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by

Jennifer Chu Nichols

May 2013

WHAT DO SCHOOL LEADERS NEED TO KNOW ABOUT THE PERFORMANCE  
OF HIGH-ACHIEVING STUDENTS ON STANDARDIZED TESTS

A Doctoral Thesis Presented to the  
Faculty of the College of Education  
University of Houston

In Partial Fulfillment  
of the Requirements for the Degree

Doctor of Education  
in Professional Leadership

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May 2013

## Dedication

To my family – you have encouraged and supported me to pursue my dreams and goals, no matter what they are. We believe in living life to the fullest and always reaching for the top. My parents, Richard and Ellen Chu, have provided their children with the foundation for success, the perseverance to follow through and finish, and the support to make it happen. The success of your children and grandchildren are direct results of your hard work, sacrifice, and upbringing. My husband, Jake, and our daughter, Layla, have also inspired me to reach for the stars while also grounding me in the simple pleasures – life, love, and pursuit of happiness.

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### Abstract

The No Child Left Behind Act (NCLB) of 2001 has changed the accountability of student achievement in American public schools. Since the enactment, achievement *has* increased for low-achieving students (Loveless, 2008). However, achievement for *high-achieving* students is leveling (Finn, Scull, & Winkler, 2011). This study identified and analyzed the performance trends of a cohort of students at the individual student level in mathematics and reading over four years. Students maintained, gained, lost, or never had high-achieving status during the study. Math lost high achievers overtime whereas reading gained high achievers overtime. Achievement status groups and trends across grade levels were examined by gender, ethnicity, and socioeconomic status to determine differences. There were differences in the performance of ethnic and economically disadvantaged groups but not by gender. This study highlights the need to examine achievement gaps among high achievers, not just low achievers, to ensure *all* students' needs are met.

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## **Chapter 1**

### **Introduction**

The enactment of the Federal No Child Left Behind Act (NCLB Act) of 2001 has been a game changer for accountability of student achievement in American public schools. The NCLB Act holds states accountable for improving academic achievement for all students regardless of ethnicity and socioeconomic background. Under NCLB, schools must meet Adequate Yearly Progress (AYP) by demonstrating an increasing percentage of students meeting proficiency standards in mathematics and reading, with the goal of 100% of students meeting proficiency standards in the school year 2013-2014. Many analysts worry that programs and policies, including NCLB, tend to focus on improving the lowest-achieving students and leave the high-achieving students ignored (Finn, Scull, & Winkler, 2011). In the effort to help our lower-achieving students, could it be that high achievers are being left behind? The purpose of this study was to examine the performance trends of high-achieving students at the individual student level. It analyzed which students maintained high-achieving status over the course of the study, which students were initially high achieving but lost their advantage overtime, which students developed into high achievers by the end of the study, and which students were not high achievers at all. It also analyzed if there was a difference between the performance trends of high-achieving students by gender, ethnicity, and socioeconomic status. How are high-achieving students performing in the era of accountability? Are their needs and challenges being met so they reach their fullest potential?

In 2000-2007, achievement in high-achieving students leveled off compared to the much faster growth in achievement of low-achieving students (Loveless, 2008). In a survey of 900 nationally representative public-school teachers, 81% believed that

academically struggling students are most likely to get one-on-one attention from teachers while only five percent named advanced students (Duffett & Farkas, 2008). Another indication is the lack of funds allocated by the federal government to gifted education in respect to the enormous amount of money invested in K-12 education. There was also not even a minimum standard imposed for gifted education despite many mandates for low achievers with NCLB. This made it easy for states and districts to ignore the needs of high achievers (Epstein, Pianko, Schnur, & Wyner, 2011). Over time, this can be an overshadowed problem with significant ramifications for the future of our nation's competitiveness. In fact, according to the 2009 Program for International Student Assessment (PISA) results, the United States ranked 14<sup>th</sup> in reading, 25<sup>th</sup> in math, and 17<sup>th</sup> in science among the 34 participating countries. In the PISA results two years later in the 2011, other countries caught up with or passed the United States. The United States placed 31<sup>st</sup> out of 56 participating countries in the advanced level in mathematics (Epstein, Pianko, Schnur, & Wyner, 2011). If the nation wants to remain globally competitive, some argue that we need a "public education system that pushes beyond the limits of the 'talented tenth' paradigm and fully develops the human capital of far more of our students" (Epstein, Pianko, Schnur, & Wyner, 2011, p. 51).

### **Statement of the Problem**

State accountability systems are currently reinforcing the focus on low or minimum standards. Because most accountability systems are tied to sanctions and states do not want to sanction the majority of their schools, standards have remained relatively low (Dougherty, Mellor, & Smith, 2006). States also do not want to set standards at a level that would deny high school diplomas to high percentages of disadvantaged

students (Dougherty, 2008). As a result of the passing standards being so low, passing standardized tests and getting a high school diploma do not accurately signify college and career readiness. School systems that embrace high standards and college and career readiness can adopt their own higher goals instead of waiting for state standards to rise. Research shows that “setting ambitious college-readiness standards and goals can be a powerful strategy for steering a school system towards excellence” (Dougherty, Mellor, & Smith, 2006, p. 4). Schools systems should push students beyond the passing standard and seek to achieve advanced levels of achievement or total mastery.

Research on individual performance trends of top students is minimal. Districts and campuses that want all of their students to reach their fullest potential need to know and track how their top performing students are achieving in their school system. Knowing who high achievers are and how they perform over time can give a clearer picture of how they are performing in an era of accountability. Just as schools and districts track low-performing students, or “bubble” students, whose state assessment scores fall near the passing standard, they should track these high-performing students, or “bubble” students, near the advanced standard. The need for analysis of high achievers fell under four categories: 1) The importance of college readiness standards for all students; 2) The need to examine the growth rate gap in low and high achievers; 3) The need to examine the representation of minorities and low-income students amongst high achievers; and 4) The nation’s need to produce high achievers to remain globally competitive.



**The importance of college readiness standards for all students.** According to Dougherty, Mellor, and Smith (2006), school districts that want to prepare their students for post-secondary education and work must do at least three things. The first is to adopt high college-readiness standards that minimize the amount of remediation a student will need in college. The second is to make these high standards the K-12 curriculum for all students regardless of their background. The third is for students to reach these high standards in elementary school. By the time students reach the secondary level, achievement gaps are difficult and costly to close due to the amount of catch up these students may need. School systems that embrace attainable college readiness standards for *all* students will elevate the performance and goals of their students and schools.

Currently, states set their own standards for their curriculum and standardized assessments. Federal funding is tied to mandates related to student achievement on these standardized tests. This causes policy makers and educators to set attainable goals that do not cause many of their schools or districts to fail (Dougherty, 2008). Setting the focus and achievement bar at too low of a level does not help close the achievement gap. If schools want to work on closing the achievement gap in a way that all students have the skills and opportunities necessary for college and a competitive workforce, then schools need to shift their long-term focus to college-readiness for all students (Dougherty, Mellor, & Smith, National Center for Education Accountability, 2006). Federal mandates do not currently incorporate minimum standards for high levels of achievement, but schools districts and states can incorporate them on their own.

An example would be in 2010-11 when the state of Texas incorporated high achievement into its accountability system by adding a Commended Performance (CP)

standard to the higher ratings of Recognized and Exemplary. To earn commended performance on the Texas Assessment of Knowledge and Skill (TAKS) standardized test, a student must score 2400 on the exam, which is considerably higher than the state standard and is typically only a few questions away from total mastery. To meet the met standard level, the student must score at least a 2100 on the test. To receive the rating of Recognized by the Texas Education Agency (TEA), campuses needed to have 15% of students score at the commended level and 80% of students meet the met standard level for each subject. To receive the rating of Exemplary, 25% of students needed to have scored at the commended level of performance and 90% of students meet the met standard for each subject. CP was evaluated only for reading/ELA, math, writing, and social studies in two student groups – All Students and Economically Disadvantaged - if the minimum size criteria were met.

In 2004, the Texas Higher Education Coordinating Board released information on the “relationship between TAKS scores and student performance on other college readiness measures such as the SAT, ACT, and the Texas Higher Education Assessment (THEA) exam” (Dougherty, Mellor, & Smith, National Center for Education Accountability, 2006). In determining the commended performance benchmark, the Texas Higher Education Coordinating Board made a concentrated effort to find a math and reading/ELA benchmark that would give a strong indication that the student would be ready for college algebra and not require remediation in reading or writing.

School leaders should monitor commended performance students as closely as the below standard students. Schools should aim for students to be taught consistently rigorous, college-ready curriculum from a young age and through the school years. That

would “equalize opportunities across socioeconomic backgrounds so that no group of citizens is denied the benefits of a strong education” (D'Angiulli, Hertzman, Kohen, & Maggi, 2004). Maintaining commended performance for high achieving students is critical in ensuring sustainable achievement in any school system. For states like Texas that use a criterion-referenced standardized test, commended performance means near total mastery of objectives. That can and should be an expectation for all students. This study will give school leaders insight on who current high achievers are, how they are performing over time, which subpopulations are underrepresented among high achievers, and how to increase and maintain the high-achieving population.

**The need to examine the growth rate gap in low and high achievers.** Since NCLB's enactment, achievement has increased for low-achieving students, and at a strong growth rate (Loveless, 2008). This is certainly worth celebrating, even though they are still far behind. NCLB's goal is clear, as it is titled on its cover “An Act to close the achievement gap.” Therefore as a nation, we have focused on and allocated resources and time to closing achievement gaps by bringing up our lowest achieving students. Another goal is for all subpopulations to meet the same goals. These subpopulations include gender, ethnicity, and socioeconomic status.

However, the nation has not put emphasis in ensuring there are no achievement gaps between gender, ethnicity, or socioeconomic status subgroups for high-achieving students. Recognizing and maintaining high achievement among students, regardless of gender, ethnicity, or socioeconomic status, are key components to successfully eliminating achievement gaps over time. Research shows the growth rate for high-achieving students is not as strong of a growth rate as low-achievers, although they have

increased (Finn, Scull, & Winkler, 2011). For example, in 2000-2007, average 4<sup>th</sup> grade reading NAEP scores for the top percentile of students increased by 3 points. The lowest percentile of students increased their scores by 16 points. On the 8<sup>th</sup> grade math NAEP, average scores for the top percentile of students increased by 5 points compared to a 13-point increase for the lowest percentile (Loveless, 2008). This leveling effect is cause for concern and can indicate a decline of high achievers in the future.

At the federal level, the level of performance for high achievers is not mandated. There are no expectations for growth or minimum performance-level mandates for high performers. If the nation is to foster and expect the growth in achievement for these students, the measurement of growth or decline of these students' achievement cannot continue to be excluded in the accountability system. Likewise, the difference in programs or interventions available to at-risk students versus high-performing students is vast. Districts and schools spend time, money, and resources on closing the achievement gap in their population. They might offer after-school tutorials, Saturday tutorials, pull-out programs, concept recovery programs, study guides for students and parents, turn-around classes, and more. These are in an effort to help lower-performing students get closer to and over the passing standard on state assessments. Most of the time, districts and schools are not making anywhere near the same effort to try to work with students who are near the advanced level of performance to help push them over the advanced-standard line.

**The need to examine the representation of minorities and low-income students among high achievers.** A notable concern is the underrepresentation of minorities and low-income students in the population of high achievers. In 2005, there

were 380,000 8<sup>th</sup> grade students who scored in the 90<sup>th</sup> percentile on the NAEP math test. Only 10.2% of those students qualified for free-and-reduced lunch. Of those students scoring in the 90<sup>th</sup> percentile, 81.5% were white, 2.6 % were black, and 4.4 % were Hispanic. Among 8<sup>th</sup> grade students nationwide, 61.1% were white, 16.1% were black, and 16.2% were Hispanic (Loveless, 2008). Minorities and low-income students are underrepresented among top students in the United States at all levels of the educational system – from elementary to post-secondary. “This longstanding pattern has been documented by virtually every traditional measure of academic achievement, including grade point average (GPA), class rank, and standardized test scores” (Miller, 2004, p. 1).

Regardless of gender, ethnicity, and socioeconomic status, high-achieving students have flown “under the radar” as they have no problems passing state assessments. Measuring achievement growth and declines of high-achieving students is just as important as measuring the achievement growth and declines of low-achieving students. All children deserve to reach their fullest potential. Schools need to know if they are truly meeting the needs of all students. Little research has been completed at the individual level for high-achieving students, regardless of gender, ethnicity, and socioeconomic status, yet it is certainly an influential and potentially powerful population for the future of society.

**The need to grow high achieving people in society.** According to the World Bank (2004a), there are five integrated blocks for an economy’s improved competitiveness. These include physical infrastructure, business environment, trade and investment facilitation, financial services, and human capital. An educated population is associated with increased return on capital, better health status, transmission of cultural

values, more intelligent political participation such as voting, and reduced criminal behavior. These are factors that affect a country's overall competitiveness (United Nations Programme Development, 2005).

Human capital theory explains the importance of and the links between skills and competitiveness. The basis of the theory is that education and training are investments that produce returns in the future (Quiggin, 1999). In other words, what the nation is investing in the education and training of people should produce positive returns on investment in the future.

Over the past decades, the United States has recruited high achievers from other countries. People from all over the world have migrated to the United States to get an education and to live and work in the United States. In recent years, the trend has changed. These high achievers are coming to get an education and are then moving back to apply their knowledge in their home country. The United States can no longer depend on this human capital of some of the best and brightest students from its school systems.

In addition to the loss of high achievers that choose to live and work outside of the United States, the total population of high achievers within the United States is in danger of shrinking. The United States is becoming a minority majority country and minorities are underrepresented among high achievers. The country is headed in the direction to not have enough high achievers in the future to compete with other nations.

It is critical that schools consider the high-achieving students in the age of accountability. It is understandable that schools will focus their resources on low-achieving students as the penalty for not meeting Adequate Yearly Progress (AYP) is steep; however, in this global economy which is constantly evolving and expanding, we

cannot afford to lose our competitive edge. To do that, schools must continue to invest resources and efforts into challenging high-achieving students with rigorous curriculum and high expectations. These students are a valuable resource and will most likely produce a higher return on investment in a variety of ways for the school, community, and nation.

### **Purpose of the Study**

The purpose of this study was to track the performance of a cohort of students at the individual student level to create and analyze longitudinal performance trends. By categorizing and tracking which students maintained, gained, lost, or never had high achieving status, this study allowed the high-achieving population to be examined more closely. The population was examined by gender, ethnicity, and socioeconomic status to determine trends or gaps among subpopulations.

When studying high achievers, it is to be expected that not all students will maintain their high achieving status. Some students will lose status over time. The question is who? If a large percentage of students who lose their high-achieving status come from certain subpopulations, it is a cause for concern. For example, if a pattern shows a decline in achievement amongst girls in math, or a decline in achievement amongst Hispanics in reading, it is important to identify and intervene. It is also realistic to expect some students to gain high-achieving status in later grade levels. These students are also important to study as they have made improvements, and schools should want to know what worked for them in hopes of helping more students become high achievers. It is also important to look at those who were not high achieving at all. Who are those students?

This study examined if there are differences in performance trends of high achieving students by gender, ethnicity, and socioeconomic status.

### **Recent Research on High Achievers at the Individual Student Level**

In 2011, a study conducted on individual high achievers and their performance over time gave light to the difference in performance trends by gender, ethnicity, and socioeconomic status. It was the first study to examine the achievement of high performing students over time at the individual level and was detailed in *Do High Flyers Maintain Their Altitude? Performance Trends of Top Students* (High Flyers) by authors Xiang, Dahlin, Cronin, Theaker, and Durant. Studies on high achievers have been limited. They are generally limited to a short time frame or few grade levels. They may not have analyzed school poverty and other school context. They may not have the data that allows the researcher to track students at the individual level.

High Flyers defines high achievers as students who scored at or above the 90<sup>th</sup> normed percentile on the Measures of Academic Progress (MAP) reading and math assessments. They tracked two groups of high achievers: an elementary/middle school cohort and a middle/high school cohort. The elementary/middle school cohort was followed from 2004-05 through 2009-10 as they progressed from third to eighth grade and consisted of 81,767 students in math and 93,182 students in reading from 1,500 schools in 30 states. The middle/high school cohort was followed from 2005-06 through 2009-10 as they progressed from sixth grade to tenth grade and consisted of 43,423 students in math and 48,220 students in reading from more than 800 schools in 28 states. This analysis tracked students to determine how many of them remained high-achieving



over time, how many lost their high-achieving status, and how many gained the high-achieving status in later grades.

Data from the High Flyers study revealed surprising results. One finding was that nearly three out of five high achievers maintained their high achieving status over the years. In the elementary/middle school cohort, 57.3% in math and 55.9% in reading maintained their status. In the middle/high school cohort, 69.9% in math and 52.4% in reading maintained their status. Despite the 30% to 50% of students who declined and lost their high-achieving status over time, in the final year of the study, there were more high achievers than in the initial year. The number of “late bloomers” who gained the high-achieving status in the later years surpassed the number of students who declined.

Another finding was that those that lost their high-achieving status and those that gained their high-achieving status during the study came from or remained in the top third of students. Those who fell below the 90<sup>th</sup> normed percentile on the MAP assessment typically fell only to the 70<sup>th</sup> or 80<sup>th</sup> percentiles. Those who later gained and scored at or above the 90<sup>th</sup> normed percentile typically came from the 70<sup>th</sup> or 80<sup>th</sup> percentiles. They did not find evidence of low-performing students from the 20<sup>th</sup>-40<sup>th</sup> percentiles entering high-achieving status.

Another finding of the study was that high-achieving students grew academically at similar rates as low and middle achievers in math. The performance gap between low, middle, and high performing students’ mean scores in math were about the same over the four years. However in reading, the performance gap between high and low achievers narrowed by over a third. The low-achieving elementary/middle school students grew

nearly twice as fast as the high achievers. While this is laudable for the low achievers, the leveling of the high achievers growth rate is of concern.

Which students were likely to remain High Flyers? Are the students who lost their status or gained their status distinguishable by race, gender, or socio-economic status? They found that minorities, females, and students in high-poverty schools were underrepresented among high achievers in the elementary/middle school and middle/high school cohorts. Minorities included African American, Hispanic, and Native American students. Non-minority students included Anglo and Asian students. Representation of minority students among the high achievers grew or stayed the same in all subjects and grades, which shows growth and improvement, albeit they represented less than 10% of the high achievers. Females were underrepresented among high achievers in math and slightly overrepresented among high achievers in reading. In the elementary/middle school cohort, representation of girls among high achievers rose from 41.9% to 44.0% of high achievers in math. In reading, they rose from 51.7% to 53.0% in reading. In the middle/high school cohort, the girls rose from 39% to 41.7% in math, and from 49.8% to 52.6% in reading. The number of students from high-poverty schools among high achievers experienced declines in their representation. In the elementary/middle school cohort, students from high-poverty schools declined from 19.4% to 16.1% between third and eighth grade in math, and from 13.5% to 13.4% in reading. In the middle/high school cohort, they declined from 18.1% to 15.3% between 6<sup>th</sup> grade and 10<sup>th</sup> grade in math, and from 16.6% to 14.7% in reading.

The findings of *Do High Flyers Maintain Their Altitude?* are valuable and pave the way for more research in the field of high-achieving students. The research

conducted in the study influenced the research in this study on high-achieving students. Top students in schools are the nation's greatest resource for the future. Little research has been conducted on high-achieving students, and this study will add to the gap in the research on longitudinal performance trends of high achievers.

### **Implications for School Leadership**

School leaders and educators are charged with the duty to educate each and every child, no matter his or her disability, background, ethnicity, gender, or income level. Every student deserves to be academically challenged based on his or her initial knowledge level, which can be difficult for schools to achieve, especially with the diverse and mobile population in the United States.

Educators should be highly motivated to work with and grow top students. High-achieving students are academic leaders and represent the best of the best on the campus. They go on to post-secondary education or into the work force, most likely contribute to the community and society, and give a name for the school and neighborhood. The notion that high-achieving students can learn on their own or fend for themselves is simply not accurate. Current students face a global competitiveness that no other generation has encountered. They must be at the top of their game and be able to compete with the world's best. It is essential to examine the performance trends of high-achieving students over time to ensure they are given the rigorous and engaging education that they need and deserve. Societies advance and thrive on the innovations of top achieving people. The repercussions and costs of stifling human potential are immeasurable. School leaders need to know how high achievers are doing on their campus and in their school system so adjustments can be made if needed.

