GETTING STUDENTS TO GRADUATION:
THE RELATIONSHIP BETWEEN ACADEMIC INTERVENTIONS AND
GRADUATION RATES FOR FAILING HIGH SCHOOL STUDENTS

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GETTING STUDENTS TO GRADUATION: 
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ABSTRACT

Graduating high school has significant positive implications for individuals and society. Alternatively, not graduating high school has significant negative impacts. Although prior work has analyzed the relationship between academic interventions and student outcomes, very little research has been done to analyze the relationship between academic interventions at the secondary level for failing students and subsequent graduation rates. As such, this research analyzes the relationship between academic interventions (summer school, remedial courses, test preparation and individual tutoring) and high school graduation rates for students who fail their 10th grade math competency test using the publically available, nationally representative high school data from the Educational Longitudinal Study, 2002 (ELS 2002). As a broad group, these interventions have no significant relationship with graduation rates. When analyzed in groups based on individualization, the more individualized interventions (test preparation and tutoring) increase the likelihood of graduation rates for students who failed their competency test compared to students who received no interventions.
I dedicate this Master’s thesis to my family and loved ones, near and far. 
To my mother, Janet Hadley, who has always shown me the power that an intelligent, 
driven, confident, and compassionate woman holds in this world.
To my father, H. Lawrence Webb, who has read nearly every paper I have ever submitted 
and taught me to think analytically, act with patience, and lead by example.
To my sister, Laura Webb, who keeps me rooted in the work of education, as she 
continues the challenging work of teaching with the tenacity and dedication that every 
child deserves in their teacher.
To my friends, new and old, who have supported me throughout my life as I have taken 
on new adventures and endeavors.
To my teachers and professors, who have taught me important academic and life lessons.
To my former students, who inspired the focus of this thesis, who taught me more than 
they could ever know, and who inspire my passion to increase educational equity.

You have shaped me into the person I am today. I cannot begin to thank you enough.

With love and gratitude,
Emily Lucille Webb
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INTRODUCTION

In his 2009 State of the Union address, President Barack Obama stated, "We have one of the highest high school dropout rates of any industrialized nation… This is a prescription for economic decline because we know the countries that out-teach us today will out-compete us tomorrow.” For years prior to this State of the Union, economic and education researchers analyzed the association between educational attainment and economic prosperity, but never before had this issue been so clearly stated to such a broad and powerful audience. President Obama’s focus on this challenge brought the issue of high school graduation to a public audience in an unprecedented way and has motivated a wider-reaching group of politicians, community activists, district and school staff, and families to begin thinking about educational attainment in a new light.

High school graduation is critical for individual and societal success. However, research indicates that students who fail a course or standardized test in their first two years of high school are significantly less likely to graduate within six years than their peers who do not fail (Allensworth, 2005; Allensworth and Easton, 2007). To address the causes of failure, schools and districts across the country have implemented a variety of academic interventions, including summer school, tutoring, test preparation and remedial education to better support students’ learning. These programs cost schools valuable resources, and yet, there is little research that indicates that these interventions do truly impact student achievement and graduation.

At a time when school resources are growing ever limited, it is critical they are used in a way that most directly and positively impacts students. The aim of this research
is to assess the extent to which these interventions actually improve graduation rates at
the high school level.

**LITERATURE REVIEW**

Graduating high school has significant positive implications for individuals and
society. Alternatively, not graduating high school has significant negative impacts. As
early as the 1980s, Rumberger concluded that there were individual consequences for
high school dropout. Most significantly, these repercussions include low levels of
academic skills and inability to find employment with adequate income (Barton, 2005;
Rumberger, 1987). On average, dropouts earn 30% less than their peers with high school
diplomas or GEDs, resulting in an increasing likelihood of persistent poverty (Sum,
Khatiwada, McLaughlin, and Palma, 2009). Furthermore, dropouts are more likely to
have poorer levels of health, an increased propensity to commit crime, reduced
intergenerational mobility, and reduced political participation (Balfanz and Legters,
2004).

Beyond individual implications, there are societal repercussions for high school
dropout as well. As indicated above, high school dropouts are less likely to have jobs in
many cases. In the case where they are employed, they are less likely to make a living
wage. For society, this results in significant forgone tax revenues (Alexander, Entwisle,
and Dauber, 2003; Rumberger, 1987). Additionally, high school dropouts are
significantly more likely to use government services including health services, homeless
shelters, food banks, government housing, and welfare programs, or end up in prison, all
of which are highly costly to taxpayers (Rumberger, 1987; Sum et al., 2009).
Based on both the societal and individual implications of dropout, researchers have been motivated to explore factors that lead to dropout, with the goal of discerning accurate predictors of dropout to help prevent it and to support increased graduation rates. Multiple studies have concluded that students at risk for dropout can be identified as early as third grade (66% accuracy), with increased accuracy of prediction by sixth, eighth, and ninth grade (up to 85% accuracy) based on factors including test scores, attendance, and grade retention (Alexander et al. 2003; Balfanz and Letgers, 2004; Barrington and Hendricks, 1989; Jacob and Lefgren, 2007).

Once students begin high school, there are additional characteristics that contribute to dropout, with the most significant predictor being inadequate credit accumulation from course failure (Allensworth, 2005; Allensworth and Easton, 2007). Students who fail a core content standardized exam or course in their freshman or sophomore year are also more likely to dropout than their peers who pass (Reardon, Arshan, Atteberry, and Kurlaender, 2010). Additionally, students from high-poverty schools or districts have 15 to 18 percent lower graduation rates than their more affluent peers (Swanson, 2004).

In 2002, focus on high school graduation rates shifted with the implementation of No Child Left Behind (NCLB), which required schools to report graduation rates for the first time. With the NCLB emphasis on accountability and data-informed decisions, schools were required to provide evidence of efforts to combat dropout and promote on-time graduation. As a result, researchers shifted from the well-saturated topic of dropout causes to efforts to prevent dropout and promote graduation (Jacob and Lefgren, 2004).
This research, however, remains limited, with the majority of it focusing on kindergarten through eighth grade or post-secondary education interventions.

