

THE RELATIONSHIP BETWEEN DISABILITY STATUS AND ACADEMIC OUTCOMES:  
RACE AND SES AS MODERATORS

by

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## ABSTRACT

EMILY AYALA. The Relationship Between Disability Status and Academic Outcomes: Race and SES As Moderators. (Under the direction of DR. MARTHA CECILIA BOTTIA)

Addressing the educational achievement of children with learning disabilities is an important topic that deserves heightened attention because of the large number of kids that suffer learning disabilities (LD) but also given the large number of resources devoted to the education of students with LD. Prior research suggests there are many disadvantages that having a learning disability brings to children. Existent studies also recognize the important role that race and SES has on students' achievement. However, there has been little evidence based on how belonging to a minority group and/or coming from a low socioeconomic status background affects the relationship between students' academic achievements and the designation of a LD. Framed in Labeling Theory and Cumulative Disadvantage Theory this study answers the following questions: does having an intellectual disability have a significant relationship with student's academic achievement? And more importantly, does and how race and socio-economic status (SES) moderate the relationship between LD and academic achievement? Using nationally representative data from the Educational Longitudinal Survey (ELS) of approximately 8,000 students and utilizing descriptive statistics and OLS models this study answers these questions.

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## INTRODUCTION

According to data from the National Health Interview Survey, in the United States, between the years of 2006 to 2010, the prevalence of LD (learning disability) in children under 18 was 0.5% (Howard et al. 2020). This implies that 7.3 million students have a learning disability in the US (Howard et al. 2021). LD is by far the most common type of disability classification for students, which makes up approximately 41 percent of public-school special education students nationally (Shrifer and Freeman 2021). Among students with a primary classification of either mild, moderate or severe LD, 32% were in elementary school, 27% were in middle school and 41% were in high school (Kim et al. 2020).

A disproportionate amount of school funding goes to the education of disabled children (Kim et al. 2021). On average, schools spend about 15% less on a disabled student than they would on a neurotypical student (Kim et al 2021). The financing of special education differs significantly across states and localities. Overall, approximately 8% of special-education funding is federal, some 56% comes directly from states, and the remainder is local (Hanushek et al. 2002). Moreover, there is a wide variation of school funding for special education across different school districts (Hanushek et al. 2002). Addressing the educational achievement of children with learning disabilities is an important topic that deserves heightened attention not only because of the large number of kids that suffer LD but also given the large amount of resources devoted to the education of students with LD. There is a necessity to better understand what can be done to help these students perform at their highest level in school.

A popular and reliable way to determine LD status of students is by identifying if students have an Individualized Education Plan or not. An Individualized Education Plan (IEP)

explains the program of special education instruction, supports, and services kids need to make progress and succeed in school (Salle et al.2013). The Office of Special Education and Rehabilitative Services (OSERS, July 2001) reported that the IEP process is one of the most important tools in ensuring that effective teaching, learning, and increased achievement occurs for all students with disabilities (Thompson, Thurlow, Whetstone, 2001).

Previous research has shown that students labeled with an LD often demonstrate poorer academic performance and have other indicators of social disadvantage that may hinder their enrollment in college preparatory coursework (Shifrer et al. 2014). *Daniel R.R. v. State Board of Education* (1989) was one of the first court cases to establish the idea that students with disabilities should be educated in the least restrictive environment to the maximum extent possible (Salle et al 2013). This means that it is important for students with LD to be included into daily school activities with their neurotypical classmates. Students with disabilities who were only educated in the special education setting such as in a resource room or a special day class, and were not included in general education classes, were engaged in tasks linked to grade level content only 50% of the time (Salle et al. 2013). Students in special education were not given the same opportunities as their peers to succeed. The students that remained in general education/inclusion classrooms had higher achievement than those who moved to special education classrooms (So Hyun 2017). This is information that we can see is already established in the literature. These disadvantages may be complicated further by students' own race/ethnicity or socioeconomic status.

The No Child left Behind Act (NCLB) intended to promote increased access to the general education curriculum and improve academic performance for all students, including students with disabilities. These policy mandates have developed increased participation in state

and district accountability systems for students with disabilities (Altman et al., 2010). However, there is very little conclusive evidence that these policies have resulted in improved opportunities to learn and make academic gains that are measured by state standardized assessments for students with disabilities (Salle et al. 2013). As a consequence, it is a cause for concern that there has been little evidence based on how students' academic achievements are influenced by the designation of a LD and how it relates to those who also belong to a minority group and come from low socioeconomic statuses (Hanushek et al. 1998). In this study, I explore deeper into this topic and I look at the relationship between having a LD and students' academic achievement. Furthermore, I also explore how race and SES moderate this relationship.

Given the existent gaps in the literature, this study answers two main research questions. First, does having an intellectual disability have a significant relationship with student's academic achievement? Second, this research also explores if race and social economic status (SES) moderate the relationship between LD and academic achievement. I hypothesize that having a learning disability does have a significant relationship with students' academic achievement. I also hypothesize that minority students/ students who come from lower class or working-class families with a learning disability face even more barriers than their white/ more privileged peers with LDs. Therefore, these students will have more obstacles in reaching academic success.

The first section of this proposal summarizes the previous literature on the relationship of having a learning disability and academic achievement, and the relevance race/ethnicity and SES have on this relationship. This section ends with the introduction of the research questions to be examined. The second section discusses the two theoretical frameworks that guide this research: labeling theory (Shifrer 2016) and cumulative disadvantage theory (Bisetti and Landes 2021).

The third section explains my conceptual model as well as the hypotheses to be tested. The fourth section discusses the dataset, key variables, and quantitative methodology that was used in this research. Lastly, sections five and six provide the results, discussion, policy implications and conclusions.

## **LITERATURE REVIEW**

### *Relationship between Having a Learning Disability and Academic Achievement*

There is significant evidence that shows that having a learning disability negatively affects academic achievement. The relationship between having a LD and math achievement has been reported extensively and has suggested that the majority of students with LD have deficits in mathematics (Kohli 2015). For example, according to the 2017 National Assessment of Educational Progress (NAEP), only 16 percent of students with learning disabilities were proficient in math as of 4<sup>th</sup> grade compared to the 44 percent of students without disabilities (Schwartz, Hopkins and Stiefel 2021). Students classified with an LD typically struggle in math coursework regardless of the specific diagnosis (Shifrer 2014). National Assessment of Educational Progress (2005) showed that 43% of students in 4<sup>th</sup> grade with disabilities scored below the basic testing level compared to 17% of 4<sup>th</sup> grade students without disabilities (Judge and Watson 2011). Similarly, Shifrer (2016) finds that adolescents with an LD designation had lower scores on the 10th grade math test, achieved poorer grades, failed more semesters of math, and had a higher chance of dropping out of school when compared to adolescents without the LD label.

But studies also find a lack of competence for LD students in reading. In fact, prior studies show that children with a learning disability scored about 1 standard deviation lower on the reading test than their peers without a learning disability (Morgan et.al 2010). Sarid, Meltzer

and Raveh (2020) find that students with LD have a hard time with the speed they are able to read in, their processing speed, semantic processing, and working memory.

Research also shows that there are substantial achievement gaps between students with learning disabilities and students with no disabilities (Kohli et al. 2015). NAEP's test scores data shows that there are significant achievement gaps between those with and without disabilities in fourth and eighth grade (Wu, Morgan and Farkas 2014). Students without disabilities progressed in their classes at a higher rate than their peers who had learning disabilities (Kohli et al. 2015). High school academic achievement of students labeled with an LD is significantly lower than their peers who did not have the LD label and they are more likely to drop out of high school. Students with LD typically perform one to two grade levels below their peers who are the same age as them in reading, mathematics, and writing (Freeman et al. 2019). In general, students with LD showed lower math achievement and slower math growth rates compared with the general population (Tan et al. 2019). In particular, they struggled the most with numerosity discrimination (Tan et. Al 2019).

Additionally, Theobald et el. (2018) discusses how students who are in the LD category have lower grade point averages and among the highest dropout rates. Research shows that 4.7% of students with an LD graduated with a high-school diploma, whereas 35.2% dropped out (Freeman et.al 2019). These examples are clear evidence that students with disabilities are lagging behind their peers who do not have the LD designation.

It has been proven that there are deficits for students with an LD to comprehend their appropriate grade level mathematics (Stevens and Schulte 2017). This deficiency is present at school entry and they hinder a student's ability to growth in mathematics early on in their academic career. These deficits include low fluency in understanding small set quantities and

difficulty mapping numbers to quantities (Stevens and Schulte 2017). It's crucial for all students to be equally prepared for college and have the same chances in high school that will set them up for success when they get to college.

Furthermore, students with LDs follow math course sequences that do not prepare them adequately for college education. There is a hierarchal structure of math courses that a student must go through in high school. This hierarchy includes Algebra I, Geometry, Algebra II, and then to higher level courses. Algebra I is a course most adolescents take in the 9th grade and 34% of adolescents designated with an LD are predicted to finish high school having never attempted this course (Shifrer 2016). Similarly, 72% of undesignated adolescents and 60% of adolescents with a designated LD label are predicted to attempt at least Algebra II by the end of high school (Shifrer 2016). However, since the LD designation results in separation from other students, these students are less likely to experience progression in their 10th grade math course placement compared to their undesignated peers who had similar academic achievements in a comparable level of math during 9th grade. Consequently, students labeled with an LD not only do poorer on their tests but they also are less likely to be prepared for college (Shifrer 2016).

Based on the lower academic achievement that is reported for students with LDs, it is not surprising that individuals with LD face more obstacles than their peers when it comes to entering into postsecondary education programs (Sarid, Meltzer and Raveh 2020). Students with LD have lower rates for enrollment in college preparatory coursework (Shifrer et al. 2013). The National Center for Learning Disabilities claims that once the student is labeled as having a LD, it's important to see how they are placed into certain classes, because it will have a large impact on their academic achievement. Studies show that 27% of students labeled with an LD obtained all of the credits that are typically required for high school graduation, in contrast to 50% of their

non-labeled peers. (Shifrer et al. 2013). Students with an LD's trajectories differ from their peers who do not have the LD label because they are not given the chance to be as prepared for the transition to college as their peers and this has important consequences for their future lives (Shifrer 2016). Progression through high school math coursework is closely linked with success in other academic subjects and enrollment in college (Shifrer 2016).