Implications for the practice of school leaders begin with having an awareness of how top students are performing. They can then use that data to develop and implement staff development for teachers of gifted students and allocate necessary resources for program development efforts to ensure all students' needs are being met. This study, by examining performance trend differences by gender, ethnicity, and socioeconomic status, will give light to subpopulations that may be underrepresented among high achievers. It will also reveal whether the number of high achieving students in schools is growing, leveling, or even worse, declining.

Another implication for the practice of school leaders includes having ability to make decisions based on trends of advanced-levels of achievement by grade level. For example, if a drastic decrease in high achievers occurs between two particular grade levels, school leaders can examine this weak point. It may be a curriculum void. It may be the teaching at that grade level. It may be the foundations from previous grade levels are not being properly taught. No matter what the school leader chooses to investigate, the issue is at least revealed and able to be addressed. If school leaders are not tracking high achievers at the individual level, these issues are not being raised and investigated. It can be difficult and costly to try to recover students once they have lost their high-achieving status. Most analysis of commended performance or high achievers compare different sets of students. Analyzing students at the individual level gives school leaders a longitudinal look at the schools' programs.

Another implication for school leaders is to look at the achievement status of students from the initial year to final year. This gives an overall look at which students maintained status along the way, gained status later, lost status they once had, or never

had high-achieving status. For those that maintained or gained status, there are insights to what works for them. School leaders can look at the characteristics of those students in the effort to duplicate those characteristics for other students. For those that were once high achieving but lost status along the way, insights must be gained to minimize the drop in achievement of these students. These students were once high achieving alongside their peers. The characteristics and causes of those that lost status will help school leaders focus on retaining these students before they lost status. For the students who were never high achieving during the study, the resources, efforts, and strategies used to lift lower-performing students to the proficiency levels should be applied relatively to students who have the potential to reach advanced levels.

School systems and school leaders should track and identify their high-performing students, apply effort and resources to maintain and grow more high achievers, and work to close any achievement gaps among subpopulations.

### **Research Questions**

This study examined the performance trends of high-achieving students to determine and find answers to the following research questions.

- What are the performance trends of high-achieving students over time?
  - What percentage maintains their high-achieving status over time?
  - What percentage loses their high-achieving status over time?
  - What percentage gain high-achieving status over time?
- Is there a statistical difference between the performance of high-achieving students by gender, ethnicity, and socioeconomic status?

## **Definition of Terms**

### **High Achievement**

This longitudinal descriptive study examined individual students as they progressed from 5<sup>th</sup> to 8<sup>th</sup> grade. Students were considered high achieving by scoring commended performance on the Texas Assessment of Knowledge and Skills (TAKS) in mathematics and/or reading. The TAKS test is a criterion-referenced standardized test used by the state of Texas public schools since 2003 to measure student attainment of reading, writing, mathematics, science, and social studies skills. It is the state's standardized test for No Child Left Behind.

Students demonstrate a level of proficiency on the TAKS test by scoring a minimum of 2100 on the exam, which is considered "met standard." In this study, high-achieving students are defined as students who earned "commended performance" on the TAKS test in reading and/or math. To earn commended performance on TAKS, a student must score 2400 on the exam, which is considerably higher than the state standard and shows a strong understanding of the knowledge and skill tested at the grade level.

### **Matched Data Set**

In this study, the cohort of students was a matched data set. This means the study looked at the same set of students over time. The students had to have been in the district during each year of the study and had a standardized test score in math and reading during each year of the study to be included in the sample.

## **Chapter 2**

### **Literature Review**

The following is a selected literature review that focuses on high-achieving students and their achievement over time.

#### **High Achievers: An Overview**

The first section of this chapter, “College Readiness: A Goal for All Students” provides information on school systems and states that have moved towards college readiness goals for all students and how they have accomplished and defined it. Only some states have longitudinal databases for students that track performance from P-12 and higher education. Texas has had a statewide longitudinal database since 1990 (Dougherty, 2008).

The second section of this chapter, “High Achievement and Gender” provides information on performance trend differences in achievement between high-achieving males and females. Over the decades, there has been an achievement gap between males and females, most notably in math and science. Males have and continue to outperform females in math and science achievement tests (Park & Reis, 2001). There could be a number of reasons and combination of reasons for the achievement gap between genders. Different attitudes about achievement by boys and girls, different treatment by teachers, and different abilities and backgrounds are all possible causes. This section will examine research on gender differences in schools.

The third section of this chapter, “High Achievement and Ethnicity” provides information on high-achieving students from different ethnic groups and differences in their achievement. Achievement gaps between Black and Hispanic students when compared to White students have long been a hot topic in educational research. The

achievement gap exists at all levels of education, from elementary through post-secondary school (Miller, 2004). One goal of NCLB is for all American public school students to reach the level of proficient regardless of ethnicity by the school-year 2013-2014. Achievement gaps for the proficient level amongst low-performing minorities and Whites have narrowed over the decades, yet they still continue. How does this trend look for advanced-level students? Is the gap narrowing or widening? Minorities are not only scoring lower on achievement tests, they are underrepresented in top quartiles of students by grades. Minorities are also underrepresented in rigorous curriculum, such as Advanced Placement or Honors courses, and possibly as a result, are also underrepresented in the nation's top colleges (Miller, 2004). This is of significance for the future of our diverse nation. As the United States' minority population grows, attention must shift to high achievers in that growing population as they will play a significant role in the future of the nation's economy, human capital, and global competitiveness.

The fourth section of this chapter, "High Achievement and Socioeconomic Status" provides information on the differences in achievement between low-income or non-low-income students. Evidence shows that low-income students are disproportionately underrepresented in top percentiles of students, and that the school system is not raising or maintaining high achievement in low-income students at the same rate as non-low-income students. Little research has been conducted on low-income students who are high-achieving. That is due in part to the fact that states have not been required by the federal government to collect, track, or disaggregate data on this population. Many have the belief that all high-achieving students come from high-



socioeconomic families, can fend for themselves, and have support and guidance to be successful in school (Finn, Scull, & Winkler, 2011). In 2007, there were 3.4 million high-achieving, low-income students in American public schools (Bridgeland, DiIulio, & Wyner, 2007). Although percentage-wise, they are underrepresented, number-wise, there are a lot of these students. This is not a small population that does not warrant studying, growing, or nurturing. One goal of NCLB is for all students, regardless of socioeconomic background, to perform at the proficiency level by school year 2013-2014. Yet research shows that the majority of economically disadvantaged students are educationally at-risk before they even enter school. That leaves the schools completely responsible and accountable for catching these students up no matter what their background may be. High-achieving students, especially those who live in low-socioeconomic neighborhoods where many more educationally disadvantaged students are concentrated, can become disengaged by the academic pacing which must slow down to accommodate the higher percentage of low-achieving students in the classroom. Having students with such a broad range of abilities asks teachers to have to bring up low-performing students along with meeting the more academically rigorous needs of our high-achieving students. This section will outline research on socioeconomic status and achievement.

### **College Readiness: A Goal for All Students.**

In *Identifying Appropriate College-Readiness Standards for All Students*, authors Dougherty, Mellor, and Smith (2006) focus on the importance and benefits of school systems that set college-readiness standards for all students which are higher than state standards. School systems can become shortsighted at targeting incremental test score

gains which can result in narrowing instruction to focus on test items, focusing on a limited student population close to the passing standard, or narrowing the curriculum by omitting content not on this year's test but are valuable in the long run. The authors examine a case study on the state of Texas and how it set the college-readiness benchmarks on its standardized TAKS test. In 2004, the Texas Higher Education Coordinating Board related TAKS scores to predicted student performance on other college-readiness measures such as the SAT, ACT, and the Texas Higher Education Assessment (THEA) exam. The goal was to find a scale score for 11<sup>th</sup> grade exit-level TAKS that would indicate that a student would most likely not need any remediation when entering college. From there, scale scores should be identified at lower grade levels that would keep students on track for college readiness by the time they graduate from high school.

In *They Can Pass, but Are They College Ready?*, author Dougherty (2008) describes the identification process required to accurately set college readiness benchmarks on state tests. A properly designed longitudinal student database will inform the setting of these benchmarks to indicate college and career readiness. Setting the correct benchmark requires the weighing of advantages of higher and lower standards. Standards that are set too high can be discouraging and detrimental to disadvantaged students. Standards that are set too low can cause students to struggle in college because they were not identified as needing remediation.

In *Passing Tests Not Prize – To Indicate True Subject Mastery, Students Should be 'Commended,' but Few Districts Boast Top Scores*, the Dallas Morning News (2009) reports that policymakers and business leaders are troubled at the small percentage of

students performing at the commended level in some districts. Even though the state and federal accountability system do not require minimum commended performance standards, businesses, parents, and community members do look at those percentages. Some districts set specific goals for commended rates. Dallas ISD set a plan for 70% of high school students to be commended. Focusing on passing rates can be “detrimental for college-bound students – even though they passed the exit-level TAKS tests, many of them need remedial reading or math classes” (p. 1). Commended levels indicate a rigorous curriculum that challenges students to achieve a greater depth of learning.

### **High Achievement and Gender**

In *Gender Differences in High-Achieving Students in Math and Science*, authors Reis and Park (2001) analyze gender differences between high achieving students in math and science with respect to their achievement. This study used data from the National Education Longitudinal study of 1988, which had a follow up every two years in 1990, 1992, and 1994. The study focused on those who were defined as high achieving (top 10%), which resulted in 1,328 students. The researcher examined the differences in achievement in math and science between males and females. They found that there were more high-achieving males than females in math and science, when defined by a test score. The males outperformed the females significantly on the achievement tests. The mean score for males in math was 707 compared to the mean score for females at 621. The mean score for males in science was 809 compared to the mean score for females at 519. Various reasons are cited in the research literature to explain why some females do not succeed in or pursue math or science. These include a lack of ability or effort, issues related to socialization of talented students’ perceptions of their ability, low

self-efficacy in math or science, the influence of standardized tests, parent and teacher attitudes on performance, and perceptions about future careers (Arnold, 1995; Callahan, Cunningham, & Plucker, 1994; Fennema, 1990). The authors reference the work of Swiatek and Lupkowski-Shoplik (2000), which note attitude differences between gifted elementary-aged students. Boys tend to favor science and technology, while the girls favor English, writing, reading, and foreign language. According to the Educational Testing Service in 1996, males averaged 46 points higher than females on the math section of the SAT exam. Rogers (1990) suggests that when the classroom teacher creates a classroom environment that is open and supportive, more females will be attracted into the fields of higher level math. Gavin (1996) found that nearly half of female math majors attributed their decision to major in math to the influence of a high school math teacher who encouraged them and affirmed their talent in math. The authors note the importance of promoting high achieving males and females into the field of math and science. They recommend that more work needs to be done to narrow the achievement gap in math and science between males and females. They suggest teachers and parents to encourage high-achieving males and females by fostering high expectations and support. Teachers of gifted students must be prepared to recognize and affirm talent in their math and science classrooms, especially amongst girls.

In *“Brains Before ‘Beauty’?” High Achieving Girls, School and Gender Identities*, authors Francis, Read, and Skelton (2010) conducted a qualitative study on 71 students from 9 different schools in the UK. Of the 71 students, 36 were female. All students were 12- to-13-years-old and identified to be high-achieving by their teachers. They were observed in a variety of classes and then individually interviewed. What they

found was that all students agreed that being high achieving and a successful student included getting along with classmates. Girls had to negotiate more between being attractive, popular among peers, and the pressure to be academically successful. Earlier studies found that girls tend to have lower self-confidence and have greater anxiety about school performance (Lucey, Melody, & Walkerdine, 2003). The authors argue that general stereotypes of “good girls” and “bad boys” in school are not only inaccurate but could be damaging to girls. It gives the perception that all girls are successful, and all boys are not. This misperception can cause high-achieving females whose achievement declines to remain unnoticed. It also gives the misperception that boys need more attention from their teacher because they are harder to teach and manage than girls are. Being a “proper school girl” means being cooperative, diligent, conscientious, and caring to teachers and friends (Hey, 1997). The study showed that many girls in the study find peer approval and being with friends more important than academic achievement. The authors look at the pressures placed on girls to be popular and high achieving. Some studies show an increasing link to academic achievement and the increase in the level of self-harm and eating disorders (Evans, Holroyd, & Rich, 2004). The author notes that gender expectations and pressures do affect students’ experiences and successes in school. Understanding the differences in perceptions on high achievement between males and females certainly needs to be considered when analyzing differences in achievement between the populations.

The article “Comparison of Teacher Talk Directed to Boys and Girls and Its Relationship to Their Behavior in Secondary and Primary Schools” looks at gender in the classroom. Alex Harrop and Jeremy Swinson (2009) conducted a study to investigate

communication between teachers and boys, teachers and girls, and the type of interactions that take place in the classroom. Do teachers give more attention to boys or girls? Do they give more positive or negative feedback to boys or girls? How do boys and girls differ when it comes to on-task and off-task behaviors? Several large and small scale studies from the past which investigated teacher communication and attention between boys and girls resulted in conflicting results. In some cases, boys were found to receive more criticism and neutral comments about their behavior. Other cases found the interactions to be equal or little difference.

Swinson and Harrop (2009) conducted an investigation in which 18 primary school teachers and their classes were observed. Teacher behaviors that were observed were questioning, instructing and redirecting, approval for academic behavior, approval for social behavior, disapproval for academic behavior, and disapproval for social behavior. This was observed with the students demonstrating on-task behavior. Swinson and Harrop (2009) carefully defined each teacher behavior and were specific in how the teachers were observed. The results of the primary-level study showed that boys received more teacher communication in all six categories, with “instruction and redirection” being the most statistically significant. The results also showed a statistically significant difference in on-task behavior with girls having a mean score of 93% and boys at 86%. Additionally, it was noted that more than half of the boys were off-task more than once in a lesson compared to less than one third of the girls were off-task more than once.

Harrop and Swinson (2009) designed an investigation that used the same methodology of their study conducted in primary schools to see if secondary schools would yield the same results. Twenty different teachers and their classes were observed.

Each observation lasted approximately 45 minutes. The gender of each student was noted and teacher utterances were observed at 10-second intervals. On-task behavior was observed twice at the beginning, twice in the middle, and twice towards the end of the lesson. The teacher's verbal behavior was categorized into the six categories. Means and standard deviations of the teachers' utterances were analyzed by one-tailed *t*-tests.

Results of the study, compared to the primary schools, for the six categories: (1) Questioning: In primary and secondary, boys received slightly more questions than girls. (2) Instructions and redirections: In the primary, boys received more than the girls. In the secondary, girls received more than boys. (3) Approval for academic behavior: In the primary, boys received significantly more. In the secondary, no difference was found between boys and girls. (4) Disapproval for academic behavior: Boys received more in both settings. (5) Approval for social behavior: In the primary, boys received significantly more than the girls. In the secondary, girls received marginally more than the boys. (6) Disapproval for social behavior: boys received more than girls in both settings. It appears that the proportion of teacher talk with the genders appears to be relative compared to the levels of on-task behavior.

When the same methodology was used in the primary and secondary levels, the teacher communication behavior in the secondary levels were seen to be different than in the primary level. Overall difference in teacher talk to the genders in the secondary levels was very little; whereas, in the primary level, the boys received considerably more than girls. Also, there was little difference in on-task behaviors in the secondary level; whereas, in the primary level, girls exhibited more on-task behaviors than boys.

A limitation of this study would be that while the authors try to use the same methodology to get an accurate comparison between primary and secondary levels, variables in the sample are not completely accounted for in the study. Variables such as differences in individual student achievement, at-risk factors, home-life, classroom norms, or different classroom lessons/content areas are not factored into the study.

### **High Achievement and Ethnic Minorities**

This section serves to provide information on literature regarding achievement in minority students including achievement gap analysis and trends, opportunities or lack of opportunities for minority students, and perceptions by teachers and students regarding minority education.

**Achievement gaps among top percentiles of students.** Achievement gaps between Black and Hispanic students when compared to White students have long been a hot topic in educational research. The achievement gap exists at all levels of education, from elementary through post-secondary school (Miller, 2004). As noted earlier, one goal of NCLB is for all American public school students to reach the level of proficient regardless of ethnicity by the school-year 2013-2014. Achievement gaps for the proficient level amongst low-performing minorities and Whites have narrowed over the decades, yet they still continue. How does this trend look for advanced-level students? Is the gap narrowing or widening?

Most studies regarding minorities focus on minorities who come from low-socioeconomic households because they are at risk of school failure. Examples of programs created for those students are Head Start and Success for All. However, achievement for minorities who are from middle or high socioeconomic families has not



been studied in depth by educational researchers. Therefore, there are very few educational resources and strategies, from preschool through higher education, that show strong empirical evidence that they increase numbers of high-achieving minorities.

In *Are Achievement Gaps Closing and Is Achievement Rising for All?*, the data shows that long before NCLB, achievement gaps between minorities and Whites have been shrinking (Chudowsky, Chudowsky, & Kober, 2009). The Black-White achievement gap has been narrowing since NAEP scores were issued in the 1970's. The gaps have narrowed due to minority test scores improving, while test scores of Whites have increased only slightly. The Black-White and Latino-White gaps still remain large, especially among high-achieving scores. This has received relatively little attention when compared to the achievement gap for low-performing students. Chudowsky, Chudowsky, and Kober (2009) analyzed student achievement in grade 4 reading and math from 2002-2008 by subpopulation. It investigated achievement gaps between subgroups at three achievement levels – basic-and-above, proficient-and-above, and advanced. It found that all subgroups showed more gains than declines at all three achievement levels. The trends varied by subject and subgroup. Although the gaps narrowed, the gaps remained large – upwards of 20 percentage points in many cases.

In *Promoting Sustained Growth in the Representation of African Americans, Latinos, and Native Americans among Top Students in the United States at All Levels of the Education System*, author L. Scott Miller (2004) examines the achievement gap among high-achieving minorities at all levels of education from elementary to post-secondary. Miller references data from the federal government's Early Childhood Longitudinal Study, which showed that some minority students entering kindergarten

were already educationally disadvantaged before beginning school. These findings were based on basic literacy skills and mathematics concepts. Miller also looks at the large gap between African American and Latino AP scores and SAT scores when compared to the scores of Whites or Asians. This is important because AP and SAT tests are highly correlated with acceptance into top colleges. In the United States in 2000, 56,905 Whites and Asians scored 700 or higher on the math section of the SAT versus 2,454 minorities (Blacks, Mexican Americans, Puerto Ricans, other Latinos, and Native Americans). There were 23 times as many White and Asian seniors who scored a 700 or higher than the other ethnic groups combined. This is a huge gap that needs to be investigated. The same huge discrepancy is shown in the number of students taking AP exams and scoring a 3 or higher, where 299,400 Whites earned a 3 compared to 13,535 Blacks and 15,684 Mexican Americans. Blacks and Mexican Americans were much more likely to score a 1 on an AP exam than Whites and Asians in addition to an already small population taking the exams in the first place.

Minorities are not only scoring lower on achievement tests, they are underrepresented in top quartiles of students by grades. Minorities are also underrepresented in rigorous curriculum, such as Advanced Placement or Honors courses, and possibly as a result, are also underrepresented in the nation's top colleges (Miller, 2004). This is of significance for the future of our diverse nation. As the United States' minority population grows, attention must shift to high achievers in that growing population as they will play a significant role in the future of the nation's economy, human capital, and global competitiveness.

Miller (2004) makes suggestions from his study. He suggests establishing trend-monitoring systems for high achievers and additional research on high-achievers at the K-12 level, especially for minority students. He recommends education for minority parents as well. In general, there is an overall lack of research on high-achieving minority students and a lack of successful programs with empirical evidence showing improvement. The author recommends that more specialized nonprofit organizations or university-based centers focus on educating and supporting middle- or high-socioeconomic minority students and their parents on improving school readiness.