At the elementary and middle school levels, the most frequently reported remediation findings focus on the impact of grade retention on improving student outcomes. In general, researchers agree that after third grade, students gain little to no additional academic benefits from retention (Jacob and Lefgren, 2004; Jacob and Lefgren, 2007). The data on the benefits of retention prior to third grade, however, are not as widely agreed upon, with some researchers concluding that there are substantial benefits to retention while others conclude the benefits are limited and are damaged by the stigmas associated with retention (Alexander et al. 2003).

Within higher education, retention takes on the form of remedial courses for college students entering college with knowledge and skills gaps, rather than holding students back a grade. Overall, students enrolled in remedial courses are slightly less (6-7%) likely to graduate than their peers who do not take remedial coursework. (Attewell, Lavin, Domina, and Levey, 2006). Attewell et al. (2006) do suggest that there are other factors that could influence post-secondary completion rates as well including race, socioeconomic status, and cost of school, which may lead to an overstatement on the influence of remedial classes on academic outcomes.

While there is little information on the impact of tutoring at younger grade levels, college level tutoring resulted in positive outcomes for students who were behind in courses. The focus on tutoring was to get students back on track in their courses and thus back on track towards college graduation, as measured by grade point average and persistence from fall to spring semesters. (Kostecki and Bers, 2008).
Summer school, as an academic intervention, has mixed success in getting students back on grade level after failing a course or grade. In some cases, summer school is a tactic used to prevent summer learning loss by continuing learning when school is not technically in session, while in other cases, it acts as a tool to make up lost course credits should a student fail a course. Since the implementation of NCLB, summer school has been the most widely used intervention for students who have fallen behind. However, data from these programs indicates that no more than 50% of the students who attend mandated summer school for failing a course gain enough academic improvement in one summer to move to the next grade level (Pipho, 1999). Other research indicates that for students at lower grade levels (third grade and below), summer school substantially improves student outcomes and helps students get back on track with their peers (Jacob and Lefgren, 2004).

In all, the research that has been done around high school graduation importance, trends, causes, and remediation are powerful indicators of the need for action to get students to graduation. However, nearly all of these studies end with a call for more information on remediation strategies that work. And yet, little research has been done analyzing the impact of remediation strategies on getting students to graduate at the secondary level. Little has been done to determine whether or not academic interventions successfully increase graduation rates for students who failed in their early high school years. This research paper aims to fill that gap by analyzing the impact of these intervention strategies on high school graduation.

In most states, secondary education is unique in that it is the first point in a student’s education that they are required to earn a specific number of credits and pass a
series of required courses and exams to be eligible to graduate. This level of education is also unique in that high school students face a ticking clock between the start of high school and graduation. Students who fall behind in high school credits are significantly less likely to graduate high school than their peers. These characteristics are just some of the ways in which high school differs from the other settings in which these intervention strategies were tested. Additionally, research indicates that during the transition from middle school to high school, specific academic achievement losses occur, which indicates that high school students face different barriers to achievement than students in younger grades (Alspaugh, 1998).

This existing gap in the literature around the impact of academic interventions at the secondary level needs to be filled, as it has the opportunity to address the issues associated with preventing dropout and getting students to graduation. This outcome in turn promotes better results for both students and society. By determining the most effective interventions, research can better guide schools to serve their students in impactful and effective ways to get students to graduation. High school is the final opportunity the public school system has to help students before they fall through the cracks. It is imperative that research target remediation for these students to ensure they are truly receiving the attention and opportunity for success they deserve.

**CONCEPTUAL MODEL AND HYPOTHESIS**

Within the K-12 continuum, high school marks a unique and significant point in a student’s development for many reasons. For the purpose of this research, however, it is important to note that high school is the first point where students are not legally required
to complete four years of education.\textsuperscript{1} Research indicates that students who fail coursework or high school competency exams, which determine whether students have mastered the state/district graduation requirements, in their first two years of high school are significantly more likely to drop out than their peers. (Allensworth and Easton, 2007; Barrington and Hendricks, 1989; Reardon et al., 2010)

To combat high school dropout, schools and districts have chosen to use academic intervention strategies. The strategies used by schools participating in the Educational Longitudinal Study 2002 Data Set include summer school, enrollment in remedial math, individualized tutoring, and enrollment in a competency test preparation course aimed at targeting student deficiencies. Each of these strategies function in a slightly different manner, but all aim to provide students the learning time and knowledge they need to pass the competency test and graduate high school.

The core hypothesis of this research is that students who receive any intervention after failing their 10\textsuperscript{th} grade competency test are hypothesized to graduate at higher rates than students who receive no intervention. Assuming this primary hypothesis holds true, a secondary hypothesis is that students who receive the more customized interventions of individualized tutoring and targeted test preparation will graduate at higher rates than students who receive the less individualized academic interventions of summer school and enrollment in remedial courses.

To inform the research of this hypothesis, the conceptual model depicted in Figure 1 shows the relationship between factors that influence high school graduation rates. The model begins with all 10\textsuperscript{th} grade students who are required by their school/district/state to take a math competency test. Upon completing the exam, students fall into one of two

\textsuperscript{1} Depending on the state students live in, legal drop out ages range from 16-18.
categories: students who pass the exam and are thus deemed graduation ready in math and students who have failed the math competency test, and are thus labeled not graduation ready in math. (Math is used as an illustrative example, but the same logic applies to any other subject area.) The group of interest for this analysis is students who have failed the competency test. This is the starting point because as indicated above, this is a risk factor for not graduating.

*Figure 1. Conceptual Model*

When students fail their competency test, depending on the district and school that students are enrolled in, there are two courses of action that take place on the school level.

- **No Academic Intervention:** The student’s failure can be attributed to the fact that they are only in 10th grade the first time they take the exam, thus it can be considered natural that they may not have mastered the material they need to know to graduate.
• **Required Academic Intervention:** Students who fail the competency test are required by their school or district to participate in academic intervention(s) provided by the school or district. Typically, the student does not have a choice in which intervention they receive as most schools in this data only offer one or two interventions.

Students who participate in an intervention can receive one of four possible interventions: summer school, enrollment in a remedial course, individualized tutoring, or targeted test preparation. The school/district they attend determines the intervention students receive.

In the high schools that require summer school, students who are academically behind are required to retake their current math course to relearn the same material they should have learned during the school year. Enrollment in a remedial course the following school year takes on one of two scenarios: 1. Students are reenrolled in the exact same math course they had taken in the previous school year with the goal that increased time exposed to repeated material will improve learning outcomes. 2. Students are simultaneously enrolled in two math classes, one on grade-level, and one remedial, with the remedial course curriculum guided by high frequency areas of misunderstanding among high school math students. Each of these academic intervention strategies is based in the theory that students will better understand the material through prolonged and repeated exposure to the same content. The content in each of these interventions is typically presented in the same way the traditional course is taught at the school.

Rather than require summer school or enrollment in a remedial course, some high schools require students to receive individualized tutoring or targeted test preparation. Each of these interventions take place on a more individualized level and seek to fill
specific knowledge and skills gaps that are revealed by the students’ performance on their competency test. These academic interventions are based on the theory that students need not only extended exposure to the material but that they also need a more customized style of teaching to better support their learning.

Regardless of what intervention students who failed their competency test receive, the ultimate outcome is predicted to be the same: students who receive an intervention graduate at higher rates than students who receive no intervention. It is necessary, however, to note that there are many other factors that influence high school graduation that are outside the spectrum of academic interventions. These factors typically fall into two broad categories: school/district factors and individual factors. School and district factors include teacher quality, enrichment programs, student body composition, access to resources, and school and community culture. Every school has factors that influence a student’s path to graduation that have no direct relationship with whether or not the school offers academic interventions.

Individual factors include race, gender, previous academic performance, behavior/attendance, and socioeconomic status. Each of these characteristics influence the likelihood that student will graduate high school. While there may be some relationship between these factors and a student who fails a competency test, if these factors do not change following that failure, they will continue to influence a student’s graduation outcome. As such, regardless of the success of interventions, both the individual and school/district factors will influence students’ graduation outcomes.
EMPIRICAL MODEL

To analyze the extent to which intervention strategies impact high school graduation rates, I will be using a linear probability model. The primary estimating equation is as follows:

Equation 1:  \[ grad = \beta_0 + \beta_1 \text{int}_\text{atall}_i + \beta_2 X_i + \mu \]

The dependent variable \( grad \) is a binary variable equal to 0 if the student did not complete high school and equal 1 one if the student did graduate high school within 6 years of starting, for all students who failed their math competency test in 10th grade. The outcome \( grad \) is predicted by the independent variable \( \text{int}_\text{atall} \), a series of control variables \( X \), and random error \( \mu \). The base group for this analysis is students who failed their competency test, but received no interventions. The variable \( \text{int}_\text{atall} \) is a binary variable, which is equal to 0 if the student did not receive any intervention and equal to 1 if the student did receive an academic intervention.

In this equation, the variable \( X \) is a series of control variables that I plan on using in this analysis. To control for school differences, dummy variables will be created for each school in the dataset. It is necessary to control for school-level factors as these are likely to have a powerful influence over student outcomes and whether an intervention is received or the type of intervention received. To account for individual differences that may influence student outcomes, there will also be controls added for gender, race/ethnicity, socioeconomic status, and prior academic achievement. The purpose of controlling for these factors is to ensure that the estimated effect of intervention on final outcome of graduation is influenced only by the students’ actual participation in the
intervention and not by these other variables that also can influence receipt of intervention and graduation rates.

In my hypothesis, I predict that students who fail the competency test and receive any academic intervention graduate at higher rates than students who fail their competency test and receive no interventions. If my hypothesis holds true, I predict the sign on $\beta_1$ to be positive and statistically significant. This sign would signal that interventions do increase the likelihood that students graduate high school.

For a secondary analysis, I plan on evaluating a probit model of Equation 1 rather than a linear probability model. The intention of running the probit model is again to analyze the impact that each intervention type has on likelihood of graduation. However, unlike in the linear probability model, the probit model will bound the predicted graduation rate values between zero and one. Ideally, each model will produce similar results.

I will then conduct another linear probability model analysis to test my secondary hypothesis that students who receive more individualized interventions will graduate at higher rates than students who receive the less individualized interventions. In this analysis, the interventions are divided into two separate categories based on the extent to which they are individualized, with the remainder of the estimating equation, (including control variables) remaining the same as Equation 1.

Equation 2: \[ \text{grad} = \beta_0 + \beta_1 \text{int}_1 + \beta_2 \text{int}_2 + \beta_3 X_i + \mu \]

The dependent variable \( \text{grad} \) is a binary variable equal to 0 if the student did not complete high school and equal 1 one if the student did graduate high school within 6 years of starting, for all students who failed their math competency test in 10\textsuperscript{th} grade. The
outcome $grad$ is predicted by the independent variables $intI$, $intII$, and a series of control variables $X$. The variable $intI$ is a binary variable, which is equal to 0 if the student did not receive the interventions in Intervention Category 1 and equal to 1 if the student did receive either of the interventions in Intervention Category 1. Intervention Category 1 includes summer school and enrollment in a remedial or repeated course the following school year. The variable $intII$ is a binary variable, which is equal to 0 if the student did not receive the interventions in Intervention Category 2 and equal to 1 if the student did receive either of the interventions in Intervention Category 2. Intervention Category 2 includes individualized tutoring and targeted test preparation.

The decision to group the interventions into Intervention Category 1 and Intervention Category 2 is based on an assumption around the degree of individualization that typically occurs in interventions. For a student enrolled in summer school or a repeated or remedial course in the following school year, I am assuming there is no customization of material to that student’s needs. In a typical summer school setting, the instructor works through a year’s worth of content at an accelerated pace to be covered in a time period of 3-5 weeks rather than 9 months. Working at such a pace, it is highly unlikely that the teacher can customize the material based on the specific deficiencies of students enrolled.

In a typical remedial course, there are two potential formats: 1. Students are reenrolled in the exact same math course they had taken in the previous school year. 2. Students are simultaneously enrolled in two math classes, one on grade-level, and one remedial, with the remedial course curriculum guided by high frequency areas of misunderstanding among high school math students. While these types of classes may
help students relearn material they missed the first time, there is no inherent change in the way the learning occurs. Students are still in the classroom being taught the material from the curriculum. Thus, although students are exposed to the material again if they participate in the interventions from Intervention Category 1, there is likely little to no individualization of the material.

Alternatively, the interventions in Intervention Category 2 have a much larger opportunity for individualization than those in Intervention Category 1. In a tutoring setting, students are typically in smaller groups than a full classroom setting and are organized based on their strengths and weaknesses. In this setting, the students’ specific needs are more likely to be addressed in a more meaningful way than a larger group, traditional classroom setting. As with tutoring, remediation courses are typically developed around specific student weaknesses.

In my hypothesis, I predict that these more customized interventions have a larger positive impact on student outcomes due to the fact that they more specifically recognize and address the needs of the students who had previously failed the competency test. In addition, I predict that students who fail the competency test and receive any of the interventions graduate at higher rates than students who fail their competency test and receive no interventions. If my hypothesis holds true, I predict the sign on $\beta_1$ and $\beta_2$ to be positive, with $\beta_2$ to have a larger magnitude than $\beta_1$. This sign would signal that the interventions do increase the likelihood that students graduate high school, with the more individualized interventions in int2 making a larger positive impact on expected outcomes.
DATA SUMMARY AND DESCRIPTIVE STATISTICS

To analyze the impact of high school interventions on high school graduation, I will use data from the Educational Longitudinal Study (ELS) of 2002. The data were collected by the National Center for Education Statistics (NCES) within the Institute of Education Sciences (IES) at the US Department of Education and were originally collected to analyze students’ paths from the start of high school through postsecondary education or work and beyond. In addition, the data were gathered to gain insight into patterns of college access and persistence upon high school graduation (Ingels, Pratt, Alexander, Jewell, Lauff, Mattox, and Wilson, 2014).

The ELS: 2002 data come from a nationally representative longitudinal sample that measures information about students and schools (both are units of analysis) over time. Thus far, ELS: 2002 has collected data in the Base Year (2002), two years later for the first follow up in 2004, and two years after that for a second follow up in 2006. In each of these collection years, data were collected on the same students. In the Base Year, First Follow-Up, and Second Follow-Up data were collected from students, their parents, their teachers, their school principals, and their school librarian (if applicable). Finally, starting in summer 2012 and continuing through February 2013, researchers interviewed a sample of students as the final phase of data collection focusing on secondary or labor market outcomes for students (Ingels et al., 2014).

In the base year, schools were eligible to be a part of the sample if they had 10th grade students and if they were state Department of Education public schools, charter schools, Catholic schools, or other private schools in each state and the District of Columbia. Originally 1,268 schools were sampled, of which 1,221 were eligible to
participate. Of those 1,221 schools, 752 schools successfully gathered data from enough students with the student questionnaire to have an accurate and statistically viable model. For schools that did not have students complete the questionnaire, 99% completed the administrator and library questionnaire. Within the portion of schools that did not respond, districts provided information on school characteristics, which provided researchers insight into which types of schools were non-respondents. For student level data, of the 19,128 sampled students, 17,591 students were eligible to participate. Some students were deemed ineligible to participate for a variety of reasons including missing data or changing schools or districts. Of the students eligible to participate, data were successfully collected on 16,197 students (Ingels et al., 2014).

Among all of the information gathered in ELS: 2002, the variables of interest to my analysis are students’ 10th grade comprehensive math exam scores and student participation in one or more academic interventions. Within ELS: 2002, measures of academic interventions include summer school, remedial courses, tutoring, and targeted test preparation if students fail their math competency test. Within these data, the sample size decreases when analyzing the academic interventions listed above for students required to receive an intervention (treatment group) and those who did not receive an intervention (control group) after failing their math competency test. The sample size decreases for two primary reasons. First, only a portion of the population was required to take a competency test, as this is decided on a district level in most states. Second, only a portion of entire student population failed their math competency test. In addition, the sample size decreases because only students who were definitively required to receive an academic intervention after failing and students who did not receive an intervention after
failing could be included. This omits students who failed, but were given the unmandated option to receive an intervention. The final combined sample size for the control group and treatment group is 4,547 students with approximately two-thirds of the population receiving treatment and approximately one-third remaining in the control group.

Table 1. Summary Statistics²

<table>
<thead>
<tr>
<th>Student Population Composition (%)</th>
<th>Research Sample Population Composition (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sample Population</td>
</tr>
<tr>
<td>Student Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>48.19%^</td>
</tr>
<tr>
<td>Female</td>
<td>51.81%^</td>
</tr>
<tr>
<td>Student Race</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>53.35%^</td>
</tr>
<tr>
<td>Black</td>
<td>12.84%^</td>
</tr>
<tr>
<td>Hispanic</td>
<td>18.03%^</td>
</tr>
<tr>
<td>Asian</td>
<td>8.97%^</td>
</tr>
<tr>
<td>Other</td>
<td>4.79%^</td>
</tr>
</tbody>
</table>

| Parent’s Education Level          |                 |                              |               |                   |
| Less than High School Diploma     | 7.26%^          | 6.16%                        | 7.33%         | 7.21%             |
| High School Diploma               | 21.68%^         | 19.93%                       | 21.66%        | 21.70%            |
| Some College                      | 33.80%^         | 32.77%                       | 33.93%        | 33.72%            |
| College Degree or Higher          | 37.26%^         | 41.14%                       | 37.08%        | 37.38%            |

| Parents’ Income                   |                 |                              |               |                   |
| Low Income                        | 23.03%^         | 20.96%                       | 22.20%        | 23.59%            |
| Middle Income                     | 65.52%^         | 64.27%                       | 65.26%        | 65.69%            |
| High Income                       | 11.46%^         | 14.77%                       | 12.54%^       | 10.72%            |

| Urbanicity of Schools             |                 |                              |               |                   |
| Urban                             | 29.03%^         | 33.87%                       | 29.64%        | 28.61%            |
| Suburban                          | 50.01%^         | 47.93%                       | 51.74%^       | 48.84%            |
| Rural                             | 20.96%^         | 18.19%                       | 18.62%^       | 22.55%            |

| Grade Retention                   |                 |                              |               |                   |
| No, never retained                | 86.08%^         | 67.36%                       | 86.16%        | 86.03%            |
| Yes, retained in past             | 13.92%^         | 12.14%                       | 13.84%        | 13.97%            |

² Notes: ^ indicates that the analytic sample is statistically significantly different from the entire ELS: 2002, as determined using a T test. ^^ indicates that the control group is statistically significantly different from treatment group, as determined using a T test
Table 1 contains the summary statistics for both the sample population (students who failed their competency test) and the entire ELS: 2002 sample. The summary statistics consist of information on student’s gender, race/ethnicity, socioeconomic status, parental education status, type of school, geographic location, and retention status. Within the ELS: 2002, there was no publicly available data on student’s academic achievement prior to 10th grade. As such, I have chosen to use both parents’ education levels and prior student retention to serve as a proxy for prior academic achievement. While these are not perfect measures, previous research has shown that each of these variables is an accurate predictor of student achievement (Jacob and Lefgren, 2007). Thus, I have chosen to use them to control for prior student achievement in this study.

It should be noted that there are statistically significant differences between my analytic sample and the entire ELS: 2002 for all variables in Table 1. This is not remarkably unexpected, however, as certain populations within the United States education system consistently perform better or worse than other groups. For example, black and Hispanic students traditionally perform more poorly than their white or Asian peers. This has resulted in a high proportion of black and Hispanic students in the sample of student’s who failed their competency test. Similarly, students from socioeconomically poorer backgrounds or with parents with lower education levels also typically have lower academic achievement than their peers. This is consistent with the disproportionate numbers of students with these characteristics in the sample of students who failed their competency test. Although these differences are statistically significant, in terms of sheer magnitude of percentage, there are only small discrepancies between the entire ELS: 2002 sample and my analytic sample. In addition, for nearly all variables analyzed in my
RESULTS

Primary Analysis

Table 2 presents my regression results from analysis Model 1 (main model, Equation 1), which analyzes the impact of academic interventions for students who failed a math competency test in tenth grade on high school graduation. I hypothesized that students who receive academic interventions after failing the test will graduate at significantly higher rates than their peers who also failed but did not receive any intervention, while controlling for student, family, and school level characteristics. Although the analysis indicates that the students of interest do graduate at higher rates, the magnitude of this result is insignificant in size and statistically insignificant on all values (p=0.985). Students who received interventions after failing their 10th grade math competency test were only 0.9% more likely to graduate than their peers who did not receive interventions.

As seen in Table 2, Column 1, the control variables nearly all confirm prior research on factors impacting high school graduation. The sign on each race, income, parental education, and prior academic achievement binary variable is as expected. Black, Hispanic, and other race (Native American and multiracial) students who have failed their 10th grade math competency test graduate at statistically significant lower rates than white students who have failed a competency test. Additionally, low-income students
Table 2. Linear Probability Model Coefficient and Probit Marginal Effect Estimates of the Relationship Between Academic Interventions and High School Graduation[^3]

<table>
<thead>
<tr>
<th></th>
<th>LPM Model 1</th>
<th>LPM Model 2</th>
<th>Probit Model 1</th>
<th>Probit Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received any intervention (int_all)</td>
<td>0.009</td>
<td>0.008</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
<td>(0.007)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>intI: summer school or remedial education</td>
<td>-0.009</td>
<td>-0.008</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.012)</td>
<td>(0.011)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>intII: test prep or individualized tutoring</td>
<td>0.022*</td>
<td>0.020**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.012)</td>
<td>(0.010)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>black</td>
<td>-0.037***</td>
<td>-0.049***</td>
<td>-0.036***</td>
<td>-0.043***</td>
</tr>
<tr>
<td></td>
<td>(0.012)</td>
<td>(0.017)</td>
<td>(0.013)</td>
<td>(0.019)</td>
</tr>
<tr>
<td>hispanic</td>
<td>-0.040***</td>
<td>-0.034**</td>
<td>-0.039***</td>
<td>-0.032**</td>
</tr>
<tr>
<td></td>
<td>(0.012)</td>
<td>(0.016)</td>
<td>(0.013)</td>
<td>(0.016)</td>
</tr>
<tr>
<td>asian</td>
<td>0.019</td>
<td>0.033</td>
<td>0.017</td>
<td>0.033**</td>
</tr>
<tr>
<td></td>
<td>(0.015)</td>
<td>(0.020)</td>
<td>(0.013)</td>
<td>(0.015)</td>
</tr>
<tr>
<td>other race</td>
<td>-0.061***</td>
<td>-0.029</td>
<td>-0.066***</td>
<td>-0.036</td>
</tr>
<tr>
<td></td>
<td>(0.019)</td>
<td>(0.025)</td>
<td>(0.025)</td>
<td>(0.029)</td>
</tr>
<tr>
<td>middle income</td>
<td>0.030***</td>
<td>0.017</td>
<td>0.021**</td>
<td>0.013</td>
</tr>
<tr>
<td></td>
<td>(0.010)</td>
<td>(0.014)</td>
<td>(0.001)</td>
<td>(0.011)</td>
</tr>
<tr>
<td>high income</td>
<td>0.035**</td>
<td>0.022</td>
<td>0.031***</td>
<td>0.025</td>
</tr>
<tr>
<td></td>
<td>(0.016)</td>
<td>(0.022)</td>
<td>(0.012)</td>
<td>(0.018)</td>
</tr>
<tr>
<td>Parents education:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>high school grad</td>
<td>0.052***</td>
<td>0.086***</td>
<td>0.023**</td>
<td>0.035***</td>
</tr>
<tr>
<td></td>
<td>(0.018)</td>
<td>(0.023)</td>
<td>(0.011)</td>
<td>(0.012)</td>
</tr>
<tr>
<td>some college</td>
<td>0.082***</td>
<td>0.126***</td>
<td>0.043***</td>
<td>0.063***</td>
</tr>
<tr>
<td></td>
<td>(0.017)</td>
<td>(0.022)</td>
<td>(0.011)</td>
<td>(0.013)</td>
</tr>
<tr>
<td>college degree</td>
<td>0.100***</td>
<td>0.139***</td>
<td>0.064***</td>
<td>0.079***</td>
</tr>
<tr>
<td></td>
<td>(0.018)</td>
<td>(0.023)</td>
<td>(0.012)</td>
<td>(0.014)</td>
</tr>
<tr>
<td>public school</td>
<td>-0.074*</td>
<td>-0.089*</td>
<td>-0.076***</td>
<td>-0.077***</td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
<td>(0.052)</td>
<td>(0.012)</td>
<td>(0.015)</td>
</tr>
<tr>
<td>suburban school</td>
<td>0.011</td>
<td>0.021**</td>
<td>0.007</td>
<td>0.018*</td>
</tr>
<tr>
<td></td>
<td>(0.010)</td>
<td>(0.011)</td>
<td>(0.007)</td>
<td>(0.010)</td>
</tr>
<tr>
<td>rural school</td>
<td>0.005</td>
<td>0.019</td>
<td>0.003</td>
<td>0.013</td>
</tr>
<tr>
<td></td>
<td>(0.012)</td>
<td>(0.017)</td>
<td>(0.011)</td>
<td>(0.013)</td>
</tr>
<tr>
<td>school fixed effects</td>
<td>-0.034</td>
<td>-0.056</td>
<td>-0.072**</td>
<td>-0.084*</td>
</tr>
<tr>
<td></td>
<td>(0.028)</td>
<td>(0.036)</td>
<td>(0.035)</td>
<td>(0.044)</td>
</tr>
<tr>
<td>female</td>
<td>0.022***</td>
<td>0.023**</td>
<td>0.020***</td>
<td>0.022**</td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
<td>(0.011)</td>
<td>(0.007)</td>
<td>(0.010)</td>
</tr>
<tr>
<td>student held back</td>
<td>-0.111***</td>
<td>-0.116***</td>
<td>-0.090***</td>
<td>-0.092***</td>
</tr>
<tr>
<td></td>
<td>(0.012)</td>
<td>(0.016)</td>
<td>(0.014)</td>
<td>(0.019)</td>
</tr>
<tr>
<td>Observations</td>
<td>4,547</td>
<td>2,536</td>
<td>4,547</td>
<td>2,536</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.063</td>
<td>0.077</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[^3]: Notes: grad= whether or not a student graduated high school; for each intervention category, the omitted category is students who did not receive an intervention; for race, the omitted category is white; for parent income, the omitted category is low income; for parents’ education, the omitted category is less than high school; for school type, the omitted category is private, for school geographic location, the omitted category is urban; for female, the omitted category is male; for student held back, the omitted category is student not held back. Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1
who have failed this test graduate at lower rates than middle or high-income students. Students whose parents have less than a high school degree graduate at significantly lower rates than their peers who also failed the competency test. Furthermore, male students, public school students, and students who have previously been held back are significantly less likely to graduate than their peers.

Secondary Analysis

Table 2, Column 2 presents regression results from a secondary analysis of interventions and graduation rates (Model 2, Equation 2). I hypothesized that students who received more individualized interventions (intII) would graduate at higher rates than students who receive less individualized interventions (intI), but that either type of intervention would positively impact graduation outcomes. In this regression, both intI and intII are compared to the control group, which remains, as it was in Model 1, students who failed their competency test but did not receive any intervention.

The results from this secondary analysis are somewhat mixed. Students who failed their 10th grade math competency test and received the more individualized academic interventions do graduate at statistically significant higher rates (2.2 percentage points more likely to graduate, p=0.067) than students who failed their tenth grade math competency test and do not receive any intervention. Students who received the less individualized interventions accounted in the intI variable were predicted to be less slightly likely to graduate (0.87 percentage points less likely to graduate) than their peers who also failed the competency test, but received no intervention. The coefficient on intI,

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4 The variable intII represents students who received the more individualized academic intervention of summer school or remedial courses after failing their 10th grade math competency test.

5 The variable intI represents students who received the less individualized academic intervention of individual tutoring or test preparation courses after failing their 10th grade math competency test.

6 The graduation rate for the control group (students who did not receive any intervention) was 91.4%.
however, was not statistically significant (p=0.483). Based on magnitude and statistical significance of the coefficient on intI the data shows that there is no significant difference between the graduation rates of students who did receive intI or no intervention after failing their competency test.

**Racial Subgroup Analysis**

Table 3 presents Model 1 and Model 2 results analyzed by racial subgroups. Among racial groups, there is no significant difference in the estimated relationship between interventions and graduation rates for students who had failed their 10th grade competency test.

**Table 3. Linear Probability Model Racial Subgroup Coefficient Estimates of the Relationship Between Academic Interventions and High School Graduation**

<table>
<thead>
<tr>
<th>Racial Subgroup</th>
<th>White Model 1</th>
<th>White Model 2</th>
<th>Black Model 1</th>
<th>Black Model 2</th>
<th>Hispanic Model 1</th>
<th>Hispanic Model 2</th>
<th>Asian Model 1</th>
<th>Asian Model 2</th>
<th>Other Model 1</th>
<th>Other Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received any intervention (int_atall)</td>
<td>grad</td>
<td>grad</td>
<td>grad</td>
<td>grad</td>
<td>grad</td>
<td>grad</td>
<td>grad</td>
<td>grad</td>
<td>grad</td>
<td>grad</td>
</tr>
<tr>
<td>0.001</td>
<td>0.017</td>
<td>0.016</td>
<td>0.011</td>
<td>0.044</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(0.009)</td>
<td>(0.026)</td>
<td>(0.024)</td>
<td>(0.021)</td>
<td>(0.046)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>intI: summer school or remedial education</td>
<td>0.000</td>
<td>-0.0431</td>
<td>-0.017</td>
<td>0.004</td>
<td>-0.020</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(0.015)</td>
<td>(0.044)</td>
<td>(0.037)</td>
<td>(0.027)</td>
<td>(0.061)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>intII: test prep or individualized tutoring</td>
<td>0.017</td>
<td>0.014</td>
<td>0.037</td>
<td>-0.008</td>
<td>0.008</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(0.014)</td>
<td>(0.040)</td>
<td>(0.037)</td>
<td>(0.031)</td>
<td>(0.065)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Among Asian students who failed their competency test, there is a sign change among the variables of interest in Model 2. In my secondary analysis, the coefficient on intI was negative, while the coefficient on intII was positive. This holds true for nearly all races, except for Asian students. The coefficients on these variables change signs for Asian students, with the coefficient on intI having a positive sign and the coefficient on intII

---

7 Notes: grad= whether or not a student graduated high school; for each intervention category, the omitted variable is students who did not receive any interventions. The control variables are not included in the table but remain the same as listed in Table 3: gender, parents’ income, parents’ education level, school type, school geographic location, student retention status before starting high school, and school fixed effects. Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1
having a negative sign. However, none of the estimated coefficients for any race group are statistically significant, or large in magnitude indicating that there is no significant difference in the impact of academic interventions among different racial groups.

**Gender Subgroup Analysis**

Table 4 presents Model 1 and Model 2 results analyzed by gender subgroups. Among female students who failed their 10th grade competency test, those who received any intervention at all were significantly more likely to graduate than female students who received no intervention at all (2.22 percentage points more likely to graduate, p=0.039). Female students who received either summer school or remedial education (intI) were less likely to graduate than female students who received no intervention, while those who received either test prep or individualized tutoring were more likely to graduate than female students who received no intervention. Neither the coefficient on intI nor the coefficient on intII was statistically significant.

**Table 4. Linear Probability Model Racial Subgroup Coefficient Estimates of the Relationship Between Academic Interventions and High School Graduation\(^8\)**

<table>
<thead>
<tr>
<th></th>
<th>Female Model 1</th>
<th>Female Model 2</th>
<th>Male Model 1</th>
<th>Male Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received any intervention</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(int_atall)</td>
<td>0.022**</td>
<td>-0.004</td>
<td>-0.018</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.010)</td>
<td>(0.013)</td>
<td>(0.020)</td>
<td></td>
</tr>
<tr>
<td>intI: summer school or</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>remedial education</td>
<td>-0.003</td>
<td>-0.018</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.016)</td>
<td>(0.020)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>intII: test prep or</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>individualized tutoring</td>
<td>0.011</td>
<td>0.034*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.015)</td>
<td>(0.019)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^8\) Notes: grad = whether or not a student graduated high school; for each intervention category, the omitted variable is students who did not receive any interventions. The control variables are not included in the table but remain the same as listed in Table 3: race, parents’ income, parents’ education level, school type, school geographic location, student retention status before starting high school, and school fixed effects. Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1
Among male students who failed their 10th grade competency test, those who received any intervention at all were less likely to graduate than male students who received no intervention at all. Male students who received either summer school or remedial education (intI) were also less likely to graduate than male students who received no intervention. Neither the coefficient on int_atall nor the coefficient on intI was statistically significant. However, male students who received either test prep or individualized tutoring were significantly more likely to graduate than male students who received no intervention (3.4 percentage points more likely to graduate, p=0.075).

Sensitivity Checks

To test the sensitivity of the main model results reported in Table 2, a set of sensitivity checks was performed on each model (see Tables 2 and 5).

Table 5. Linear Probability Model Coefficient and Probit Marginal Effect Estimates of the Relationship Between Academic Interventions and High School Graduation without Controls

<table>
<thead>
<tr>
<th></th>
<th>LPM Model 1</th>
<th>LPM Model 2</th>
<th>Probit Model 1 Marginal Effects</th>
<th>Probit Model 2 Marginal Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received any intervention</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(int_atall)</td>
<td>-0.003</td>
<td>-0.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
<td>(0.008)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>intI: summer school or remedial education</td>
<td></td>
<td>-0.007</td>
<td>-0.007</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.012)</td>
<td>(0.012)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>intII: test prep or individualized tutoring</td>
<td></td>
<td>0.023*</td>
<td></td>
<td>0.023*</td>
</tr>
<tr>
<td></td>
<td>(0.012)</td>
<td></td>
<td></td>
<td>(0.012)</td>
</tr>
<tr>
<td>Observations</td>
<td>5,940</td>
<td>3,314</td>
<td>5,940</td>
<td>3,314</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.000</td>
<td>0.005</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:** grad = whether or not a student graduated high school; for each intervention category, the omitted variable is students who did not receive any interventions. Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1
As there are a large number of control variables included in Main Models 1 and 2, I chose to run both LPM regressions without any control variables. The results of these regressions are reported in Table 5. For my primary analysis (Model 1, Equation 1), there was a sign change of the variable of interest (int_atall); however the magnitude remained very small and the coefficient remained statistically insignificant. For my primary analysis (Model 1, Equation 1), there was a minimal magnitude change, but no change in sign or coefficient significance.

As each of the dependent variables is a dummy variable in both the Main Regression and the Secondary Analysis, I chose to run a dprobit analysis of the same variables originally included in each model, as well as on the first sensitivity check regressions which included no control variables. Within my primary analysis, there were no sign changes between the coefficients for the linear probability model and the margins of the dprobit model. In the dprobit analysis of Model 2, the marginal effects of intII increased in statistical significance when compared to the coefficient on the same variable in the linear probability model analysis. Overall, the findings for my primary and secondary analysis are robust to model specification.

**POTENTIAL CHALLENGES AND LIMITATIONS**

Despite the added control variables, it is clear that there is potential for omitted variable bias for several variables that cannot be accounted for including: student level motivation, the degree to which the student failed the exam, and prior academic achievement. Student motivation has the ability to influence outcomes at several points in

---

10 A dprobit model ensures that the margins can be approximately compared to the coefficients from the Linear Probability Model used in Equation 1.
this analysis. A student’s lack of motivation may be what pushed them to fail the test in the first place. If he or she remains unmotivated while receiving the intervention, it likely will not help at all. Alternatively, if the student’s failure on the exam sparks motivation to do better, it may be a change in their motivation, rather than involvement in an intervention program that results in a higher likelihood of graduation. However, if the exam failure motivates both the control and treatment group students to work harder equally, then any difference in the control and treatment group can be attributed to the intervention. Ultimately, because there is no measure for student motivation levels, it becomes impossible to determine the extent to which motivation or a lack thereof influences the results. In most research studies analyzing the impact of some treatment on a desired outcome, an inability to measure motivation must be recognized by the researcher. Although there is no strong proxy to account for this omitted variable, it is important to still admit that it can bias the results and adjust the interpretation accordingly.

Another concern associated with this model is the extent to which a student failed the exam. In the data set and in this empirical model, students either failed or did not fail their 10th grade math competency test. There is no information on how much students failed by. Thus, there is no way to control for whether a student failed by 1 point or by 20 points. This is significant because it is likely that students who failed by only a few points could have a higher likelihood of getting back on track towards graduation than a student who failed by many points. This becomes particularly problematic if the extent to which a student fails impacts their likelihood of receiving an intervention because it indicates a selection bias that is significantly more challenging to account for given the information
available in the ELS 2002 data. While I attempt to control for this based on previous retention and parental education, these are admittedly imperfect proxies for prior student achievement, which would be a better control for the degree to which a student fails the exam.

An additional challenge within this model is the inherent non-randomness of the assignment of interventions to students who fail. School and district characteristics likely play a large role in this assignment process. By controlling for school-level differences and student characteristics, some of this potential bias should be accounted for in this analysis. However, there remains the potential, especially in equation 2, that the non-randomness will influence which type of intervention students receive and in turn influence outcomes. If the lowest performing or least motivated students all received the same type of academic intervention, then the intervention may look less effective at getting students to graduate. In reality, what the data may be indicating is that this particular group of students may just be so much lower than their peers that the intervention could not increase their academic outcomes enough to impact their graduation outcome.

Finally, there is no measurement in this data set to indicate the quality of the intervention program. While the strategies associated with each type of intervention are known, the quality of their implementation is not. This is significant because research has repeatedly concluded that within schools, teachers are the single most important factor to improving student achievement (Hanushek and Rivkin 2012; Harris and Sass 2015). As such, a particular intervention could have the possibility to be successful depending on the quality of the individual leading the intervention. There is an inherent relationship
between quality and outcome that is not accounted for in this model. However, research also indicates that variation in teacher quality within schools is typically larger than variation among schools. (Hanushek and Rivkin 2012). Therefore, this challenge of accounting for teacher quality is somewhat addressed by the fact that the quality of intervention instructor across schools may not vary as greatly as one may expect.

Based on the results of this study, there could be the temptation to give up on all of these interventions as not one of them significantly impacted graduation rates for students who failed their competency test. If I were better able to distinguish quality and intensity of the interventions at different schools there may be evidence to indicate that the low-quality programs are ineffective while higher quality programs are more effective. This would create an impetus to determine how to improve the existing interventions rather than create new interventions.

**DISCUSSION**

The focus of this research was to determine the effectiveness of academic interventions on high school graduation rates, for high school students who failed their math competency test in their sophomore year. In high schools across the country, the academic interventions studied here (summer school, remedial courses, individual tutoring, and test preparation courses) are some of the most widespread and longstanding remediation efforts implemented in efforts to put students back on track to graduation. The data analysis from this study, however, indicates that these interventions, as a whole, are minimally associated with improved graduation outcomes for students who have fallen behind their peers (see Table 2). The key exception to this conclusion is the
statistically significant impact of the more individualized interventions (intII) on graduation outcomes. Although small in magnitude, there is consistent and clear evidence that students who receive test preparation or individualized tutoring interventions graduate at higher rates than their peers who receive no interventions.

One possible explanation for the overall limited impact of the interventions analyzed in this study is that it is highly likely that across the United States there is a large amount of variation in the implementation of each of these interventions. Just as the curriculum and coursework look slightly different at different schools and in different districts, so too does summer school, remedial courses, tutoring and test preparation courses. In the data used for this analysis, there is no way to differentiate quality of the interventions. This inability to differentiate this critical factor could thus limit the ability to truly measure effectiveness of the interventions. It could be that one, or all of these does increase graduation rate, but it is poor implementation that results in their ineffectiveness. There is likely more consistency in delivery and intensity in the more individualized interventions, which would explain the results of the secondary analysis.

Given the large amount of federal, state, and local money that go into funding these intervention programs, it would be beneficial for further research to be conducted on academic interventions at the high school level and their impact on graduation rates. More specific research that stipulates program characteristics and monitors program implementation could provide more meaningful analysis of the impact of these interventions. Should future research find the interventions to be as ineffective as I have in this study, two critical actions need to be taken. First, both federal and state Departments of Education should consider transferring the funding from such programs
into efforts that more effectively combat the achievement gap at earlier grade levels, so
students are less likely to arrive to high school behind grade level. Second, more research
into high school level interventions must be conducted to determine how to best support
the learning of high school students who have fallen behind their peers.

As the United States continues to focus on increased high school graduation rates
for all students, it is critical that they find more effective ways to combat the factors
keeping students behind. Although students should not arrive to high school behind, the
reality is that they do every day. As long as this continues to happen, schools must have
effective ways to ensure that the all students who come through their doors can be given
the support and guidance they need to graduate high school. High school graduation rates
have risen over the past thirty years, yet it remains critical to maintain the downward
trend of dropout and the upward trend of graduation to generate a prosperous economic,
social, and political future for the Untied States. Effective interventions for failing
students are a crucial piece that will ensure that high school graduation becomes a reality
for all students.