Overall, evidence shows that the academic accomplishments of students with learning disabilities are troublingly low (Hopkins and Stiefel 2021). Hampton and Mason (2003) suggest that this may be because many general education teachers lack sufficient resources such as reformative technique training, reducing teaching loads, available planning time, etc. to cope with the diversity of students with a LD and they fail to meet the unique necessities of these students. If teachers will be working in classrooms with diverse students, then they should have the proper training that will ensure that they have the appropriate materials and teaching methods that will benefit each one of their students (Valles 1998). It is important for schools to include these different techniques in their teacher trainings so that all students have a chance to succeed in their classroom (Valles 1998). Academic outcomes for students with LD tend to improve when the teachers include different types of direct instruction (Schwartz, Hopkins and Stiefel 2021). It has been proven that when teachers use these different kinds of instructional approaches, it will allow students with LDs to have higher math and reading outcomes (Schwartz, Hopkins and Stiefel 2021).

### *IEPs and Academic Achievement*

As Karvonen and Huynh (2007) asserted, understanding the relationship between IEPs and large-scale assessments for students with disabilities provides evidence about students' opportunities to learn the general curriculum and how these opportunities subsequently impact

performance on standardized assessments (Salle et al. 2013). Unfortunately, there is scant research available regarding the effect of IEP quality on student access to the general curriculum and student performance on standardized assessments (Salle et al. 2013).

The process of creating an IEP plays a crucial role in the educational experiences of a student with a disability (Barnard-Brak and Lechtenberger 2010). The type of school that a student with a disability attend has a significant impact on whether they obtain an IEP or not. Students who attended large schools had their odds of attaining an IEP over time by 12% (Woods 2018). Schools that had a higher number of students with disabilities in each classroom were more likely to have an IEP once they entered Kindergarten (Woods 2018). Research shows that students who are allowed to participate in their IEP meetings had better academic achievements than the students who had no participation in their IEP's (Barnard-Brak and Lechtenberger 2010). Studies suggest that student IEP participation has been positively associated with the development of self-determination skills (Barnard-Brak and Lechtenberger 2010). These self-determination skills led to better academic outcomes. These students had better perceptions of the IEP process whenever they were able to be involved in their IEP meetings which allowed them to have higher levels of motivation to achieve their academic goals (Barnard-Brak and Lechtenberger 2010). Unfortunately, often times, students who are able to participate in their own IEP meetings, are not given the opportunity to do so. Studies show that approximately 76% of these IEPs were signed by the students, but only 5% of these IEPs showed any indication of student participation in the IEP process (Barnard-Brak and Lechtenberger 2010).

## *The Role of Race and SES*

### ***Race/Ethnicity***

Previous research confirms that the prevalence rates of LD in children are typically higher among racial/ethnic minority groups. Education and health administrative records indicate that Hispanic children are one and a half times as likely, and Black children are twice as likely to be diagnosed with LD when compared to their White counterparts (Kim et al. 2020). In fact, students who are Black have been reported to be 2.4 times more likely to be identified as having a learning disability (Wu, Morgan and Farkas 2014). Kim et al. (2020) finds that the highest percentage of the students with a primary classification of either mild, moderate, or severe LD were non-Hispanic Blacks at 45%, followed by non-Hispanic Whites at 39%, and Hispanics or others at 16% (Kim et al. 2020).

Prior studies document that individuals with LDs that come from diverse backgrounds – and their families- suffer a large number of obstacles for the correct delivery of services (Blanchett 2009). These barriers include, but are not limited to, differing cultural perspectives of disability, limited access and unfamiliarity with available service delivery options, service providers' lack of understanding of the effect of families' race, social class, cultural values/beliefs, experiences, and perspective of disabilities on service delivery, and families' lack of access to culturally and linguistically responsive curriculum and services (Blanchett 2009). For example, Shifrer et al. (2014) attributes course taking disparities not only to students' LD status but also to their racial minority and lower SES backgrounds (Shifrer et al. 2014). For the students who have a disability or belong to a racial/ethnic minority group, each of these characteristics increases the student's risk of attaining lower reading and mathematics achievement (Wu, Morgan and Farkas 2014). Given the documented prevalence of minority

students amongst children with LDs, it is crucial to take race/ethnicity into account when discussing children with learning disabilities. There were early signs of achievement gaps in mathematics and less growth across grades for African American, Hispanic, and Native American students with disabilities (Stevens and Schulte 2017).

Vast portions of the studies that address racial/ethnic differences among children with LD discuss the differences in the type of curriculum these students receive. Data have shown that students of minority racial and ethnic backgrounds are more likely to be taught in more restrictive environments, where they lack experiences with their general education peers and are denied vital learning opportunities (NCLD 2020). These segregated classrooms give the special education students limited access to the general curriculum which affects their academic outcomes (Blanchett 2009). Research from the National Center for Learning Disabilities (2020) shows that 55 percent of White students with disabilities spend more than 80 percent of their school day in a general education classroom. Meanwhile, only a third of Black students with disabilities spend that much time in a general education classroom (Blanchett 2009). As well, twenty seven percent of Hispanic and American Indian students with disabilities are also more likely to be taught in separate classrooms, compared to White students (NCLD 2020).

In fact, the comparison between special education and general education is very well established in the research. It has been noted that African American students that are placed in special education experience more restrictive placement than their white counterparts (Shifrer et al. 2013). This means that they are placed into segregated classrooms with limited access to the general education curriculum which therefore leads to poor post-school outcomes (Blanchett 2009). Furthermore, research shows that African American students who are identified as having a disability often experience “double jeopardy”. Often times, the types of schools that lower

income African American students attend are schools that lack college preparatory coursework and they have a lack of resources such as updated books, calculators, laptops etc. (Blanchett 2009). This means that not only do these African American students experience all the educational inequalities related to their SES by attending schools that are insufficiently funded and resourced, but they also experience disparities in the special education system (Blanchett 2009).

Blanchett (2009) also focuses on families' cultural beliefs and the disagreement they face with the institutional beliefs of special education. The author discusses how parents' cultural perspectives of disability also affect the extent to which they seek out relevant services (Blanchett 2009). In some cultures, it is seen as a bad or negative thing to have a child with a learning disability. Therefore, they fail to accept the idea that their child may need services to address their LD (Blanchett 2009). Furthermore, this can affect a student's academic success (Blanchett 2009). If they do not have the appropriate services to help them in school, then they will not do well. Improving students' access to behavioral supports and beneficial services needs to become a top priority for policy makers (Freeman et.al 2019).

### ***SES***

Studies have shown that students' own socioeconomic status (SES) has a strong influence on the situation of students with learning disabilities. Students who belong to low socioeconomic statuses are more likely to be identified as having LD once they enter school, but they are less likely to receive early intervention services (Stevens and Schulte 2017). Students with an LD who were on free or reduced lunch had slower growth in their math classes since they did not receive appropriate services for their LD (Stevens and Schulte 2017). The lack of reception of appropriate services often times happen because families from low SES are unaware of or lack

access to the numerous services that can help their child with a LD succeed (Blanchett, 2009; Hampton and Mason 2003). Some of these services include social services, community services and special education services (Blanchett 2009). Evidence shows that participation in a learning support program helps students with LD cope with the obstacles they face, it helps improve their GPA, and it increases their likelihood of graduating high school (Sarid, Meltzer and Raveh 2020). When students with a LD receive the appropriate services, it sets them up for success in their academic career.

In fact, socioeconomically disadvantaged students with disabilities perform lower in school because they have fewer home resources that leads them to having less opportunities for growth in mathematics (Stevens and Schulte 2017). Studies show that students that had mothers who were highly educated and had a college degree were more likely to have an IEP when compared to their peers whose mother only had a high school diploma (Woods 2018). The only revealing predictors of change in IEP status over time was shown in the students that had higher maternal education and those that had lower academic achievement (Woods 2018). According to Woods (2018) parents who are able to effectively communicate better with schools and advocate for their child's needs are also more likely to have appropriate services delivered to their children.

Low-income parents have to face the challenge of finding appropriate services that accept Medicare/Medicaid and are sufficiently trained and knowledgeable to work with individuals with learning disabilities (Blanchett 2009). In addition, another obstacle these parents have to face is that they are often so busy with the struggles of their daily life which includes living in poverty while also being a caregiver to an individual with a LD (Blanchett 2009). Therefore, they usually

don't have the time or energy to seek out special programs or services that are not readily available for their son or daughter (Blanchett 2009)

Studies have also mentioned the importance to identify the different intersectional characteristics an individual with a learning disability might have so that we can provide greater understanding of issues that deal with the lack of access to services for the individuals with a LD (Howard 2020). Studies that fail to incorporate the complexity of student demographics and their relation to LD, may be misleading (Stevens and Schulte 2017). These kinds of studies will not show the true nature of group differences and how it effects a student's academic achievement (Stevens and Schulte 2017). Therefore, we proceed to discuss what prior studies have shown regarding the role of SES on students with LD achievement.

The present study aims to add to the literature in a couple of ways. First, by expanding the analysis of the relationship between having a learning disability and academic achievement. Second, by testing whether race/ethnicity and SES moderate this relationship. Overall, this research seeks to address the following questions:

1. Does having an intellectual disability have a significant relationship to academic achievement?
2. Does race and class moderate the relationship between having a LD and academic achievement?

### **Theoretical Framework**

In order to address my research questions, I utilize two theoretical frameworks: Labeling Theory and Cumulative Disadvantage Theory. These theoretical frameworks help explain the reasoning behind my two research questions.

## *Labeling Theory*

### *Labeling Theory: A Negative Approach to Disabilities*

Labeling theory is a theory proposed by Howard. S Becker (1963) which proposes that individuals will identify themselves and behave in a way that matches the altered perceptions others have placed on them so that they can comply with the prediction of the label (Shifrer 2013). Labeling theory partially attributes the poorer outcomes of labeled persons due to the stigma related to labels (Shifrer 2013).

