using these data-driven methods to make necessary educational decisions about students (Gresham, 2011). For most districts that utilize it, RtI is framed in a three-tiered model which are based around the notion of universal, small group and intensive interventions. Children who are at risk of being evaluated for special education services generally would be exposed to all three tiers, with specific emphasis placed on their ability respond appropriately to the intervention(s) presented (Sullivan & Long, 2010). With the passing of IDEIA in 2004, districts were given the option to use these empirically validated interventions as part of the evaluation process for diagnosis and classification within a special education model (IDEIA, 2004, 614[6]b). This is particularly important for the classification of SLD. For a school to qualify a student with a specific learning disability, inadequate instruction must be ruled out as a reason for low achievement and RtI is designed to do just that (Sullivan & Long, 2010). Although neither IDEIA or NCLB mandates that states or districts use RtI, many throughout the nation or gravitating towards this data-driven approach (Zirkel & Krohn, 2008).

In a survey of 557 school-based school psychologists, it was reported that over 90% claimed to have received some training in Rti, while just over half of the respondents reported using RtI in their sites. Of those who do use it at their schools, 58% said it was used as a screening procedure for the SLD diagnosis. One interesting outcome of this survey was that while 68% reported that it improved student achievement, 17% said it negatively influenced their school culture (Sullivan & Long, 2010).

Vaughn and Fuchs (2003) posed the following strengths of the RtI model: a) it does not imply that a student necessarily needs to have significant discrepancy between cognitive abilities and achievement which is particularly beneficial for students with lower cognitive abilities; b)

there is increased potential for earlier and more valid identification; c) a lessening of bias on the part of teachers and evaluators as the data would be based on empirically sound interventions; and d) the clear alignment of identification with instructional demands of the classroom.

With the new options that RtI gives states and districts for the classification of these children, many questions arise. Is the discrepancy model of diagnosis of SLD simply what Thorndike called in 1963 *underachievement*? Does a child not performing on grade level when they are cognitively able to according to their IQ necessarily a disability? Should other factors be ruled out? Some researchers believe that RtI cannot and should not be used as a primary tool for diagnosis until it is more developed as a theory and practice (Witsken, Stoeckel & D'Amato, 2008; Reynolds & Shaywitz, 2009). These researchers point to the fact that many of the core features of RtI have yet to be unanimously accepted or applied such as the need for universal screeners, effective progress monitoring strategies, how to develop evidence based interventions and a need to educate teachers about intervention-focused classroom instruction. It has even been stated that "Many of the problems [associated with RtI] reflect the lack of critical knowledge concerning just about every assumption influencing the RtI implementation process" (Reynolds & Shaywitz, 2009). Reynolds also argued that the RtI model is just another discrepancy model as students must have a discrepancy between their rate of learning and that expected from their peers (1984, 2009)

While RtI is a relatively new model, and many facets of the process are still being extensively researched, huge strides have been made to ensure that this is the most appropriate model for the treatment and understanding of student learning. Much research has been and is continuing to be done on ensuring the integrity of implementation of interventions as well as making sure that the interventions themselves are sound and readily accessible (Duhon et al 2009; Gresham 2001). Proponents of RtI would advocate for the treatment validity of these empirically validated interventions, and the beneficial nature of this type of data for not only the student, but for the educators responsible for these children's success. If RtI is a better method for tying

deficits to valid treatment is it not in the best interest of the child to use that as a qualification standard? By measuring students against their peers using empirically validated intervention and monitoring learning across time, many of the questions raised by a discrepancy-only model can be ruled out, including outside influences and lack of quality instruction.

Factors Related to Classification

Looking back at the definition prescribed by IDEIA the following possible causes of low achievement must be ruled out, “environmental, cultural, or economic disadvantage.” The following factors would conceptually be tied to these types of disadvantage.

Language Spoken at Home

Over the past 20 years the number of linguistically diverse children and families in the U.S. has greatly increased. Presently, 14 million children under age 18 in the U.S. are either immigrants or the children of immigrants, and 25% or more live in homes where the dominant language is not English (Bornstein et al., 2007; Capps et al. 2005). This is the fastest growing population group in our nation, according to the most recent Census data. In 2005 it was estimated that the public schools in the US provided programs for nearly 3 million children in English as a Second Language programs. By 2008 it was estimated that the number of children who speak a language other than English at home was almost 11 million (or 21% of the United States population (NCES, 2010).

The implications for educators and school psychologists are just beginning to be understood. These children’s parents often have difficulty communicating with schools, even though school success is often viewed as a hallmark of cultural assimilation for the family (Pong, 2003). It is often the case that parents’ understanding of their children’s academic success may vary as a function of their culture and their SES. Also, in research done by Schaller, Rocha and Barshinger (2006) on Mexican-American immigrants, it was found that while many mothers had strong convictions about their children achieving academically, many parents held only a 6th grade or lower education. Taking these factors into consideration, it is a long-standing issue for

school districts, particularly in urban and more diverse areas, that there is a disproportionate number of language-minority children in special education. Rueda and Windmueller (2006) found that nationwide, children who live in homes where English is not the primary language spoken are 27% more likely to be placed in special education while in elementary school than their primarily English speaking peers and twice as likely in secondary grades.

From district to district there is much variability in the services that English Language Learner (ELL) students receive and whether or not their services are found under the special education umbrella. While many districts classify ELL students as SLD, on the basis of the students having learning difficulties due to language difference, others are hesitant to label students as having a learning disability as such unless they have formally assessed the students in their primary language (McCardle, McCarthy, Cutting, Leos & D'Emilio, 2005).

One factor possibly contributing to the over-representation of language minority students in special education is the current method of diagnosis using the discrepancy model. Many IQ tests have been found to have cultural bias and language barriers which can prohibit students from attaining a score truly representative of their cognitive abilities. For example, Neisser et al, who compiled the report for a task force put together by the American Psychological Association in 1996 found that African Americans scored, on average, an entire standard deviation behind their white peers on standardized cognitive abilities tests. These potential biases reach beyond just the realm of intelligence testing in its pure form (i.e. Weschler scales), and research has shown similar score deficits on tests such as the SAT (Freedle, 2003) and even on socio-emotional measures such as the MMPI (Monnot, Quirck, Hoerger & Brewer, 2008).

RTI, on the other hand, offers promising alternatives to this method of diagnosis, culturally and linguistically appropriate interventions and instructional techniques are still being researched (Xu & Drame, 2007). By using direct intervention to measure learning progress and growth, true disabilities can be ruled separately from the language barrier and appropriate services can be formed to best serve the child.

Previous research has found discrepancies in achievement across racial and ethnic groups, with African Americans and Latinos scoring substantially lower (Morgan, Farkas & Hibel, 2008)). Also, many children from immigrant families have parents with limited educations. Compared to children from non-immigrant families, those from immigrant families are more than three times as likely to have a parent who has not graduated from high school (Hernandez, Denton & Macartney, 2007). Correlations have been found between parental educational level and children's levels of attained education (Hernandez et. al, 2007). While research has indicated that children who are ELL are overrepresented in both the MR and Language and Speech Impairment categories, particularly in secondary grades, there is a lack of current information about their representation within the Learning Disabled category (Artiles et al, 2002).