*In Mo' Money, Mo' Problems? High Achieving Black High School Students' Experiences with Resources, Racial Climate, and Resilience*, Allen and Griffin (2006) conduct a study on 17 Black, high-achieving high school juniors and seniors about their experiences in school. Half of the students attended a well-resourced suburban school, and the other half attended a low-resourced urban school. Using qualitative and quantitative data, the researchers examined how the context of the schools affected students in terms of preparation for college. The study found that no matter which context, the Black, high-achieving students faced unique barriers. At the well-resourced suburban high school, 39 AP and Honors classes were offered. At the low-resourced urban school, 9 AP and Honors classes were offered. The suburban school had a college counselor and the Advancement via Individual Determination (AVID) program, which is a program focused on improving college-going rates of low-income or minority students. The urban school did not have a counselor devoted just to being a college counselor nor the AVID program. Both schools had an on-campus college center with scholarship and application information.

In addition to the disparity in resources, the students' perceptions and rating of their high school's college preparation efforts were quite different. At the suburban school, where Black students were underrepresented in AP and honors courses, the Black students noted the abundance of resources available to them, but felt more racial tension. They felt an increased pressure to perform well to "prove" them worthy of being in AP and Honors classes. They also felt that teachers and counselors rarely encouraged them to apply directly to a 4-year university, and school personnel automatically thought they would be best suited at a community or junior college, despite having the academic strength to attend a university. At the urban school, where Blacks are the majority, the students did not note the feelings of racial tension in their school. They associated racial tension more with things that happen outside of school but not in school. They are aware of the lack of resources at their school but do not blame the school for that. They express frustration, not at the lack of resources, but at the underperforming students at their school who make their school look bad and constantly complain about what they do not have. At the urban school, the students generally were more appreciative of the efforts by teachers and counselors to guide them. The urban students felt that their teachers were the best of the best; whereas, at the suburban school, the students focused less on their teachers but more on the racial tension felt in the climate. Despite the different challenges these Black, high-achieving students faced, all of the students in the study showed resilience and still kept focused on their goal of attending college. Similar to the two schools in this study, the authors reference Ornelas & Solorzano (2004) which found that Black and Latino students are underrepresented in schools that offer Advanced Placement (AP) coursework, and, of the classes that are offered, enrollment is minimal by

Blacks and Latinos. Blacks and Latinos are also underrepresented in prestigious colleges. Urban schools, where Black students are often concentrated, have fewer resources, less per-student expenditures, and are more likely to have less-qualified teachers (United States Department of Education, 2004). This study outlined some of the different barriers Black, high-achieving students face. Context does make a difference and should be considered when working with this population.

According to AVID website, AVID is a “college readiness system for elementary through higher education that is designed to increase school-wide learning and performance. The AVID College Readiness System accelerates student learning, uses research based methods of effective instruction, provides meaningful and motivational professional learning, and acts as a catalyst for systemic reform and change” (AVID, 2013). Although the AVID elective is designed to help all students, its main focus is the least served academic students in the middle of academic achievement. AVID students have showed higher success rates than non-AVID students for over 30 years, which sets it apart from other school reform programs. In terms of taking Advanced Placement (AP) exams, AVID students outperform their non-AVID peers. For example, 57% of AVID Hispanics took AP tests compared to 14% of non-AVID students. For African American students, 14% AVID students took AP exams compared to 8% of non-AVID students. Of the 33,204 AVID seniors in 2012 who reported their demographics, academic achievement data and future plans, just over 98% indicated they would be graduating from high school, with 90% planning to attend a postsecondary institution: 58% to a four-year college and 32% to a two-year institution (AVID, 2013). Not all schools have programs like AVID available to their students. They may lack resources such as

staffing, funds, or district support. As school leaders, support, resources, and programs that focus on maintaining and growing high-achieving, low-income or minority students need to be made available.

In *Minority Scholars – Diversity and Achievement*, authors Saunders and Maloney describe the success of a program implemented in an Omaha high school to increase minority scholars and provide them with support (2004). It began in 1995 when minority students were severely underrepresented in honors and AP courses on the campus. Minorities accounted for 25% of the student population on that campus. At that time, out of 120 Honors English students, five were minorities. There were even fewer enrolled in the AP English class as seniors. In an effort to increase enrollment in rigorous coursework by minorities, high-achieving minority students formed a support group called Minority Scholars under the guidance and support of school administrators. They identified some barriers high-achieving minorities faced such as lack of support or encouragement from family and peers and a sense of isolation and pressure being a minority in predominantly White classes. The Minority Scholars met during lunch time instead of before or after school which allowed for all students to attend if desired. Funding came from a local, non-profit foundation. Support services provided to the members included college planning, test taking, career exploration, leadership, and time management. When the program began in 1995, there were only 15 members. In 10 years, it grew to 70 members. The number of minority students eligible for National Honors Society (NHS) increased from 6 students to 28 students. The number of male minorities in the program increased from 3 to 21. The number of Black students who qualified for the African-American Academic Achievement Award increased from 6 to

34 students. For increased diversity awareness for all students, the campus ELA department added several major works by minority writers to the course. Overall, this program successfully increased minority students in more rigorous coursework, thus increasing their chances of attending and graduating high school and college. The program has since been replicated at other Omaha high schools.

In *Breaking Barriers: A Case Study of Two High-Performing Schools*, two high schools with high enrollments of low-income and racially minority students are profiled (ACT, Inc., 2006). These schools successfully prepared students for post-high school goals, despite the odds that these students are less-likely to be successful in higher education. Over the years, both schools showed improvements in the academic achievement and college-readiness of their students. This was demonstrated by an increase in ACT test scores, a decrease in academic achievement gaps in most subjects among minorities and Whites, an increase in students taking more rigorous coursework, and fewer students taking remedial classes in college. What did these two schools do differently? In what ways did they change their emphasis?

The successes of these schools were due to a combination of multiple policy and practice efforts, including emphasizing college readiness for all students, a strong alignment of curriculum, increasing and maintaining an experienced and committed faculty, providing academic and career training and support, monitoring individual student progress, focusing on positive results, and parental and community involvement. To emphasize college-readiness for all students, the school held college planning nights, financial aid nights, and prep-courses for college admission tests. When students were accepted to a college or awarded a scholarship, the students' names were mentioned on

the public announcement system and put on a recognition bulletin board. To better align the curriculum, the school promoted upper-level coursework and emphasized literacy. The school looked at early math coursework and sequencing to better give a student the opportunity to take five years of high school math coursework before graduating. To maintain a more experienced and committed faculty, the teachers at both schools actively participated in Professional Learning Communities (PLC) to strengthen collaboration and networking groups. The teachers also were trained to take on the role of advisor for approximately 30 students. This allowed for individualized academic support and career planning support. Parents were involved in this process as well so all parties were actively supporting these students. The schools also made efforts to focus on positive results by having Quarterly Achievement Breakfasts to honor outstanding students, student of the month recognitions, and the college bulletin board. By changing their emphasis and making college readiness and academic success a top priority, these two case studies showed that teachers and school leaders can have a big impact on increasing the success of their students, especially those who are low-income and of racial minority.

### **High Achievement and Socio-Economic Status**

*In Are Achievement Gaps Closing and Is Achievement Rising for All?*, a multiyear study of student achievement in 4<sup>th</sup> grade reading and math from 2002-2008 was analyzed by subgroups at three achievement levels – basic-and-above, proficient-and-above, and advanced (Chudowsky, Chudowsky, & Kober, 2009). One of the goals of the study was to examine if low-income students have made gains at all three achievement levels and whether progress is lagging at any level. At the advanced level, these high achieving students showed more gains in math than reading. In reading amongst



advanced-level students, 63% of states showed gains over the years, 27% showed decline, and 10% had no change. In math amongst the advanced-level students, 70% of states showed gains over the years, 14% showed declines, and 7% showed no change. In most states, they found that the gap between low-income and non-low-income student achievement shrunk. However, in 10 of the 33 states with sufficient data, the gap widened. In those instances, the gaps most often widened because both groups improved, but the comparison subgroup improved more than the target group.

In *High-Flying Schools, Student Disadvantage, and the Logic of NCLB*, Harris (2007) looked at the causes of inequity and described the strong evidence that students' social and economic disadvantages are a significant cause behind educational inequity. Harris references the work of Fryer and Levitt (2004) in which studies of students in their first year of kindergarten are analyzed. The data showed that economic disadvantages can have a big impact on achievement levels before the students even enter school. The gap that the students begin with is similar to the gap that continues throughout their school years. The author concludes that schools *are* educating disadvantaged students, and at the same rate as non-disadvantaged students, but making up the ground lost before school started is difficult to overcome. Current NCLB regulations, which do not look at value-added or level gains at the individual student level, make schools completely responsible for all educational inequity, including those that a child may start out with before they are even in school. Harris' study compared achievement in high- and low-poverty schools. It found that schools with both low poverty and low minority are 89 times more likely to be consistently high-performing compared to schools with high poverty and high minority populations. Only 16% of high-poverty schools are high

performing. Coupled with a high minority population reduces it to only 10% of schools. The author concludes that laws like NCLB do not reward schools for what they can control and because accountability has the potential to facilitate school improvement, the system should move to value-added or level-gain analysis at the individual student level in order to measure accurate gains or losses.

In *The Constraints of Poverty on High Achievement*, Beilke and Burney (2008) examine differences in schools with higher minority and low-income student populations. These schools are less likely to offer rigorous curricula and Advanced Placement (AP) courses. Students of low-income are under-identified and under-represented in rigorous coursework. The study found that high-minority and low-income schools are less likely to have experienced and qualified teachers due to teachers not desiring to work at those schools and teacher burnout. High-achieving students in these schools are not presented with the academic rigor and challenges offered to their high-achieving peers in schools with lower minority and higher income. Low-income students are less likely to enter college and significantly less likely to graduate from college despite the advantages post-secondary education can bring them. Post-secondary education is associated with increased earnings over a lifetime and can be a low-income person's way out of poverty. Beilke and Burney (2008) recommend that high-achieving students of all income levels should be identified and provided with enriched and accelerated instruction and ongoing support to retain them in the curriculum, and teachers be provided with professional development to understand the limitations poverty brings to students.

In *Effects of Neighborhood Socioeconomic Characteristics and Class Composition on Highly Competent Children*, the authors examine high-achieving

students who live and go to school in economically disadvantaged neighborhoods (D'Angiulli, Hertzman, Kohen, & Maggi, 2004). Research shows that children of low-income families tend to perform worse than do children from affluent families. Research also shows that by grade 1, the proportion of students at risk for developing problems in reading and math vary depending on the school neighborhood. Some high-achieving students in a low-socioeconomic neighborhood school are held back from the slower academic pacing in a classroom with a larger proportion of students who may have difficulty in reading and math. Also, low-socioeconomic schools have less qualified teachers who are prepared to meet the needs of high-achieving students. The effort to maintain academic pacing with other classrooms and schools without low-socioeconomic populations can lead to teacher burnout, teachers wanting to transfer, and low morale.

In *No Child Gets Ahead*, Carnevale (2007) refers to the federal Early Childhood Longitudinal Study. In that study, more than one million grade school students from families making less than \$85,000 a year start out in the top half of their class. More than half of these students come from families making less than \$50,000 per year. Only half of these one million students will ever get a two-year or four-year college degree. These students are overlooked in American schools. Affluent children tend to have family support systems. Low-achieving students from the poorest families get compensatory government aid. These students from working-class families are on their own without much support. Decline of high-achieving students often goes unnoticed, especially in schools with a high number of low-achieving students. Even if they do well on standardized tests and bring home top grades, they are academically behind their peers in affluent public and private schools, which decreases their chances of getting into the

nation's top colleges. The author recommends that the education accountability system needs to move away from uniform standards and towards individualized standards, which can help the school system improve one student at a time.

*In Achievement Trap: How America is Failing Millions of High-Achieving Students from Lower-Income Families*, Bridgeland, DiIulio, and Wyner (2007) look at low-achieving students' disadvantages over time, starting with an unequal start. In the top quartile of first graders, only 28% are from lower-income families. The authors derive that if socioeconomic status did not make a difference, 50% of the top quartile should come from lower-income families. In the K-12 school years, low-income students do not maintain or gain high-achievement status as strongly as their non-low-income peers. As this trend continues over the school years and into college and graduate school, fewer and fewer low-income students are represented in top quartiles. In the nation's effort to raise the achievement gap for low-performing low-income students, it must be accompanied with the effort to promote high-achievement in that population as well. If high achieving students slip down over time, the effort to close the gap will not be successful. The researchers find that there are approximately 3.4 million students in K-12 who live in households earning less than the national median rate that are in the top quartile academically. Many assume that high-achieving students have the resources and family support to fend for themselves. There are 3.4 million students living in poverty but are high-achieving. If allowed to continue to decline, the nation will rob itself of highly-skilled and highly-educated workers. This large population is a valuable resource to our communities and country. Bridgeland, DiIulio, and Wyner (2007) suggest that it is time for the accountability system to hold schools responsible for not only meeting

proficiency standards but also meeting advanced levels. Information at the state and federal level for high-achieving low-income students is inadequate. A more rigorous approach in this field is needed if America values the potential of this large population of students. The article also highlights the obstacles that high-achieving low-income students face at every step from elementary school to graduate school.

### **Leadership in Schools**

School leaders have the huge responsibility of ensuring that all students are receiving a strong education. Effective school leaders do what it takes for all students to be successful. Knowing about achievement gaps or struggling subpopulations is not enough. School leaders are the ones that take that information or data and lead the charge in making changes. They identify issues, engage their stakeholders, lead the search for solutions, collaborate on plans that meet all needs, and then implement and sustain the change (Lezotte & McKee, 2006).

In “Stepping Up Leading the Charge to Improve Our Schools,” Lezotte and McKee state that “whatever the model of school improvement chosen, the degree to which a school or district is successful in implementing positive and sustainable change depends on a very important factor: an effective leader” (p. xii). School leaders are the ones that create the vision of a school system to meets all students’ needs. School leaders determine student priorities, staff development objectives, needs of the campuses and district, and how those things will be accomplished. Without school leaders that are willing to stay abreast of critical issues in the school system and to take action to turn the problems around, school systems will fail to meet the needs of students in an ever changing world.

*In The School Principal as Leader: Guiding Schools to Better Teaching and Learning*, the Wallace Perspective (2011) states that effective principals perform five key functions: 1) Shaping a vision of academic success for all students, 2) Creating a climate hospitable to education, 3) Cultivating leadership in others, 4) Improving instruction, and 5) Managing people, data and processes to foster school improvement. School leaders that create a vision of high expectations for all are taking big step towards closing the achievement gap between advantaged and less advantaged students. An effective school leader makes sure that vision and message trickles down to the faculty and students. Principals guide professional development for teachers that align with the vision and goals and cultivate leadership in others. School leaders strive to improve instruction on their campus by using data to drive decisions. Without effective school leaders, failing schools will not be able to transform.

## **Chapter 3**

### **Methodology**

This chapter outlines the procedures for examining the population trend of high-achieving students over time. This chapter includes a description of the research design, research questions, setting, subjects, procedures, and instruments.

#### **Description of the Research Design**

This is a longitudinal descriptive study examining high-performing students over time at the individual student level. In this study, students are considered high achieving by scoring commended performance on the math and/or reading Texas Assessment of Knowledge and Skills (TAKS) test. Test scores from a matched data set of students who were in 5<sup>th</sup> to 8<sup>th</sup> grade from 2007-08 to 2010-11 from one school district have been used. Whether the students earn commended performance on the Math and/or Reading TAKS test during grades 5-8 and when have been tracked. Performance trends have been identified, categorized, and examined by gender, ethnicity, and socioeconomic status.

#### **Research Questions**

This study examines the performance trends of high achieving students to determine and find answers to the following research questions.

- What are the performance trends of high-achieving students over time?
  - What percentage maintains their high-achieving status over time?
  - What percentage loses their high-achieving status over time?
  - What percentage gain high-achieving status over time?
- Is there a statistical difference between the performance of high-achieving students by gender, ethnicity, and socioeconomic status?

**Setting**

The district used in this research is located in a highly populated suburban area of Texas. The district is in the top ten largest districts in the state with nearly 70, 000 students in 2012. The district comprises of 74 campuses and 14 other sites and employs 9,000+ employees and substitutes. The 2012-2013 operating budget is \$481,323,227 with \$6,931 expenditure per student and 64% of M&O budget allocated to instruction. The representative demographics of the district were 29.5% African American, 19.48% White, 26.23% Hispanic, 21.82% Asian/Pacific Islander, and .51% American Indian. During the 2010-2011 school year, this district earned a Texas Education Agency (TEA) ranking as an Acceptable District as documented on the Academic Excellence Indicator System (AEIS) report.

Also documented on the AEIS report is the district's commended performance on the Texas Assessment of Knowledge and Skills (TAKS) Test for all grade levels tested. The sum of all grade levels tested and scoring commended were 38% in Math, 40% in Reading/ELA, 39% in Writing, 38% in Science, 58% in Social Studies, and 23% in all tests.

**Subjects**

The study will look at a matched data set of students in grade 5 in 2007-2008 through grade 8 in 2010-2011 from one school district. Matched data set indicates that the same set of students was analyzed over time. The students had to be in the district during each year of the study and have a standardized test score in math and reading during each year of the study to be included in this cohort.



*Table 3-1 Gender of Cohort*

Gender	Number of Students	Percent of Cohort
Males	1799	49.3
Females	1850	50.7

Note: Total number of students in cohort = 3650

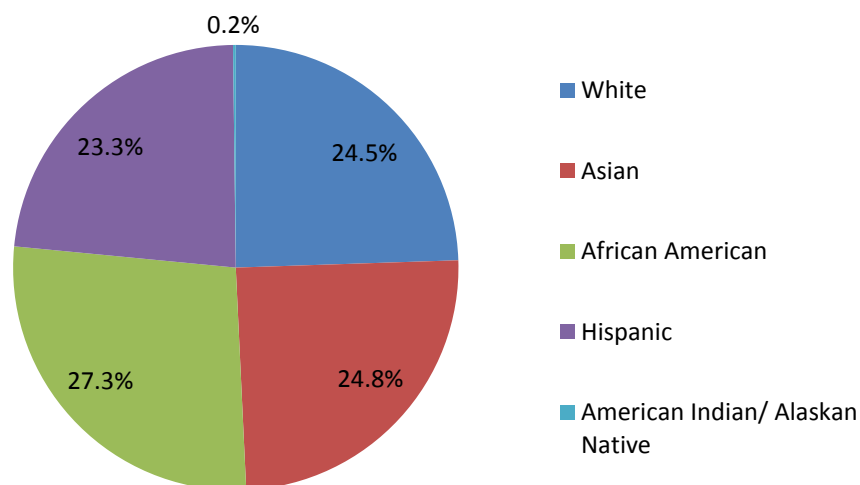
The total number of students in the cohort was 3,650. Of those, 1,850 (50.7%) were females and 1,799 (49.3%) were males.

*Table 3-2 Ethnicity of Cohort*

Ethnicity	Number of Students	Percent of Cohort
Asian or Pacific Islander	904	24.8
African American	996	27.3
Hispanic	850	23.3
White	893	24.5
American Indian or Alaskan Native	7	0.2

Note: Total number of students in cohort = 3650

*Figure 3-1 Ethnicity Breakdown*



The ethnic breakdown of the students in the cohort was 904 (24.8%) Asian or Pacific Islander, 996 (27.3%) African American, 850 (23.3%) Hispanic, 893 (24.5%) White, and 7 (.2%) American Indian or Alaskan Native. This data is outlined in Table 3-2 and Figure 3-1.

*Table 3-3 Socioeconomic Status of Cohort*

Socioeconomic Status	Number of Students	Percent of Cohort
Not Economically Disadvantaged	2555	70
Free Meals	825	22.6
Reduced Meals	270	7.4

Note: Total number of students in cohort = 3650

A total of 1,095 (30%) of the students were economically disadvantaged with 825 (22.6%) qualifying for free meals and 270 (7.4%) qualifying for reduced-price meals.

*Table 3-4 Limited English Proficiency (LEP) of Cohort*

LEP Status	Number of Students	Percent of Cohort
Currently LEP	280	7.7
First year after exiting LEP	86	2.4
Second year after exiting LEP	289	7.9

Note: Total number of students in cohort = 3650

A total of 655 (18%) of the students were Limited English Proficiency (LEP) students with 280 (7.7%) identified as a current LEP student, 86 (2.4%) were in their first year of monitoring after exiting the bilingual or English as a second language (ESL) program, and 289 (7.9 %) were in their second year of monitoring after exiting the bilingual or English as a second language (ESL) program.