Previous studies have shown that educators perceive children with learning disability designations more negatively than their undesignated students (Shifrer 2016). If a student knows that their teacher is expecting them to perform poorly academically due to their LD designation, then it will be hard for the student to act in a way that does not match with the teacher's expectations. A student could be the brightest individual in the classroom, but if their teacher doesn't believe in them or if their parents don't expect them to do well in school then they will act in accordance to that label that is placed on them. Teachers and parents are the most important supporters for a child in their early years. It's crucial for the adults around them to support them and think highly of them. Student performance is partially based off of teachers' educational attainment expectations, even after taking into consideration the students' particular qualities that shape the teachers' educational attainment expectations (Shifrer 2016). The negative influence of teachers' expectations within the classroom on student performance, has a stronger effect on low-achieving students, and also has a stronger effect for students from lower income households compared to those in high income households (Shifrer 2016). Therefore, it is

not surprising that prior studies (Shifrer 2016) find that youth labeled with LDs appear to perform poorly on numerous life out-comes, such as math outcomes.

Studies show that students who were labeled with an LD had negative implications. Teachers had lower expectations for students with this label and therefore this led the students to be less motivated to perform well in school. Numerous students reported being made fun of by their peers and being called names such as “stupid” or “retarded” which negatively affected their self-esteem (Peguero et al. 2011)

Through the lens of labeling theory, teachers that place negative labels on students with LD will have a harder time getting into a high track placement. If a teacher perceives a student with LD as unable to attain higher levels of knowledge, then this will affect the students access to higher educational classes. Additionally, students with a LD will face stratification in relation to the stigma that comes with their LD designation. They will not be able to progress into the higher-level math courses because their teachers will deem them unfit for those rigorous classes (Shifrer 2016).

#### *Labeling Theory: A Possible Positive Approach to Disability*

While there is a lot of literature on the negative impacts of labeling theory, there is also a lot of work showing the positive impacts it can have. Studies show that when the LD label was placed on students, it gave some students a sense of relief (MacMaster 2002). They finally felt like they could let go of the “something is wrong with me” idea in their head. Instead, it felt like they could finally use a valid description when talking about their disability (MacMaster 2002). Some students welcomed the LD label and it actually increased their self-esteem. These students felt like their learning disability was an unrewarded struggle (MacMaster 2002). Once the LD

designation was placed on them, they said they viewed their disability as something that had specified conditions and it no longer felt like a negative stigma (MacMaster 2002).

Studies also show that the LD label has had positive impacts on the student's because it draws needed attention to the students who have learning disabilities so it can serve as a sort of advocacy for the services that are required for students with LD (Osterholm 2000). These LD labels can hopefully serve as encouragement for research and practitioners to pay close attention to the issues students with LD face (Osterholm 2000). Additionally, this heightened attention may lead to an improvement in services and interventions (Osterholm 2000).

In the study called "Pygmalion in The Classroom" by Rosenthal and Jacobson (1968), researchers hypothesized that if we label certain kids as gifted, then the teachers will treat them as gifted kids which will therefore lead these kids to rise to the occasion and perform better academically (Rosenthal and Jacobson 1968). In this study they gave elementary students a test which would identify their "giftedness" that would emerge over the course of the school year. However, it did not truly dictate which students were gifted (Rosenthal and Jacobson 1968). Instead, they randomly selected some kids to manifest this "gifted" label.

This study of gifted kids can extrapolate to the case of students with LD because they are both getting a label placed onto them that has a certain stigma around it. This stigma will lead them to behave in a certain way to fit that stigma. For example, gifted kids will perform better in school to match the positive stigma associated to that label. In addition, if having a LD is seen as a positive trait because of the high intellect and creativity it can bring to a child, then this student will act in accordance to fulfill this positive expectation that is placed on the LD label.

There was evidence that showed that the teachers did in fact treat these "gifted" students differently. The children with these labels fulfilled this prophecy and performed better academically (Rosenthal and Jacobson 1968). This study shows that teacher expectations can have a positive impact through labels that are placed on students. In addition, this study shows that these affects impacted kids in the lower grade levels more than kids in higher grade levels (Rosenthal and Jacobson 1968).

Studies show that having a LD label can actually allow individuals to view themselves as having positive traits such as high intellect and high creativity (Saatcioglu and Skrtic 2019). These positive stigmas have helped elevate LDs so that more people see it as a good thing instead of a negative (Saatcioglu and Skrtic 2019). For example, there are many students who have a LD that have impeccable memories. Even though they have a hard time understanding mathematics or reading, they are able to recall the slightest details. These positive aspects of learning disabilities has helped improve the reputation of learning disabilities and made it more of a positive characteristic (Saatcioglu and Skrtic 2019)

### Cumulative Disadvantage Theory

Cumulative disadvantage theory explains that initial family, community, and school inequalities create advantages or disadvantages that build up over time (DiPrete & Eirich, 2006). Small advantages at an early stage grow bigger over time because early advantages allow access to future advantages by providing the necessary skills and body of knowledge that set up future successful outcomes (Bottia et al. 2021). Cumulative disadvantage theory is rooted in the work of Merton (1988) which explains how inequalities develop and how some people have more disadvantages based off their race, social class, gender, etc. Which will have an impact on their

quality of life. Individuals who come from racial minority groups have been historically diminished from educational trajectories throughout their life (Biseti and Landes 2021).

When someone is born as a minority they are already at a disadvantage because they are not a part of the majority white population. If they come from a low SES, they will not have the same access to good quality schools as a student from a high SES might have. When they begin school, they are already facing the disadvantages they were born with such as being a minority female student from a low SES. On top of this, if they enter kindergarten and are diagnosed with a LD this will cumulate with all of the other disadvantages they already have been faced with. As their academic career continues, these obstacles will continue to get worse and grow on one another.

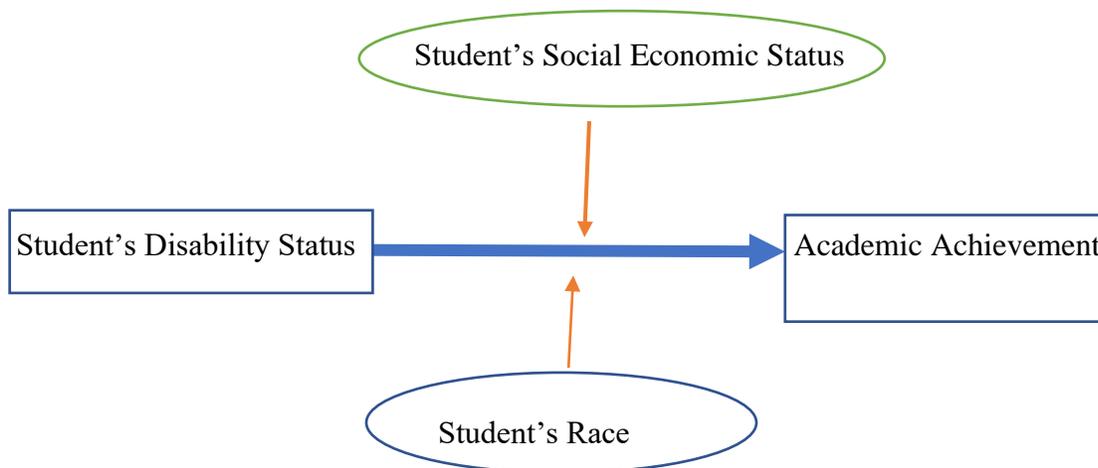
Cumulative disadvantage is shown by comparing children who have similar potential for educational attainment, that is shown by their academic records, attitudes, and behaviors as of early high school (Shifrer 2013). The results appear to be consistent with the predictions of labeling theory. Teachers and parents hold significantly lower educational expectations for adolescents labeled with LDs than they do for similarly achieving and behaving adolescents that do not have the learning disability label (Shifrer 2013). These lower expectations contribute to labeled adolescents' lower educational expectations for themselves (Shifrer 2013). These disadvantages continue to stack up for those that come from low SES and from a minority racial group. The extent that each group of people has experienced disadvantage will most likely be different. Some groups may experience numerous disadvantages due to the intersection of their disability and minority group status (Biseti and Landes 2021). It is important to take cumulative disadvantage into account because investigating the intersection of LD and race-ethnicity will add more nuance to the research on educational attainment for those individuals with learning

disabilities (Biseti and Landes 2021). Although the overall educational attainment of individuals with LD has gradually increased, the individuals who are at the intersection of disability status and racial-ethnic minority status do not see these same increases (Biseti and Landes 2021). In addition to this, non-Hispanic Blacks started with lower levels of education compared with non-Hispanic Whites when it came to high school degrees. Therefore, the Black students are already starting off with more of a disadvantage which just continues to pile up for them over time (Biseti and Landes 2021).

### Conceptual Model and Hypotheses

Based on the previously discussed literature and theoretical frameworks, the conceptual model presented in Figure 1 summarizes the purpose of this research. The intention is to test, at the student level, if there is a significant relationship between having a LD and students' academic outcomes. Additionally, it also aims to test if student's race and SES moderates the relationship between disability status and academic achievement.

**Figure 1: Conceptual Model**



## **HYPOTHESIS**

Based on labeling theory individuals will identify themselves and behave in a way that matches the altered perceptions others have placed on them so that they can comply with the prediction of the label. Assuming the negative perception of the LD label has on students is the dominant one among students with LDs, I hypothesize the following:

H1: If student has a LD then he/she will have a lower academic achievement than students who do not have a LD. Cumulative disadvantage theory states that there are individuals who have numerous disadvantages such as race, class, gender, etc. These disadvantages will pile up on one another as time goes on which will have a negative impact on their quality of life (Bisetti and Landes 2021). Due to this, I expect that, those individuals who endure cumulative disadvantage due to race or SES status will face more challenges throughout their educational career. Thus, I hypothesize the following:

H2: The achievement gap between students with LD and without an LD is larger among students who are racial minorities than students who are white.

H3: The achievement gap between students with LD and without an LD is larger among students who are from lower SES than students who are from higher SES.

## **DATA AND METHODS**

### **Data**

To test the relationship between having a learning disability and academic achievement, I use the Education Longitudinal Study of 2002 (ELS) national dataset. ELS is uniquely established to compare students labeled with an LD to students not labeled with an LD, with

measures of numerous factors that are potentially associated with both the LD label and academic outcomes. ELS is a large nationally representative dataset created and gathered by the National Center for Education Statistics (NCES). This dataset is appropriate to answer our questions regarding the relationship between the LD label and academic achievement. NCES first surveyed 16,373 spring-term 10th graders enrolled in approximately 750 public schools in 2002. The ELS sampling frame excluded special education schools (Ingels, Pratt, Rogers, Siegel, & Stutts, 2004), but included special education students enrolled in non-special education high schools. ELS students were resurveyed in 2004 when most were seniors, and again in 2006 when most had been out of high school for two years. From that total sample population, schools provided information of the learning disability of around 8,100 students. These students are the focus of this study.

## Variables

### *Dependent Variables*

To measure students' academic achievement, I utilize two different kinds of dependent variables: students' 10<sup>th</sup> grade math achievement and students' 10<sup>th</sup> grade reading achievement. These variables are continuous variables that range between 19 and 87 for math achievement, and between 23 and 79 for reading achievement (See Table 1). I utilize different measures to capture achievement to cover a variety of ways to measure students' achievement and to have more reliability on the measure of students' academic achievement.

**Table 1. Dependent Variables**

	<b># of</b>					
<b>Variable</b>	<b>observations</b>	<b>mean</b>	<b>stand dev</b>	<b>min</b>	<b>max</b>	
<b>10th gr. reading scores</b>	15,892	50.526	9.885	22.57	78.76	
<b>10th gr math scores</b>	15,892	50.710	9.912	19.38	86.68	

### *Key Independent Variable*

In this study I measure students *learning disability status (LD)* by looking at their Individualized Education Plans (IEP). IEPs are used to identify children with disability status (Shifrer 2016). IEP's document the student's disability and recognizes which supports will be provided, the settings in which the services will be provided, which supports will be used, and their academic goals for the school year (Schwartz, Hopkins and Stiefel 2021). IEPs are reanalyzed every year and services can either be modified, continued, or discontinued when necessary (Schwartz, Hopkins and Stiefel 2021). It's important to note that some students may be referred for an IEP but they will never receive one if their parents refuse (Schwartz, Hopkins and Stiefel 2021).

IEPs are important to use when measuring special education because there are certain students who have "unspecified disabilities" due to their parents not having positive reactions to any disability questions or vice versa, sometimes parents will qualify their children as having a developmental delay, but they do not require an IEP (Shrifler and Freeman 2021). Measuring individuals with an IEP will ensure that only those students who have been administered by the school as having a LD will be included in this study.

To test if the labeling of a student with a LD designation might have a positive effect on students' academic achievement, due to possible positive labeling effects, I also utilize alternate measures to get to the LD designation. For this specific purpose, I utilize parent's opinion of if they think the student has a disability. There were some students who were not identified by the school as having a disability, but their parents believed they did have a disability. In order to see if the label has an impact on the student's academic achievements, I compare two groups. The

first is students with a possible disability and no label, meaning their parent thinks they have a disability but the school does not. The second group is students with a possible disability and a label, which includes students who have an IEP and parents also think they have a disability.

### *Moderating Variables*

To control for *Race/ethnicity*, I included the race variable available in ELS. The variable available in ELS reports if student is American Indian, Asian, Black, Hispanic, Bi- and Multi-racial, White, West/South Asian and Pacific Asian & Southeast Asian. For my specific analysis, I primarily focus on students who are Black or African American, Hispanic-no race specified, Hispanic- race specified, and White students. My purpose is to focus on minority students who have a larger sample size and who also face a large number of obstacles based on Labeling Theory and Cumulative Disadvantage Theory.

To control for *socioeconomic status (SES)*, I included the ELS continuous variable that is based on five equally weighted standardized components such as: fathers' education, mothers' education, family income, fathers' occupation, and mothers' occupation. Table 2 presents the key variables utilized in this analysis, their names in the ELS dataset, and a brief description of each of the variables.

**Table 2. Key Variables utilized in Analyses from ELS**

<b>Study Variables</b>	<b>ELS</b>	<b>Description</b>
10th gr. reading scores	bytxrstd	10th grade reading standardized score
10th gr math scores	bytxmstd	10th grade mathematics standardized score
IEP	byiepflg	base year individualized education plan
Race	F1race_r	student's race/ethnicity composite (restricted)
SES	byses1	Socio-economic status composite

### *Other Control Variables*

Other control variables included in the model are: gender, age, ever in English as Second Language program; if both biological parents live in household- single parent indicator, if school attended is Public, Catholic, or Other; and urbanicity of school locale as indicated in the source data for sampling. Previous literature has included these variables for their control variables because they found that when characteristics for student and type of school were controlled for, there were disparities between the academic gains between girls and boys. The boys made significantly fewer academic gains than the girls (Bozick et al. 2008). Also, type of school was important to have as a control variable because students in private schools had a higher percent of academic gains than the students in public schools. For example, Catholic school students gained 1.4 more correct answers than their peers in public school (Bozick et al. 2008). In addition, students who came from a household with both parents had higher academic gains than those who lived in a single-family household (Bozick et al. 2008).

Also, I utilized the variable of teacher's expectations for students to further test the idea that the label may have a positive impact on students. By looking at this variable, we can see if labeling theory is related to academic achievement. If a teacher has a high expectation of a student, and that student excels academically, then we can infer that the label the teacher places on the student, based off their expectations for them, has a positive impact on the student. On the other hand, if a teacher has low expectations for a student and that student performs poorly in school, then we can say that the label has a negative impact on the student.

For the weight variable I used the F1PNLWT variable in ELS, which is a panel weight. Panel weights are used when the analysis requires more than one round of data collection. The panel weight creates a combination of responses (Ibrahim and Johnson 2020). The weight

variable was important to use because it maintained the representativeness of the sample which allows for the outcome of the study to be generalized to students who entered 10<sup>th</sup> grade in 2002 (Ibrahim and Johnson 2020). There were impacts that the non-responders of the survey had on the sample, but the weight variable accommodated for these effects (Ibrahim and Johnson 2020).

## **Methods**

### **Descriptive Statistics and OLS Models**

In this study I first use descriptive statistics to explore the relationships between the key independent variable (learning disability-IEP) and students' academic achievement (10<sup>th</sup> grade math scores, 10<sup>th</sup> grade reading scores). Through the comparison of mean values of groups of students provided via cross tabulations (see Table 3) I identify the possibility of positive or negative relationships between the dependent variables and the key independent variables. These descriptive statistics help me get a better understanding of the relationships between my independent variable and my dependent variables.

### **Analytic Technique**

To test my hypotheses, I utilize ordinary least squares regression (OLS). OLS is a statistical method of analysis that allows you to examine continuous data. OLS is a good estimator when analyzing my data because it allows me to identify the strength and significance of the relationship between my independent variable and dependent variables, while I control for other important factors. This method of OLS allows me to examine the relationship of LD and academic achievement by minimizing the sum of the squares in the difference between the observed and predicted values of the dependent variable configured as a straight line. For my specific purposes, the key independent variable is learning disability and my dependent variable is academic achievement. My dependent variable has two different types of measures which

include: math scores, and reading scores. OLS allows me to determine if the relationship between LD and academic achievement is significant and if the relationship is positive or negative. Therefore, allowing me to test *hypothesis #1*.

Equation 1 presents the regression function to look at the relationship between my dependent variable and my independent and moderating variables.

$$\text{Equation \#1: } \hat{Y}_i = \hat{\alpha} + \hat{\beta}_1 X_{i1} + \hat{\beta}_2 X_{i2} \dots + \hat{\beta}_k X_{i,k}$$

When  $\hat{Y}_i$  is the dependent variable of academic achievement (math or reading scores) then  $X_{i1}$  is the students LD status,  $X_{i2}$  the student's race, and  $X_{i3}$  socioeconomic status.  $\hat{\beta}_k X_{i,k}$  includes other control variables as well as the interaction effects between LD status and race, and LD status and SES, etc.

To test the possible moderating effect of race and SES on the relationship between LD and academic achievement, I include OLS models with interaction terms. A moderator variable is a variable involved in an interaction with another variable in the model such that the effect of the other variable depends upon the value of the moderator variable. Adding interactions benefits my regression model because it increases the understanding of the relationships among the variables in my model. Moreover, it allows me to test hypotheses #2 and #3 which state that the relationship between LD and academic achievement varies depending on students' race and/or SES. When an interaction is present it demonstrates the effect of one predictor variable on the response variable and shows that it fluctuates at different values of the other predictor variable. I first run a series of models without controlling for prior academic achievement, and then end the statistical analysis running the same series of models but this time controlling for student's

achievement in 9<sup>th</sup> grade. This way I will be able to isolate the effect that having an IEP status has on students, keeping in mind the existent inequalities in academic achievement.

## **Results**

### **Descriptive Statistics**

The following sections review the results of my descriptive statistics and models used to test my hypotheses. Table 3 shows the weighted descriptive statistics for all the variables in my analytic sample which includes 14,654 students. My outcomes include two variables: reading scores, and math scores. For the general population of students, the average for reading scores was 50.2 with a maximum of 78.8, and the average for math scores was 50.2 with a maximum of 86.6.

Turning to the key independent variable of disability status, my analytic sample included 7,381 observations of whether students had an IEP or if they did not. This makes up about 50% of the students in my sample. There was a lot of data missing on IEP because a lot of schools did not include whether or not a student had an IEP. Frequently, the information on IEP status was missing, and IEP information was usually only relevant for public schools. Another reason why the observation number for the IEP variable is low is because some students could not participate or be included in the study because they were unable to complete the questionnaire due to their disability. Importantly, 13% of the students reported that they had an IEP while 87% of students reported that they did not have an IEP.

The descriptive statistics of my moderating variables such as race and socioeconomic reveal a couple of things. First, about 60% of the students in my sample are White, approximately 14% of the students are Black and about 16% are Hispanic. Next, I used a

continuous variable to capture SES. The minimum value is -2.11 and the maximum value is 1.82.

The mean of this SES variable is .005.

**Table 3: Weighted Descriptive Statistics**

Variable	Obs	Full Sample (n=14,654)				Students with IEP (n=821)	Students without IEP (n=6,560)
		Mean	Std. Dev.	Min	Max	Mean	Mean
Reading Scores When Student is in 10th Grade	14,654	50.254	9.825	22.57	78.76	40.014	51.601
Math Scores When Student is in 10th Grade	14,654	50.274	9.811	19.38	86.68	39.537	51.639
Male	14,654	0.503	0.500	0	1	0.651	0.483
English As A Second Language (ESL)	13,114	0.079	0.270	0	1	0.132	0.072
Individualized Education Plan (IEP)	7,381	0.131	0.337	0	1	1.000	0.000
Socioeconomic Status (SES)	14,006	0.005	0.721	-2.11	1.82	-0.272	0.034
Single Parent Household	11,603	0.039	0.194	0	1	0.052	0.035
White	14,654	0.603	0.489	0	1	0.566	0.668
Asian	14,654	0.040	0.195	0	1	0.019	0.032
Black	14,654	0.144	0.351	0	1	0.166	0.116
Hispanic, no race specified	14,654	0.072	0.258	0	1	0.061	0.060
Hispanic, race specified	14,654	0.089	0.285	0	1	0.115	0.078
Urban School	14,654	0.300	0.458	0	1	0.239	0.261
Catholic School	14,654	0.043	0.202	0	1	0.009	0.052
Other Private School	14,654	0.034	0.180	0	1	0.005	0.028

In Table 3, I included the descriptive statistics for the control variables which include gender, whether they lived in a single parent household or not, type of school (urban, catholic, or other private school) and whether they were ever in an ESL program. The gender of the students in the sample was about half males and half females. The percentage of students in the sample who live in a single parent household is about 4%. In addition, I control for a measure for urbanicity of the place where the school is located. This measure is broken down into three categories: urban, catholic school and other type of private school. About 30% of the schools were located in urban areas, 4% of them were catholic schools and 3% belonged to the other private school category.

When we look at students with IEP's and students without IEP's it is important to note that the reading and math scores are substantially lower for students with IEP's compared to those without. While students with an IEP had a mean reading score of 40, a student without an

IEP had a mean of 51. The mean of math scores for a student with an IEP is 39 while the mean of math scores for students without an IEP is 51. From this table we can also see that the mean of students in an ESL program who also had an IEP is .132. The mean of students in an ESL program that did not have an IEP is .072. There is a higher number of students who were in the ESL program and also had an IEP when compared to students who did not have an IEP but were in the ESL program. Next, when we look at SES, this table shows that the average SES for students with an IEP is  $-.272$ . The average SES for students who did not have an IEP is  $.034$ . The mean SES of students who had an IEP is substantially lower than the students who did not have an IEP.

## **DISCUSSION**

### *Correlation Tables*

Table 4 includes the correlations between the dependent variables and independent variables. From this table, we can see that having an IEP is negatively correlated with math scores at  $-.393$ . It is also negatively correlated with reading scores at  $-.373$ . This means that if a student has a LD their math scores are lower. Not surprisingly, males had a positive correlation of  $.572$  with math scores. Therefore, implying that male students have higher math scores than female students. However, being male had a negative correlation with reading scores at  $-.063$ . Which suggests that male students have lower reading scores than female students. This is not surprising because men tend to excel in math scores over females, but usually fall behind them in reading scores. This table also includes the correlations between race and academic achievements. Hispanic students were negatively correlated with math scores at  $-.203$ . Similarly, black students also had a negative correlation with math scores at  $-.232$ . SES and reading scores had a positive correlation of  $.4366$  which shows that a student's socioeconomic status has a

positive impact on how well a student does academically when it comes to reading. Table 4 also looks at how there is a positive correlation between math scores for both catholic and other private schools but a negative correlation between math scores and students who attended urban schools. This implies that students in private schools get higher scores in math and reading.

**Table 4. Correlations between Dependent Variables and Independent Variables**

	Math Scores	Reading Scores	Male	ESL	IEP	SES	Single Parent	Black	Asian	Hispanic	Urban	Catholic	Other Private
Math Scores When Student is in 10th Grade	1												
Reading Scores When Student is in 10th Grade	0.757	1											
Male	0.057	-0.064	1										
English As A Second Language (ESL)	-0.157	-0.199	0.010	1									
Individualized Education Plan (IEP)	-0.393	-0.373	0.099	0.062	1								
Socioeconomic Status (SES)	0.444	0.437	0.015	-0.122	-0.147	1							
Single Parent Household	-0.123	-0.101	-0.103	0.002	0.030	-0.097	1						
Black	-0.233	-0.192	-0.011	0.001	0.061	-0.139	0.084	1					
Asian	0.091	0.002	0.003	0.095	-0.038	-0.008	-0.017	-0.094	1				
Hispanic	-0.203	-0.199	-0.008	0.077	0.044	-0.212	0.016	-0.126	-0.108	1			
Urban School	-0.011	0.001	-0.008	0.021	-0.040	0.041	0.012	0.113	0.077	0.138	1		
Catholic Sch	0.150	0.190	-0.012	-0.029	-0.095	0.227	-0.041	-0.044	-0.083	-0.002	0.236	1	
Other Private School	0.144	0.140	0.004	-0.027	-0.083	0.190	-0.009	-0.042	-0.038	-0.073	0.079	-0.123	1

### *Reliability Check*

I included students with possible disability to check for the possibility of a positive effect of the labeling theory. By capturing the universe of kids who have learning disabilities and then comparing those who have an IEP, then you have a group of labeled kids and a group of non-labeled kids. By doing this, it will allow me to see if those with IEP's differ from those without IEPs within the universe of kids with learning disabilities. While this is not going to change the relationship between the independent and dependent variables, it's going to give me evidence that I can use to argue is either consistent or inconsistent with my theory.

**Table 5. Gap in Mean Values of Key Variables, by Full Sample, Race/Ethnicity, and SES**

		10th grade math scores	10th grade reading scores
All	Students with a LD	39.6	40.01
	Students without a LD	52.07	51.96
	Students without IEP but with disability according to parent	43.51	43.84
	<i>GAP (students with disability vs. no disability)</i>	<i>12.47</i>	<i>11.95</i>
	<i>GAP (students with disability label vs. no disability label and presumed disability)</i>	<i>8.56</i>	<i>8.12</i>
	Black students with IEP	37.39	38.16
	Black students without IEP	45.38	46.52
	Black students without IEP but with disability according to parent	43.3	44.15
	<i>GAP (students with disability vs. no disability)</i>	<i>7.99</i>	<i>8.36</i>
	<i>GAP (students with disability label vs. no disability label and presumed disability)</i>	<i>2.08</i>	<i>2.37</i>
	Hispanic students with IEP	35.88	37.33
	Hispanic students without IEP	46.63	46.45
	Hispanic students without IEP but with disability according to parent	44.23	44.22
	<i>GAP (students with disability vs. no disability)</i>	<i>10.75</i>	<i>9.12</i>
	<i>GAP (students with disability label vs. no disability label and presumed disability)</i>	<i>2.4</i>	<i>2.23</i>
Race/Ethnicity	White students with IEP	41.59	41.61
	White students without IEP	54.01	54.08
	White students without IEP but with disability according to parent	48.4	48.82
	<i>GAP (students with disability vs. no disability)</i>	<i>12.42</i>	<i>12.47</i>
	<i>GAP (students with disability label vs. no disability label and presumed disability)</i>	<i>5.61</i>	<i>5.26</i>
	Lowest quartile with a IEP	36.98	37.83
	Lowest quartile without a IEP	46.53	46.32
	Lowest quartile students without IEP but with disability according to parent	44.817	44.369
	<i>GAP (students with disability vs. no disability)</i>	<i>9.55</i>	<i>8.49</i>
	<i>GAP (students with disability label vs. no disability label and presumed disability)</i>	<i>1.71</i>	<i>1.95</i>
	Highest quartile with a IEP	45.11	45.24
	Highest quartile without a IEP	57.01	56.86
	Highest quartile students without IEP but with disability according to parent	52.68	52.79
	<i>GAP (students with disability vs. no disability)</i>	<i>11.9</i>	<i>11.62</i>
	<i>GAP (students with disability label vs. no disability label and presumed disability)</i>	<i>4.33</i>	<i>4.07</i>
SES			

Table 5 presents the existing gaps in key variables by group of students without controlling for other factors. The table above shows how when considering race, the largest gap exists between white students with IEP and IEP and white students without an IEP. The gap in 10<sup>th</sup> grade math scores is 12.42 and the gap in 10<sup>th</sup> grade reading scores is 12.47. When we

compare this to Black students, the gap for black students with an IEP and Black students without an IEP in math scores is 7.99 and the gap in reading scores is 8.36. Next, when we look at the gap between students with disability and compare it to students with no disability and the presumed label, the biggest gap still exists between White students. For white students, this gap in math scores is 5.61 and the gap in reading scores is 5.26. This gap is substantially lower in minority students. The gap between Hispanic students with disability and Hispanic students with no disability but have the presumed label is 2.4 points in math scores and 2.23 reading points.

Next, when we focus on SES, the smallest gaps are within students in the lower SES. The gap for students in lower SES with a disability vs student in the lower SES without a disability is 9.55 in math scores and 8.49 in reading scores. The gap for students in the higher SES with a disability and students in the higher SES without a disability is substantially higher at 11.9 points in math scores and 11.62 in math scores. Similarly, the same pattern exists for students with disability and students with no disability and the presumed label. Students in the higher SES with the disability label have a gap of 4.33 in math scores and 4.07 in reading scores when compared to students in the higher SES with no disability and the presumed label.

In table 5 I look at students with a possible disability, meaning their parents think they have a disability but they do not have an IEP and they are not identified by the school as having a disability (students with a disability but not the label). This table shows that the mean for all students reading scores is 50.254. The mean of reading scores for students with possible disability is 43.848 and 40.014 for students with IEP. Students with IEP scored lower in all three groups (reading scores, math scores, teacher expectations). From this, we can imply that students with IEP's do worse in math and reading than students with a possible disability. Students with IEP's also had lower teacher expectations than the students with a possible disability.

**Table 6. Teacher Expectations of Disabled Students with a Label and Disabled Students with No Label**

	Disabled w/ Label		Disabled w/ NO Label	
	Obs	Mean	Obs	Mean
Teacher Exp.	347	2.691	303	3.562
Teacher Exp. For Black Students	51	2.573	25	3.393
Teacher Exp. For Hispanic Students	40	2.438	17	3.146
Teacher Exp. For White Students	215	2.776	226	3.608
Teacher Exp. For Students In Highest Quartile	49	3.386	97	4.221
Teacher Exp. For Students In Lowest Quartile	120	2.387	53	2.915

Table 6 shows that teacher expectation of a disabled student is on average 2.691 while disabled students with no label had an average teacher expectation of 3.562. Therefore, teacher expectations of students are lower for disabled students with the label when compared to disabled students with no label. From this, we can infer that the label has a negative impact on students academically and teachers have lower expectations for students with the LD label. When taking race into account, White disabled students had higher teacher expectations when compared to Black disabled students and Hispanic disabled students. Disabled Hispanic students scored the lowest in teacher expectations. Next, when looking at SES, teacher expectations were lower for students in the lower SES for both disabled students with the label and without the label. Teachers had higher expectations for disabled students who came from a higher SES.

When students have the label placed on them, this results in teacher expectations to be lower. The biggest gap in teacher expectations between students with and without the label is present in students that belong to the higher SES. The gap between the higher SES disabled students with the label and disabled students without the label is .835. This ELS variable of teacher perception/expectations for students allows us to see if labeling theory is related to academic achievement and if teacher expectation can have a positive or negative effect on labeling.

The students with the possible disability but no label performed better academically than the students with a disability who had the label. We can see this from the results in table 5. For example, table 5 shows that the 10<sup>th</sup> grade math scores of students with an LD is 39.6 while the average math score for a student with a possible disability but no label is 43.51.

### *Multivariate Analysis*

#### *Models Without Prior Achievement Controls (9<sup>th</sup> grade Achievement)*

I start the statistical model section running models predicting math and reading achievement in 10<sup>th</sup> grade without controlling for prior achievement, therefore these first models only show correlations between the key variables. I included table 7 to demonstrate the unweighted and weighted regression analysis predicting math scores. Looking at the IEP variable, we can see that as the number of students with an IEP increases, math scores decrease by 10.811 in the unweighted analysis and it decreases by 11.013 in the weighted analysis. These results were statistically significant. This shows, as expected, that there is a significant and negative relationship between having an IEP and math scores.

In table 7, socioeconomic status was also statistically significant. This table shows that as SES increases, student's math scores will also increase by 4.179 in the unweighted analysis and 4.196 in the weighted analysis. This implies that students who belong to higher SES groups will perform better in math than those students in lower SES groups. Next, we can see the relationship between student' race and math score. Students who are white scored 2.403 points higher on math than students who are not white. Black students scored 5.878 points lower on math and Hispanic students scored 4.186 lower white students. These findings were all statistically significant.

Table 7 demonstrates that students who went to school in an urban area scored on average .414 points lower on their math scores than students who did not attend schools in urban areas, however this did not have a high significance. Students who attended catholic schools had math scores that were 1.448 points higher than students who attended school in an urban area and 1.887 times higher for the students who attended other private school than those who went to school in an urban area.

**Table 7. Regression Analysis Predicting Math Scores, Unweighted and Weighted analysis**

Math Scores When Student is in 10th Grade	Unweighted Analysis (n=5867)		Weighted Analysis (n=5533)		
	Coef.	Std.	Coef.	Std.Err	
Male	1.581	0.211 ***	1.696	0.217 ***	
English As A Second Language (ESL)	-3.554	0.394 ***	-4.093	0.420 ***	
Individualized Education Plan (IEP)	-10.811	0.357 ***	-11.013	0.347 ***	
Socioeconomic Status (SES)	4.179	0.157 ***	4.196	0.162 ***	
Single Parent Household	-3.002	0.588 ***	-2.909	0.586 ***	
Race					
White	2.403	0.412 ***	1.876	0.632 ***	
Black	-5.878	0.369 ***	-5.845	0.367 ***	
Hispanic, no race specified	-3.663	0.477 ***	-4.054	0.491 ***	
Hispanic, race specified	-4.186	0.427 ***	-4.398	0.432 ***	
Urban School	-0.414	0.243 *	-0.457	0.257 *	
Catholic School	1.448	0.318 ***	1.343	0.497 ***	
Other Private School	1.887	0.407 ***	2.480	0.682 ***	
_cons	52.731	0.186 ***	52.930	0.181 ***	

\*\*\* represent significance to the 99%

R-squared= 0.379 | 0.3851 |

\*  $p \leq 0.05$ , \*\*  $p \leq 0.01$ . \*\*\*  $p \leq 0.001$

Table 8 includes the unweighted and weighted regression analysis predicting reading scores. This table shows that the unweighted analysis of average reading scores for students with IEP is 9.805 points lower than the average reading score of students without an IEP and 10.051 points lower in the weighted analysis. There is a big gap here in reading scores for students with an IEP and those without an IEP. We can infer that student with an IEP will perform worse on their reading scores when compared to students without an IEP. The unweighted analysis shows

that ESL scores will decrease by 4.890 if the student was ever in an ESL program. For the weighted analysis it will decrease by 4.695. ESL students will score lower in both math and reading but their reading scores will be the lowest. This is not surprising since English is their second language which causes them to experience more barriers when reading in English. As seen in Table 8, men will score .918 points lower in reading scores, which can be expected since this a subject they tend to struggle in when compared to math. Similar to the results from the math scores, students who have an IEP, students who attend urban schools, and students who are black or Hispanic will perform lower on reading scores.

**Table 8. Regression Analysis Predicting Reading Scores, Unweighted and Weighted**

### Analysis

Unweighted Analysis (n=5867)			Weighted Analysis (n=5533)		
Reading Scores When Student is in 10th Grade	Coef.	Std. Err	Coef.	Std. Err	
Male	-0.918	0.217	***	-0.809	0.224 ***
English As A Second Language (ESL)	-4.890	0.404	***	-4.695	0.433 ***
Individualized Education Plan (IEP)	-9.805	0.366	***	-10.051	0.358 ***
Socioeconomic Status (SES)	4.115	0.161	***	4.055	0.166 ***
Single Parent Household	-2.793	0.604	***	-3.136	0.605 ***
Black	-4.695	0.376	***	-5.267	0.377 ***
Asian	-0.428	0.421		-0.584	0.651
Hispanic	-3.844	0.346	***	-4.457	0.357 ***
Urban School	-0.251	0.249		0.116	0.265
Catholic School	2.548	0.326	***	2.299	0.513 ***
Other Private School	1.942	0.416	***	2.321	0.700 ***
_cons	53.621	0.188	***	53.828	0.184 ***

\*\*\* represent significance to the 99%

R-squared=0.3466

R-squared=.346

\*  $p \leq 0.05$ , \*\*  $p \leq 0.01$ . \*\*\*  $p \leq 0.001$

### Interactions

Next, I included Table 9 to look at math scores with race and SES interactions. It is important to look at these values remembering that these values are controlling for many other

important factors in the relationship between LD and academic achievement. Therefore, it is important to look at the gaps when one controls for many other factors.

Table 9 shows that White students with an IEP (IEP=1, White=1 (this is because White is the reference category)) will have their math scores associated with an 11-point disadvantage since the coefficient for White students with an IEP is -11.221. Black students with an IEP (IEP=1, Black=1) will have a score associated with an 8-point disadvantage in math scores since I have to add the effects of IEP and of the interaction of IEP with Black  $-11.221 + 2.734 = -8.487$ . Tables show the scenario where IEP=0 and Black=1 but the inverse value will present the situation where IEP=1 and Black =1. The findings from the interactions of Asians with an IEP and Hispanics with an IEP were not statistically significant. The gap for white students is bigger while the gap for black students is smaller.

**Table 9. Regression Analysis Predicting Math Scores with Interactions by Race and SES, Unweighted and Weighted Analysis**

Math Scores When Student is in 10th Grade	Unweighted Analysis				Math Scores When Student is in 10th Grade	Weighted Analysis			
	Coef.	Std.Err.				Coef.	Std.Err.		
Male	1.567	0.212	***		Male	1.707	0.218	***	
English As A Second Language (ESL)	-3.558	0.395	***		English As A Second Language (ESL)	-4.129	0.421	***	
Individualized Education Plan (IEP)	-11.221	0.446	***		Individualized Education Plan (IEP)	-11.733	0.425	***	
Socioeconomic Status (SES)	4.319	0.165	***		Socioeconomic Status (SES)	4.387	0.172	***	
Single Parent Household	-3.085	0.589	***		Single Parent Household	-2.983	0.587	***	
Black	-3.321	0.950	***		Black	-3.074	0.932	***	
Asian	1.410	1.624			Asian	1.846	2.267		
Hispanic	-4.453	0.925	***		Hispanic	-3.746	0.909	***	
Urban School	-0.427	0.243	*		Urban School	-0.518	0.257	**	
Catholic School	1.499	0.319	***		Catholic School	1.344	0.499	***	
Other Private School	1.859	0.406	***		Other Private School	2.325	0.681	***	
iep#c.ses					iep#c.ses				
	1	-0.851	0.513	*	1.000	-1.060	0.506	**	
iep#black					iep#black				
	0	1	-2.734	1.024	***	0.000	1.000	-2.914	1.005
	1	0	0.000	(omitted)	1.000	0.000	0.000	(omitted)	
	1	1	0.000	(omitted)	1.000	0.000	0.000	(omitted)	
iep#asian					iep#asian				
	0	1	1.276	1.675	0.000	1.000	0.292	2.359	
	1	0	0.000	(omitted)	1.000	0.000	0.000	(omitted)	
	1	1	0.000	(omitted)	1.000	1.000	0.000	(omitted)	
iep#hispanic					iep#hispanic				
	0	1	0.853	0.988	0.000	1.000	-0.226	0.975	
	1	0	0.000	(omitted)	1.000	0.000	0.000	(omitted)	
	1	1	0.000	(omitted)	1.000	1.000	0.000	(omitted)	
_cons					_cons				
		52.545	0.185	***			52.763	0.181	***

\*  $p \leq 0.05$ , \*\*  $p \leq 0.01$ . \*\*\*  $p \leq 0.001$

Next when we look at the interaction of IEP and SES we can see from the model that students who have an IEP and have higher SES, will have an additional .851 disadvantage compared to students who have an IEP but have a lower SES. This is showing that the negative effect of having an IEP is moderated by SES, and becomes worse as the SES of students increase ( $-11.221 - .851 = -12.072$ ). This was found to be significant in the results.

**Table 10. Regression Analysis Predicting Reading Scores with Interactions by Race and SES, Unweighted and Weighted Analysis**

Reading Scores When Student is in 10th Grade	Unweighted Analysis					Reading Scores When Student is in 10th Grade	Weighted Analysis					
	Coef.	Std.Err					Coef.	Std.				
Male	-0.915	0.217	***			Male	-0.805	0.224	***			
English As A Second Language (ESL)	-4.937	0.405	***			English As A Second Language (ESL)	-4.738	0.433	***			
Individualized Education Plan (IEP)	-10.526	0.457	***			Individualized Education Plan (IEP)	-10.781	0.437	***			
Socioeconomic Status (SES)	4.219	0.169	***			Socioeconomic Status (SES)	4.164	0.177	***			
Single Parent Household	-2.803	0.603	***			Single Parent Household	-3.143	0.604	***			
Black	-3.702	0.974	***			Black	-3.683	0.959	***			
Asian	2.179	1.665				Asian	2.616	2.332				
Hispanic	-2.867	0.948	***			Hispanic	-3.444	0.935	***			
Urban School	-0.243	0.249				Urban School	0.087	0.265				
Catholic School	2.508	0.327	***			Catholic School	2.258	0.513	***			
Other Private School	1.879	0.417	***			Other Private School	2.265	0.700	***			
iep#c.ses						iep#c.ses						
	1	-1.190	0.526	-2.260	0.024 **		1	-1.160	0.521	**		
iep#black						iep#black						
	0	1	-1.137	1.050	-1.080	0.279		0	1	-1.818	1.034	0.079
	1	0	0.000	(omitted)			1	0	0.000	(omitted)		
	1	1	0.000	(omitted)			1	1	0.000	(omitted)		
iep#asian						iep#asian						
	0	1	-2.779	1.717	-1.620	0.106		0	1	-3.449	2.426	0.155
	1	0	0.000	(omitted)			1	0	0.000	(omitted)		
	1	1	0.000	(omitted)			1	1	0.000	(omitted)		
iep#hispanic						iep#hispanic						
	0	1	-1.107	1.013	-1.090	0.275		0	1	-1.141	1.003	0.255
	1	0	0.000	(omitted)			1	0	0.000	(omitted)		
	1	1	0.000	(omitted)			1	1	0.000	(omitted)		
_cons		53.662	0.190	282.830	0.000 ***	_cons		53.880	0.186	0.000	***	

\*  $p \leq 0.05$ , \*\*  $p \leq 0.01$ . \*\*\*  $p \leq 0.001$

Table 10 shows that White students with an IEP (IEP=1 White=1) will have their reading scores associated with a 10-point disadvantage since the coefficient for White students (reference category) with an IEP is -10.526. This was statistically significant. The interactions for Black students with an IEP (IEP=1 Black=1), Asian students with an IEP (IEP=1 Asian=1) and Hispanic students with an IEP (IEP=1 Hispanic=1) were not statistically significant. Therefore,

suggesting that in the case of reading achievement, race/ethnicity is not moderating the influence of IEP on reading achievement.

The interaction between IEP and SES is significant in the models predicting reading achievement. Table 10 shows that as the SES increases for students the negative influence of having an IEP also increases by an additional 1.190 points; therefore, lowering even more the reading scores than the students from high SES with an IEP in the unweighted analysis. In the weighted analysis students from low SES who also had an IEP scored 1.160 points lower than the students who came from high SES groups and also had an IEP.

*Models Including Prior Achievement (with 9<sup>th</sup> grade achievement)*

The following tables provides analyses similar to the one discussed in the prior section but this time controlling for prior academic achieving. By controlling for prior achievement, I can test if it is true that race and SES are acting as moderators. If after controlling for prior achievement these interactions between having an IEP and race/SES are still significant, then I have suggestive evidence of the effects of race/SES as moderators.

**Table 11. Models Predicting Math Scores When Student is in 10th Grade, Controlling For 9th Grade Achievement**

	Unweighted Analysis (n=7151)			Weighted Analysis (n=6,681)		
	Coef.	Std. Err	Signif.	Coef	Std. Err	Signif.
Gender	-2.797	0.176	***	-2.985	0.221	***
Individualized Education Plan (IEP)	-8.599	0.281	***	-8.942	0.38	***
Socioeconomic Status (SES)	3.119	0.133	***	3.056	0.175	***
Single Parent Household	0.155	0.035	***	0.159	0.048	***
Black	-3.639	0.295	***	-4.015	0.352	***
Asian	0.826	0.333	*	0.482	0.627	
Hispanic	-2.78	0.273	***	-3.538	0.356	***
School Urbanicity	-0.0323	0.13		-0.09	0.161	
School Control	0.727	0.162	***	0.763	0.203	***
GPA for 9th grade courses	4.722	0.116	***	4.528	0.15	***
Constant	42.912	0.557	***	44.145	0.751	***

\*\*\* represent significance to the 99%

\*  $p \leq 0.05$ , \*\*  $p \leq 0.01$ . \*\*\*  $p \leq 0.001$

From table 11 we can see that even when we control for prior 9<sup>th</sup> grade achievement, having an IEP has a negative and significant relationship with students' math achievement. For example, it shows that when 9<sup>th</sup> grade achievement is controlled for, students with an IEP will still score 8.599 points lower on math scores in the unweighted analysis and 8.942 points lower in the weighted analysis. Models also show that 9<sup>th</sup> grade GPA has a positive and significant effect on both weighted and unweighted models. This implies that having an IEP is adding even more negative influences to the math achievement of students when in 10<sup>th</sup> grade.

**Table 12. Models Predicting Math Scores When Student is in 10th Grade with SES and Race Interactions, Controlling For 9th Grade Achievement**

Math Scores When Student is in 10th Grade	Unweighted Analysis (n=7151)			Weighted Analysis (n=6681)		
	Coef	Std. Err		Coef	Std. Err	
Gender	-2.792	0.175	***	-2.973	0.22	***
Individualized Education Plan (IEP)	-9.021	0.358	***	-9.455	0.524	***
Socioeconomic Status (SES)	3.186	0.14	***	3.168	0.177	***
Single Parent Household	0.153	0.035	***	0.157	0.048	***
Black	-2.005	0.716	**	-2.03	0.82	**
Asian	3.384	1.304	**	4.046	2.537	**
Hispanic	-3.559	0.689	***	-4.249	0.866	***
School Urbanicity	-0.033	0.13		-0.08	0.16	
School Control	0.707	0.116	***	0.734	0.203	***
GPA for 9th grade courses	4.705	0.116	***	4.509	0.15	***
iep#c.ses						
1	-0.601	0.408		-0.887	0.665	
iep#black						
0 1	-1.964	0.782	*	-2.372	0.898	*
1 0 0		(omitted)		0	(omitted)	
1 1 0		(omitted)		0	(omitted)	
iep#asian						
0 1	-2.728	1.346	*	-3.868	2.614	
1 0 0		(omitted)		0	(omitted)	
1 1 0		(omitted)		0	(omitted)	
iep#hispanic						
0 1	0.928	0.746		0.872	0.941	
1 0 0		(omitted)		0	(omitted)	
1 1 0		(omitted)		0	(omitted)	
cons	42.998	0.558	***	44.216	0.748	***

\*\*\* represent significance to the 99%

\*  $p \leq 0.05$ , \*\*  $p \leq 0.01$ . \*\*\*  $p \leq 0.001$

From this table we can see that when you control for 9<sup>th</sup> grade academic achievement, white students with an IEP (IEP=1 White=1), will have their math scores associated with a 9point disadvantage since the coefficient for IEP for White students is -9.021. Black students with an IEP (IEP=1 Black=1) will have a score associated with a 7-point disadvantage in math scores since the sum of  $-9.021+1.964= -7.057$ . Asian students with an IEP (IEP=1 Asian=1) will have a score associated with a 6-point disadvantage since  $-9.021+2.728= -6.298$ . For clarification, the direction of the coefficients for the interactions between IEP and Black and IEP and Asians are inverted because the tables show the scenario where IEP=0.

Additionally, when we look at black students with an IEP (IEP=1 and black=1) they will score 1.964 points higher in math than black students with no IEP (IEP=0 Black=1). Therefore,

the interaction of blacks with IEP is positive. The results from the interaction between SES and IEP were not statistically significant.

**Table 13. Basic Reading Achievement Model with 9<sup>th</sup> grade Achievement (unweighted and weighted)**

	Unweighted Analysis (n=7151)			Weighted Analysis (n=6681)		
	Coef.	Std. Err		Coef	Std. Err	
Gender	-0.314	0.185		-0.48	0.229	
Individualized Education Plan (IEP)	-7.937	0.295	***	-8.301	0.387	***
Socioeconomic Status (SES)	3.221	0.139	***	3.087	0.181	***
Single Parent Household	0.178	0.037	***	0.179	0.047	***
Black	-3.07	0.31	***	-3.584	0.371	***
Asian	-2.392	0.354	***	-2.219	0.518	***
Hispanic	-3.068	0.288	***	-4.067	0.374	***
School Urbanicity	-0.234	0.137		-0.505	0.172	
School Control	1.03	0.17	***	1.147	0.215	***
GPA for 9 <sup>th</sup> grade courses	4.219	0.122	***	4.061	0.156	***
Constant	40.626	0.586	***	42.121	0.775	***

\*\*\* represent significance to the 99%

\*  $p \leq 0.05$ , \*\*  $p \leq 0.01$ . \*\*\*  $p \leq 0.001$

When we look at basic reading achievement with 9<sup>th</sup> grade achievement controlled for, there is a significant negative impact on students with an IEP. In the unweighted analysis, students who have an IEP will score 7.937 points lower on reading scores than students without an IEP. In the weighted analysis students who have an IEP will score 8.301 points lower on reading scores than students without an IEP. This means that the negative effect of having an IEP on reading achievement exists even when controlling for prior academic achievement. As expected, models show that having higher prior academic achievement is related to higher reading scores in 10<sup>th</sup> grade.

**Table 14. Reading Achievement Model with 9th grade Achievement and Interactions by SES and Race (Unweighted and Weighted)**

Reading Scores When Student is in 10th Grade	Unweighted Analysis (n=7151)		Weighted Analysis (n=6681)	
	Coef	Std. Err	Coef	Std. Err
Gender	-0.3097	0.185	-0.466	0.228
Individualized Education Plan (IEP)	-8.605	0.377 ***	-9.101	0.514 ***
Socioeconomic Status (SES)	3.312	0.147 ***	3.183	0.187 ***
Single Parent Household	0.176	0.037 ***	0.175	0.047 ***
Black	-1.995	0.755 **	-1.324	0.92 **
Asian	1.776	1.371	2.524	2.398
Hispanic	-2.836	0.726 ***	-3.643	0.898 ***
School Urbanicity	-0.241	0.137	-0.492	0.171
School Control	0.993	0.17 ***	1.118	0.215 ***
GPA for 9th grade courses	4.202	0.123 ***	4.035	0.157 ***
iep#c.ses				
1	-0.898	0.43 **	-0.821	0.622
iep#black				
0 1	-1.202	0.823	-2.696	0.995 **
1 0	0 (omitted)		0 (omitted)	
1 1	0 (omitted)		0 (omitted)	
iep#asian				
0 1	-4.45	1.418 **	-5.157	2.449 **
1 0	0 (omitted)		0 (omitted)	
1 1	0 (omitted)		0 (omitted)	
iep#hispanic				
0 1	-0.253	0.785	-0.468	0.978
1 0	0 (omitted)		0 (omitted)	
1 1	0 (omitted)		0 (omitted)	
cons	40.756	0.587 ***		

\*\*\* represent significance to the 99%

\*  $p \leq 0.05$ , \*\*  $p \leq 0.01$ . \*\*\*  $p \leq 0.001$

From this table we can see that when you control for 9<sup>th</sup> grade academic achievement, White students with an IEP (IEP=1 White=1) will have their reading scores associated with an 8-point disadvantage since the coefficient for White students with an IEP is -8.605. Black students with an IEP (IEP=1 Black=1) will have a reading score associated with a 7 point disadvantage since  $-8.605 + 1.202 = -7.403$ . Asian students with an IEP (IEP=1 Asian=1) will have a reading score associated with a 4-point disadvantage since  $-8.605 + 4.45 = -4.155$ .

Additionally, when we look at black students with an IEP (IEP=1 Black=1), they will score 1.202 points higher in reading than Black students with no IEP (IEP=0 Black=1). Once

again, this means that the interaction between Black and IEP is positive. Furthermore, this shows that race is moderating the effects of IEP for Blacks and Asians but not for Hispanics given that the interaction for them is not important. The results from the interaction between SES and IEP were not statistically significant.

### **Limitations**

This study suffers from a number of limitations. First, and most importantly, there are issues with the way LD is measured in this study because there is no perfect measure available for LD in the ELS data set. I measured LD by looking at whether or not a student had an IEP however, there is a possibility that many of the kids with learning disabilities might not have gotten recognized. For example, not all schools reported information regarding IEP and some of the schools that reported IEP participation did not report for every child. Additionally, IEP is not a perfect measure for LD. It encompasses a range of different situations for students, for example, having autism, or having social/emotional issues, or having learning issues. There may be a student who performs well academically but needs extra help in other aspects of schooling. For example, a student may not have a hard time getting good grades in school but they may lack social, emotional or behavioral skills that allow them to still qualify for an IEP. For example, if a student does not understand that they must sit and be quiet and not talk to others during an exam they may be assigned an IEP just for the purpose that they do not understand the ‘social norms’ of test taking and they must be put into a separate classroom to take a test. Nevertheless, it is the best measure I could find in the data.

Another issue to carefully consider is that one of my control variables, whether or not student’s live in a single parent household, had 11,603 observations which is low compared to

the number of observations for math scores, reading scores, urbanicity, race, and SES which includes about 14,654 observations.

Another important limitation to look at is that when we control for prior achievement, you need a couple of years to show the true effects of schooling. However, in my study I looked at only 1 year of prior achievement (9<sup>th</sup> grade to 10<sup>th</sup> grade) so there is not enough time in between these measurements to show exactly how prior achievement may have affected the results.

## **FUTURE RESEARCH AND POLICY IMPLICATIONS**

This study leaves many paths open for future research. Future researchers should look deeper into why the IEP label appears to not be helping Hispanic students while it seems to help Black students. It's important to look at the cultural or linguistic differences they may face and have more educators in US schools with better understanding of class and ethnic differences in parents' child-rearing and socialization processes, the different types of communication styles (because of language differences), and the many orientations Latino/a families have toward formal education (Bottia et al 2016) to improve the impact IEPs might have on Hispanic students. The IEP's might not be designed in a way that is benefiting the Hispanic students particularly, and it would be interesting for future research to look deeper into this. In order to move forward with the future of kids with LD such as ensuring there's more enrollment in college, better grades and more job opportunities policy makers must focus more of their attention on the education of disabled children.

The education of disabled children is often overlooked and it's crucial to ensure that there is a more proportionate amount of school funding that goes to the education of children with

LD's. Students with LD's often need more resources that are costly such as specialized speech devices, picture exchange communications systems, etc.

## **Conclusions**

In this study, I sought to examine whether having a learning disability would have a significant relationship on a student's academic achievement, as indicated by labeling theory. Overall, the results of my statistical analyses present evidence that support hypothesis 1 which states that students with a LD have lower academic achievement than students who do not have an LD. This is evident in Table 7 through 14 which show that students with a LD had lower scores in reading and math when compared to students without the LD. There is evidence that this significant and negative relationship exists even when models control for prior achievement (9<sup>th</sup> grade GPA). Using ELS data, I find that having an IEP (placing a label on a student with a disability) has a negative relationship on their academic achievements. This is suggestive evidence that students with a disability label continue to perform worse in 10<sup>th</sup> grade.

I also aimed to explore whether this relationship between LD and academic achievement is moderated by race and socio-economic status. To test Hypothesis 2, I utilized first descriptive analysis which showed that the gaps were bigger for White students than it was for minority students. Therefore, my findings from the descriptive analysis were inconsistent with Hypothesis 2. My results showed that the biggest achievement gaps occurred between White students when compared to Black and Hispanic students. I then ran regressions with interactions between having an IEP and race and my results suggest that the absence of IEP further disadvantages Black students, going against the cumulative disadvantage theory and suggesting that for the case of Black students, having an IEP label at schools is helping decrease the negative effect that being Black has on a student. Furthermore, my results lend support to show that the presence of

IEPs for black students, actually might have helped them perform better academically. There is suggestive evidence that this significant relationship still exists even when models control for prior achievement (9th grade GPA). These findings are inconsistent with cumulative disadvantage theory because we can see that the presence of the IEP is actually improving Black students scores a bit. But could speak to the possibility of a positive labeling effect.

Hypothesis 3 was found to be inconsistent with my results because the achievement gap between students with LD and students without LD is actually larger among students who are from higher SES than students who are from lower SES. Table 5 shows that in regard to SES the biggest achievement gap is between students with LDs in the higher SES.

Additionally, I ran regressions with interactions between having an IEP and SES and my results show that the interactions of academic achievement and SES are significant. Higher SES students with an IEP appear to perform worse academically than students from a lower SES who have an IEP. This is inconsistent with cumulative disadvantage theory because the models found that lower SES students with an IEP will actually have academic scores a little higher.

The models that controlled for prior achievement (9<sup>th</sup> grade GPA) show that in regard to math scores, the interaction between IEP and SES is not significant. When looking at reading scores while controlling for prior achievement, these results were statistically significant.

Although my findings are not in line with Cumulative Disadvantage they can be interpreted as a possible positive Labeling effect. My findings did not align with cumulative disadvantage theory because the lower SES students with IEP actually scored higher academically, so therefore, their disadvantages do not appear to cumulate and do not seem to cause a negative relation with their academic scores. The presence of the IEP appears to actually

help lower SES and Black students' academic achievement. My findings are suggestive of a positive interpretation of labeling theory because from the models we can see that when an IEP (label for LD) is present, it resulted in better academic scores for Lower SES students. This label may lend support to show that there was a positive impact from the IEP on their academic scores and actually ended up helping them academically. These findings are important because they are suggesting that in an educational system that appears to consistently undermine the situation of minority students, it seems that the use of IEPs is not causing any additional harm to this group but instead it might be benefiting them.

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## APPENDIX A: CORRELATIONS MATRIX BETWEEN DEPENDENT VARIABLES AND INDEPENDENT VARIABLES

	Math Scores	Reading Scores	Male	ESL	IEP	SES	Single Parent	Black	Asian	Hispanic	Urban	Catholic	Other Private
Math Scores When Student is in 10th Grade	1												
Reading Scores When Student is in 10th Grade	0.757	1											
Male	0.057	-0.064	1										
English As A Second Language (ESL)	-0.157	-0.199	0.010	1									
Individualized Education Plan (IEP)	-0.393	-0.373	0.099	0.062	1								
Socioeconomic Status (SES)	0.444	0.437	0.015	-0.122	-0.147	1							
Single Parent Household	-0.123	-0.101	-0.103	0.002	0.030	-0.097	1						
Black	-0.233	-0.192	-0.011	0.001	0.061	-0.139	0.084	1					
Asian	0.091	0.002	0.003	0.095	-0.038	-0.008	-0.017	-0.094	1				
Hispanic	-0.203	-0.199	-0.008	0.077	0.044	-0.212	0.016	-0.126	-0.108	1			
Urban School	-0.011	0.001	-0.008	0.021	-0.040	0.041	0.012	0.113	0.077	0.138	1		
Catholic Sch	0.150	0.190	-0.012	-0.029	-0.095	0.227	-0.041	-0.044	-0.083	-0.002	0.236	1	
Other Private School	0.144	0.140	0.004	-0.027	-0.083	0.190	-0.009	-0.042	-0.038	-0.073	0.079	-0.123	1