Race and Ethnicity

In 1968, Dunn proposed in his classic article that the overrepresentation of minorities labeled as "mild mentally retarded" may lead to questioning of the validity of the current special education labeling model. In the last 40 years, many of these concerns still plague educators and researchers. The majority of research over the last four decades has focused primarily on African American students getting placed in mild MR and emotional disturbance programs across the country. In the 1970s, African American children made up 16% of the total public school enrollment but represented 38% of those labeled as Mentally Retarded (Losen & Orfield, 2002). While the current numbers are closer to African Americans representing 17% of our public schools, they still represent a third of the Intellectually Disabled population, with many states are now serving similar numbers under the label of Learning Disabled (Hosp & Reschly, 2002).

Of the 1.5 million categorized as mentally retarded, emotionally disturbed or learning disabled in 1998, over half were African American or Native American (Losen & Orfield, 2002). This disproportionality is particularly salient in the Southern United States where long-standing biases may still abound, but the problem is not isolated to this region of the country. The sheer number of minority students placed in special education is enough to cause alarm, however many

researchers (MacMillan & Reschly, 1998; Serwarka, Deering and Grant, 1995) have also found that African American and Hispanic children are more likely to be placed in more segregated placements as part of their special education plans than their similarly diagnosed Caucasian peers- possibly violating their legal right to placement in the least restrictive classroom environment (IDEIA, 2004). Of the children who are placed in the most restrictive special educational settings (more than 60% of their day out of the general education setting), 33% are African American, while African Americans make up less than 13% of the total U.S. school population (Fierros & Conroy, 2002).

In 1982, Heller, Holtzman & Messick published a report for the National Research Council concerning disproportionality in special education. They outlined their findings into six plausible hypotheses for this phenomena: a) the legal and administrative advantages that come from federal funds associated with special education classification numbers, b) students' biological and emotional characteristics, c) potential quality differences that are received by students of various races, d) the cultural biases present in assessment measures used for placement, e) the home and family environment associated with different ethnic groups including child-rearing norms and poverty and f) a broad and more historically grounded explanation involving a long standing chasm between minority and majority culture.

According to previous research by Morgan, Farkas and Hibel (2008) using the ECLS-K database (NCES, 2004), Hispanic and African American children entered Kindergarten with significantly lower reading scores than White children. Meanwhile, African American, Hispanic and Asian students' reading skills grew slower than those of White children, leaving African American children with the largest gap in their reading skills by the 8th grade .

It was also found by Lardner and Hammons (2001) that the more urban a district is, the lower the percentage of minority students that are enrolled in special education programs. Also, districts that have higher percentages of students who are minorities are more likely to have lower overall special education numbers- regardless of the SES or size of the district. They also found

that while there is no set or standard number for percentage of children who are enrolled in special education, it has consistently been the case over time that minority status is an important factor in both the placement and services received (Lardner & Hammons, 2001).

Socioeconomic status

Between 2000 and 2005, the number of children in the United States who were living below the poverty line increased by 9%, or 1.3 million. With this increase, 17% of all U.S. children lived below the poverty line. Among African American children this percentage was over 33% (Howard, Dresser & Dunklee, 2009). Children from low SES households are 1.5 times more likely to be labeled as learning disabled than their middle or upper class peers, and they are twice as likely to drop out of high school (Duncan & Brooks-Gunn, 2001). Low-SES children are four times as likely to start school with lower levels of academic achievement and to show flat growth between kindergarten and first grade in mathematics, with similar effects found for reading (Jordan & Levine, 2009). Being poor is consistently tied to significantly slower rates of development, particularly in the areas of physical well-being, social/emotional, lack of strong support systems, less exposure to language and encouragement to use language and lower levels of cognition and general knowledge (Howard et al, 2009). Lee and Burkham (2002) found that students from the five poorest communities in the country, when compared to those in the five wealthiest communities, had 1/5 as many books, were read to 63% less often, spent on average 7 more hours a week watching TV and were much more likely to have moved frequently before starting school.

A major challenge for both researchers and educators is distinguishing children who have an actual learning disability from those whose lack of achievement stems from social and economical disadvantage. It would be expected, conceptually, that these students (often classified as Low Achievers or LA), would have discrepancy between their achievement levels and their age-expected norms, even if not significantly discrepant from their individual IQ (Blair & Scott, 2002). These students should have IQs that is consistent with their low achievement-

indicating that they are performing at levels consistent with their expected capabilities, even if that is low. If this were the case, then the number of low SES students labeled as Learning Disabled using the traditional discrepancy method would not be expected to have spiked. The general consensus is that there are statistically significant between group differences on achievement tests are present, and perhaps the use of these measures alone to qualify them as disabled may be a disservice to the child. Many would argue that low achievement in and of itself cannot, then be enough to base a qualification for special education with such known discrepancies in achievement across racial and SES lines (Hale, Nalieri, Kaufman & Kavale, 2004). These researchers would prefer to focus such energies on prevention and early intervention for these children who are at risk.

Two risk factors for SLD classification that are related to low SES are late or ineffective prenatal care and low birth weight. Other risk factors identified as highly correlated with low SES include single-parent homes, low levels of parental education, lack of pre-academic skills prior to entering school, low levels of preschool attendance, and high mobility. It has been found consistently across research that all these factors are effective predictors of children later being assigned a Learning Disabled label in school even though the definition of Learning Disability under IDEIA (2004) lends towards ruling out environmental disadvantage (Blair & Scott, 2002).

Single parent homes

According to the U.S. Census, in 1970 twelve percent of children in the U.S. lived in homes with only one parent. Thirty years later that number had risen to a little over 30%. While the majority of these children are reared by single mothers, the number of single-father homes also increased, rising 62% between 1990 and 2000 (Lee, Kushner, & Cho, 2007). One of the areas on which this drastic shift in family dynamic has had been shown to have great impact in is the arena of education. Being brought up in a single parent home has been shown to have significantly negative effects on academic achievement, graduation rates, behavior referrals and social development (Pong & Ju, 2000).

Students from non-intact homes have additional stressors and a generally lower SES standing than their in-tact family peers. This phenomenon was examined closely by Marks (2006), whose research indicated that even across countries, children from non-intact families performed significantly lower on math and reading achievement scores. Out of the 30 countries studied, the United States had (a) the most teenagers living in single parent families and (b) the most significant negative outcomes on both reading and math scores. Large effects were also found for children in reconstituted (remarried) families, indicating that this consequence may be attributable not merely to the absence of two guardians in the home, but also to the presence of the conflict and stressors often present with parental divorce and separation. While being raised by a single parent is often tied to lower SES; even when SES was accounted for statistically, significant academic deficits remained (Marks, 2006).

Lee et al. (2007) also examined the impact of single-parenthood on children and found that of the various possible family constellations (single fathers of sons vs. daughters; single mothers of sons vs. daughters), sons who lived with single mothers, sons who lived with single fathers and daughters who lived with single mothers all had significantly lower academic achievement scores than their same age peers. Daughters who lived with highly involved single fathers were the only ones who kept up with their peers.