### **Procedures**

The district granted approval for the use of their data in this study. The University of Houston Committee of the Protection of Human Subjects granted approval of this study (see Appendix A). To remove all identifiers that might indicate individual students, the data received was de-identified by name and replaced with local student ID number only.

This longitudinal descriptive study examined a cohort of students from one school district located in a highly populated suburban area in Texas. This cohort of students was in grade 5 in 2007-08, grade 6 in 2008-09, grade 7 in 2009-10, and grade 8 in 2010-11. This study analyzed the high-performing students in the cohort for four years to track their performance at the individual student level. Each year of the study, the high achievers were tracked and categorized by gender, ethnicity, and socioeconomic status.

The study also categorized the students into achievement status groups depending on whether they maintained, gained, lost, or never had high-achieving status throughout the study. Standardized test scores in math and reading were used. In this study, students were considered high achieving by scoring commended performance on the math and/or reading Texas Assessment of Knowledge and Skills (TAKS) test, which are criterion referenced tests. To earn commended performance on TAKS, a student must score 2400 on the exam, which is considerably higher than the state standard and is typically only a few questions away from total mastery.

### **Instruments**

This study will examine individual students from grades 5, 6, 7, and 8 from 2007-2011 who earned commended performance on the Texas Assessment of Knowledge and Skills (TAKS) in mathematics and/or reading. The TAKS test is a criterion-referenced standardized test used by the state of Texas public schools since 2003 to measure student attainment of reading, writing, mathematics, science, and social studies skills. It is the state's standardized test for the Federal No Child Left Behind Act (NCLB) of 2001.

Under NCLB, in order for states to receive federal funding, they must set standards-based assessments and administer them to all students in certain grade levels. The NCLB Act holds states accountable for improving academic achievement for all students regardless of ethnicity and socio-economic background. Under NCLB, schools must meet Adequate Yearly Progress (AYP) by demonstrating an increasing percentage of students meeting proficiency standards in mathematics and reading, with the goal of 100% of students meeting proficiency standards in the school-year 2013-2014. The table below shows the subjects and grade levels tested in Texas using the TAKS test.

*Table 3-5 TAKS Test Subjects and Grade Levels*

<b>Grade Level Tested</b>	<b>Subject</b>					
	<b>Reading</b>	<b>Mathematics</b>	<b>Writing</b>	<b>English Lang. Arts</b>	<b>Social Studies</b>	<b>Science</b>
<b>3</b>	X	X				
<b>4</b>	X	X	X			
<b>5</b>	X	X				X
<b>6</b>	X	X				
<b>7</b>	X	X	X			
<b>8</b>	X	X			X	
<b>9</b>	X	X				
<b>10</b>		X		X	X	X
<b>11</b>		X		X	X	X

Students demonstrate a level of proficiency on the TAKS test by scoring a minimum of 2100 on the exam, which is considered “met standard.” In this study, high-achieving students are defined as students who earned “commended performance” on the TAKS test in reading and/or math in grades 5, 6, 7, and/or 8. To earn commended performance on TAKS, a student must score 2400 on the exam, which is considerably higher than the state standard and is typically only a few questions away from total mastery. The number of correct answers needed to score commended performance varied slightly by grade and content.

*Table 3-6 Performance Standards of TAKS Tests by Content and Grade Level*

Grade	Content	Total Number of Questions on Test	Number of Questions to Meet Minimum Standard	Percent of Questions to Meet Minimum Standard	Number of Questions to Meet Commended Standard	Percent of Questions to Meet Commended Standard
5	Reading	42	30	71%	39	93%
6	Reading	42	30	71%	39	93%
7	Reading	48	31	65%	44	92%
8	Reading	48	35	73%	45	94%
5	Math	44	28	64%	40	91%
6	Math	46	28	61%	42	91%
7	Math	48	27	56%	43	90%
8	Math	50	29	58%	45	90%

In 2012-13, Texas changed to a new accountability system with the State of Texas Assessments of Academic Readiness (STAAR) test, which replaced the TAKS test. While labels are different, the label for advanced is still expected to exist for the new accountability system.

### **Limitations**

One limitation of this study is the TAKS test because it is a criterion referenced test and mastery of the test is very likely. Studying high-achieving students using TAKS is limited because those students get close to 90-100% passing. However, this study defined high-achieving students as commended performance. A limitation is that only one achievement test was used to determine and define high achievement in this study.

Factors such as course grades, academic history, or student background were not included.

Another limitation of this study is that it presumes that the commended standard is constant over time. The commended standard may be easier at one grade and more difficult at another. While the state provides information to suggest that the commended standard is the same at every grade level, this study did not research that standard.

Another limitation is only one school district was used in this study. It also did not factor the individual campuses that the students attended or interventions experienced. It did not look at the intervening factors at school that could contribute to students gaining or losing commended performance. For example, the expertise of the teachers, the intervention programs available, or the climate of the school were not researched.

Lastly, this study did not factor programs or intervening factors that could take place outside of school, such as tutorial programs or private learning academies available to students.

## **Chapter 4**

### **Results**

#### **Restatement of Problem**

Recent school accountability systems call for schools to demonstrate an increasing percentage of students meeting proficiency standards in mathematics and reading. Many analysts believe that in the effort to help lower-achieving students meet proficiency standards, the high-achieving students are being left behind (Finn, Scull, & Winkler, 2011). The purpose of this study was to identify and examine the performance trends of high-achieving students at the individual student level. The study analyzed which students maintained high-achieving status, which students lost high-achieving status over time, which students gained high-achieving status later, and which students never had high-achieving status. It also analyzed if there was a difference between the performance trends of high-achieving students by gender, ethnicity, and socioeconomic status.

The research questions addressed in this study are as follows:

- What are the performance trends of high-achieving students over time?
  - What percentage maintained their high-achieving status over time?
  - What percentage lost their high-achieving status over time?
  - What percentage gained high-achieving status over time?
- Is there a statistical difference between the performance of high-achieving students by gender, ethnicity, and socioeconomic status?

#### **Data Analysis**

This longitudinal descriptive study examined a cohort of students from one school district located in a highly populated suburban area in Texas. This cohort of students was



in grade 5 in 2007-08, grade 6 in 2008-09, grade 7 in 2009-10, and grade 8 in 2010-11. This study analyzed the high-performing students in the cohort for four years to track their performance at the individual student level. Each year of the study, the high achievers were tracked and categorized by gender, ethnicity, and socioeconomic status. The study also categorized the students into achievement status groups depending on whether they maintained, gained, lost, or never had high-achieving status throughout the study. Standardized test scores in math and reading were used. In this study, students were considered high-achieving by scoring commended performance on the math and/or reading Texas Assessment of Knowledge and Skills (TAKS) tests, which are criterion referenced tests. To earn commended performance on TAKS, a student must score 2400 on the exam, which is considerably higher than the state standard and is typically only a few questions away from total mastery.

**Demographics of subjects.** The study analyzed a matched data set of students from 2007-2011 as they progressed from 5<sup>th</sup> to 8<sup>th</sup> grade in one school district. Only the students who had TAKS scores in reading and math in the district during all four years were included in the cohort.

The total number of students in the cohort was 3,650. This includes all students whether they were high achieving or not. Of those, 1,850 (50.7%) were females and 1,799 (49.3%) were males.

*Table 4-1 Gender of Cohort*

Gender	Number of Students	Percent of Cohort
Males	1,799	49.3
Females	1,850	50.7

Note: Total number of students in cohort = 3,650

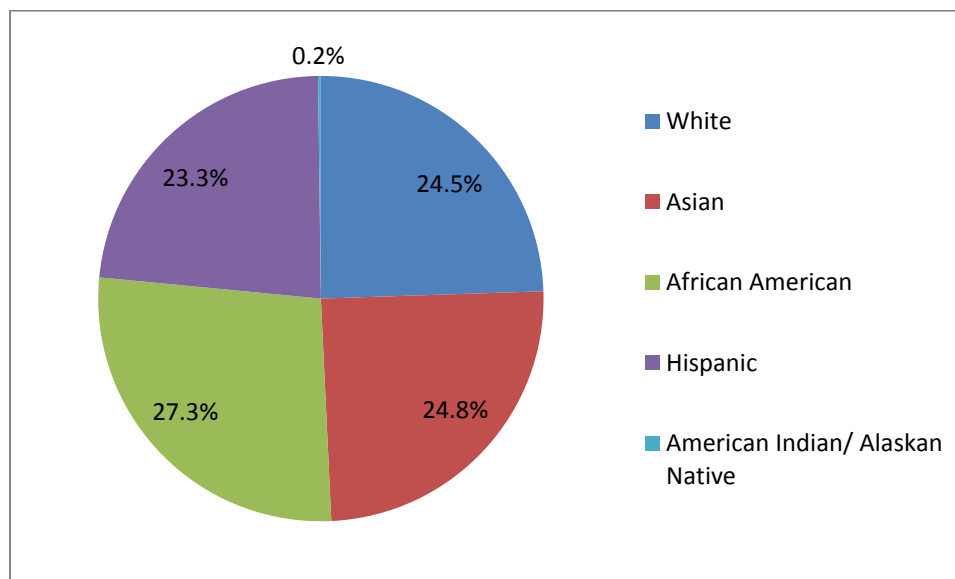
The ethnic breakdown of the students in the cohort was 904 (24.8%) Asian, 996 (27.3%) African American, 850 (23.3%) Hispanic, 893 (24.5%) White, and 7 (.2%) American Indian or Alaskan Native. This data is outlined in Table 4-2 and Figure 4-1.

*Table 4-2 Ethnic Breakdown of Cohort*

Ethnicity	Number of Students	Percent of Cohort
Asian or Pacific Islander	904	24.8%
African American	996	27.3%
Hispanic	850	23.3%
White	893	24.5%
American Indian or Alaskan Native	7	0.2%

Note: Total number of students in cohort = 3650

*Figure 4-1 Ethnic Breakdown of Cohort*



In this study, students were considered economically disadvantaged if they received free or reduced-price meals. A total of 1,095 (30%) of the students were economically disadvantaged with 825 (22.6%) qualifying for free meals and 270 (7.4%) qualifying for reduced-price meals. A total of 2,555 students were non-economically disadvantaged.

*Table 4-3 Socioeconomic Status of Cohort*

Socioeconomic Status	Number of Students	Percent of Cohort
Not Economically Disadvantaged	2,555	70
Free Meals	825	22.6
Reduced Meals	270	7.4

Note: Total number of students in cohort = 3,650

A total of 655 (18%) of the students were Limited English Proficiency (LEP) students with 280 (7.7%) identified as a current LEP student, 86 (2.4%) were in their first year of monitoring after exiting the bilingual or English as a second language (ESL) program, and 289 (7.9 %) were in their second year of monitoring after exiting the bilingual or English as a second language (ESL) program.

*Table 4-4 Limited English Proficiency (LEP) of Cohort*

LEP Status	Number of Students	Percent of Cohort
Currently LEP	280	7.7
First year after exiting LEP	86	2.4
Second year after exiting LEP	289	7.9

Note: Total number of students in cohort = 3650

### **Performance Trend of Cohort**

What are the performance trends of high-achieving students over time? What percentage maintained their high-achieving status over time? What percentage lost their high-achieving status between the initial and final years? What percentage gained high-achieving status over time, becoming high achievers between the initial and final years?

To answer these questions, the cohort of students needed to be analyzed in two main ways for math and reading each. The first was to categorize the students into four categories: 1) maintained status by being high achieving in the initial and final year, 2) gained status by not being high achieving in the initial year but being high achieving by the final year, 3) lost status by being high achieving in the initial year but no longer in the

final year, and 4) non-high achieving status by not being high achieving in the initial and again not in the final year.

The second way the cohort needed to be analyzed was at each grade level between the initial and final year to establish a longitudinal trend. For the first research question, the cohort was examined as a whole. For the second research question, the cohort was examined in more detail by gender, ethnicity, and socioeconomic status.

**Math.** Overall, 1,199 of 3,650 (32.8%) students maintained status. The number of students that gained status was 167 (4.6%) students. The number of students that were high achieving in 5<sup>th</sup> grade but lost status by 8<sup>th</sup> grade, the final year of the study, was 659 (18%). Lastly, 1625 (44.5%) students were not considered high achievers in grade 5 and again not in grade 8. These were considered non-high achieving status.

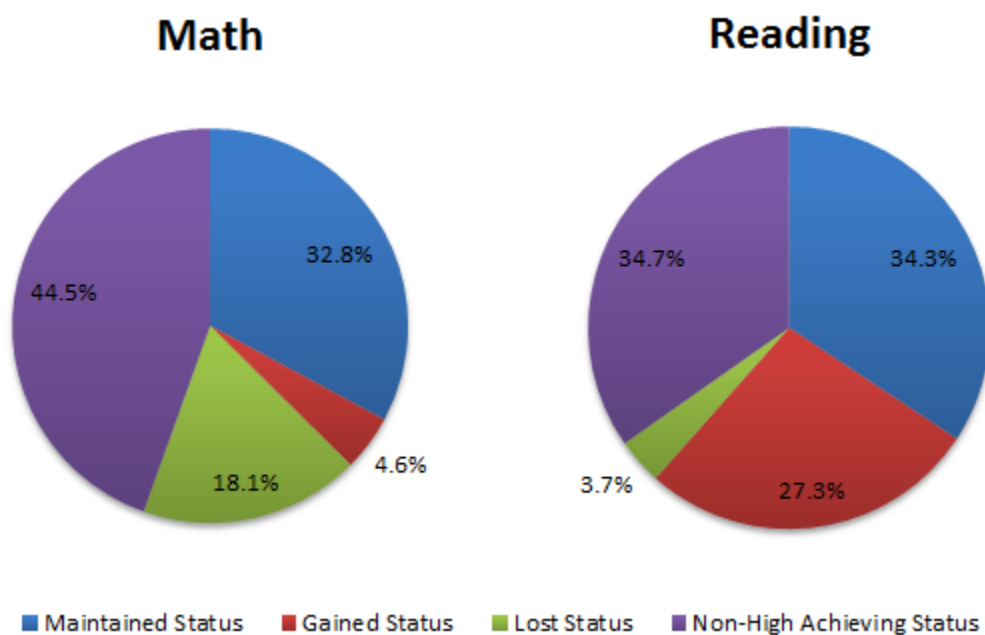
**Reading.** Overall, 1,252 of 3,650 (34.3%) students maintained status. They were high achieving in the initial year and again in the final year. The number of students that gained status was 995 (27.3%) students. The number of students that were high achieving in 5<sup>th</sup> grade but lost status by 8<sup>th</sup> grade, the final year of the study, was 135 (3.7%). Lastly, 1,268 (34.7%) students were non-high achievers.

Table 4-5 and Figure 4-2 outline the overall achievement status in math and reading for the cohort.

*Table 4-5 Trends of High Achievers in Math and Reading from Grade 5 to Grade 8*

	Total Students in Cohort	Maintained Status	Gained Status	Lost Status	Non-High Achieving Status
<b>Math</b>					
Number of Students	3,650	1,199	167	659	1,625
Percentage of Students	100%	32.8%	4.6%	18%	44.5%
<b>Reading</b>					
Number of Students	3650	1252	995	135	1268
Percentage of Students	100%	34.3%	27.3%	3.7%	34.7%

*Figure 4-2 Overall Cohort Achievement Status for Math and Reading*



Overall, the performance trends for math and reading were opposite of each other. Math lost hundreds of high achievers overtime while reading gained hundreds of high achievers overtime. In the initial year, there were 1,858 high achieving 5<sup>th</sup> grade math students. Four years later in 8<sup>th</sup> grade, only 1,366 remained as high achievers. This was a loss of 492 individuals or 13.5% decrease overtime in math high achievers from 5<sup>th</sup> to 8<sup>th</sup> grade.

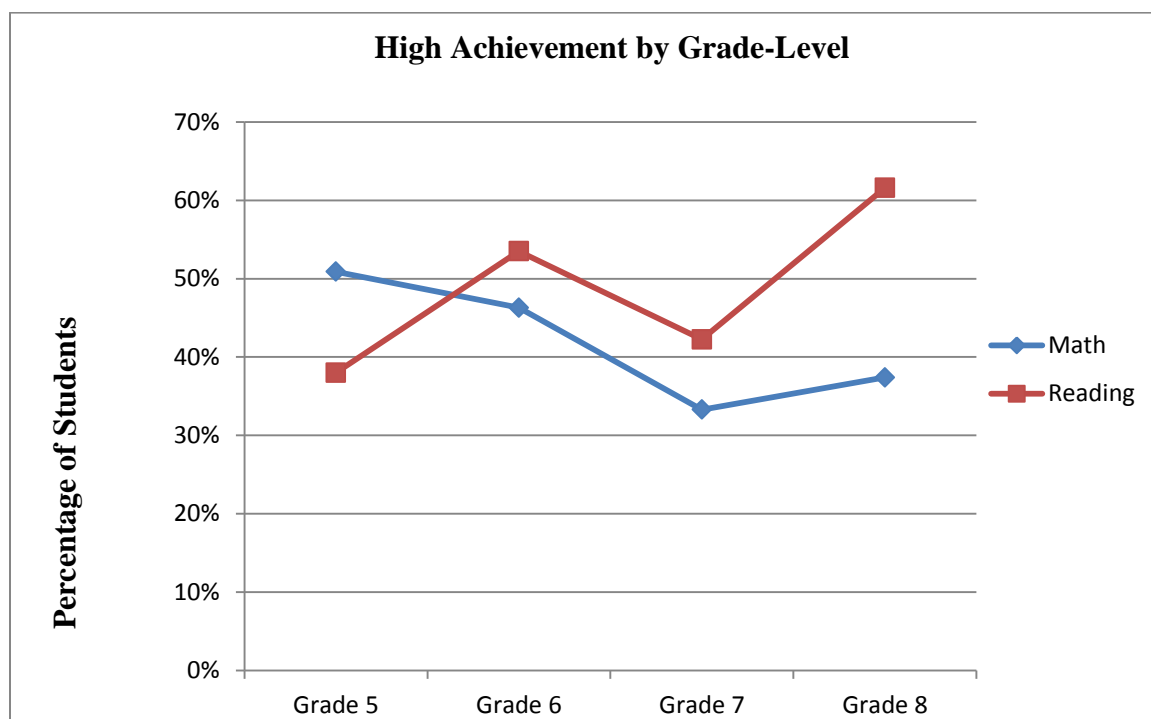
In reading, 1,387 students were high-achieving in 5<sup>th</sup> grade. By 8<sup>th</sup> grade, 2,247 students were high-achieving in reading. That is a gain of 860 individuals or 23.6% increase overtime in reading high achievers. Table 4-6 below shows the change from the initial to final years in math and reading. This change in number of students includes students that lost high-achieving status and those that gained high-achieving status over time.

*Table 4-6 High-Achieving (HA) Students in Initial and Final Years*

	Total Number of Students in Cohort	Number of HA Students in Initial Year	Percentage of HA Students in Initial Year	Number of HA Students in Final Year	Percentage of HA Students in Final Year	Difference in Number of Students	Change in HA Students Percentage
Math	3,650	1858	50.9%	1,366	37.4%	-492	-13.5%
Reading	3,650	1387	38.0%	2247	61.6%	+860	+23.6%

**Performance across grade levels.** The study further analyzed how the students performed at each grade-level between the initial and final years to establish a trend. Figure 4-3 shows the percent of overall high achievers for math and reading for grade 5, 6, 7, and 8.

Figure 4-3 Performance Trends for Math and Reading



**Math performance trend by grade level.** Overall, the trend line for math performance decreased from 5<sup>th</sup> through 7<sup>th</sup> grade. The cohort lost the most high-achievers between 6<sup>th</sup> and 7<sup>th</sup> grade. In 8<sup>th</sup> grade, the final year, there was a gain back of high achievers but not enough to restore levels from previous grades. In 5<sup>th</sup> grade, 1,858 (50.9%) students scored commended performance in math. In 6<sup>th</sup> grade, 1,690 (46.3%) students scored commended performance in math, which is a loss of 168 students. In 7<sup>th</sup> grade, 1,214 (33.3%) students scored commended performance in math, which is a loss of an additional 476 students. In 8<sup>th</sup> grade, the final year of the study, 1,366 (37.4%) students scored commended performance in math, which was a gain of 152 students. An overall loss of 492 (-13.5%) high-achieving math students occurred between 5<sup>th</sup> to 8<sup>th</sup> grade.



**Reading performance trend by grade level.** The trend line for reading performance of the cohort was much different than math. There was a large gain of high achievers from 5<sup>th</sup> to 6<sup>th</sup> grade. Then there was a decrease from 6<sup>th</sup> to 7<sup>th</sup> grade and then a sharp increase again from 7<sup>th</sup> to 8<sup>th</sup> grade. Specifically, in 5<sup>th</sup> grade, 1,387 (38%) students scored commended performance in reading. In 6<sup>th</sup> grade, 1,951 (53.5%) students scored commended performance in reading, which is a gain of 564 students. In 7<sup>th</sup> grade, 1,542 (42.2%) students scored commended performance in reading, which is a loss of 409 students. In 8<sup>th</sup> grade, the final year of the study, 2,247 (61.6%) students scored commended performance in reading, which was a gain of 705 students. An overall increase of 860 (23.6%) high-achieving reading students occurred between 5<sup>th</sup> and 8<sup>th</sup> grade.

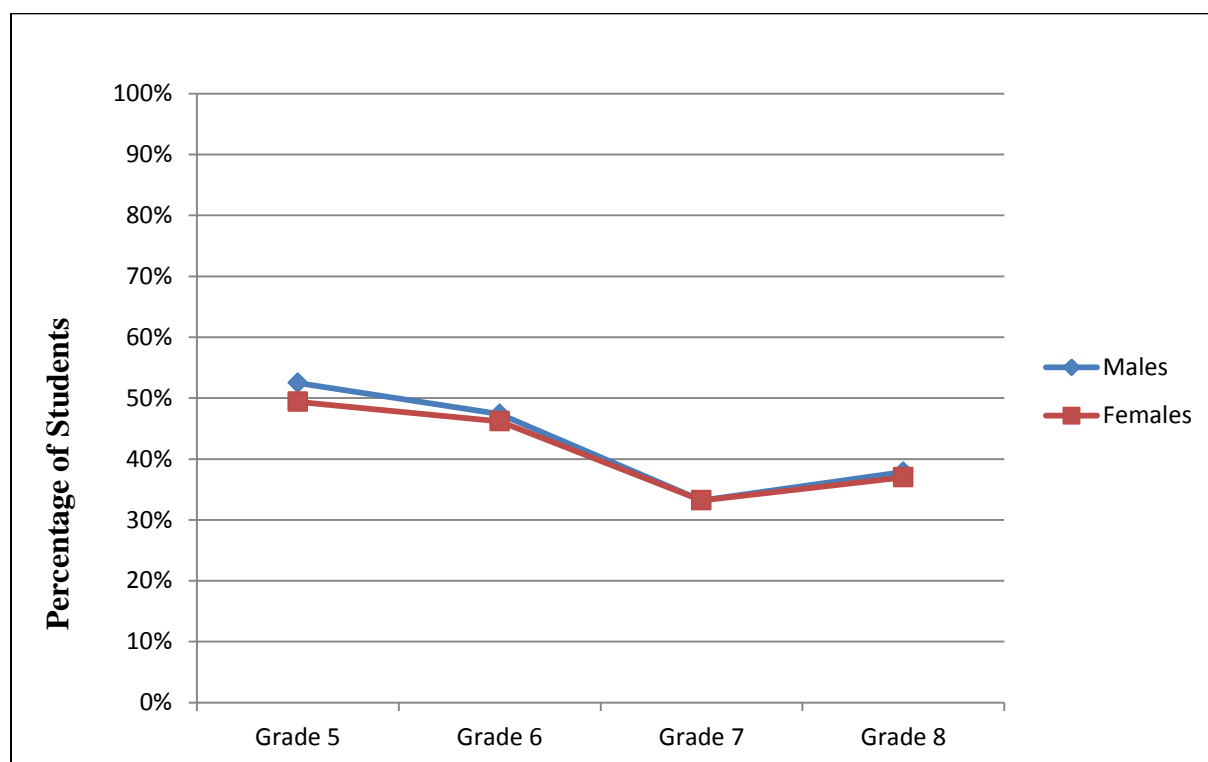
### **Performance Trend by Gender**

To fully analyze the population trend of high-achieving students in this study, it was necessary to look at performance trend lines by gender, ethnicity, and socioeconomic status. The second research question of this study is: Is there a statistical difference between the performance of high-achieving students by gender, ethnicity, and socioeconomic status?

**Performance trends in math by gender.** This study found no significant difference in the performance trends between males and females in math. Figure 4-4 shows the trend for males and females by grade level. The trend lines nearly overlap. For males and females, both groups showed a slight decrease from 5<sup>th</sup> to 6<sup>th</sup> grade. Then both groups had a steeper decrease of high-achieving students from 6<sup>th</sup> to 7<sup>th</sup> grade. Both groups gained back some high achievers in 8<sup>th</sup> grade but not enough to restore levels from

previous grades. More specifically for males, in 5<sup>th</sup> grade, 945 out of 1,799 (52.5%) of males were high-achieving. In 6<sup>th</sup> grade, 836 out of 1,799 males (47.4%) were high-achieving. In 7<sup>th</sup> grade, 598 (33.2%) of males were high achieving, and in 8<sup>th</sup> grade 598 (37.9%) males were high achieving. For females, 913 out of 1,850 (49.4%) females were high achieving in 5<sup>th</sup> grade. In 6<sup>th</sup> grade, 854 out of 1,850 (46.2%) females were high achieving. In 7<sup>th</sup> grade, 615 (33.2%) of females were high achieving, and in 8<sup>th</sup> grade 686 (37.0%) females were high achieving.

*Figure 4-4 Performance Trends in Math by Gender*



**Achievement status in math by gender.** Males and females were analyzed and categorized into the achievement status groups of maintained, gained, lost, or never had

high-achieving status. There was little difference in the percentage of males and females that maintained, gained, or lost, or never had high-achieving status.

Table 4-7 and Figure 4-5 depict the numbers and percentages of achievement status for math for males and females. For males, 596 of 1,799 (33.1%) students maintained status compared to 603 out of 1,850 (32.6%) for females. The number of students that gained high-achieving status by the final year was 84 (4.7%) males and 83 (4.5%) females. The number of students that lost status by the final year was 349 (19.4%) males and 310 (16.7%) females. Lastly, 770 male (42.8%) and 854 (46.2%) female students were not considered high achievers in math in grade 5 and again not in grade 8. These were the non-high achievers. Overall, the percentages of achievement statuses in math were not significantly different between genders.

*Table 4-7 Achievement Status in Math by Gender*

	Total Students in Cohort	Maintained Status	Gained Status	Lost Status	Non-High Achieving Status
Males					
Number of Males	1799	596	84	349	770
Percentage of Males	100%	33.1%	4.7%	19.4%	42.8%
Females					
Number of Females	1850	603	83	310	854
Percentage of Females	100%	32.6%	4.5%	16.7%	46.2%

Figure 4-5 shows the achievement status of students divided by gender with males and females side by side.

*Figure 4-5 Achievement Status in Math by Gender*

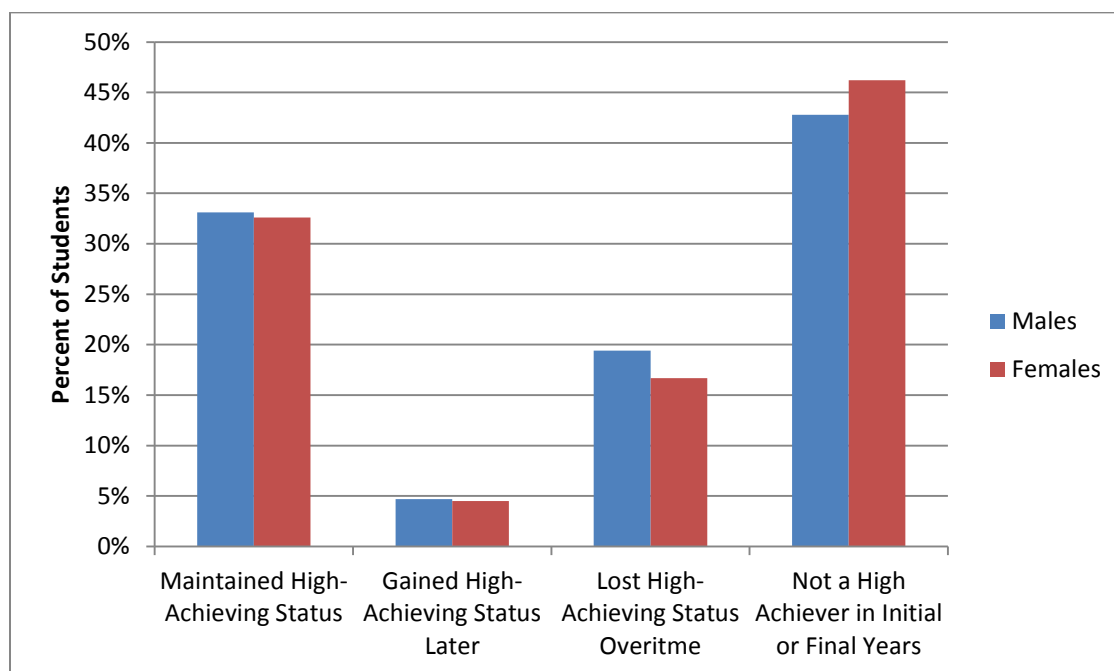
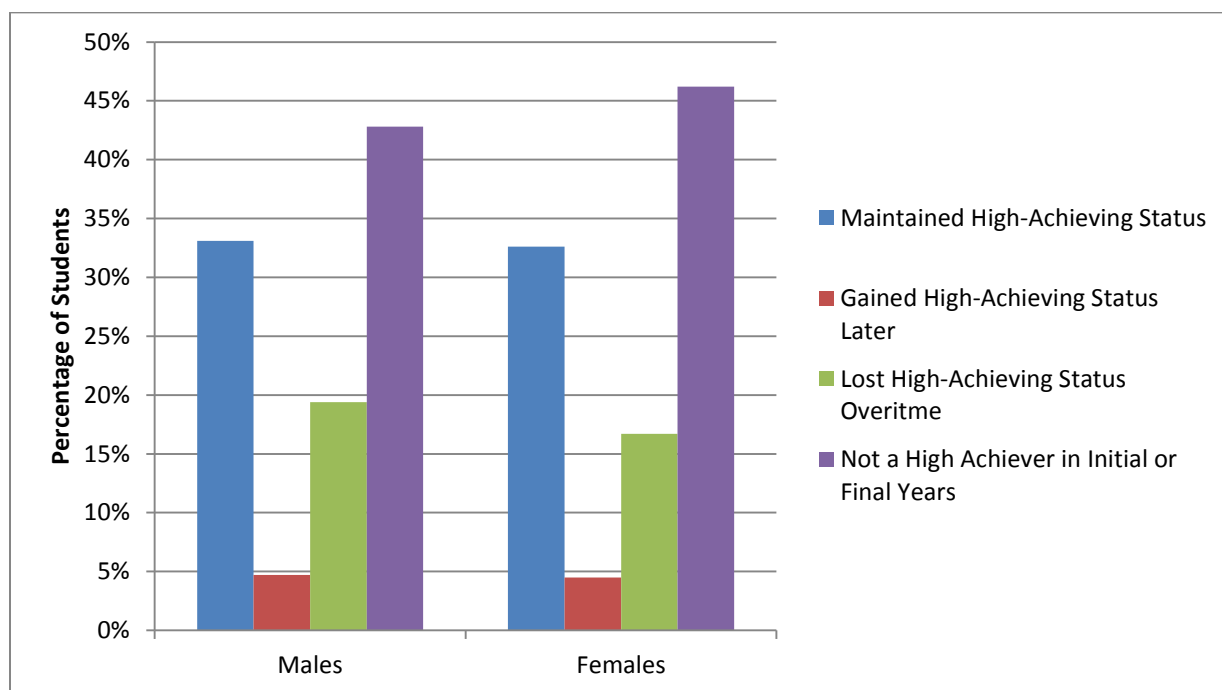


Figure 4-6 shows the percentage of achievement status groups of students grouped by gender.

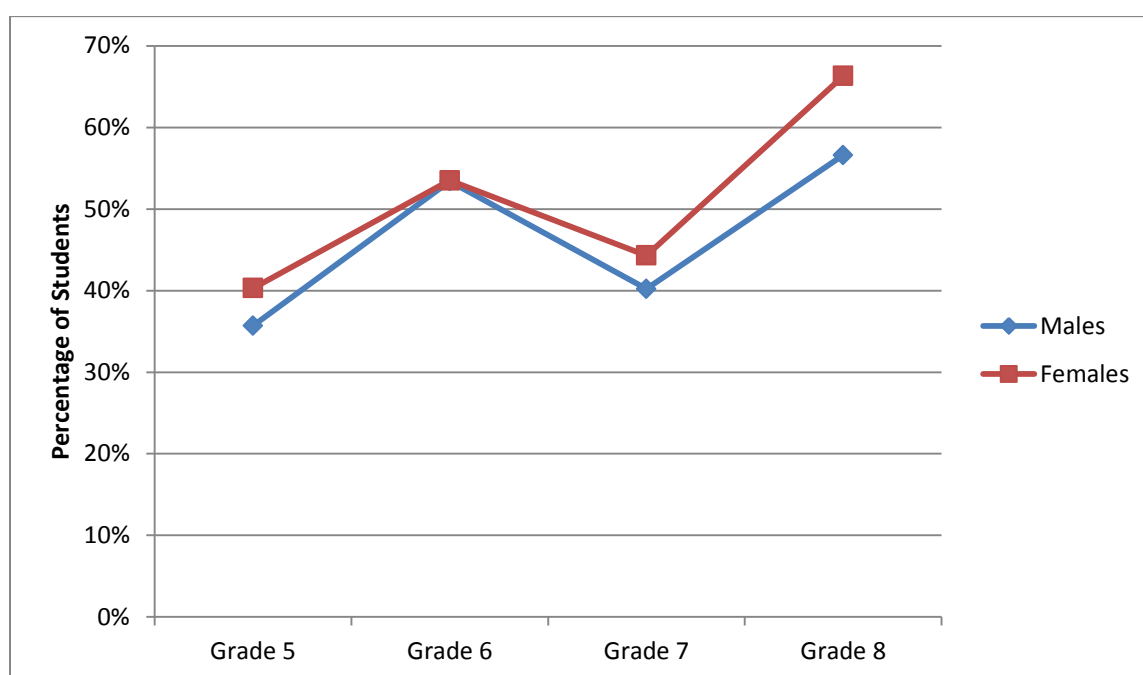
*Figure 4-6 Achievement Status in Math Grouped by Gender*



**Performance trends in reading by gender.** This study found slight differences in the performance trends between males and females in reading. Figure 4-7 shows the trend for males and females by grade level. The trend lines are similar but have a few differences. For males and females, both groups showed increase in high achievers from 5<sup>th</sup> to 6<sup>th</sup> grade. Then both groups had a loss of high-achieving students from 6<sup>th</sup> to 7<sup>th</sup> grade. Both groups gained back high achievers in 8<sup>th</sup> grade which ultimately resulted in more reading high achievers in the final year than the previous years in the study. More specifically for males, in 5<sup>th</sup> grade, 642 out of 1,799 (35.7%) of males were high-achieving. In 6<sup>th</sup> grade, 961 out of 1,799 males (53.4%) were high-achieving. In 7<sup>th</sup>

grade, 723 (40.2%) of males were high-achieving, and in 8<sup>th</sup> grade 1019 (56.6%) males were high-achieving. For females, 745 out of 1,850 (40.3%) females were high-achieving in 5<sup>th</sup> grade. In 6<sup>th</sup> grade, 990 out of 1,850 (53.5%) females were high-achieving. In 7<sup>th</sup> grade, 819 (44.3%) of females were high achieving, and in 8<sup>th</sup> grade 1227 (66.3%) females were high achieving.

*Figure 4-7 Performance Trends in Reading by Gender*



**Achievement status in reading by gender.** Males and females were analyzed and categorized into the achievement status groups of maintained, gained, lost, or never had high-achieving status for reading. Like with math, there was little difference in the percentage of males and females that gained or lost achievement status. In this study, there were a higher percentage of maintained high achievers among females than males in reading by 5.8%.

Table 4-8 and Figure 4-8 depict the numbers and percentages of achievement status for reading for males and females. For males, 564 of 1,799 (31.4%) students maintained status compared to 688 out of 1,850 (37.2%) for females. The number of students that gained high-achieving status by the final year was 455 (25.3%) males and 539 (29.1%) females. The number of students that lost status by the final year was 78 (4.3%) males and 57 (3.1%) females. Lastly, 702 male (39%) and 566 (30.6%) female students were not considered high achievers in reading in grade 5 and again not in grade 8. These were the non-high achievers. Overall, the percentages of achievement statuses in reading were not significantly different between genders.

*Table 4-8 Achievement Status in Reading by Gender*

	Total Students in Cohort	Students that Maintained High Achievement Over Time	Students that Gained High Achieving Status Over Time	Students that Lost High Achieving Status Over Time	Non-High Achieving Students
<b>Males</b>					
Number of Males	1799	564	455	78	702
Percentage of Males	100%	31.4%	25.3%	4.3%	39%
<b>Females</b>					
Number of Females	1850	688	539	57	566
Percentage of Females	100%	37.2%	29.1%	3.1%	30.6%

Figure 4-8 shows the achievement status of students divided by gender with males and females side by side.

*Figure 4-8 Achievement Status in Reading by Gender*

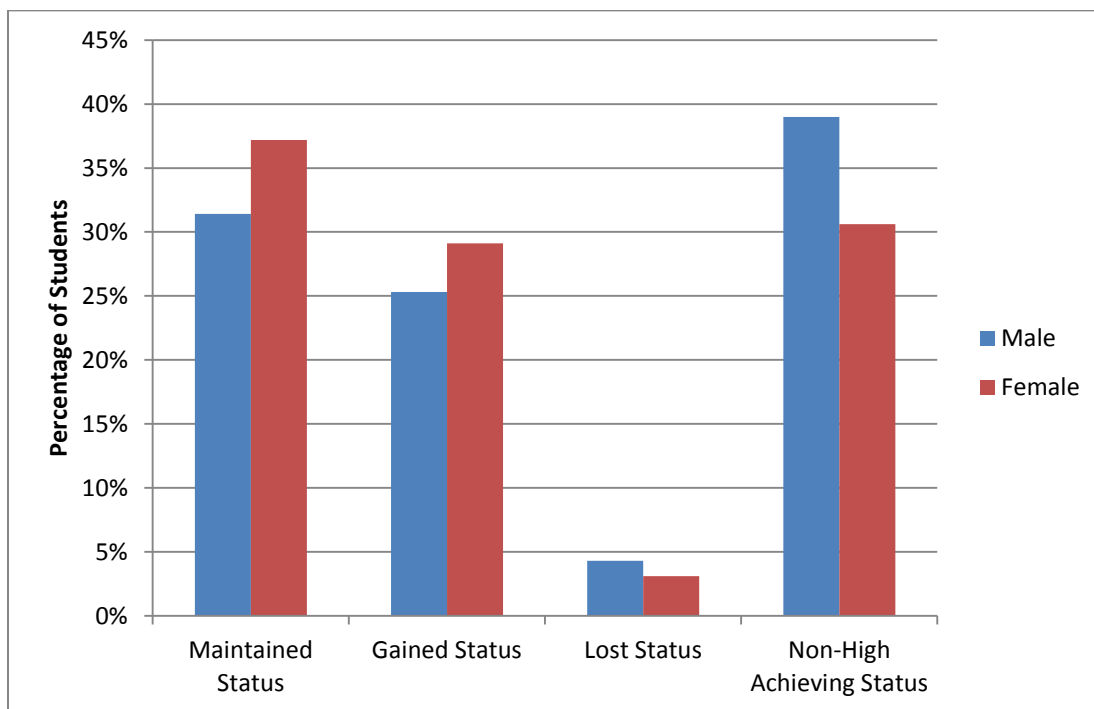
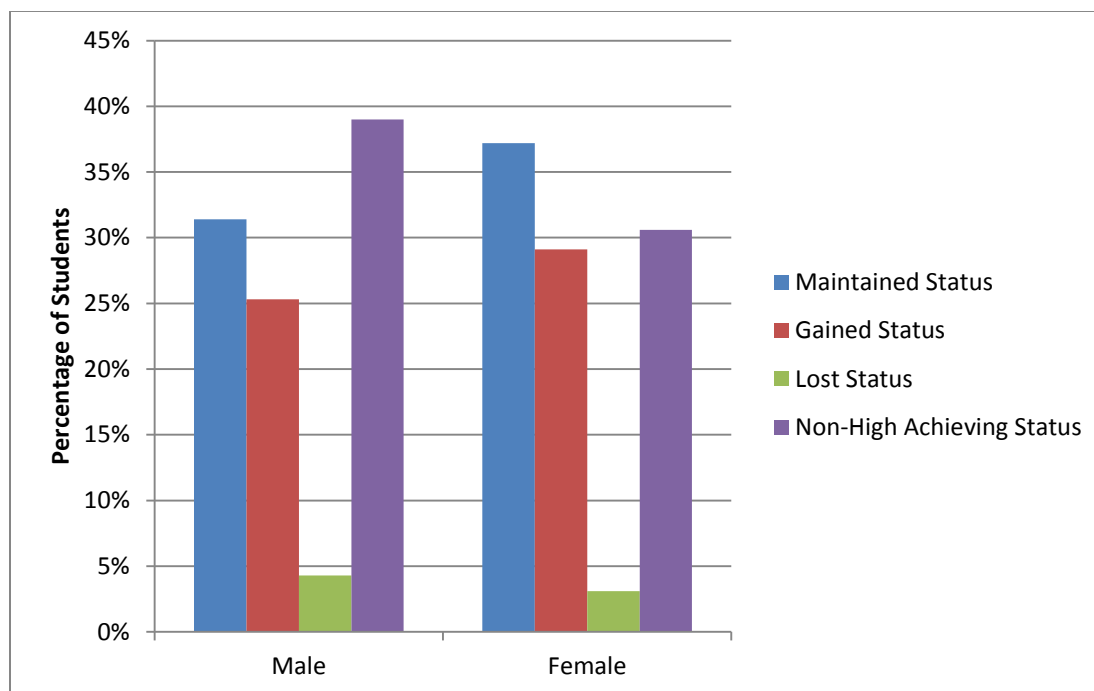




Figure 4-9 shows the percentage of achievement status groups of students grouped by gender.

*Figure 4-9 Achievement Status in Reading Grouped by Gender*



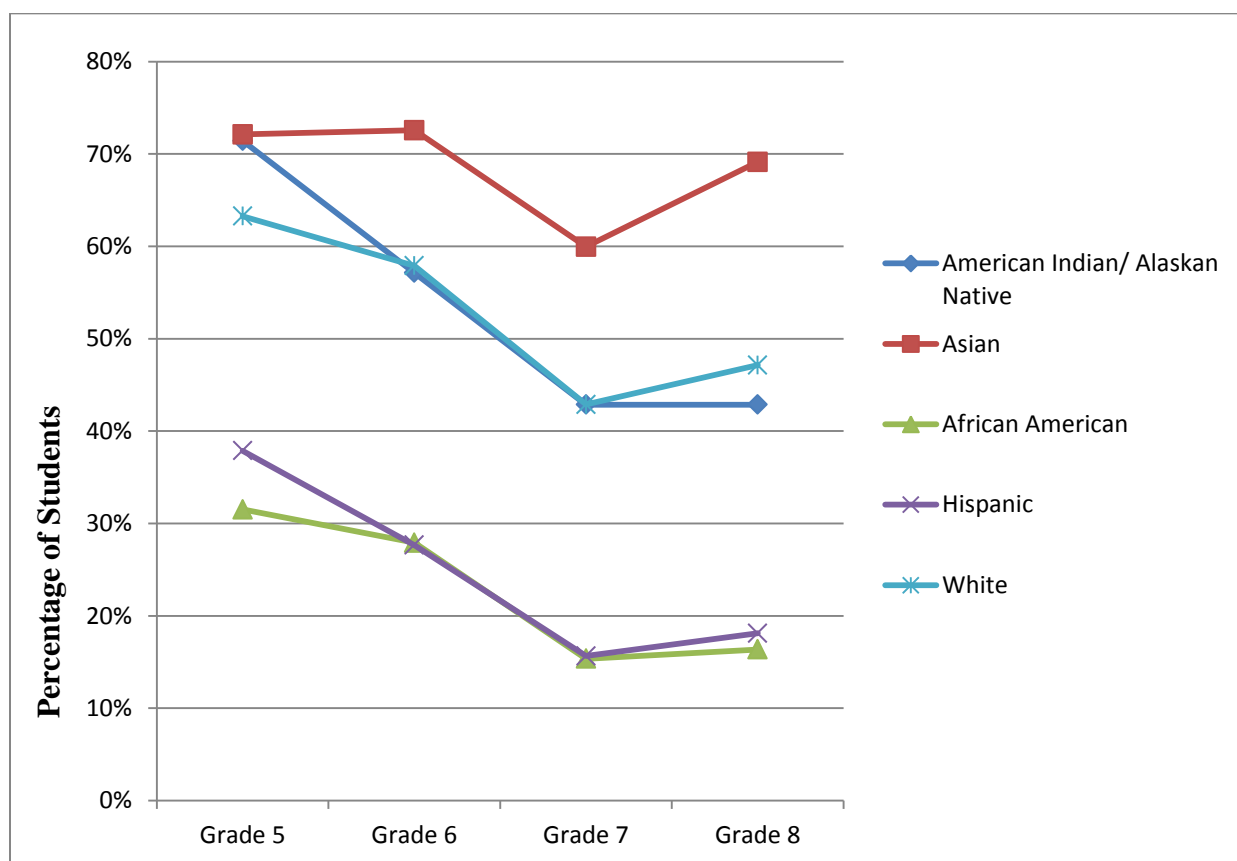
### Performance Trend by Ethnicity

**Ethnicity comparisons in math.** This study found differences in the performance trends between ethnic groups in math. Figure 4-10 shows the trend lines for high achievers by ethnicity for each grade level. All ethnic groups have increases and decreases of high achievers throughout the study, but the trend lines between grade levels differ. For example, from 5<sup>th</sup> to 6<sup>th</sup> grade, Hispanics show a greater decrease of high achievers than White or African American students. Asians show a gain in high achievers from 5<sup>th</sup> to 6<sup>th</sup> grade. Also notable is the underrepresentation of Hispanic and

African American students among high achievers. Asians had the highest percentage of high achievers in the cohort followed by Whites, Hispanics, and then African Americans.

All ethnic groups decrease from 6<sup>th</sup> to 7<sup>th</sup> grade and increase or maintain from 7<sup>th</sup> to 8<sup>th</sup> grade. Hispanic and African American groups have a much smaller percentage of high achievers compared to the other ethnic groups. Asians have more than double the number of high achievers than African Americans, yet their population sizes are comparable.

*Figure 4-10 Performance Trends of High Achievers by Ethnicity*

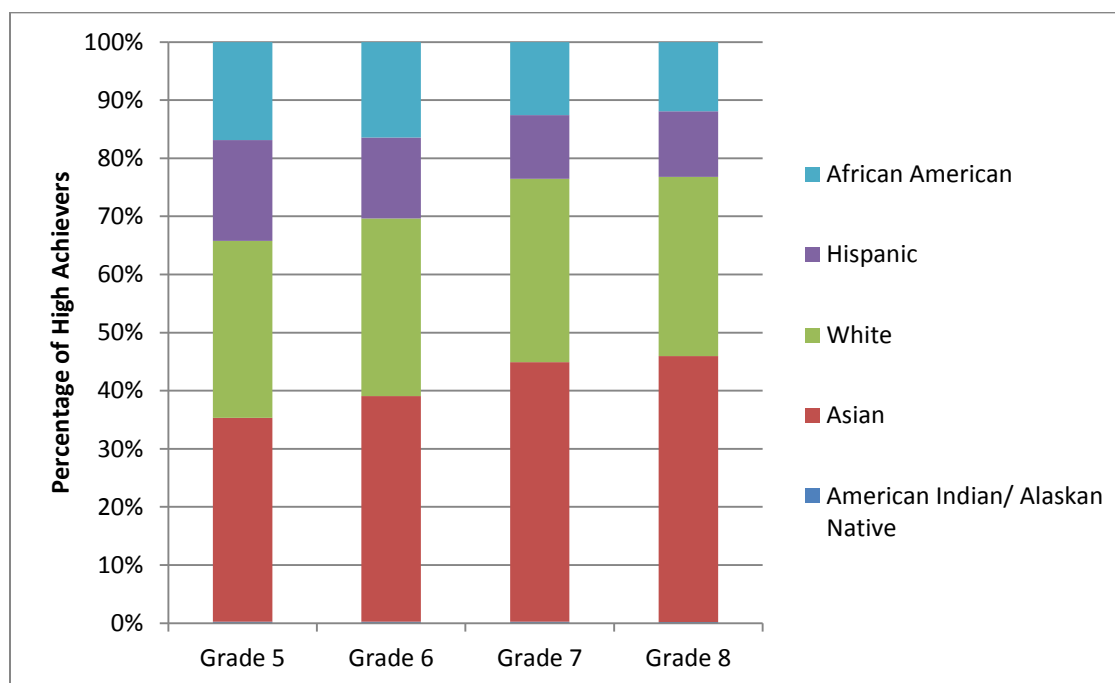


The cohort had 904 Asian students. There were 652 (72.1%) Asian high achievers in 5th grade, 656 (72.6%) in 6th grade, 542 (60%) in 7th grade, and 625 (69.1%) in 8th grade. There were a total of 893 White students in the cohort. There were 565 (63.3%) White high achievers in 5th grade, 517 (57.9%) in 6th grade, 383 (42.9%) in 7th grade, and 421 (47.1%) in 8th grade. In the cohort, there were 850 Hispanic students. There were 322 (37.9%) Hispanic high achievers in 5th grade, 235 (27.6%) in 6th grade, 133 (15.6%) in 7th grade, and 154 (18.1%) in 8th grade. There were 996 African American students in the cohort. There were 314 (31.5%) African American high achievers in 5th grade, 278 (27.9%) in 6th grade, 153 (15.4%) in 7th grade, and 163 (16.4%) in 8th grade. African Americans had the lowest number of high-achieving students among the large ethnic groups despite comprising the largest total number of students in the cohort. There were 7 American Indian or Alaskan Native students. There were 5 (71.4%) high achievers in 5th grade, 4 (57.1%) in 6th grade, 3 (42.8%) in 7th grade, and 3 (42.8%) in 8th grade.

**Ethnic breakdown of high achievers by grade level in math.** The study divided the high achieving population at each grade level by ethnicity to look at the representation of each group among high achievers. Figure 4-11 shows that African Americans and Hispanics combined account for 34% of high achievers in 5<sup>th</sup> grade and less than 25% of the high achievers in 7<sup>th</sup> and 8<sup>th</sup> grade. Combined, Hispanics and African Americans account over half of the total cohort population. This is a significant underrepresentation of both ethnic groups. Conversely, Asians are overrepresented among high achievers. Asians make up 35% to 45% of the high achievers but make up

only 24.8% of the total population. Whites consistently made up approximately 30% of the high achievers. They account for 24.5% of the total cohort population.

*Figure 4-11 Ethnic Breakdown of Math High Achievers by Grade Level*



In 5<sup>th</sup> grade, 1,858 students scored commended performance in math. Of those, 5 (.3%) were American Indian or Alaskan Native, 652 (35.1%) were Asian, 314 (16.9%) were African American, 322 (17.3%) were Hispanic, and 565 (30.4%) were White. In 6<sup>th</sup> grade, 1,690 students scored commended performance in math. Of those students, 4 (.2%) were American Indian or Alaskan Native, 656 (38.8%) were Asian, 278 (16.5%) were African American, 235 (13.9%) were Hispanic, and 517 (30.6%) were White. In 7<sup>th</sup> grade, of the 1,214 students that scored commended performance in math, 3 (.2%) were American Indian or Alaskan Native, 542 (44.6%) were Asian, 153 (12.6%) were African American, 133 (11%) were Hispanic, and 383 (31.6%) were White. In 8<sup>th</sup> grade, the final

year of the study, 1366 students scored commended performance in math, of which , 3 (.2%) were American Indian or Alaskan Native, 625 (45.8%) were Asian, 163 (11.9%) were African American, 154 (11.3%) were Hispanic, and 421 (30.8%) were White.

**Achievement status by ethnicity.** Ethnic groups were analyzed and categorized into the achievement status groups of maintained, gained, lost, or never had high-achieving status. There were significant differences in the percentages of students that maintained, gained, or lost, or never had high-achieving status in math among each ethnic group. In math, African Americans were the most underperforming ethnic group, followed by Hispanics. Asians and whites have much higher percentages of students who were high achieving in both the initial and final years (maintainers) than African Americans and Hispanics. American Indian or Alaskan Natives have high percentages, but their total number of students in the cohort is seven. Asians have over 4 times the percentage of maintained high achievers than African Americans and Hispanics. Whites more than double the Hispanics and triple the African Americans in percentage of high achievers. Conversely, Hispanics and African Americans have the highest percentages of non-achievers in the cohort. Of the African Americans in the cohort, 65.6% of them were not high achieving at all during this study. For Hispanics, 59.2% were not high achieving during this study.

Figure 4-12 and Figure 4-13 depict the numbers and percentages of each achievement status for math for each ethnic group. Figure 4-12 shows the ethnic groups of students by achievement status. Figure 4-13 shows the achievement status of students grouped by ethnic group.

Figure 4-12 Achievement Status of Ethnic Groups in Math

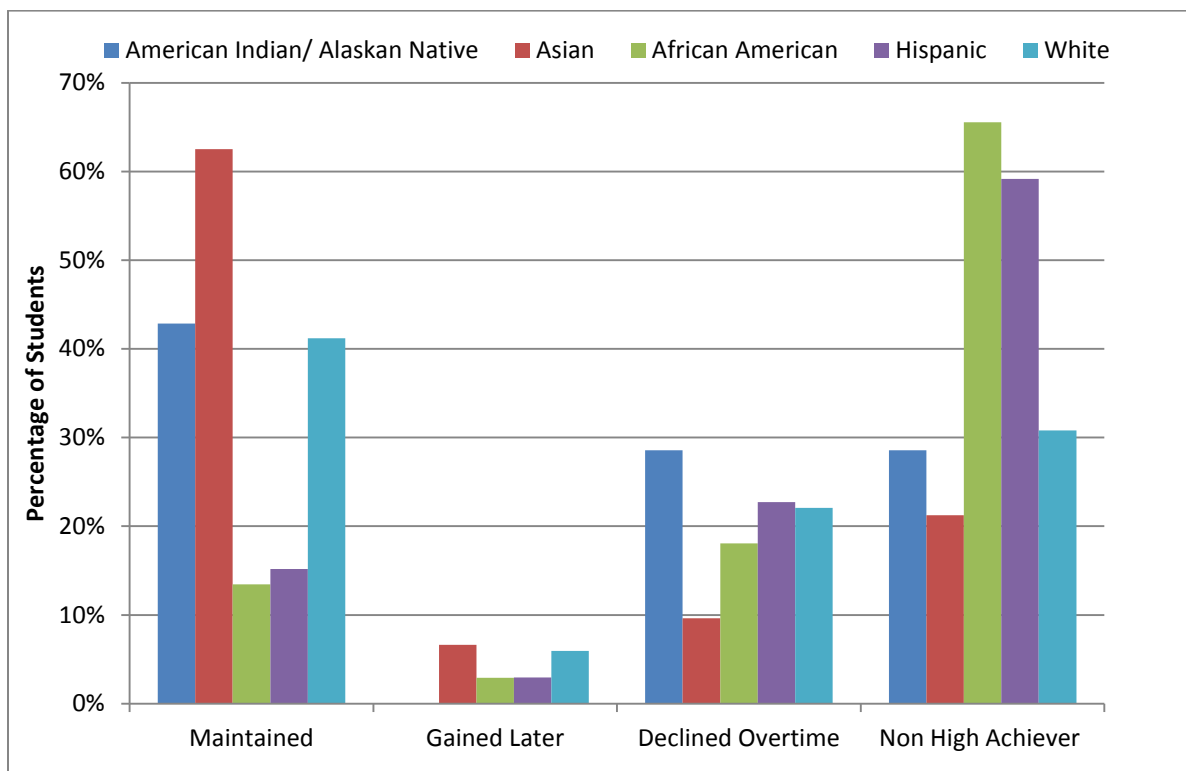
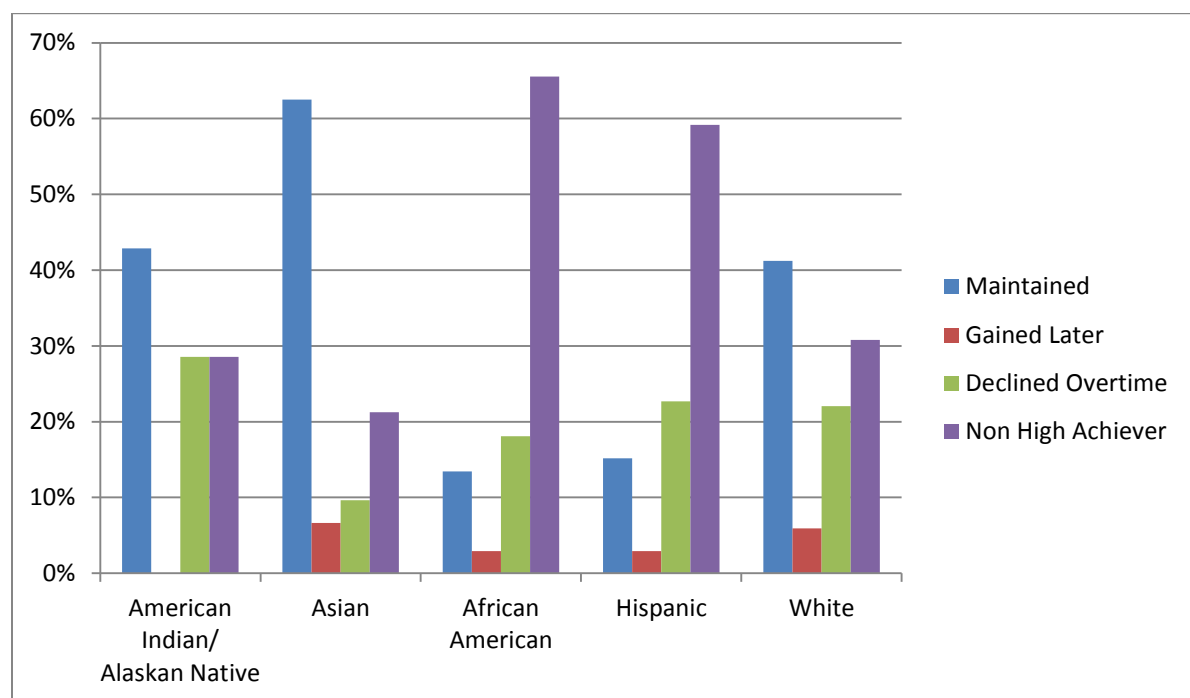


Figure 4-13 shows the achievement status of students grouped by ethnic group.

*Figure 4-13 Achievement Status in Math by Ethnic Group*



Of the 1,199 students that maintained, 3 (42.9%) were American Indian or Alaskan Native, 565 (62.5%) were Asian, 134 (13.5%) were African American, 129 (15.2%) were Hispanic, and 368 (41.2%) were White. Of the 167 students that gained high achieving status by the final year of the study, 0 (0%) were American Indian or Alaskan Native, 60 (6.6%) were Asian, 29 (2.9%) were African American, 25 (2.9%) were Hispanic, and 53 (5.9%) were White. Of the 659 students that lost high achieving status from the initial to the final year, 2 (28.6%) were American Indian or Alaskan Native, 87 (9.6%) were Asian, 180 (18.1%) were African American, 193 (22.7%) were Hispanic, and 197 (22.1%) were White. Lastly, of the students that were non-high achieving in the initial and final years, 2 (28.6%) were American Indian or Alaskan

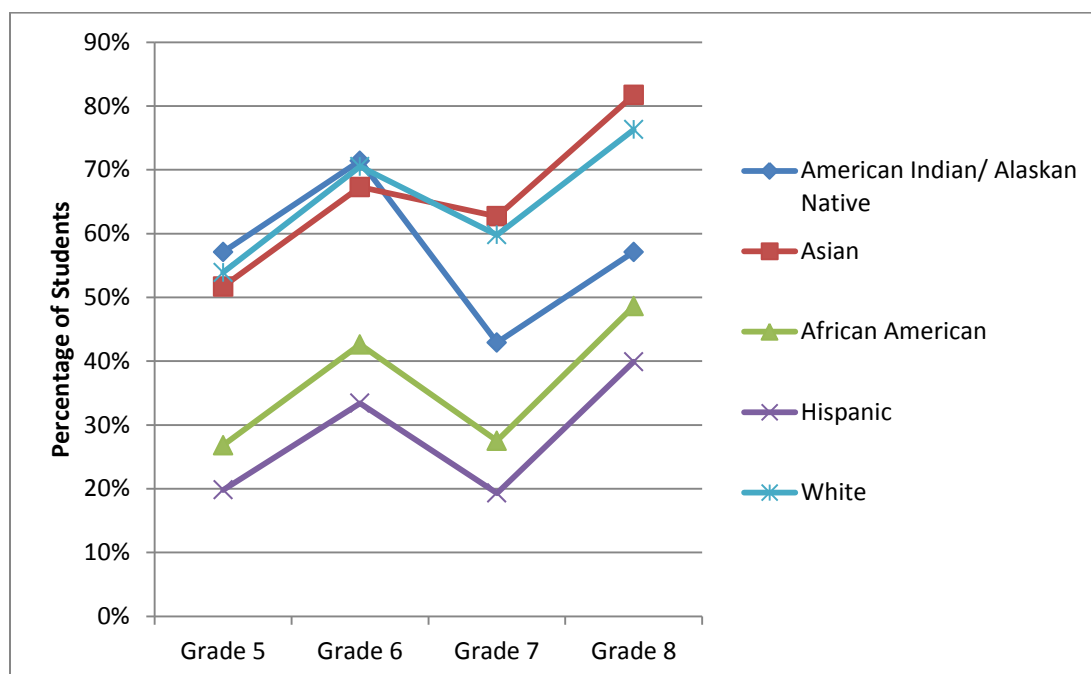
Native, 192 (21.2%) were Asian, 653 (65.6%) were African American, 503 (59.2%) were Hispanic, and 275 (30.8%) were White.

**Performance trends in reading by ethnicity.** Like in math, this study found differences in the performance trends between ethnic groups in reading. Figure 4-14 shows the trend lines for high achievers by ethnicity for each grade level. All ethnic groups have increases and decreases of high achievers throughout the study, but the trend lines between grade levels differ. Again, the underrepresentation of Hispanic and African American students among high achievers is prevalent. In the final year of the study, of the major ethnic groups, Asians had the highest percentage of high achievers in the cohort followed by Whites, African Americans and then Hispanics.

All ethnic groups gained high achievers from 5<sup>th</sup> to 6<sup>th</sup> grade. From, 6<sup>th</sup> to 7<sup>th</sup> grade, all ethnic groups showed a loss of high achievers. From 7<sup>th</sup> to 8<sup>th</sup> grade, each ethnic group showed great gains of high achievers. Hispanic and African American groups have a much smaller percentage of high achievers compared to the other ethnic groups. Asians started out with lower percentages of reading high achievers than Whites but surpassed them in the final two years of the study. Hispanics had the lowest percentage of high achievers for all years of the study.



*Figure 4-14 Performance Trends in Reading by Ethnicity*

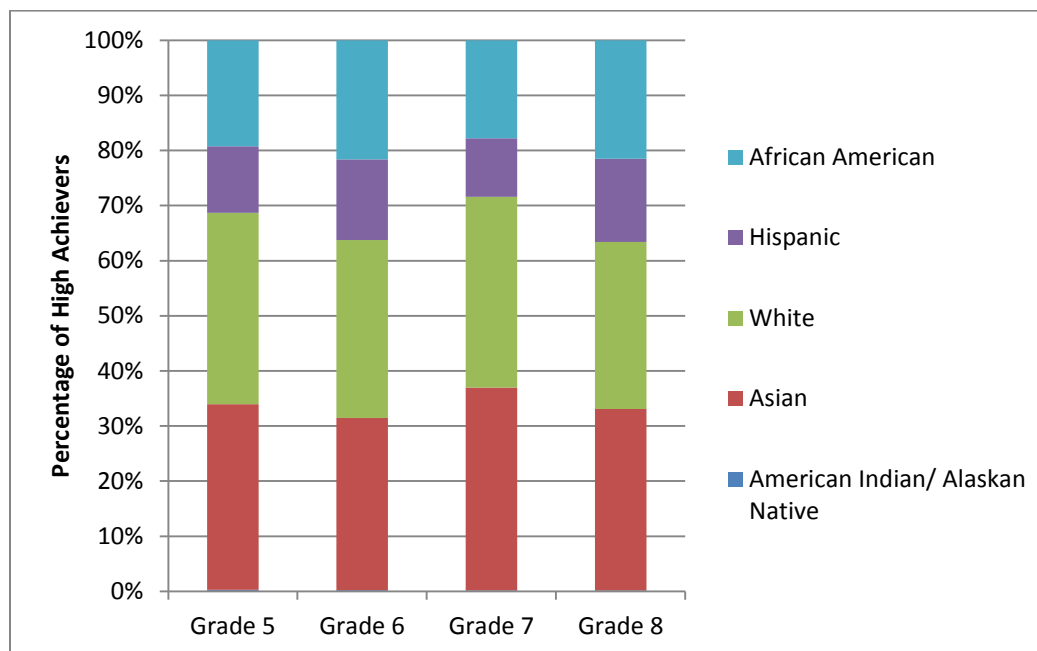


The cohort had 904 Asian students. There were 467 (51.1%) Asian high achievers in 5th grade, 608 (67.3%) in 6th grade, 567 (62.7%) in 7th grade, and 739 (81.7%) in 8th grade. There were a total of 893 White students in the cohort. There were 481 (53.9%) White high achievers in 5th grade, 630 (70.5%) in 6th grade, 534 (59.8%) in 7th grade, and 681 (76.3%) in 8th grade. In the cohort, there were 850 Hispanic students. There were 168 (19.8%) Hispanic high achievers in 5th grade, 284 (33.4%) in 6th grade, 164 (19.3%) in 7th grade, and 339 (39.9%) in 8th grade. There were 996 African American students in the cohort. There were 267 (26.8%) African American high achievers in 5th grade, 424 (42.6%) in 6th grade, 274 (27.5%) in 7th grade, and 484 (48.6%) in 8th grade. Hispanics had the lowest percentage of high-achieving students among the large ethnic groups in reading. There were 7 American Indian or Alaskan

Native students. There were 4 (57.1%) high achievers in 5th grade, 5 (71.4%) in 6th grade, 3 (42.8%) in 7th grade, and 4 (57.1%) in 8th grade.

**Ethnic breakdown of high achievers by grade level in reading.** The study divided the high achieving population at each grade level by ethnicity to look at the representation of each group among high achievers. Figure 4-15 shows that African Americans and Hispanics combined less than 36% of high achievers at all grade levels. Combined, Hispanics and African Americans account over half of the total cohort population. This is a significant underrepresentation of both ethnic groups. Conversely, Whites and Asians are slightly overrepresented among high achievers making up over 30% of the high achievers each.

*Figure 4-15 Ethnic Breakdown of High Achievers in Reading*



In 5th grade, 1,387 students scored commended performance in reading. Of those, 4 (.3%) were American Indian or Alaskan Native, 467 (33.7%) were Asian, 267 (19.2%) were African American, 168 (12.1%) were Hispanic, and 481 (34.7%) were White. In 6th grade, 1,951 students scored commended performance in reading. Of those students, 5 (.3%) were American Indian or Alaskan Native, 608 (31.2%) were Asian, 424 (21.6%) were African American, 284 (14.6%) were Hispanic, and 630 (32.3%) were White. In 7th grade, of the 1,542 students that scored commended performance in reading, 3 (.2%) were American Indian or Alaskan Native, 567 (36.8%) were Asian, 274 (17.8%) were African American, 164 (10.6%) were Hispanic, and 534 (34.6%) were White. In 8th grade, the final year of the study, 2,247 students scored commended performance in reading, of which 4 (.2%) were American Indian or Alaskan

Native, 739 (32.9%) were Asian, 484 (21.5%) were African American, 151 (11.3%) were Hispanic, and 681 (30.3%) were White.

**Achievement status by ethnicity in reading.** Ethnic groups were analyzed and categorized into the achievement status groups of maintained, gained, lost, or never had high-achieving status in reading. There were significant differences in the percentages of students that maintained, gained, or lost, or never had high-achieving status in reading among each ethnic group. In reading, Hispanics are the most underperforming ethnic group, followed by African Americans. Hispanics had the lowest number of high achievers, which means they had the highest number of non-achievers of the ethnic groups. White students made up the highest performing ethnic group in reading. Like in math, Asians and Whites have much higher percentages than African Americans and Hispanics of students who were high achieving in both the initial and final years (maintainers). Asians and whites have over 3 times the percentage of maintained high achievers than Hispanics and more than double the percentage of African Americans.

Figure 4-16 and 4-17 depict the numbers and percentages of each achievement status for reading for each ethnic group. Figure 4-16 shows the ethnic groups of students by achievement status. Figure 4-17 shows the achievement status of students grouped by ethnic group.

*Figure 4-16 Achievement Status of Ethnic Groups in Reading*

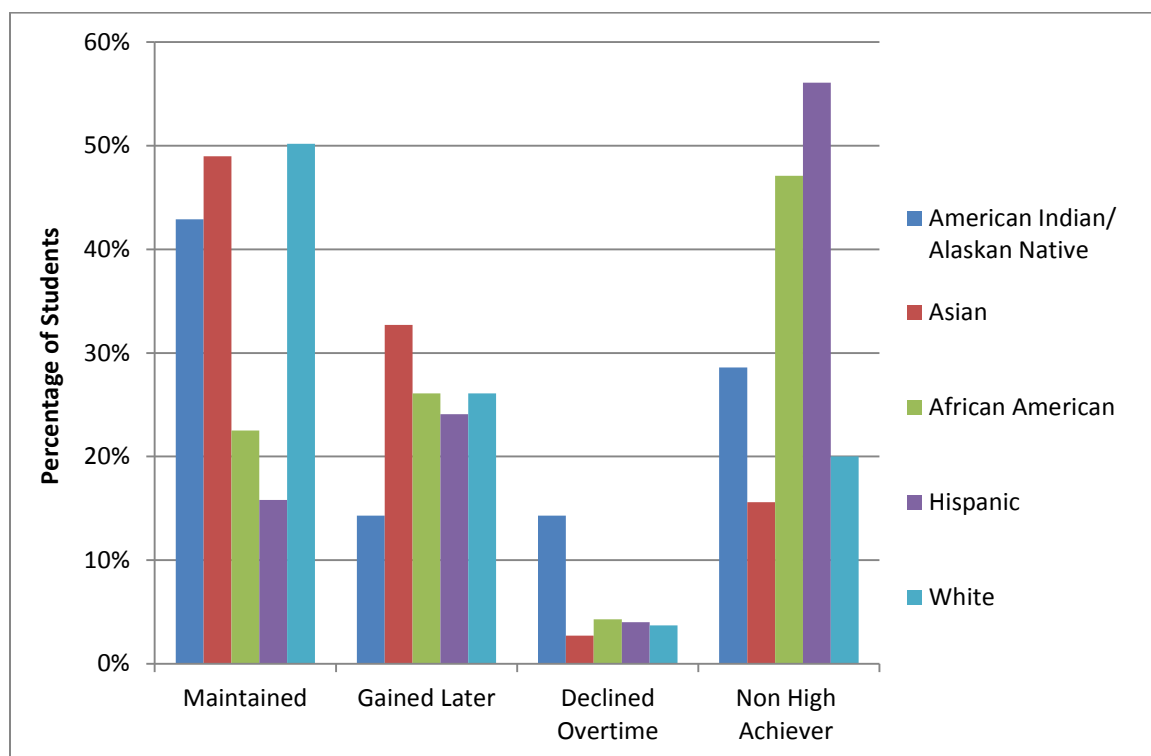
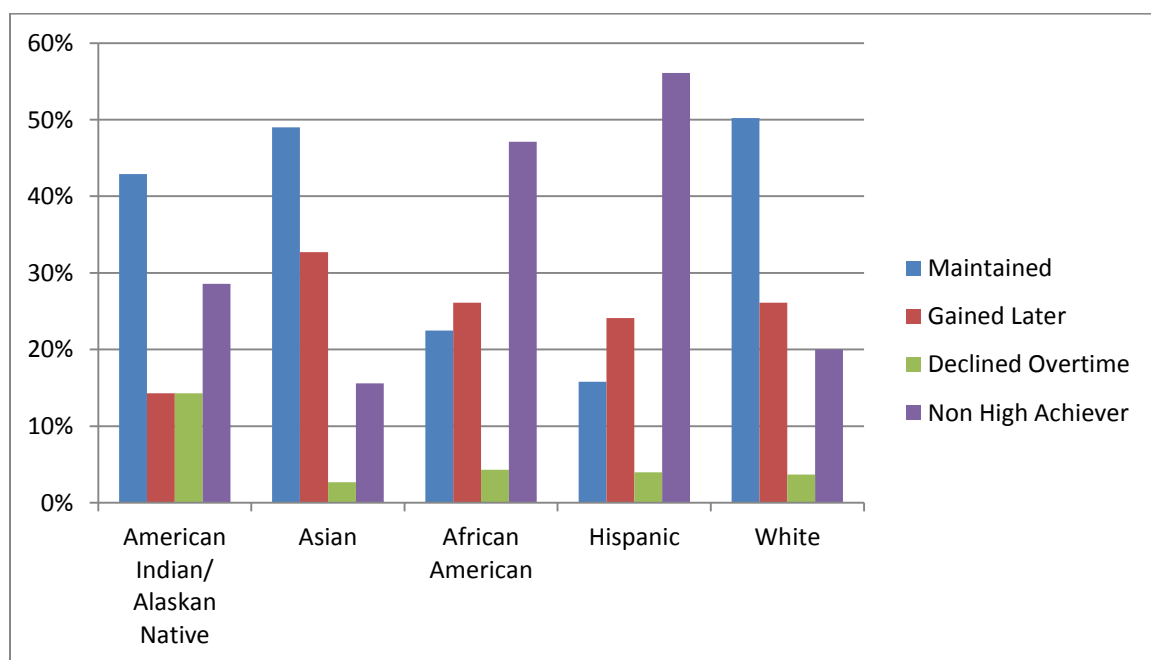


Figure 4-17 shows the achievement status of students grouped by ethnic group.

*Figure 4-17 Achievement Status in Reading by Ethnic Group*



In reading, of the 1,252 students that maintained high-achieving status overtime, 3 (42.9%) were American Indian or Alaskan Native, 443 (49%) were Asian, 224 (22.5%) were African American, 134 (15.8%) were Hispanic, and 448 (50.2%) were White. Of the 995 students that gained high achieving status by the final year of the study, 1 (14.3%) was American Indian or Alaskan Native, 296 (32.7%) were Asian, 260 (26.1%) were African American, 205 (24.1%) were Hispanic, and 233 (26.1%) were White. Of the 135 students that lost high achieving status from the initial to the final year, 1 (14.3%) was American Indian or Alaskan Native, 24 (2.7%) were Asian, 43 (4.3%) were African American, 34 (4%) were Hispanic, and 33 (3.7%) were White. Lastly, of the students that were non-high achieving in the initial and final years, 2 (28.6%) were American Indian or Alaskan Native, 141 (15.6%) were Asian, 469 (47.1%) were African American, 477 (56.1%) were Hispanic, and 179 (20%) were White.

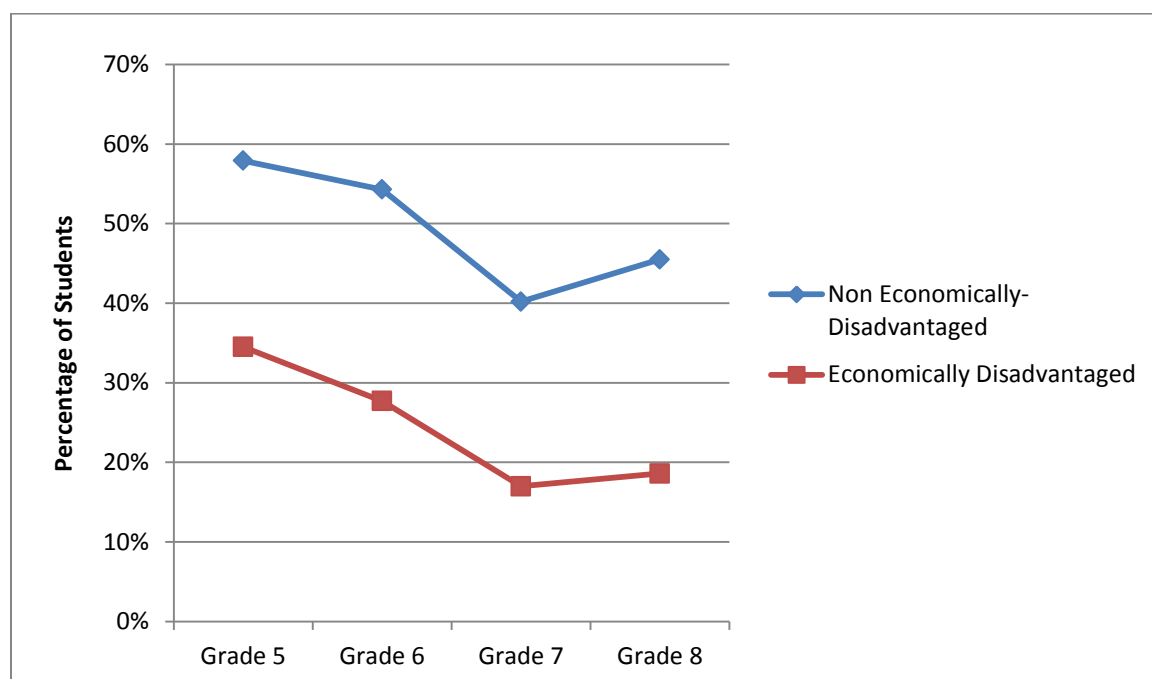
### **Performance Trend by Socioeconomic Status**

In this study, economically disadvantaged students were defined as those that received free or reduced meals. In the total cohort of 3,650 students, 1,095 (30%) were economically disadvantaged and 2,555 (70%) were non-economically disadvantaged.

**Performance trend in math by socioeconomic status.** Economically disadvantaged and non-economically disadvantaged students showed similar patterns in their trend lines in math from grades 5-8 as seen in Figure 4-18. Both groups had declines from grade 5 to grade 7. Both groups gained high achievers in 8<sup>th</sup> grade. There are much smaller percentages of high achievers among economically disadvantaged students. Of the 1,095 economically disadvantaged students in the cohort, 378 (34.5%) were high achieving in 5<sup>th</sup> grade, 303 (27.7%) in 6<sup>th</sup> grade, 186 (17%) in 7<sup>th</sup> grade, and

204 (18.6%) in 8<sup>th</sup> grade. In comparison, there were a total of 2,555 non-economically disadvantaged students in the cohort. Among those, 1,480 (57.9%) were high-achieving in 5<sup>th</sup> grade, 1,387 (54.3%) in 6<sup>th</sup> grade, 1,028 (40.2%) in 7<sup>th</sup> grade, and 1,162 (45.5%) in 8<sup>th</sup> grade.

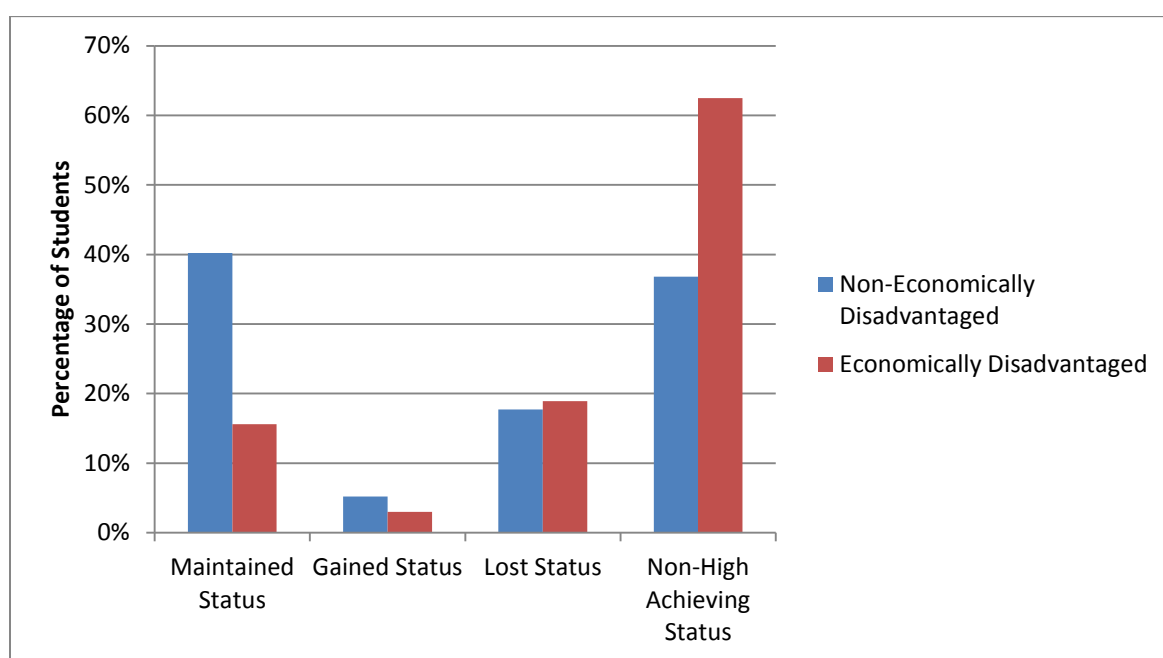
*Figure 4-18 Performance Trend in Math by Socioeconomic Status*



**Achievement status in math by socioeconomic status.** The study analyzed economically disadvantaged and non-economically disadvantaged students and categorized those that maintained high-achieving status, gained high-achieving status after the initial year, lost the high-achieving status by the final year, or was not high-achieving at the initial or final years. Figure 4-19 shows the percentages of those categories for economically and non-economically disadvantaged students. The study found that economically disadvantaged students had less than half the percentage of

students maintaining high-achievement overtime, with 15.6% for economically disadvantaged and 40.2% for non-economically disadvantaged students. Also, at 62.5%, economically disadvantaged students had a much higher percentage of students that were non-high achieving during the initial year and again in the final year, compared to 36.8% of non-economically disadvantaged students.

*Figure 4-19 Achievement Status in Math by Socioeconomic Status*



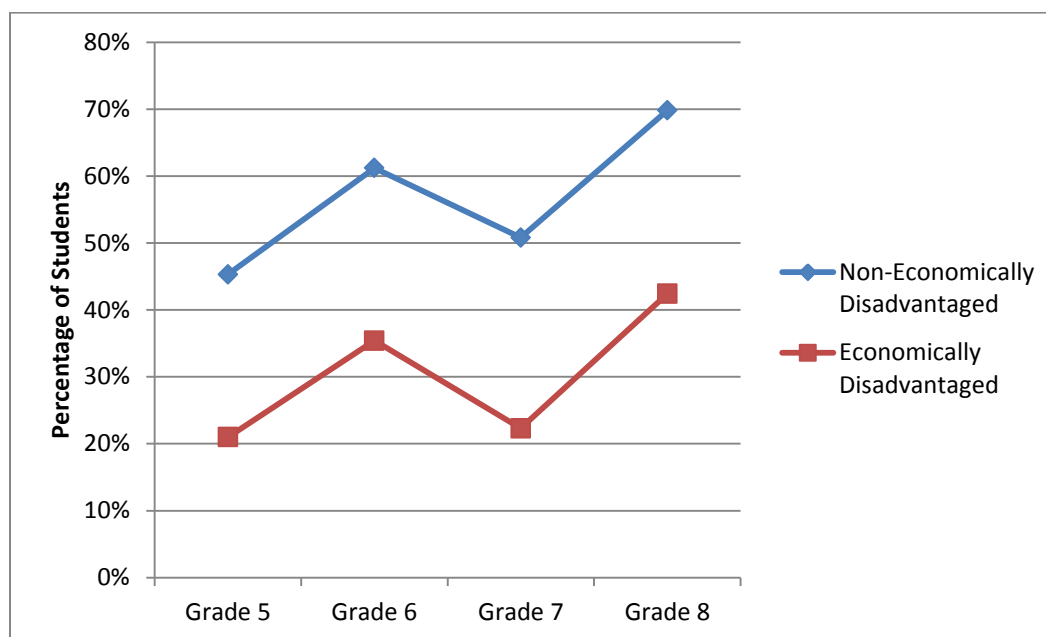
In math, for economically disadvantaged students, 171 out of 1,095 (15.6%) students maintained high-achieving status compared to 1,028 out of 2,555 (40.2%) of non-economically disadvantaged students. The number of students that gained status was 33 (3%) economically disadvantaged students compared to 134 (5.2%) non-economically disadvantaged students. The number of students that lost status was 207 (18.9%) economically disadvantaged students compared to 452 (17.7%) non-economically



disadvantaged students. Lastly, 684 (62.5%) economically disadvantaged students were not considered high achievers in math in grade 5 and again not in grade 8 compared to 941 (36.8%) of non-economically disadvantaged students. There was a significant difference between socioeconomic status groups when comparing the percentage of students who were not high achieving at all. The percentage of non-high achievers among economically disadvantaged students was 25.7% more than for non-economically disadvantaged students.

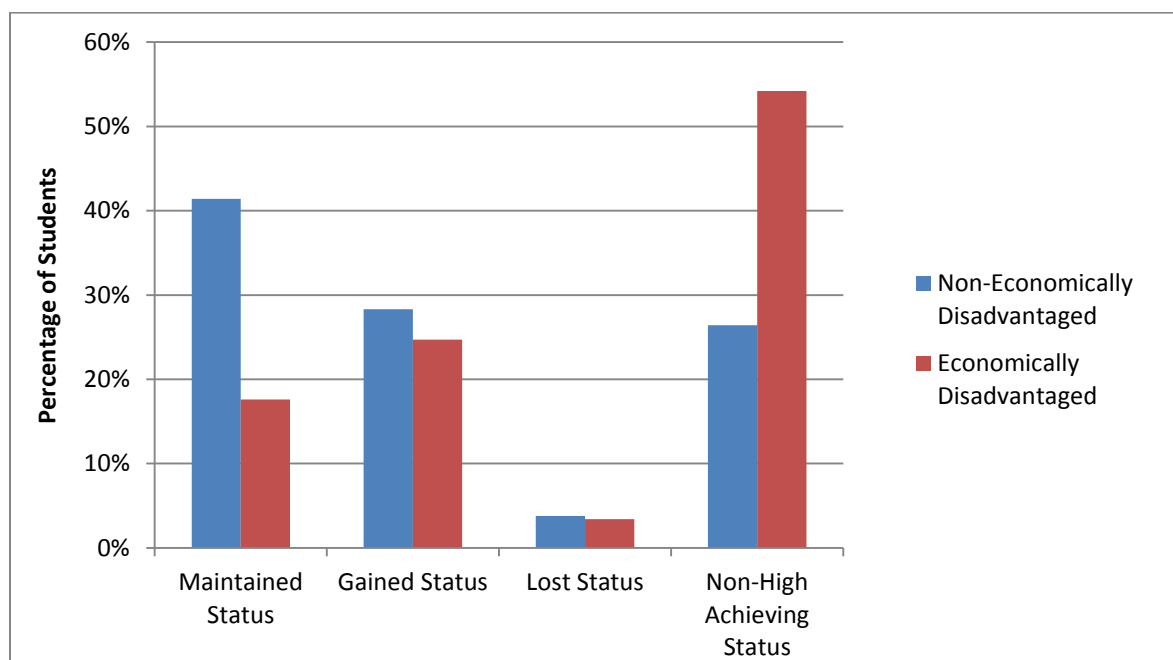
**Performance trend in reading by socioeconomic status.** Economically disadvantaged and non-economically disadvantaged students showed similar patterns in their trend lines in reading from grades 5-8 as seen in Figure 4-20. Both groups had increases from grade 5 to grade 6. Both groups lost high achievers from 6<sup>th</sup> to 7<sup>th</sup> grade. Both groups gained high achievers back in 8<sup>th</sup> grade. Like math, the economically disadvantaged group had smaller percentages of high achievers at each grade level in reading. Of the 1,095 economically disadvantaged students in the cohort, 230 (21%) were high achieving in 5<sup>th</sup> grade, 388 (35.4%) in 6<sup>th</sup> grade, 244 (22.3%) in 7<sup>th</sup> grade, and 464 (42.4%) in 8<sup>th</sup> grade. In comparison, there were a total of 2,555 non-economically disadvantaged students in the cohort. Among those, 1,157 (45.3%) were high-achieving in 5<sup>th</sup> grade, 1,563 (61.2%) in 6<sup>th</sup> grade, 1,298 (50.8%) in 7<sup>th</sup> grade, and 1,783(69.8%) in 8<sup>th</sup> grade.

*Figure 4-20 Performance Trend in Reading by Socioeconomic Status*



**Achievement status in reading by socioeconomic status.** The study analyzed economically disadvantaged and non-economically disadvantaged students for those that maintained high-achieving status, gained high-achieving status, lost high-achieving status, or was not high-achieving during the study. Figure 4-21 shows the percentages of those categories for economically and non-economically disadvantaged students. The study found that economically disadvantaged students had less than half the percentage of students maintaining high-achievement overtime, with 17.6% for economically disadvantaged and 41.4% for non-economically disadvantaged students. Also, at 54.2%, economically disadvantaged students had a much higher percentage of students that were non-high achieving during the initial year and again in the final year compared to 26.4% of non-economically disadvantaged students.

*Figure 4-21 Achievement Status by Socioeconomic Status for Reading*



In reading, economically disadvantaged students had 193 out of 1,095 (17.6%) students maintain status compared to 1,059 out of 2,555 (41.4%) of non-economically disadvantaged students. The number of students gained status by the final year was 271 (24.7%) economically disadvantaged students compared to 724 (28.3%) non-economically disadvantaged students. The number of students that lost status was 37 (3.4%) economically disadvantaged students compared to 98 (3.8%) non-economically disadvantaged students. Lastly, 594 (54.2%) economically disadvantaged students were not considered high achievers in reading in grade 5 and again not in grade 8 compared to 674 (26.4%) of non-economically disadvantaged students. There was a significant difference between the performance trends of socioeconomic status groups in reading when comparing the percentage of students who were not high achieving at all. The

percentage of non-high achievers in reading among economically disadvantaged students was 27.8% more than for non-economically disadvantaged students.

## **Chapter 5**

### **Conclusions**

#### **Overview of Study**

This purpose of this study was to examine high-achieving students and their performance on standardized tests over a period of years. In recent years, accountability measures have called for schools to raise achievement levels of lower-performing students on standardized tests. Students from all subpopulations are expected to perform at the same proficiency level. Penalties for schools and districts that fail to meet accountability standards are steep. As a result, many resources go towards lower achieving students. They become a focus for schools and teachers. This study was designed to analyze how high achieving students are performing on standardized tests at the advanced level in the era of accountability.

This longitudinal descriptive study examined a large cohort of 3,650 students from 5<sup>th</sup> to 8<sup>th</sup> grade. It categorized and analyzed the same students overtime at the individual student level. Tracking the same students allowed for a longitudinal trend to be established. Students were divided within four categories: 1) those who maintained high-achieving status by being high achieving in the initial and final year of the study, 2) those who were not high achieving in the initial year but gained high-achieving status by the final year, 3) those who were high achieving at the beginning but lost status by the final year, and 4) those who were not high achieving at all. The trends were further analyzed by gender, ethnicity, and socioeconomic status.

Students were considered high achieving by scoring commended performance on the math and/or reading Texas Assessment of Knowledge and Skills (TAKS) test.

Performance trends were identified, categorized, and examined by gender, ethnicity, and socioeconomic status.

This study was designed to answer the following research questions:

- What are the performance trends of high-achieving students over time?
  - What percentage maintains their high-achieving status over time?
  - What percentage loses their high-achieving status over time?
  - What percentage gains high-achieving status over time?
- Is there a statistical difference between the performance of high-achieving students by gender, ethnicity, and socioeconomic status?

### **Summary of Results**

The results of this study in relation to the research questions are detailed in this section.

**Research question one.** The first research question examined the performance trends of high-achieving students over time. It examined the percentage of students in the cohort that maintained high-achieving status, gained high-achieving status, lost high-achieving status, or never had high-achieving status. The study also examined how the students performed in the grade levels between the initial and final years to establish a longitudinal trend.

Overall, this cohort lost 659 high-achievers from 5<sup>th</sup> to 8<sup>th</sup> grade in math. While many were once high achieving but declined overtime, there were 167 students that gained status by the final year but were not high achieving in the initial year. That gave a total difference of 492 (-13.5%) fewer math students overtime. In reading, an opposite trend occurred. Reading had a gain of 995 high achievers from the initial to final year.

This is a large increase of students who were not high achieving in 5<sup>th</sup> grade but were high achieving in 8<sup>th</sup> grade. There were 135 students who started out as high achieving but no longer were at the final year. Reading had a total difference of 860 (+23.6%) more reading students overtime.

In math, 32.8% of students maintained high-achieving status overtime, 18% lost status overtime, 4.6% gained status by the final year, and 44.5% were not high achieving in the initial and final year.

In reading, 34.3% of students maintained high-achieving status overtime, 3.7% lost status overtime, 27.3% gained status by the final year, and 34.7% were not high achieving in the initial and final year.

**Research question two.** The second research question examined if there was a statistical difference between the performance of high-achieving students by gender, ethnicity, and socioeconomic status.

In math and reading, there was no statistical difference between the performance trends of high-achieving students by gender. Males and females had similar trend lines and similar percentages. There were slightly more males among high achievers in math and slightly more females among high achievers in reading.

In math and reading, there were statistical differences between ethnic groups in math and reading. All ethnic groups had gains and losses of high achievers over the years. The main difference is the percentage of high achievers within each ethnic group. Asians had the highest percentage of high achievers in math. Whites had the highest percentage of high achievers in reading. African Americans had the lowest percentage of high achievers in math. Hispanics had the lowest percentage of high achievers in

reading. Hispanics and African Americans were consistently underrepresented among high achievers in math and reading at every grade level.

In math and reading, there were statistical differences between the performances of the socioeconomic groups. Economically disadvantaged and non-economically disadvantaged groups gained and lost high achievers at similar percentage changes. However, economically disadvantaged students were underrepresented among high achievers compared to their representation among the total population. This study shows that these achievement gaps are not exclusive to low performing students. They exist at the advanced levels as well.

Longitudinally as a group, math experienced the greatest loss of students between 6<sup>th</sup> and 7<sup>th</sup> grade. In 5<sup>th</sup> grade, there were a strong percentage of high achievers in math. They steadily lost students as the cohort progressed into 6<sup>th</sup> and then 7<sup>th</sup> grade. By 8<sup>th</sup> grade, some high achievers were recovered but not enough to restore the levels from 5<sup>th</sup> grade.

### **Implications for School Leaders**

School leaders and educators are charged with the duty to educate each and every child, no matter his or her disability, background, ethnicity, gender, or family income level. Every student deserves to be academically challenged based on his or her initial knowledge level. It is important that schools are recognizing potential in all students, even at the advanced levels of achievement.

There have been few studies on high achieving students at the individual student level. The majority of studies about high-achieving students look to find characteristics of high achievers or compare different cohorts of students. This study fills a gap in the



research by tracking the same group of students over a period of years to analyze their progress as individuals and as members of subpopulations.

From the results of this study, there are some celebrations for school leaders to recognize. For example, in math and reading, there were no major differences in the performance between males and females. This shows that gender inequity is not a factor among high achievers in this district. Also, the overall cohort gained 995 high achieving students in reading from 5<sup>th</sup> to 8<sup>th</sup> grade. This shows that students can gain high achieving status in reading at the middle school level. In this study, there were more high-achieving reading students at the end of the study than there were in the beginning of the study. School leaders can analyze differences in their math and reading programs. These gains may indicate that this district has a richer reading or language arts program and focus than other content areas.

This study also showed that there are areas of concern and changes needed among high achievers. In math, not nearly as many high achievers were recovered once they lost the status, and math had less high achieving students by the final year than the initial year. The overall cohort lost 659 students who were once high achieving but no longer were by the final year in math. Because recovering high achievers in math at the secondary level is difficult and costly, school leaders must recognize that these students had the potential and give more attention and intervention to these students when they begin to slip from the ranks (Dougherty, Mellor, & Smith, 2006). These students needed to be recognized, challenged, engaged, and supported to maintain the level of achievement they once had. School leaders often track and provide intervention for “bubble students,” who are slightly above or below the proficiency level to ensure they

reach the mark. School leaders should be doing the same for “bubble students” at the commended performance level.

In this study, African American, Hispanic, and low-SES students were underrepresented among high achievers in this study. Other studies show that minorities score lower on achievement tests and underrepresented among high achievers at all levels of education (Miller, 2004). School leaders should know that there are more high achievers out there in these populations. They need to be identified and fostered to reach their full potential. Students from economically disadvantaged backgrounds often do not have enough resources at their disposal to make it on their own (Beilke & Burney, 2008; Carnevale, 2007). They need additional support and guidance from the school as they most likely do not have resources at home that non-economically disadvantaged high-achieving students may have. Programs such as Advancement Via Individual Determination (AVID) are designed to help students reach their college dreams. Although the AVID elective is designed to help all students, its “main focus is the least served academic students in the middle of academic achievement” (AVID, 2013). AVID students have showed higher success rates than non-AVID students for over 30 years, which sets it apart from other school reform programs. In terms of taking Advanced Placement (AP) exams, AVID students outperform their non-AVID peers. For example, in 2012, 57% of AVID Hispanics took AP tests compared to 14% of non-AVID students. For African American students, 14% AVID students took AP exams compared to 8% of non-AVID students. Of the 33,204 AVID seniors in 2012 who reported their demographics, academic achievement data and future plans, just over 98 percent indicated they would be graduating from high school, with 90 percent planning to attend

a postsecondary institution: 58 percent to a four-year college and 32 percent to a two-year institution (AVID, 2013). AVID has demonstrated success by preparing elementary and secondary students, mostly underserved from families without a college-going tradition. Not all schools have programs like AVID available to their students. Schools, especially in low-income neighborhoods, may lack resources such as staffing, funds, or district support (Beilke & Burney, 2008; D'Angiulli, Hertzman, Kohen, & Maggi, 2004). As school leaders, support, resources, and programs that focus on maintaining and growing high-achieving, low-income or minority students need to be made more available.

Another implication for school leaders is to reach out to minority or low-income parents. Miller (2004) suggests school leaders partner up with specialized non-profit organizations or university-based centers focused on educating and supporting minority students and their parents on improving school readiness.

Research shows that school districts that want to prepare their students for post-secondary education and work must do at least three things. The first is to adopt high college-readiness standards that minimize the amount of remediation a student will need in college. The second is to make these high standards the K-12 curriculum for all students regardless of their background. The third is for students to reach these high standards in elementary school. By the time students reach the secondary level, achievement gaps are difficult and costly to close due to the amount of catch up these students may need. School systems and school leaders that embrace attainable college readiness standards for all students will elevate the performance and goals of their students and schools (Dougherty, Mellor, & Smith, 2006).

Recognizing and understanding of the longitudinal performance trends of student achievement at the advanced levels gives school leaders an opportunity to take action. