SPECIAL EDUCATION INTEGRATION IN U.S. SECONDARY SCHOOLS:
INVESTIGATING HOW TEACHER PERCEPTIONS RELATE TO ACADEMIC
OUTCOMES FOR STUDENTS WITHOUT DISABILITIES

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SPECIAL EDUCATION INTEGRATION IN U.S. SECONDARY EDUCATION: INVESTIGATING HOW TEACHER PERCEPTIONS RELATE TO ACADEMIC OUTCOMES FOR STUDENTS WITHOUT DISABILITIES

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ABSTRACT

Education policy in the United States has been moving toward a more inclusive approach, founded in a belief that every child deserves equal opportunity for a world-class education. This strong preference set forth by policymakers has prompted a series of new education models in American classrooms, characterized by integrating students who receive special education into general education classes.

Existing research on the results of this shift in the education system suggests that students with disabilities benefit academically and social from integration with general education students and that students without disabilities are by-and-large unaffected by integration with their peers who receive special education services. Much of this research, however, evaluates the efficacy of different modalities of integration. Fewer studies focus on the extent to which teacher perceptions about integration might influence educational outcomes.

This study endeavors to investigate whether teachers are more or less likely to report that they are limited in their teaching by students with disabilities and, subsequently, whether those perceived limitations are related to the educational outcomes for students without disabilities. It does not evaluate whether students who receive special education harm students without disabilities nor does it pass judgment on
integration as a policy. Instead, it aims to understand how teacher perceptions may serve
as an indicator of strengths or vulnerabilities within an integrative model.

This research draws from a United States Department of Education dataset and
applies a series of logistical regressions to establish a relationship between, 1) students
with Individualized Education Plans (IEPs) and the extent to which teachers report
limitation; and, 2) teachers' perceived limitations and the academic achievement among
students without disabilities. The results identify statistically significant relationships
within both questions, suggesting that teachers are more likely to report limitations when
students with IEPs are in their class and that a portion of students without disabilities are
more likely to experience poorer grades when teachers feel limited.

The findings in this research are interesting and insightful but do not establish
sweeping or definitive conclusions because of the risk of omitted variable bias and other
limitations inherent in the data. However, the research provides a baseline for additional
research as well as some areas where policies may be refined to better train, support, and
resource teachers to enable them to most effectively teach students of all abilities.
The research and writing of this thesis is dedicated to everyone who helped along the way.

My arrival at Georgetown University and the sense of resolve I adopted to complete a Master’s degree while working full-time is credited to my parents, who demanded from me excellence in my academic affairs and taught me the value of an unyielding work ethic. I would not be who I am today without them and the values they instilled in me.

This accomplishment would also not be possible without the steadfast support of another McCourt School alumnus and my fiancé, Bobby Clark. His patience, love, and encouragement have helped sustain my determination and my spirit. He believed in me even when I did not believe in myself.

Finally, I would not have reached the finish line without the support of my friends at Georgetown and beyond. Many thanks for their encouragement as I pursued my dreams, and their patience for the moments I missed due to school commitments.

Many thanks,

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INTRODUCTION

Education policy in the United States has been moving toward a more inclusive approach, founded in a belief that every child deserves equal opportunity for a world-class education. One key component to ensuring that education is accessible to all has involved reforming how American schools manage and implement special education for students with disabilities.

A series of legislative and policy changes in recent decades codified the significance that policymakers have placed on ensuring that students of all abilities receive a quality education. Special education services were first federally mandated in the United States in 1975 when Congress passed the Education for All Handicapped Children Act (Understanding Special Education Website). The act, which later revised as the Individuals with Disabilities Education Act (IDEA), requires states to provide special education services as a condition of receiving federal education funding. Under IDEA, students requiring special services should receive an Individualized Education Programs (IEP) to help tailor education to their needs (“United States Department of Education Official Website,” n.d.). In 2001, the No Child Left Behind Act required schools to ensure that students of all abilities access the general curriculum, be taught by highly qualified teachers, and factor into professionals' accountability for achievement outcomes (Coriella, 2006).

This strong preference set forth by policymakers has prompted a series of new education models in American classrooms. One format, called “Mainstreaming,” involves selectively placing students with disabilities into classes where they may benefit from integration and pulling them out of the general setting during classes where they may not
benefit (Perles, 2015). Another recent model, called “Inclusion,” is slightly more values-driven and is centered on student belonging and aims for full integration with robust resources that enable students with disabilities to be complete participants in their school communities (Snow, 2016).

Research studying the effects of these new education models has predominantly pointed to a range of benefits for students with disabilities. Statistical evidence and anecdotal observations from teachers often suggest that students perform better academically and also benefit in their social development (Freeman & Alkin, 2000). These studies would indicate that the policy intervention in special education in the United States is achieving its desired results. Another question to address when evaluating its effect, however, is whether there is any evidence that it has impacted students without disabilities. Studies investigating this question have primarily indicated that students without disabilities are not affected by mainstreaming or inclusion models. Some research, however, has suggested that students without disabilities in an integrated setting experienced a drop in performance compared to their peers who were not in an integrated environment. One paper points to several studies with such findings, all which examined students in middle school or high school (St. John, 2015). This differentiation between student population, based on their grade, raises the idea that integrative models could relate to student outcomes differently at earlier grades than at later grades.

Teachers represent another critical element as American schools move to integrate students with disabilities more fully. Educators, who are on the front lines of integration, are one of—if not the most—critical factors in ensuring that students of all abilities receive a quality education. They also bear some of the most significant burdens of its
implementation (Newton et. all, 2014). Research suggests that although teachers may be supportive of integration as a concept, many have a range of concerns about the support they receive to execute these new education models.

This study intends to advance existing knowledge the relative effects of the United States’ integrated approach to special education. It aims to identify whether teacher perceptions of their ability to effectively teach is related to the academic achievements of students without disabilities in secondary education. Ideally, its findings will help inform discussions about how to further improve emerging models of instruction in schools, and how to best support teachers to deliver the next generation of American students.

**LITERATURE REVIEW**

**Integration and Academic Outcomes for Students With Disabilities**

A critical factor in the existing literature on the topic of inclusive classrooms relates to the focus population of the preeminent studies on the issue. Given the mandate of IDEA, which focused on ensuring that educators provide equal access to quality, public education for disabled students, many seminal studies on inclusion concentrated on the outcomes—both academic and social—for students with disabilities. In their review of influential studies on the topic, Freeman and Alkin (2000) reviewed the social and educational outcomes for disabled students identified in 431 studies on the issue. The conclusions of these studies varied in their results, but found that integrating students with disabilities entirely (e.g., "inclusion") or partially (e.g. "mainstreaming") into general education classrooms was related to positive higher achievement and social development. For example, a study on the outcomes for disabled 8th grade students in two
comparable school districts--one that integrated its students fully and another that practiced a "pull-out" program--noted that fully-integrated students had a statistically significant higher grades and attended more days of school, highlighting improvements in both academic and social outcomes (Rea et. all, 2002).

In a meta-analysis that included more recent studies, Rujis and Peetsma (2009) similarly found that inclusion was related to positive to neutral academic results for students with mild to moderate learning disabilities in nine studies conducted at the turn of the century. However, both Freeman and Alkin's (2000) and Rujis and Peetsma's (2009) meta-analyses included important caveats cautioning readers from making concrete conclusions from their findings, primarily because of the varying nature inherent in the available research. The authors highlighted that the designs of studies varied widely, as did the inclusion construct for students and the student sample composition. It is no surprise that studies on the topic hesitate to make sweeping generalizations, given the dozens of factors that influence education, the diversity of American school systems, and the profoundly personal nature of learning.

**Integration and Academic Outcomes for Students Without Disabilities**

Research about the relationship between inclusive education programs and the academic outcomes for non-disabled students is available, albeit to a lesser extent than studies that focus on students who received special education. In one meta-analysis, Staub and Peck (1995) found that existing research indicates that the integration of disabled students does not impede non-disabled student learning. In fact, Staub and Peck (1995), Meyer (2001), and Rujis and Peetsma (2009) note that research points to a neutral relationship between inclusion and non-disabled learning outcomes. In an encouraging
sign, parents and teachers in these studies identified positive social results for their general education children, including growth in social cognition, reduced fears of people who are different than themselves, and diverse friendships.

A 2004 study in Indiana cited by Rujis and Peetsma had similar findings and offered insight into drivers for improvements among non-disabled students in inclusive settings. In a study that compared integrated—in this study, designed as an integrated setting in reading and mathematics classes—and non-inclusive primary classrooms, data from approximately 600 students suggested that students exposed to the mixed environment performed better on reading and mathematics tests than their peers who were in non-integrated settings (Rujis & Peetsma, 2009). The authors noted that researchers suspected that the extra support in an inclusive classroom served to benefit all students, not just the disabled students.

Karl Huber and colleagues (2001) investigated whether a more precise relationship between inclusion non-disabled student learning could be identified based on past student achievement. They grouped primary school children in three similar school districts in Pennsylvania into three categories based on previous reading and math test scores: students who were performing below their grade level, students who were performing at their grade level, and students who were performing above their grade level. Interestingly, Huber et al. (2001) found that non-disabled students performing either below their grade level or at their grade level improved in both reading and math scores after placement in an inclusive classroom compared to their peers in non-inclusive classrooms. However, students who had performed above their grade level fell behind in both standardized tests. They characterized this finding as a potential “differential effect”
on non-disabled students, in which underperforming non-disabled students benefitted from the extra support in inclusive classrooms while high achievers lost ground.

One study that found a negative correlation between classroom inclusion and academic performance in middle school education comes from research a study in New York state. The study identified students who were placed in inclusive classrooms, controlled for student and other school variables, and compared student performance New York standardized tests. The study indicated that there was a statistically significant relationship between placement in an inclusive classroom and more deficient performance on the test (St. John, 2015). According to the research, students placed in inclusive classrooms experienced lower overall average scores on the State ELA Assessment as well as the New York State Mathematics Assessment (St. John, 2015). Notably, St. John pointed to several other studies that found that students without disabilities in grades 6-12 in integrated settings performed poorer than their non-integrated peers on statewide standardized tests (St. John 2015). While many studies identified neutral to positive results for younger students, St. John’s findings suggest that there may be a different effect for older students.

**Teacher Perceptions of Classroom Integration**

Understanding teacher perceptions of classroom inclusion is an important factor as the United States adopts a more integrated education model. Despite the demonstrable statistics that show that learning among students with disabilities, by and large, has improved in integrated models, surveys and studies throughout the past several decades have revealed teacher skepticism toward integration. These studies indicate that, although
teachers may be supportive of integration, in theory, they are wary of some of the policy's other effects and do not feel adequately resourced to implement the model effectively.

In an early study on the subject, D’Alonzo and colleagues surveyed 226 teachers about their views about a unified system of education. A majority of respondents felt that integration would result in improved social skills, increased opportunities, and increased cooperative learning (D’Alonzo et. all, 1997). At the same time, the same sample indicated significant concern about the prospect for heightened stress among teachers, the quality of education, increased costs, the potential for parental anxiety, and lack of teacher preparedness for such a model (D’Alonzo et. all, 1997). More recent studies suggest that teacher concerns have persisted throughout the subsequent years (McClesky & Waldron, 2000). McFarlane and Woolfson (2013) contended that poor teacher attitudes toward integration have potentially contributed to the ineffective implementation of special education policies; in other words, teacher skepticism has, in part, precluded the new integrative system from achieving its stated goals.

However, like many issues relating to special education, data remains cloudy, and confounding variables are abundant. Some studies failed to produce statistically significant results about the teacher perceptions, particularly when comparing general education teachers with special education teachers (Bruce, 2010).

**Advancing Existing Knowledge**

Significant work has been done to understand the link between classroom integration and academic and social outcomes for students with disabilities. However, many of these studies focus on younger student populations. In their meta-analysis, Rujis and Peetsma noted that there were fewer studies on students in secondary education
Furthermore, most of the available research looks at the direct relationship between integrated education models—using variations in the integrative approach, such as mainstreaming and inclusion, as the predictor variables—and education outcomes. Very few, if any, incorporate a teacher variable into their research.

This study aims to provide an expanded understanding of the strengths and vulnerabilities of America’s integrated approach to education by focusing on teacher perceptions as a predictive variable for academic achievement. In particular, it attempts to identify whether a relationship exists between teacher perceptions and the academic achievement of secondary school students without disabilities. This research does not intend to convey that students with disabilities influence academic achievement among students without disabilities. Instead, it strives to contribute to an ongoing conversation about what is working in American special education, and where further effort needs to be taken to ensure that every student receives a quality, world-class education.

CONCEPTUAL FRAMEWORK

Conceptualization

In the broadest sense, this study endeavors to understand how the integrated classroom model interacts with teacher perceptions, and whether those perceptions have any relationship to academic achievement. Unlike many previous studies, it does not aim focus only on the effects—or lack therefore—of the integrated education model (i.e., if students without disabilities are affected by students without disabilities). Instead, this study seeks to pull into consideration the potential secondary effects experienced by educators. Do teachers feel different in integrated classrooms? If so, how does that influence educational outcomes? If an effect exists, how can administrators ensure that
educators are adequately trained, supported, or otherwise resourced to amplify positive outcomes and mitigate against negative ones?

A number of existing studies focus on comparing integration models for efficacy while others report on teacher feelings about integration. However, few link the two variables and evaluate them in the context of educational outcomes. This study predicates itself on the fundamental judgment that policymakers stand to benefit from broadening the aperture of research beyond comparing models of integration and investigating whether teacher limitations—or lack thereof—and academic outcomes are linked.

**Hypotheses**

To build upon previous research that compares the efficacy of different integrative modalities, this study will investigate two primary research questions. The first questions will evaluate whether there is a relationship between the presence of students with IEPs in a classroom and a teacher's perception that their teaching is limited because of students with disabilities. Second, it will examine whether teacher perceptions are related to the GPA achievement for 9th graders who do not have disabilities. The hypotheses for these two distinct research questions are as follows:

*Question 1:* Is there a relationship between the presence of students with disabilities in a classroom and teacher perceptions that they are limited because of students with disabilities?

- **H1:** Teachers are more likely to perceive that their teaching is limited by students with disabilities if a student with an IEP is in the class.
**Question 2:** Is there a relationship between teacher perceptions that they are limited in their teaching because of students with disabilities and the Grade Point Averages for 9th graders who do not receive special education?

- **H₁:** GPAs among 9th-grade students without disabilities are statistically impacted when teacher perceive students with disabilities limit their teaching.

**Key Independent Variable**

*Teacher Perceptions.* Teacher efficacy is a widely discussed factor that influences educational outcomes in integrated classrooms (Everett, 2017). It is also less of a focus in the existing literature on integrated classrooms. Much of previous research attempts to compare any different effects of integrations versus traditional special education models. By using teacher perceptions as a key independent variable, this study attempts to advance existing knowledge by adding another dimension to how student academic performance within the educational model. In other words, students may perform differently if their teacher feels more, or less, confident in their ability to deliver the curriculum.

**Other Key Factors**

*School and Classroom Factors.* Factors at the school and classroom levels have been found to be related to learning outcomes in inclusive settings. For instance, how schools structure their forms of inclusion—through fully integrated or pull-out programs—has been identified as statistically impacting learning outcomes for intellectually disabled students (Tremblay, 2013). Another critical factor for inclusive classroom success is effective coordination between general education teachers and their co-teachers that specialize in delivering content to students with disabilities (Everett,
Some research focused on co-teaching indicates that special education educators are only able to dedicate up to 21% of their time co-teaching, highlighting a critical school-level factor for consideration (Hale, 2016).

**Student Factors.** Variables within the student population also impact the academic outcomes. These can be demographic variables such as gender, race, socioeconomic factors, and parental education levels. There are additional considerations for students with disabilities, including when the student begins receiving special education and the severity of the student’s disability (Freeman & Alkin, 2000).

![Visualized Conceptual Framework](image-url)
DATA AND METHODS

The statistical analysis contained in this study utilizes the Department of Education's High School Longitudinal Study of 2009, a nationally representative study of over 23,000 students from 944 schools. The study began in 2009, with follow-up data collection in 2012 and 2016. The study's primary focus is on student trajectories from the beginning of high school into post-secondary education; thus, many of the predictor variables in the study focus on to college preparation, but several variables are relevant to studying academic achievement in the integrated context.

In total, the dataset includes 23,503 observations. The sample for this study was considerably smaller, however, due to the variety of methods used to collect the data resulted and measures taken to protect student privacy further resulted in suppressed data. Removing suppressed data, non-responses, and missing data reduced the sample size was 4,045 students from across the country.

- **Special Education Variable.** The instrumental variable indicating whether students received special education services was a significant source of missing data. Out of a total of 23,503 observations in the data set, this variable had 13,319 missing observations because reporting relied on school personnel providing student rosters.

- **Predictor Variable.** The predictor variable, teacher perceptions about the extent to which students with disabilities limited their teaching, was a survey question posed to teachers. Approximately 1,000 teachers did not respond to the survey or did not have students who receive special education in their classroom.
• *Key Dependent Variable.* The academic achievement key dependent variable, measured in GPA, was a survey question. Approximately 600 observations were either missing or non-responses.

• *Control Variables.* Additional observations were lost during the analysis because of missing and suppressed data in a series of control variables. Several of these variables relied upon survey responses and included questions that respondents may have either not known the answer to [IE has my child been diagnosed with a disability] or would have preferred not to respond to [race]. Additionally, several of the control variables used involved data that was suppressed by design. The Department of Education suppresses data that may disclose Personal Identifying Information; while researchers may access the restricted data via petition, this process proved too lengthy of a process for this project (High School Longitudinal Study of 2009 Official Website, n.d.). In total, an approximate 6,000 observations were lost due to missing data or non-responses in control variables.

**Key Dependent Variable**

The dependent variable for this study is academic achievement, which can be found in a variable that measures students’ GPA for academic courses in 9th grade. Because this study is interested in understanding the potential relationship between classroom inclusion and high school academic achievement for students without IEPs, it will be useful to develop descriptive statistics that enable readers to understand the
difference in GPA performance between disabled and non-disabled students more broadly.

**Key Predictor Variable**

The primary predictor variable for this study is the extent to which teachers believe they are limited by students with special needs, a variable that was collected by the Department of Education via a voluntary survey of teachers. This variable was selected because its presence indicates that some teachers, to a varying degree, feel they are limited because of students with disabilities. In the survey, teachers could respond in several ways: "Not Applicable," "Not at All," "A Little," "Some," and "A Lot."

**Other Important Variables**

The IEP variable is a crucial instrument in refining the analysis in this study. This variable refines the composition of the sample through descriptive statistics. Importantly, it also enables the study to advance its analysis on both research questions. First, it helps answer whether teachers are more or less likely to feel limited in their teaching if any student(s) in their classroom have disabilities. Secondly, it enables researchers to refine GPA variables to reflect only students without IEPs, the key dependent variable for the second research question.

In addition to the IEP variable, the research utilized several other demographic [e.g., race, gender] and academic variables [e.g., disability diagnoses] as controls. The demographic variables include controls for gender and race. Educational performance variables include controls for attendance as well as students who experience failing grades. Finally, several controls related to reported disability variables, including whether
a student received a diagnosis of autism, intellectual disability, or attention deficit disorders.

**Analytic Approach**

*Research Question 1.* The first research question evaluates whether the presence of students with IEPs in classrooms is related to teacher perceptions that students with special needs limit their teaching. A variable was created to measure whether a teacher perceived any limitation by students with disabilities or not limited at all. The second dummy was coded to focus more on whether teachers felt a significant limitation, ranging from teachers reporting that they were limited "Not At All to A Little," or “Somewhat to A Lot.”

After establishing these variables, a series of logistical regression analyses with odds ratios were conducted to determine whether either of the dummy variables related to the key dependent variable. Controls were added through a stepwise regression process to find the model of best fit.

\[
Y_{(AnyLimit)} = \beta_0 + \beta_{(IEP)} + \beta_{(Race)} + \beta_{(Sex)} + \beta_{(Autism)} + \beta_{(IntDisability)} + \beta_{(ADHD)}
\]

\[
Y_{(SigLimit)} = \beta_0 + \beta_{(IEP)} + \beta_{(Race)} + \beta_{(Sex)} + \beta_{(Autism)} + \beta_{(IntDisability)} + \beta_{(ADHD)}
\]

Finally, a series of ordered logistical regression analyses were conducted on the original teacher limitation variable to predict the probability that a teacher would report different levels of limitations. This step enabled the research to compare whether there was a difference between teacher perceptions when students with IEPs were included in the model.

*Research Question 2.* The second research question aims to understand whether teacher perceptions that students with special needs limit their teaching are related to
academic achievement for 9th graders without disabilities. To address this question, three distinct variables were created from an original variable that measured the GPAs of 9th graders. The first measured whether a student experienced passing or failing grades; the second measured whether a student achieved a GPA average at the "B" level or below, and the third dummy was coded to measure whether a student had an average GPA at the "A" level.

This model retained the previously-designed dummy variables for teachers’ perceived limitation from the first research question. A series of logistical regression analyses with odds ratios were conducted. Controls were added through a stepwise regression process to find the model of best fit.

\[
Y_{(GPAFAIL)} = \beta_0 + \beta_{(TeacherLimit)} + \beta_{(Race)} + \beta_{(Sex)} + \beta_{(Autism)} + \beta_{(IntDisability)} + \beta_{(ADHD)}
\]

\[
Y_{(GPAB)} = \beta_0 + \beta_{(TeacherLimit)} + \beta_{(Race)} + \beta_{(Sex)} + \beta_{(Autism)} + \beta_{(IntDisability)} + \beta_{(ADHD)}
\]

\[
Y_{(GPAA)} = \beta_0 + \beta_{(TeacherLimit)} + \beta_{(Race)} + \beta_{(Sex)} + \beta_{(Autism)} + \beta_{(IntDisability)} + \beta_{(ADHD)}
\]

RESULTS

Descriptive Statistics

Table 1 provides a preliminary understanding of the sample used for analysis.\(^1\) The variables in the table preview key student characteristics that relate to the research question.

Demographic Variables. The demographic variables establish that, overall, the sample is balanced regarding race and gender. The percentage of students who identified as racial minorities and were reported to have IEPs was approximately the same as the

\(^1\) All tables are presented in the Appendix.
percentage of students with IEPs in the overall sample, providing an initial indication that ethnic minorities in the study did not have a higher rate of IEPs. Conversely, females had a lower rate of IEPs compared to the overall sample, indicating that male students comprise a disproportionate amount of the 9th graders with IEPs.

*Academic Performance.* Several variables related to students’ academic performance were also included as controls. These include the student’s 9th Grade cumulative Grade Point Average (GPA), as well as the attendance percentage during the academic year. Students with IEPs had a higher likelihood of either experiencing failing grades or having an attendance rate of less than 80%.

*Diagnosed or Reported Disabilities.* The last category of variables included those in which doctors or schools reported to parents that their child might have some form of disability, including autism, ADHD, or another intellectual disability, or if a parent has voluntarily responded to a survey that their child receives special education services. Each of these variables comprised a minority of the overall sample, but in each category, the students were significantly more likely to have an IEP.

**Inferential Statistics**

*Question 1: Relationship Between IEPs and Perceived Teacher Limitation*

The first logistical regression with odds ratio aimed to discern if a relationship existed between the presence of students with IEPs in a class and any perception by teachers that students with special needs limit their instruction. The results, outlined in Table 2, indicated a statistically significant relationship between the variables in three models. As additional control variables were introduced, the magnitude of the association
increased. The results suggest that teachers are more 42% more likely to report that they are limited in their teaching when a student with an IEP is in their class.

The second regression, summarized in Table 3, explored whether the relationship is different if a teacher felt a significant limitation rather than any limitation. A similar stepwise process was utilized to find a model of best fit. The results suggest that teachers are twice as likely to report that they are significantly limited in their instruction when students with IEPs are in their class.

Table 4 provides the results of the ordered logistical regression with predicted probabilities. The coefficients predict the likelihood that a teacher perceives that they are limited under two scenarios: when a student with an IEP in their class, and when no students with IEPs are in their class. The results indicate that the presence of such students heavily influences teachers perceptions. The regression predicted that the teacher would be more likely to report a sense of limitation in each level measured: "A Little," "Somewhat," and "A Lot." Conversely, teachers had a far higher probability of reporting no limitation when students with IEPs were not in their class.

Question 2: Evaluating Relationship Between Teacher Perceptions and Non-Disabled Student GPAs

The next order of analysis sought to explore whether teacher perceptions about their teaching is related to the academic achievement of 9th graders without disabilities. Six models were constructed based on variations of the key dependent and independent variables. The results, outlined in Tables 5 and 6, identified just one statistically significant relationship between the variables. This result suggested that students without
disabilities have a 16% more likely to experience a GPA below the “B” average when their teachers feel limited because of students with disabilities.

**DISCUSSION**

The results of the two statistical analyses provide critical insight into the research questions and allow for the rejection both null hypotheses. Each of the results in Tables 1 and 2 suggests that the first null hypothesis, which asserts that there is no relationship between IEPs and teachers reporting that students with disabilities limit them, can be rejected. There are fewer statistically significant results in Tables 5 and 6, but the relationship identified in one model allows for the rejection of the second null hypothesis, which claimed that there is no relationship between teachers feeling limited by students with disabilities and the academic performance 9th-grade students without disabilities.

These results point to several substantively significant contributions to special education policy. First, they suggest that teachers are more likely to perceive a limitation in their teaching when students with disabilities are in their class. The considerable magnitude of the findings—42% greater likelihood to report any sense of limitation; twice as likely to report a significant limitation—are consistent with existing literature that teachers remain wary about concerned about their ability to perform effectively in integrated classrooms. This does not mean that the students are a sole factor contributing to this distraction. Instead, these perceptions among teachers may be symptomatic of inadequate access to the preparation, resources, or other support required to teach students of all abilities.

Second, to a lesser degree, the findings suggest that teachers' perceived limitations may have some effect on the academic achievement among students without disabilities.
The results of for this question were weaker, but the finding that students without disabilities are 16% more likely to experience poorer than a “B” GPA when teachers felt limited raises potentially concerning implications. Notably, this result could suggest that there are real academic consequences for students when teachers are overwhelmed and perceive that they are limited. The effect does not explain the source of the teacher's perceived limitation but could mean that there are meaningful risks when teachers report that they do not feel able to perform adequately. It could also suggest that teacher perceptions could be a key symptom for administrators to look for when evaluating the health of their education system. It may, therefore, and therefore be a potentially useful variable for researchers who are conducting additional research into school systems.

The results are interesting in that they point to potential relationships within both of the research questions for one sample. However, despite findings that suggest there are significant relationships between teacher perceptions and academic outcomes for students without disabilities in one segment of the student population (around the “average” GPA earners), an important caveat is raised by the lack of statistical significance for high-achieving students as well as failing students. Noting that the statistical significance is only observed in one segment of the variable suggests that the relationship may be weak, or that omitted variable bias influences the relationship. Additional research with a bigger sample and other variables, outlined in the next section, could help bolster confidence in the existence of a relationship.

**LIMITATIONS**

Several important limitations preclude additional analysis and findings. While the variables in the regression are vital to investigate the research questions, other data that
was either intentionally suppressed for privacy reasons or otherwise not included in the design of the dataset limit the study’s ability to make definitive conclusions about the relationship between the predictor variables and dependent variables.

**Teacher Variable Limitations**

One challenge innate in this variable is that it is subjective. Different people have different thresholds for perceiving limitation. Further, this variable does not expand on why teachers report limitation. For example, it is not clear whether a teacher feels limited because of a specific student, other classroom dynamics, or school-wide factors. Furthermore, the variable does not provide insight into the teacher's background with integrated classes, or whether the teacher has was trained in inclusive or mainstream models; it would not be surprising if teachers with less training or exposure to mixed classes would report being more limited. Lastly, it does not provide information about the composition of the classroom in which the teacher feels limited. It would be worth knowing if the teacher has a large class size, including how many students with IEPs are present. For example, it is reasonable to expect that a teacher could feel differently teaching a 10-student class with one student with special needs as opposed to a 30-student class with five students with disabilities.

The dataset did not include variables that indicated teacher preparedness for students with disabilities. The analysis would have benefitted from understanding how a teachers’ background and experience with integrated education influenced their perceived limitations. Additionally, it would have been useful to include variables that controlled for the type of preparation and training that a teacher has received to support students of all abilities.
**Special Education Data**

The variables utilized for the research would have benefitted from controlling for the percentage of students receiving special education at the classroom level and the school level. This could have helped understand whether teachers are more or less likely to say that their teaching is limited based on how many students in a class or school received special education services. For example, it would be useful to understand the difference of teachers' perceived limitations when one student with an IEP is in a class, compared to how a teacher feels with ten students with IEPs in a class.

Additionally, the variables for special education in the analysis do not indicate a student’s type of disability or the disability’s severity. Due to privacy concerns, the Department of Education suppressed more detailed information about specialized educations services and student disabilities in the dataset.

**School Data**

The research would have also benefited from including average class size on the school level. Many factors probably influence perceived teacher limitations, including class sizes. The analysis relies on whether a teacher feels limited if they have a student who receives special education in their classroom but does not evaluate whether that perceived limitation grows when more students with IEPs are in the class.

**Community Data**

Finally, the study lack of community-level data limits the study. The sample is nationally-representative but does not control for variables such as a locality's support for education broadly as well as a school's funding for special education. These variables,
along with other local factors, could contribute to how limited teachers feel in their classroom.

**AREAS FOR FUTURE RESEARCH**

This study advances the body of research focused on the relationships between special education and academic achievement among secondary education students without disabilities. It can point to areas for further exploration. First and foremost, research would benefit from integrating data that was unavailable for this study, as outlined in the section on limitations. The inclusion of this data would allow for more refined insights and stronger conclusions.

Additionally, the results of this research suggest that it would be useful to examine further whether the relationship between classroom integration and academic achievement changes as students advance from elementary school into middle school and high school. While there is a body of research indicating that there is no effect on academic outcomes for students without disabilities when in integrated classrooms at a young age, St. John (2015) points to some evidence that an impact exists at later grades. One explanation may posit that teachers find it easier to teach the more straightforward curricula in earlier grades to students of varying capabilities but that the teachers become increasingly limited in their ability to deliver more complicated concepts, such as those found in high school curricula. If true, it could contribute to a different experience for on students without disabilities over time: an insignificant factor for students in primary school may evolve into something that influences academic achievement later on.

Comparing teacher perceptions and non-disabled student performance between primary
and secondary school could provide additional insights into the differential effect concept.

Finally, additional research into teacher perceptions would help refine that variable as a useful tool. This study framed its design around teacher perceptions because of its belief that these perceptions speak to the core of the education system: whether a teacher is confident that they are prepared and capable of delivering curriculum to students effectively. The results of the analysis suggest that the variable can be a useful tool to provide statistically significant findings about special education. While useful, the teacher variable in this sample was relatively simplistic. Therefore, researchers could stand to benefit by incorporating more data about teacher perceptions, including how their perceptions vary by their background in special education instruction and how they define their perceived limitations. For example, different teachers may define "Somewhat" limited differently when responding to a survey. Additional research into this variable would help refine it and, by extension, result in new insights on its relationship to special education.

**POLICY RECOMMENDATIONS**

**Bolster Teacher Training and Co-Teaching Programs**

While the legislative and policy efforts to ensure equal opportunity and access to education for all students has advanced, programs geared at supporting and training teachers to succeed in the new model have been decentralized and uneven. In a review of State-Level Education Agency efforts to prepare their personnel, the National Association of State Directors of Special Education (NASDSE) identified 23 state programs that prepare their staff in co-teaching, primarily through local education
agencies or school-level training (Friend & Hurley-Chamberlain, 2009). The review noted several successful initiatives across the country; however, while the local nature of the programs enabled them to tailor uniquely to their communities, it also contributed to unevenness in training nationwide.

Noting the lack of uniformity in training and promotion of successful programs that are worth emulating, NASDSE recommended focused initiatives that would advertise successful co-training platforms and help schools network with one another to learn about best practices. Given uneven school program funding across the country, it also recommended establishing additional grant programs that support inclusive education training.

In addition to expanding access and awareness of training programs, policymakers should boost special education funding that supports support co-teaching. Despite pledging to assist states with 40% of special education funding through the IDEA legislation, the federal government has only provided approximately 16% funding (Heasley, 2017). A bipartisan bill introduced in 2017 would require the federal government to boost its special education funding to states and localities. If passed, policymakers should consider tailoring those funds to support co-teacher training.

Bolstering teacher training through robust co-teaching programs would contribute to teacher confidence and capability. Improved confidence would hopefully reduce teacher perception that they are limited in their teaching in settings with students with disabilities. Based on the statistical analysis in this study, a reduction in teachers’ perceived limitations would potentially mitigate any subsequent academic effect on the academic achievement for students without disabilities.
Reform Teacher Education

Teacher training may prove an effective method for assisting existing professionals to succeed within the integrated education system. This approach helps teachers adapt to a new form of education. It raises a different question, however, about how to prepare future educators.

One potential, albeit dramatic option, would be to consider an overhaul in teacher education at the university level. Upon graduating from college, most teachers will confront integrated classroom models. Unfortunately, many of them will have minimal exposure to how to effectively teach in such environments. Despite the move toward inclusive classroom constructs, university degrees in education are mostly the same as they were before integration became a predominant policy. On average, future teachers take 1.5 courses in special education throughout their university training (Mader, 2017). While this might have been a sufficient introduction before integration became the norm, such a scant focus on special education amounts to a very rudimentary understanding of the issue and hardly prepares new teachers to support students of all abilities in their classroom.

An overhaul of American education degrees would be a costly and extensive endeavor, but would arguably position teachers to be more successful in the integrated classroom. Eliminating Special Education specializations, and instead infusing the curriculum throughout the whole of a teacher education degree, would ensure that all graduating teachers receive consistent training on how to instruct students with and without disabilities. If American colleges and universities graduated more teachers who were prepared to teach students of all abilities, they might feel less limited when
presented with students who have IEPs. This could help contribute to academic success for both students with and without disabilities.

**Explore Reforming Secondary Integration Models**

If additional research reveals integrative education systems have differing relationships with academic outcomes for students in elementary school, middle school, and high school, it may warrant a review and refinement of the integrative policy. While integration is demonstrably beneficial through primary school, if its benefits diminish as students grow, then alternative models should be evaluated.

One option could include identifying whether any patterns exist in the subjects where the differential effect is most present—such as advanced math or science—and devise interventions centered around subject areas. The potential options could vary but, if evidence of such an effect mounts, reforming secondary education models could be a necessary step to ensure that students with disabilities receive equal opportunity and access while also supporting teachers as they convey more complicated subject matter.

**CONCLUSION**

Through a series of legislative and other policy actions, the United States has affirmed its commitment to ensuring that every student, including those with disabilities, has the opportunity receive a quality education. This study endeavored to contribute to discussions related to whether integrative policies are related to student achievement. Its research and analysis in this study did not evaluate the theory of integration in and of itself; instead, it explored whether teacher perceptions might be related to academic achievement and, subsequently, whether those perceptions might serve as a potential indicator integrative approach success.
Limitations in the available data make it challenging to establish sweeping conclusions about the role that teacher perceptions may have on academic achievement. However, results from the statistical analysis in this study indicate that teachers are more likely to feel limited in their ability to teach when they have students with special needs in their class. It also suggests that students without disabilities may be detrimentally affected in instances when their teachers feel like they are limited. The results highlight a potential vulnerability in the current education system, in that teacher concern about their ability to adequately instruct with students of all abilities may be a critical indicator that all students, and non-disabled students, in particular, are at risk at achieving poorer academic results.

This is not to suggest that students with disabilities cause detrimental education outcomes for non-disabled students. Preferably, it is to draw attention to the importance of effectively training and supporting teachers to succeed in the integrated education model. The findings in this study—notably, that teacher perceptions are related to academic outcomes—suggest that policy interventions keenly focused on supporting teachers could have a ripple effect on student achievement. Co-teaching support, which lacks uniform accessibility and application, funding shortages, and outdated college degree curricula represent some areas for potential reform. Therefore, policymakers and administrators should explore such options with an eye on how they could potentially benefit both teachers and students.
## APPENDIX

### Table 1: Descriptive Statistics for Sample

<table>
<thead>
<tr>
<th>Individual Level Characteristics</th>
<th>Total</th>
<th>Student Does Not Have Individualized Education Plan (IEP)</th>
<th>Student Has Individualized Education Plan (IEP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Size</td>
<td>4,045</td>
<td>3,230 (79.9%)</td>
<td>815 (20.1%)</td>
</tr>
<tr>
<td>Demographic Variables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students Identifying as Racial Minority</td>
<td>1,604 (39.7%)</td>
<td>1,281 (79.8%)</td>
<td>323 (20.2%)</td>
</tr>
<tr>
<td>Students Identifying as Female</td>
<td>2,016 (49.8%)</td>
<td>1,702 (84.4%)</td>
<td>314 (15.6%)</td>
</tr>
<tr>
<td>Academic Performance Variables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students with Failing Grades</td>
<td>560 (13.8%)</td>
<td>342 (61.2%)</td>
<td>218 (38.9%)</td>
</tr>
<tr>
<td>9th Graders Attending More Than 90% of Classes</td>
<td>2,693 (66.6%)</td>
<td>2,206 (81.9%)</td>
<td>487 (18.1%)</td>
</tr>
<tr>
<td>9th Graders Attending Less Than 80% of Classes</td>
<td>45 (1%)</td>
<td>31 (68.9%)</td>
<td>14 (31.1%)</td>
</tr>
<tr>
<td>Diagnosed or Otherwise Reported Disability Variables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctor/Parent has told Parent 9th Grader Has Some Form of Autism</td>
<td>71 (1.8%)</td>
<td>7 (9.9%)</td>
<td>64 (90.1%)</td>
</tr>
<tr>
<td>Doctor/School has told Parent 9th Grader has Intellectual Disability</td>
<td>44 (10.8%)</td>
<td>6 (13.6%)</td>
<td>38 (86.4%)</td>
</tr>
<tr>
<td>Doctor/School has told Parent 9th Grader has ADD or ADHD</td>
<td>569 (14.1%)</td>
<td>226 (39.7%)</td>
<td>343 (60.3%)</td>
</tr>
<tr>
<td>9th Grader Receiving Special Education</td>
<td>706 (17.5%)</td>
<td>0 (0%)</td>
<td>706 (100%)</td>
</tr>
</tbody>
</table>
### Table 2: Whether Teacher Reports Any Limitation When Students With IEPs Are In Class

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1: Key Variables</th>
<th>Model 2: Key Variables &amp; Demographic Controls</th>
<th>Model 3: Key Variables, Demographic &amp; Academic Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Has IEP</td>
<td>1.37***</td>
<td>1.39***</td>
<td>1.42***</td>
</tr>
<tr>
<td>American Indian</td>
<td>1.92</td>
<td>1.90</td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>1.07</td>
<td>1.06</td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>1.07</td>
<td>1.07</td>
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<tr>
<td>Hispanic, unspecified</td>
<td>1.02</td>
<td>1.02</td>
<td></td>
</tr>
<tr>
<td>Hispanic, specified</td>
<td>1.07</td>
<td>1.07</td>
<td></td>
</tr>
<tr>
<td>More than one race</td>
<td>.92</td>
<td>.92</td>
<td></td>
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<tr>
<td>Native Hawaiian</td>
<td>1.06</td>
<td>1.03</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.13*</td>
<td>1.12</td>
<td></td>
</tr>
<tr>
<td>Diagnosed Autism</td>
<td></td>
<td>1.10</td>
<td></td>
</tr>
<tr>
<td>Diagnosed Intellectual Disability</td>
<td></td>
<td>1.90</td>
<td></td>
</tr>
<tr>
<td>Diagnosed ADHD</td>
<td></td>
<td>.87</td>
<td></td>
</tr>
<tr>
<td>School Attendance</td>
<td></td>
<td>1.00</td>
<td></td>
</tr>
</tbody>
</table>

***p<0.01; **p<.05; *p<.1

### Table 3: Whether Teacher Reports Significant Limitation When Students With IEPs Are In Class

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1: Key Variables</th>
<th>Model 2: Key Variables &amp; Demographic Controls</th>
<th>Model 3: Key Variables, Demographic &amp; Academic Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Has IEP</td>
<td>1.98***</td>
<td>1.97***</td>
<td>2.08***</td>
</tr>
<tr>
<td>American Indian</td>
<td>1.14</td>
<td>1.10</td>
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<tr>
<td>Asian</td>
<td>.87</td>
<td>.87</td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>1.32</td>
<td>1.28</td>
<td></td>
</tr>
<tr>
<td>Hispanic, unspecified</td>
<td>1.16</td>
<td>1.14</td>
<td></td>
</tr>
<tr>
<td>Hispanic, specified</td>
<td>1.21</td>
<td>1.19</td>
<td></td>
</tr>
<tr>
<td>More than one race</td>
<td>1.03</td>
<td>1.03</td>
<td></td>
</tr>
<tr>
<td>Native Hawaiian</td>
<td>.87</td>
<td>.84</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.05</td>
<td>1.03</td>
<td></td>
</tr>
<tr>
<td>Diagnosed Autism</td>
<td></td>
<td>.85</td>
<td></td>
</tr>
<tr>
<td>Diagnosed Intellectual Disability</td>
<td></td>
<td>1.63</td>
<td></td>
</tr>
<tr>
<td>Diagnosed ADHD</td>
<td></td>
<td>.80*</td>
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</tr>
<tr>
<td>School Attendance</td>
<td></td>
<td>1.00</td>
<td></td>
</tr>
</tbody>
</table>

***p<0.01; **p<.05; *p<.1
### Table 4: Ordered Logistical Probabilities for Research Question 1

<table>
<thead>
<tr>
<th></th>
<th>Teacher Feels Not At All Limited</th>
<th>Teacher Feels “A Little” Limited</th>
<th>Teacher Feels Limited “Somewhat”</th>
<th>Teacher Feels Limited “A Lot”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Does Not Have IEP</td>
<td>.42***</td>
<td>.40***</td>
<td>.14***</td>
<td>.04***</td>
</tr>
<tr>
<td>Student Has IEP</td>
<td>.29***</td>
<td>.44***</td>
<td>.21***</td>
<td>.06***</td>
</tr>
</tbody>
</table>

***p<0.01; **p<.05; *p<.1

### Table 5: GPA Outcomes for 9th Grade Students Without Disabilities When Teachers Report Any Limitation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1: Student Has Failing GPA n = 3,219</th>
<th>Model 2: Student Has Less Than “B” GPA n = 3,230</th>
<th>Model 3: Student Has “A” GPA n = 3,199</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher Perceives Any Limitation</td>
<td>1.02</td>
<td>1.16**</td>
<td>1.01</td>
</tr>
<tr>
<td>American Indian</td>
<td>8.99***</td>
<td>3.21***</td>
<td>2.28</td>
</tr>
<tr>
<td>Asian</td>
<td>.57*</td>
<td>.39***</td>
<td>.42***</td>
</tr>
<tr>
<td>African American</td>
<td>2.72***</td>
<td>2.12***</td>
<td>3.98***</td>
</tr>
<tr>
<td>Hispanic, unspecified</td>
<td>2.14</td>
<td>2.74**</td>
<td>N/A****</td>
</tr>
<tr>
<td>Hispanic, specified</td>
<td>2.79***</td>
<td>2.78***</td>
<td>3.95***</td>
</tr>
<tr>
<td>More than one race</td>
<td>2.26***</td>
<td>1.49***</td>
<td>1.37*</td>
</tr>
<tr>
<td>Male</td>
<td>.56***</td>
<td>.61***</td>
<td>.54***</td>
</tr>
<tr>
<td>Diagnosed Autism</td>
<td>N/A****</td>
<td>N/A****</td>
<td>N/A****</td>
</tr>
<tr>
<td>Diagnosed Intellectual Disability</td>
<td>N/A****</td>
<td>N/A****</td>
<td>N/A****</td>
</tr>
<tr>
<td>Diagnosed ADHD</td>
<td>2.35***</td>
<td>2.74***</td>
<td>5.68***</td>
</tr>
<tr>
<td>School Attendance</td>
<td>.32***</td>
<td>.99***</td>
<td>1.00***</td>
</tr>
</tbody>
</table>

***p<0.01; **p<.05; *p<.1; ****Sub-sample of students without disabilities contained no observations for this variable.
Table 6: GPA Outcomes for 9th Grade Students Without Disabilities When Teachers Report Significant Limitation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1: Student Has Failing GPA n = 3,219</th>
<th>Model 2: Student Has Less Than “B” GPA n = 3,230</th>
<th>Model 3: Student Has “A” GPA n = 3,199</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher Perceives Any Limitation</td>
<td>.911</td>
<td>1.05</td>
<td>.98</td>
</tr>
<tr>
<td>American Indian</td>
<td>9.01***</td>
<td>3.24*</td>
<td>2.29</td>
</tr>
<tr>
<td>Asian</td>
<td>.57</td>
<td>.39***</td>
<td>.42***</td>
</tr>
<tr>
<td>African American</td>
<td>2.28***</td>
<td>2.12***</td>
<td>3.99***</td>
</tr>
<tr>
<td>Hispanic, unspecified</td>
<td>2.16</td>
<td>2.72**</td>
<td>N/A****</td>
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<tr>
<td>Hispanic, specified</td>
<td>2.81***</td>
<td>2.77***</td>
<td>3.95***</td>
</tr>
<tr>
<td>More than one race</td>
<td>2.26***</td>
<td>1.49***</td>
<td>1.37*</td>
</tr>
<tr>
<td>Native Hawaiian</td>
<td>2.33</td>
<td>2.06</td>
<td>.68</td>
</tr>
<tr>
<td>Male</td>
<td>.56***</td>
<td>.61***</td>
<td>.54***</td>
</tr>
<tr>
<td>Diagnosed Autism</td>
<td>N/A****</td>
<td>N/A****</td>
<td>N/A****</td>
</tr>
<tr>
<td>Diagnosed Intellectual Disability</td>
<td>N/A****</td>
<td>N/A****</td>
<td>N/A****</td>
</tr>
<tr>
<td>Diagnosed ADHD</td>
<td>2.35***</td>
<td>2.72***</td>
<td>5.67****</td>
</tr>
<tr>
<td>School Attendance</td>
<td>.99***</td>
<td>.99***</td>
<td>1.00***</td>
</tr>
</tbody>
</table>

***p<0.01; **p<.05; *p<.1; ****Sub-sample of students without disabilities contained no observations for this variable.
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