Two major theories have developed as to why children from single parent families struggle more than their peers academically (Pong, 1997). One explanation, proposed by McLanahan in 1985, suggests that children from single parent families often experience strong economic deprivation. In 2009, the National Poverty Center reported that 30% of families reared by a single mother fell below the poverty line, almost five times the percentage of two-parent families that fall below the poverty line (5.8%). The second theory focuses instead on the lack of parental involvement generally found in single parent homes. While the implications of low parental involvement have been widely accepted, some researchers have found that this common attribute of single parent homes account for even more variability in academic achievement than

SES (Mulkey, Crain & Harrington, 1992). The day-to-day functioning of single parents present unique challenges in the monitoring of school work, behavior and academic self esteem of their children.

School readiness and pre-Kindergarten attendance

The U.S. Department of Education's National Center for Education Statistics (2005) cited three factors as the primary cause for a lack of school readiness: (a) limited economic resources in the home, (b) low parental education levels and (c) single parenting. Much research has suggested that levels of school readiness are directly tied to later academic outcomes (Hill, 2001). Research done in the last decade indicates that one in three children come to Kindergarten unprepared, initiating a gap between more ready peers which will likely be maintained if not increased through the rest of their schooling career (Maynes & Foster, 2000; Gershoff, 2003). Many variables are connected with school readiness, including race, SES and parental education level. Students who come into school lacking in pre-academic skills are at a much higher risk for low achievement, grade retention, special education placement and eventually high school dropout (Ramey & Ramey, 1998). While researchers debate the parameters of the school readiness concept, most models include aspects of physical development, emotional and social maturity, cognitive skills, language ability and general knowledge (Boethel, 2004; De Feyter, 2009; Pianta 2002).

Even accounting for parental education and SES, there are significant differences in outcome for children whose home environment lends towards early exposure to educational materials. These materials can include home resources, parental knowledge of normal child development and other parenting practices. Maternal warmth and acceptance has been linked to pre-reading and pre-math performance, as has authoritative parenting. Also, the extent to which teachers believe that parents value education and their children succeeding academically as well as the quality of their relationship with the teacher and school community were found to affect pre-reading performance (Hill, 2001).

One common issue for educators is adapting and adjusting expectations for children from homes which are culturally diverse or of low SES. For example, teachers often expect students to interact frequently with adults to develop their verbal expression skills through conversations and the practice of asking questions about the world around them which get answered by their guardians. Early verbal skills are strongly predictive of children's school engagement and school readiness. Verbal skills are nurtured in homes with ample amounts of verbal interaction (Howard et al., 2009). Yet in lower-SES homes or among families from diverse cultural backgrounds, the extent of family verbal interactions and parent feedback may be more limited, particularly if stress in the household is high. These may affect school readiness and later outcomes in profound ways (Howard et al., 2009).

There has been a dramatic rise in the expectations of early education teachers regarding children's school readiness levels since the passing of the No Child Left Behind Act of 2001 (P.L. 107-110, 2001). Before the passing of this law, many school communities viewed kindergarten as the appropriate time to gain social skills and very basic primary skills, such as the ability to identify basic shapes and colors and to recognize limited letters and numbers. However, in the last 10 years, a much stronger emphasis has been put on mastering these pre-academic skills earlier, under the assumption that students come into kindergarten knowing the skills previously taught during that year (Howard et al, 2009). Given that limited economic resources, low parental education, and living in a single parent home increase children's risk of not developing these skills at home in their first few years of life (Jordan & Levine, 2009; Marks, 2006; Mulkey, Crain & Harrington, 1992; NCES, 2005; Pong & Ju, 2000), it is especially important that young children receive social and cognitive enrichment so as to enter school on par with their peers.

In recognition of the importance of school readiness for later academic outcomes, the Head Start Program was started in 1965 to accommodate and serve children in poverty in hopes of improving their schooling careers (Lee, 2010). Head Start is currently the largest federally financed early childhood education program in the United States. While research in the last 45

years has shown much success for children who have attended Head Start, much of the focus has been on non-cognitive domains (Lee, 2010). In 1983, the Consortium of Longitudinal Studies found that children who attended pre-school were less likely to be retained or placed in special education. It has been consistently found that children who attend Head Start have higher language and literacy skills, improved social and cognitive skills and better health outcomes (Lee, Brooks-Gunn, Schnur & Liaw, 1990). While home environmental factors will likely not improve, studies have shown that the positive effects of Head Start last throughout schooling. These children have been shown to outperform their non-Head Start siblings and to have higher rates of high school graduation and college attendance (Garces, Thomas & Currie 2002).

Studies of non-Head Start preschool programs have resulted in high variability in child outcomes due to highly differing educational standards at these programs. Some may be similar to Head Start in their expectations while others may be more of a day-care play-oriented setting. Nevertheless, longitudinal studies have documented lower rates of special education placement, lowered likelihood of grade retention and crime rates for the participating children (Barnett & Booncock, 1998). The impact of non-preschool daycare centers on the educational success of children is less clear. While some studies (Broberg, Wessels, Lamb & Hwang, 1997; Vandell & Corasaniti, 1990) have shown higher cognitive and socio-emotional outcomes for these children compared to children who are not put in pre-kindergarten, others (Belsky et al, 2007) have found a direct relationship between the amount of time spent in child care before kindergarten and increased levels of aggression and disobedience in later grades.

Not only do Head Start and other quality preschool programs have beneficial effects on school readiness upon entering Kindergarten, but recent research suggests that these effects are not moderated by gender or race (Zhai, Brooks-Gunn & Waldfogel, 2011). Moreover, students who succeed academically in their first years in an educational setting are likely to continue building on their skills by developing better social skills in later elementary and into secondary education (Konald, Jamison, Stanton-Chapman & Rimm-Kaufman, 2010). Students who have

positive social skills have also been shown to succeed in the responsibilities that often come with the demands of schooling such as listening, following directions and attending to activities (Ladd, Herald & Kochel, 2006). In summary, in the last ten years, increased federal regulation of education has raised expectations for schools and their standards and this has caused increased pressure for schools to succeed. Students who showed highest rates of school readiness (especially by attending a pre-kindergarten) have shown greater rates of academic and social success in schools throughout their educational career.

Long-Term Effects of Classification

Over the years, much research has investigated the harmful effects that labeling and categorization can have on patients and clients across the mental health spectrum. Social difficulties associated with labeling can be particularly salient for children in school, as their special education status may impact their schedule, peer group, and exposure to the general education classroom. Labels can lead to stereotyping, and they may have deleterious repercussions, both on the self-esteem of the child and on teacher perceptions of the child. Kelly and Norwich (2004), for instance, found that of 101 children receiving special education services, only about 20% reported that they were “not bothered” by their special education label. This is consistent with a plethora of previous research indicating that labels can have significant effects on self-perception and notions of efficacy within academic settings.

A study of adults that were given the SLD label as children showed that very few still maintained the necessary discrepancy to meet that criterion. The majority of them, however, did still perform in the low average IQ range, therefore performing at lower levels than their peers on most academic-based tasks (Ferrari, 2009).

A less researched but very important area of the diagnosis and labeling system within the public schools’ special education programs is the way that having a child who is labeled can affect the child’s family. Research has indicated that while parental stress is heightened when a child is labeled as disabled, the mothers of these children are at a higher risk for poor health and

related risk factors associated with stress when compared to their peers who do not have a disabled child (McConkey, Truesdale-Kennedy, Chang, Jarrah, & Shukri, 2008). While research has indicated that this stress is particularly profound in parents of visibly and severely intellectually disabled children, a study by Dyson (2010) found that within families of at least one child labeled as learning disabled, the following were found: high levels of parental guilt, strained family life, lack of social support- particularly from extended family, dissonance between parents, negative interactions with the school, frustration stemming from possibly incompetent assessment techniques, insufficient special education service delivery, fears of effects of labeling, stress on non-disabled siblings and higher rates of withdrawal from school. If these effects are found to be universal for parents of children labeled with learning disabilities, it is imperative that school practitioners understand these risks and the further implications it may have on the academic and social success of the child in question.

Research Questions and Goals of this Study

This study sought to test the predictive value of each of these variables, which have been shown to adversely affect school achievement. It specifically targeted how these variables, which have been shown to be risk factors, determined the likelihood of being labeled as having a Specific Learning Disability. The research questions were as follows:

1. To what extent do the following four variables – (a) primary language spoken at home, (b) family intactness, (c) type of child care before Kindergarten, and (d) child’s race – collectively explain the likelihood that public school children will be classified as meeting the criteria for SLD by the spring of their third grade year?
2. To what extent does each of the four predictor variables listed in Question 1 explain the likelihood that children will be classified as SLD by the spring of their third grade, over and above the other variables?

Subsequently, research questions 3 and 4 were explored by informally comparing the results of each of the previous analyses across levels of school population SES. School population SES is defined as the percentage of students who are eligible for free lunch within a school.

3. How much of an impact does school population SES have on the ability of these four variables together to explain the likelihood that children will be classified as SLD by the spring of their third grade?

4. How much of an impact does school population SES have on the ability of each of these four variables to explain the likelihood that children will be classified as SLD, over and above the other variables?

CHAPTER III

METHODS

Participants

The Early Childhood Longitudinal Study-Kindergarten (ECLS-K) database, which was gathered and managed by the National Center for Educational Statistics (NCES), is a longitudinal, federally funded database that began its academic and social tracking of children in 1998. At the beginning of the study, the NCES used a probability sample design to identify a sample which was nationally representative of the population of children in the United States. A total of 21,409 children were surveyed from across the country with an average of 17 children from each school. Asian-Pacific Islanders were overrepresented (2.5:1) so that this group could be adequately analyzed. As time went on students dropped out of the study, which altered the representativeness of the sample.

For this study, students who were enrolled in 3rd grade during the 2001-2002 school year were analyzed. Students who were home-schooled or who attended private schools were not be included. Students who were missing data for the variables of home language, parenting status, primary language spoken at home and pre-Kindergarten center or Pre-Kindergarten school attendance were not be included in this study, nor were students who are on IEPs whose primary diagnosis is not SLD.

Definitions

Single-parent in the home. This study focused on children who lived with both biological parents compared to those who lived in single parent homes or homes with one biological parent and a reconstituted family of some type (i.e. stepparents or live-in partners of parents). This is consistent with research which indicates that children have academic deficits as a result of biological parental separation over and above simply only having one parent in the home (Marks, 2006).

Race. For this study, race was categorized based on parent report of child's racial affiliation. Those who classify themselves as multiple races was not be measured as it would be impossible to determine the extent to which minority status is discernible in their life. Therefore, this study examined the predictive value of minority racial affiliation when considering the SLD diagnoses: African American, Hispanic, Asian, Native Hawaiian or Pacific Islander, and Native American or Alaska Native were classified as minorities. White (Caucasian) students were dummy coded as the comparison group.

Pre-Kindergarten and center-based care. This study classified children who attended center-based care before entering Kindergarten and compared to those who were kept solely in home-based care. Students who attended any type of center or facility were categorized together (i.e. Head Start, day care, pre-school, Pre-Kindergarten). Those who were kept in a home were also classified together regardless of who the caregiver was (parent, relative or baby-sitter).

English as primary language at home. For the purpose of this study, the students were categorized based on whether or not English is the primary language used to communicate in their home environment. Parents were asked the major language used at home, and this measure put students into two categories—English or Non-English as the primary language spoken at home.

SLD classification. For the purpose of this study, children who classified as having a Specific Learning Disability were compared to their peers who received no special education

classification and with those who were in special education under a different label. Students who possess more than one classification were included in this study only if the primary classification on their IEP is SLD. This will account for as much variance as possible that is attributable to the SLD label itself.

Percentage of students receiving free lunch. This variable was based on the school administrator's response regarding the percentage of students in a given child's school who qualified for free lunch. Three distinct groups of schools were selected for comparison. *High percentage free lunch schools* served a high percentage of students qualifying for free lunch (i.e., schools with FL percentage in the highest 25% compared with all schools). *Middle percentage free lunch schools* served a moderate percentage of students qualifying for free (i.e., schools with FL percentage in the middle 25% compared with all schools). *Low percentage free lunch schools* served a low percentage of students qualifying for free lunch (i.e., schools with FL percentage in the lowest 25% compared with all schools). Only those students enrolled at the high, middle, or low-poverty schools will be included in this study. The rationale for this grouping will be discussed below in the Data Analysis section.

Therefore, given the above information, each variable was categorical and dichotomous in nature. *Single parent in the home* was classified as either both biological parents or single parent/ reconstituted families; *race* was categorized based on parent report of the race of the child (White or Non-White); *English as primary home language* was separated as either English or non-English as primary language at home and *SLD classification* will either be SLD as primary or sole special education classification, compared to peers with no IDEIA classification and no IEP on record.

Measures

During the participating children's Kindergarten and first grade years, data was collected in both the Fall and Spring from the child, parent, teacher and the administrator of the school

attended. Afterwards data on participating children were gathered three more times, in the third, fifth and eighth grades (NCES, 2004).

Child direct assessments evaluated children's cognitive and physical development. The assessments included measurements of reading skills (language and literacy), mathematical thinking skills, and physical height and weight. Beginning in the third grade, children's social-emotional development also was measured by using a questionnaire that was read aloud to each child. The children's cognitive test scores were recorded as both item response theory scale scores and as norm-referenced *T*-scores (NCES, 2004).

Beginning when children were in the third grade, the participants also were asked to complete self-description questionnaires that asked about their social and emotional functioning. They were asked to rate their interest and their perceived competence in reading, mathematics, and with all school subjects. They also were asked to rate their popularity with their peers and about various externalizing and internalizing symptoms (NCES, 2004).

Parent interviews were designed to obtain a glimpse at the environment of the child outside of school. The information asked of the parent included family composition; languages spoken at home; parent educational level, marital status, income, and employment status; child care arrangements and Head Start attendance prior to Kindergarten; parent involvement with the school; types of literacy activities and other cognitively stimulating activities engaged in with the child; child's physical health and special needs; the parent's goals for the child's future schooling; and neighborhood safety (NCES, 2004).

Teacher surveys administered to classroom teachers included questions regarding their own training, experience, pedagogical philosophy, and school climate as well as items to ascertain information about the size, make-up, dynamic, instructional activities, curriculum, and student evaluation methods used in their classrooms. Classroom teachers were also asked questions about individual students to gain insight into their perspective on the students' social and academic performance in response to various classroom demands, and about the students'

participation in special services and programs. For children in the third grade and in later grades, special education teachers also completed questionnaires. The information provided by the special education teachers included data about each child’s disability, IEP goals, type of services and amount of services provided, and primary placement of the child (NCES, 2004).

School administrators were asked to complete questionnaires and checklists giving information about the size, structure and demographics of their school (including gender, racial and free-lunch eligible information on their students); the adequacy of the physical facilities and resources of the school; race/ethnicity of the student body; safety of the school community; school security practices; community teachers; percentage of children in special education; special education programs available and school governance and climate.

Variables Selected for Study

The variables listed in Table 1 were used to analyze the research questions. The variables RACE, W1LANGST, P1PRIMPK, P1HPARNT, E5PRMDIS, E5LRNDIS, and S5ELILNC were used to answer the research questions. In the table below the name, time and type of response is listed.

Table 1.
ECLS-K Variables Selected for Inclusion in this Study.

<u>Variable Name</u>	<u>Source</u>	<u>Round of Data</u>	<u>Description</u>
RACE	Parent	Kindergarten	Race of child

W1LANGST	Parent	Kindergarten	Primary language spoken at home
P1PRIMPK	Parent	Kindergarten	Type of pre-school care
P1HPARNT	Parent	Kindergarten	Primary care giver(s)
E5PRMDIS	SPED Teacher	Third Grade	Primary Diagnosis under IDEIA
E5LRNDIS	SPED Teacher	Third Grade	Primary Diagnosis is SLD
S5ELILNC	Principal	Third Grade	Percentage of student body eligible for free lunch

Some variables, such as GENDER, CHILDDID, and R3SAMPLE are automatically included in every analysis using the ECLS-K database to include the gender, child identification number and sampling round information for each child respectively. This information was included in the statistical output of the research project. Additional information about the variables to be included in this study can be found in the codebook, located in the Appendix.

The NCES provides sample weights to help researchers generalize their sample to the population studied (the Kindergarten class of 1999 in the United States; NCES, 2004). These weights adjust for differential sampling rates, as previously alluded to, and they also adjust for non-response by the parents, teachers, school administrators, and students. The particular weights used are recommended by the ECLS-K database administrators, based on whether the data analyzed in a given study are based on the responses of parents, teachers, administrators, students, or combinations of these sources. The weights are discussed further in Data Analysis.

Procedures

The majority of the information needed for this study was contained in the ECLS-K Public Use Dataset, which is readily available to the general public for research purposes. In the interest of protecting the anonymity of students with special needs and other extenuating

circumstances, certain variables are only available through the Restricted Use Database. The NCES has set particular standards and requirements for researchers to have access to this database including particular care as to how the data will be used and most importantly, how it will be protected. The application for the use of the Restricted Use Database for this study was accepted by the NCES in the Spring of 2012 and the data involving students who were classified as SLD according to IDEIA criteria was made accessible.

In order to comply with the NCES provisions for proper use and protection of the Restricted Use Dataset (NCES, 2004), and to comply with federal regulations such as The USA Patriot Act (2001) and The Education Sciences Reform Act (2002) the following steps were taken: The appropriate forms filled out (License Document, Affidavits of Nondisclosure and Security Plan Form), acquisition of computer which could run the hardware on CD-ROM but is not connected to the Oklahoma State University network, a secure work space with a lock that is not accessible by custodial or other staff, allowing for only one copy of the data, and securing all printouts and data output in the locked area (NCES, 2004). The process of gaining the appropriate permissions and signatures began in the Fall of 2010. The Vice President for Research at the University as well as employees in the College of Education Research Administration were in communication with the advisor for this project to make sure all necessary components have been met. The head of the Director of Technology for the College of Education also agreed to all the technology components necessary for this project.

Data Analysis

This study analyzed the research questions by utilizing three binary logistic regression analyses. Logistic regression has been used as an appropriate statistical tool for assessing the strength of predictors (Hu & St. John, 2001). Considering that in this study the dependent variable was dichotomous (Learning Disabled label or non labeled), logistic regression was a

parsimonious model to use (LeBlanc & Fitzgerald, 2000). This model has been used previously to measure the amount of predictive value in a set of variables for making a single educational decision (Peng, Lee & Ingersoll, 2002; Hu & St. John, 2001). One advantage of this model is that it does not require the predictors to be structurally similar (categorical vs. continuous variables). Logistical regression is centered around the concept of the odds ratio. An *odds ratio* is the probability of an occurrence divided by the probability of a nonoccurrence ($P/(1-P)$). This formula yields nothing less than 0 but can exceed 1 (LeBlanc & Fitzgerald, 2000). For this study, the logit (natural logarithm of the odds ratio) gave the likelihood of a child with a given set of variables present in their life being labeled as Learning Disabled.

The participating students were first divided into three groups based on the percentage of students at their schools who qualified for free lunch. The SES level of each school was estimated as the percentage of students eligible for free lunch within each school. According to this measure of school SES, the wealthiest 25% of schools (low-free lunch schools) had fewer than 6.78% of students qualifying for free lunch, the middle 25% of schools (middle-free lunch schools) had between 10.1% and 27% of students qualifying, and the poorest 25% of schools (high-free lunch schools) had more than 50.94% of students qualifying for free lunch.

A binary logistic regression model was fitted to the data to analyze all research questions. The four child predictor variables were (a) race (White vs. non-White), (b) family intactness (intact vs. non-intact), (c) daycare type (pre-kindergarten program or other type of center-based care vs. exclusively home-based care), and (d) primary language spoken at home (English vs. non-English). The child outcome variable was the presence or absence of a special education classification of SLD within the school system. The variables representing child race, family intactness, preschool attendance, home language, and SLD classification were coded dichotomously as 0 or 1. The reference categories were (a) White non-Latino, (b) intact family, (c) home-based child care, and (d) English as the primary language spoken in the home.

Four binary logistic regressions were run using SPSS version 20.0 (IBM, 2011), utilizing weight C245CW0 from the ECLS-K database based on the recommendation of the NCES (2010). An alpha level of .05 was used to evaluate statistical significance. In all analyses the four predictor variables were entered together, as a single block, and the outcome variable was the presence or absence of SLD. First, to address Research Questions 1 and 2, a binary logistic regression was computed with the entire set of participants. Then, to examine Research Questions 3 and 4, three separate binary logistic regressions were conducted identical to the regressions for Questions 1 and 2, but which examined separately the students in high-poverty schools, middle-poverty schools and low-poverty schools. The odds of SLD classification that were computed for students at the three levels of school SES were compared informally.

Application of Statistical Weights

As previously alluded to, the NCES has produced weights that researchers select, based on the variables they study, to statistically adjust the analyses so as to make their results more representative of the U.S. population. Because this study analyzed data gathered from the third grade special education teacher in regard to IDEIA categorization (E5PRMDIS and E5LRNDIS), variables containing information provided by parents (RACE, WILANGST, P1PRIMPK, P1HPARNT), and a variable ascertained from the school principals (S5ELIRED) the weight children to more accurately reflect the population of 3,937,125 third grade children attending public school in 2001-2002.

Statistical power and meaningfulness of results. Due to the sizeable number of participants in this study the power of the statistical analyses was extraordinarily high, making it likely that very high rates of statistical significance would result. However, when statistical analyses are conducted with extremely high power, results that are statistical significant may lack practical meaningfulness. Pseudo R^2 coefficients of determination developed by Cox and Snell and by Nagelkerke to estimate the total variance explained by the predictor variables in logistic regression tend to underestimate the total variance explained (Leech, Barrett & Morgan, 2011).

In logistic regression analyses with very high statistical power, the odds ratio is a valid and accurate indicator of the meaningfulness of research findings. Although large sample sizes inflate statistical significance, they do not inflate odds ratios; rather, large samples stabilize the odds ratios and make them more reliable. Practical significance, as given by the odds ratios, are key to understanding the meaningfulness of this research.

CHAPTER IV

RESULTS

Table 2 summarizes the race (White vs. non-White), family intactness (intact vs. non-intact), daycare type (pre-kindergarten program or other type of center-based care vs. exclusively home-based care), and primary language spoken at home (English vs. non-English) of children in the weighted output. As Table 2 shows, overall slightly more than half of the participating children were White and resided in intact families. Just under half the participants had attended daycare or pre-Kindergarten, and more than three-quarters spoke mostly English at home. The highest poverty schools enrolled slightly higher proportions of racial and language minority students and lower percentages of students from intact families, compared with their wealthier counterparts.

Table 2.

Demographics of Children in the Sample: Percentages by Race, Family Intactness, Pre-K Attendance, and Home Language (Weighted)

Variable	All Schools ^a	Schools by Poverty Status ^b		
		Low Percentage Free Lunch	Middle Percentage Free Lunch	High Percentage Free Lunch
Race				
White	57.6%	64.5%	64.1%	57.6%
Non-White	42.4%	35.5%	35.9%	42.4%
Family Status				
Intact	58.7%	59.0%	60.0%	52.3%
Non-intact	29.8%	28.7%	30.9%	28.7%
Missing	11.4%	12.3%	9.1%	19.0%
Day Care Type				
Center or Pre-K	48.2%	48.1%	48.9%	46.6%
Home care	39.0%	37.9%	41.2%	32.4%
Missing	12.9%	14.0%	9.9%	21.0%
Home Language				
English	87.1%	91.9%	92.1%	88.7%
Non-English	12.2%	7.4%	7.7%	9.7%
Missing	0.7%	0.6%	0.2%	1.6%

^aData include all the schools in the database. ^bLow-, middle-, and high-poverty schools include only the lowest 25%, middle 25%, and highest 25% (respectively) of all schools, thereby constituting a total of 75% of all schools in the database.

Table 3 shows the percentages of children classified as having a SLD classification by the end of third grade in each of the three SES groups. Table 3 shows that although the total number of children in special education did not increase consistently with school poverty level, the percentage of children classified with a Specific Learning Disability increased as the level of poverty increased.

Table 3.

Special Education Rates of students included in study by School Free Lunch Levels (Percentages)

<u>School SES</u>	<u>SLD</u>	<u>Other SPED^b</u>	<u>Gen. Ed.^c</u>
Low %age Free Lunch	2.5%	2.0%	95.5%
Middle %age Free Lunch	3.1%	3.8%	93.1%
High %age Free Lunch	3.7%	2.4%	93.9%

^aEntries represent the mean percentages of all students enrolled in these schools who qualified for special education with a primary classification of SLD and were chosen for the study. ^bEntries represent the mean percentages of all students enrolled in these schools who qualified for special education with a primary classification other than SLD and were chosen for the study. ^cEntries represent the mean percentages of all students enrolled in these schools who did not qualify for special education chosen for the study.

Question 1. To what extent do the following four variables – (a) primary language spoken at home, (b) family intactness, (c) type of child care before Kindergarten, and (d) child’s race – collectively explain the likelihood that public school children will be classified as meeting the criteria for SLD by the spring of their third grade?

The model X^2 value was 1554.925 ($p < .0001$). Together, the four predictor variables contributed to the ability to predict the odds of SLD classification to a statistically significant extent.

Table 4 depicts the results of the logistic regression analysis for the children at all the school analyzed together. The Nagelkerke R^2 coefficient of determination was .002, indicating that the four variables combined accounted for approximately 0.2% of the variance in the likelihood of SLD classification. Examination of the classification table for the model showed that the model predicted no individuals as having a greater than 50% chance of having a SLD. Thus, although the model correctly predicted the SLD status of 100% of children who were not classified with SLD, it predicted the SLD status of none of the children who actually were classified with SLD. The model’s sensitivity was 0.0% and its specificity was 97.7%.

Table 4.

Table of Logistic Regression Results (All Schools Together)

<u>Variable</u>	<u>B</u>	<u>Wald X²</u>	<u>p</u>	<u>Odds Ratio (95% CI)</u>	<u>R²_N</u>
Race	.130	247.350	.000	1.139 (1.122, 1.155)	
Family Status	.030	13.826	.000	1.030 (1.014, 1.046)	
Day Care	.242	1022.528	.000	1.273 (1.257, 1.289)	
Primary Home Language	.127	108.392	.000	1.136 (1.113, 1.160)	.002

Note. Comparison groups are White, intact family, home based child care, English primary home language. For all model X² values, df = 4, p <.0001

Question 2. To what extent does each of the four predictor variables listed in Question 1 explain the likelihood that children will be classified as SLD by the spring of their third grade, over and above the other variables?

In Table 4, the odds ratio reported for each variable indicates the likelihood with which a child categorized in each specific group in question was classified by school personnel with a SLD, accounting for the other predictors. The analysis shows that taking into account child race, family intactness, and primary language, students who attended a daycare center or pre-kindergarten program were more likely than children cared for exclusively at home to be classified with a SLD (OR = 1.273; 95% CI = 1.257 to 1.289). Taking into account family intactness, type of daycare, and primary language, non-White students were more likely than Whites to be classified with a SLD (OR = 1.139; 95% CI = 1.122 to 1.155). Controlling for race, family intactness, and type of daycare, students whose primary home language was not English were more likely than native English speakers to be classified with a SLD (OR = 1.136; 95% CI = 1.113 to 1.160) than were students whose primary language was English.

Question 3. How much of an impact does school population SES (as measured by percentages of children eligible for free lunch) have on the ability of these four variables together to explain the likelihood that children will be classified as SLD by the spring of their third grade?

The model X^2 values were 3,140.382 for low poverty schools, 2,729.682 for medium-poverty schools, and 8,497.112 for high-poverty schools ($p < .0001$ at all three school poverty levels). Regardless of school SES, the four predictor variables together contributed to the ability to predict the odds of SLD classification to a statistically significant extent.

Low Free Lunch Schools

Table 5 depicts the results of the logistic regression analyses for the three SES levels. The Nagelkerke R^2 coefficient of determination was .030, indicating that the four predictor variables accounted for approximately 3% of the variance in the likelihood of SLD classification. Examination of the classification table for the model showed that the model predicted no individuals as having a greater than 50% chance of having a SLD. Therefore, although the model correctly predicted the SLD status of 100% of children who were not classified with SLD, it predicted the SLD status of none of the children who actually were classified with SLD. The sensitivity of the model was 0.0% and its specificity was 97.3% for low-poverty schools.

Middle Free Lunch Schools

As displayed in Table 5, the Nagelkerke R^2 coefficient of determination was .018, indicating that these variables accounted for approximately 1.8% of the variance in the likelihood of SLD classification. When the classification table for the model was examined, it showed that the model predicted no individuals as having a greater than 50% chance of having a SLD. Thus, although the model correctly predicted the SLD status of 100% of children who were not classified with SLD, it predicted the SLD status of none of the children who actually were classified with SLD. The sensitivity of the model was 0.0% and its specificity was 96.7% for middle-poverty schools.

High Free Lunch Schools

Table 5 depicts the Nagelkerke R^2 coefficients of determination for the SES level as .076, indicating that the four variables accounted for approximately 7.6% of the variance in the likelihood of SLD classification. Examination of the classification table for the model showed that the model predicted no individuals as having a greater than 50% chance of having a SLD. Thus, although the model correctly predicted the SLD status of 100% of children who were not classified with SLD, it predicted the SLD status of none of the children who actually were classified with SLD. The sensitivity of the model was 0.0% and its specificity was 96.5% for high-poverty schools.

Table 5.

Table of Logistic Regression Results by School Free Lunch Levels(Weighted)

Predictors	β	Wald X^2	p	OR (95% CI)	R^2_N
Low Free Lunch Schools					
Race	.041	3.543	.060	1.042 (1.020, 1.064)	
Family status	-1.155	1809.034	<.0001	.315 (.288, .342)	
Child care center	.226	147.440	<.0001	1.254 (1.235, 1.273)	
Home language	-1.054	380.299	<.0001	.349 (.295, .403)	.030
Middle Free Lunch Schools					
Race	-.575	1010.090	<.0001	.563 (.545, .581)	
Family status	.046	8.358	.004	1.047 (1.031, 1.063)	
Child care center	.611	1579.918	<.0001	1.841 (1.826, 1.856)	
Home language	.720	6067.382	<.0001	2.054 (2.025, 2.083)	.018
High Free Lunch Schools					
Race	.784	1468.429	<.0001	2.190 (2.170, 2.210)	
Family status	.509	747.129	<.0001	1.663 (1.644, 1.682)	
Child care center	-.358	438.716	<.0001	.699 (.682, .716)	
Home language	1.189	2757.778	<.0001	3.283 (3.260, 3.306)	.076

Notes. OR = odds ratio. R^2_N = Nagelkerke R^2 . Comparison groups are White, intact family, home-based child care, English primary home language. For all model X^2 values, $df = 4$, $p < .0001$.

Question 4. How much of an impact does school population SES have on the ability of each of these four variables to explain the likelihood that children will be classified as SLD, over and above the other variables?

Table 5 reports the odds ratios for each variable at each SES level, indicating the odds with which children in schools at each SES level were classified as having a SLD by their third grade year for the present model.

Low Free Lunch Schools

Table 5 shows that children who attended out-of-home daycare or Pre-K had odds of being classified as SLD that were 25% higher than their classmates who received home-based care (OR= 1.254, 95% CI=1.235 to 1.273, $p < .0001$), controlling for primary home language, family intactness and type of daycare. Non-native English speakers had odds of being classified with a SLD by the third grade that were .349 times as great as those of native English speakers (OR=.349, 95% CI = .295 to .403, $p < .0001$), when taking into account type of daycare, race and family intactness. Another way of expressing this relationship is that the odds of students being classified with a SLD were approximately 2.9 times higher for native speakers of English than they were for non-native English speakers. The odds of being classified with a SLD were 3.17 times higher for children from intact families than for their peers from single parent homes and reconstituted families (OR=.315, 95% CI = .288 to .342, $p < .0001$), when taking into account race, type of day care and primary home language.

Middle Free Lunch Schools

As shown in Table 5, children who attended daycare or Pre-K were found to have odds that were 84% higher of being classified as SLD (OR= 1.841, 95% CI=1.826 to 1.856, $p < .0001$) compared with their classmates who received home-based care, when accounting for race, primary home language and family intactness. Racial minority status was associated with lower odds of being labeled as having a SLD by the third grade, when family intactness, type of day care and primary home language were accounted for. Specifically, the odds of a non-White child being found to have a SLD were .563 of the odds of a White child qualifying for a SLD (OR =.563, 95% CI= .545 to .581, $p < .0001$). Another way of stating this is that the odds of a White child qualifying for SLD were 1.78 times the odds of a non-White child being classified. Students in this middle poverty category whose primary home language was not English had odds of being classified with a SLD that were twice as high as the odds of classification for their native English-speaking peers (OR = 2.054, 95% CI= 2.025 to 2.083, $p < .0001$), controlling for day care, race and family intactness.

High Free Lunch Schools

As depicted in Table 5, in high poverty schools, students who attended center based day care or pre-K had odds of being classified with a SLD that were .699 times as high as the odds for students who received home-based care (OR = .699, 95% CI= .682 to .716, $p < .0001$) when race, primary home language and family intactness were taken into account. Equivalently, the odds of a child who received home based care qualifying for a SLD were 1.43 times the odds of a child who went to daycare when race, primary home language and family intactness were taken into account. Racial minority students had odds of being classified that were twice as high as the odds of classification for their White peers (OR = 2.190, 95% CI= 2.170 to 2.210, $p < .0001$), when controlling for day care attendance primary home language and family intactness. The odds of SLD classification for students who came from homes whose primary language was not English were 3.28 times higher than the odds of their English speaking peers being classified with a SLD (OR = 3.283, 95% CI= 3.260 to 3.306, $p < .0001$), accounting for day-care attendance, race and family intactness. Children who came from non intact families had odds that 66% higher of being labeled (OR = 1.663, 95% CI= 1.644 to 1.682, $p < .0001$) than those who came from intact families, controlling for day-care, race and home language. Table 6 summarizes the percentages of children in 3rd grade who were classified as SLD according to race, family status, day care type, primary home language, and according to their school SES.

Table 6.

Demographics of Children Classified with SLD: Percentages by Race, Family Intactness, Pre-K Attendance, and Home Language (Weighted)

<u>Variable</u>	<u>Low</u> <u>Free Lunch</u>	<u>Middle Free</u> <u>Lunch</u>	<u>High</u> <u>Free Lunch</u>	<u>Total</u>
Race				
White	69.4%	68.5%	37.5%	58.2%
Non-White	30.6%	31.5%	62.5%	41.8%
Family Status				
Intact	68.7%	59.8%	42.9%	46.5%
Non-intact	18.8%	27.5%	40.6%	41.9%
Day Care Type				
Center or Pre-K	35.4%	44.5%	39.3%	53.4%
Home care	52.1%	41.3%	44.2%	35.4%
Primary Home Language				
English	5.3%	8.7%	23.8%	13.2%
Non-English	90.3%	81.7%	74.5%	83.1%

Note. Used values from ‘percent’ column. ‘Valid percent’ column have been adjusted to = 100%

CHAPTER V

DISCUSSION

The results of these analyses supported some of the research hypotheses and failed to confirm others. Regarding Question 1, the researcher expected to see collective predictive value of the four variables for the entire model, which was not confirmed. Regarding Question 2, all four variables were expected to have an effect when the whole model was run, which was also not confirmed. Only slightly elevated odds ratios were found. The results for Questions 3 did not confirm the researcher's hypothesis that there would be significant levels of variance accounted for by the four variables combined at each SES level. The variance accounted for ranged from 2-8%.

Finally, the researcher's hypothesis that there would be significant predictive value for each of the four variables at each SES level as measured by odds ratios was found to be confirmed in some areas. Significant effects were found for race at middle and high free lunch schools, for family intactness at low and high free lunch schools, for Pre-K attendance at middle and high free lunch schools and for language at all three free lunch levels.

Pre-K Attendance

While no statistically significant results were found for the predictive power of Pre-K attendance with regard to SLD identification for students in low poverty schools, there were noteworthy results for middle and high poverty schools. In middle poverty schools, children who attended Pre-K had odds of being labeled SLD that were 84% higher than their peers who were

primarily kept at home before entering Kindergarten (see Table 5). This is contrary to research for both Head Start and other preschool programs which have shown to lead to better academic outcomes for their students in elementary school and lower rates of placement in special education (Consortium of Longitudinal Studies, 1983; Barnett & Booncock, 1998; Konald, Jamison, Stanton-Chapman & Rimm-Kaufman, 2010). The present finding may be due to the fact that the questions posed to parents for the ECLS-K did not allow for distinction about the quality or type of the preschool or Pre-K program. Therefore, we included all students who were reported to have received out of home care together. This leads to a great potential variability in the quality and consistency of care for these children before entering Kindergarten.

In high poverty schools, results were more consistent with previous research. Students who did not attend Pre-K were more likely to be classified as having a SLD. Due to the nature of the Head Start program, these children are more likely to have access to federally funded programs before entering kindergarten which may be of better quality than those which are privately funded (and more expensive). Research has found that students from incredibly low SES environments have 1/5 as many books, were read to 63% less often, spent on average 7 more hours a week watching TV and were much more likely to have moved frequently before starting school when compared with preschoolers from the wealthiest communities in the country (Lee & Burkham, 2002). Students who were not sent to any type of Pre-K center were 43% more likely to be classified by 3rd grade (OR=.699; see Table 5).

Race

By and large, for the children in all the schools together, the predictive value of race for eventual diagnosis of Specific Learning Disability was not statistically significant (OR= 1.139; see Table 4). It is difficult to gauge consistency with past research for race due to the fact that all minorities were categorized together in this study and much of the previous research was centered around particular minority groups such as African Americans or Hispanic Americans (Morgan, Farkas, & Hibel, 2008; Lardner & Hammons, 2001).

However, when divided by school SES levels, more interesting results were found (see Table 5). In middle poverty schools, minority children were actually less likely to be classified as having an SLD than their White peers. This is contrary to years of previous research (Fierros & Conroy, 2002; Heller, Holtzman & Messick, 1982; MacMillan & Reschly, 1998; Serwarka, Deering and Grant, 1995). It is once again possible, though, that this is may be partially attributed to the classification system used in this study, which put all minorities in a single category. In high poverty schools, students of minority status had odds of being classified that were more than two times as high as their non-minority classmates. This is of note because in these schools minority children make up more of the student population (42.4%) than in higher SES schools. This is consistent with previous research (Hosp & Reschly, 2002; Oswald et al., 1998), but it is inconsistent with a study conducted by Lardner and Hammons in 2001 which indicated that schools with the highest number of children who were minorities had lower percentages of minorities in special education than schools with lower numbers of minority children.

Home Language

In middle and high poverty schools, findings were consistent with previous research which has indicated that those from homes whose primary language is not English are more likely to have academic difficulties and be placed in special education. For example, Rueda and Windmueller (2006) found that children who live in non English speaking homes were 27% more likely to be placed in special education while in elementary school than their primarily English speaking peers and twice as likely in secondary grades. According to this study, compared with children from primarily English-speaking homes, students from primarily non-English speaking homes had odds of being classified that were twice as high in middle poverty schools and three times higher in high poverty schools. However, in low poverty schools, students whose primary home language was not English were less likely to be classified (OR=.349). This is inconsistent

with previous research. At low-poverty schools, non-English speakers made up the lowest percentage of the school population compared with other school SES levels (7.4%; see Table 5).

Family Intactness

When considering the entire model for this study, family intactness status was shown to have virtually no ability to predict later SLD classification (OR= 1.030). This appears contrary to previous research, which indicates that children from single parent homes often have lower school achievement (Pong & Ju, 2000). This is not, in and of itself, conclusive, however, because low school achievement does not always render an SLD diagnosis. This study also combined all “non-traditional” parents together (including reconstituted families, adoptive parents and single parents), and research varies on the differences these types of families have on academic achievement and school success (Marks, 2006; Lee et al., 2007; Pong & Ju, 2000).

When considering the weight of this variable relative to school SES, trends were found. In low poverty schools, students who come from homes that had non-intact families were considerably less likely to be classified as having an SLD (OR= .315). This is of note, because one of the presumed mediating factors for single parents is solitary income and therefore a presumably lower SES standing. Children from families with single parents who also have low income have been shown to have a much lower rate of academic success (Marks, 2006). It is possible, then, that this phenomenon of low SLD classifications for children from non-intact families in these wealthy schools may be partially attributed to the higher SES home environments of these children. Children from non-intact families in the highest poverty schools had odds that were 66% higher of being diagnosed SLD than their peers from intact families. This, on the other hand, is consistent with previous research (Marks 2006, Pong, 1997, Mulkey, Crain & Harrington, 1992).

Limitations of This Study

The R^2 values found for this study, particularly when the whole model was run, indicate that these variables are poor predictors of the odds of children being classified as having a

learning disability by their third grade year. Also, the conceptualization of the variables themselves were excessively broad. The Family Intactness measure did not account for different types of non-traditional families (i.e. single mothers compared to adoptive parents compared to stable step-parents). Also, since much of the research on overrepresentation of minorities in special education has been focused on African Americans (and more recently Hispanic Americans), it would have perhaps given more insight into current trends to separate children by their ascribed race. In our study all minorities were put together.

Pre-Kindergarten attendance was also a limited measure. It is impossible to tell from the questions posed to parents the quality the center based care. Programs like Head Start and Montessori are potentially very different than more play-based day cares. Therefore, by putting them together in this measure, it is difficult to tease out how much Pre-K really prepared these children for formal education. Also, SLD children were compared only to non-diagnosed peers, and not to any other special education classifications.

Future Research

Future studies on these variables should be modified in several ways. First of all, future studies should include all children in special education to make distinctions comparing those with SLD to other SPED categories on these predictive factors. Also, future studies should look at academic achievement measures, racial make up of the school and individual student's SES to get a clearer picture of how the child fits into their environment. Lastly, the variables themselves should be teased out as referenced above with races, types of parents and types of Pre-Ks being adequately separated. In order to conduct a study with these modifications, hierarchical logistic regression must be used to allow for statistic testing of differences due to school-level characteristics.

Conclusion

While the pseudo R^2 measures in this study indicate that these four variables are not adequate predictors in and of themselves for diagnosis of a Specific Learning disability,

interesting results were found when looking at these predictors within SES groups. Future research hopes to further examine the weight of these variables in conjunction with school level variables to have a better understanding of how we can intervene on early risk factors for later special education classification.

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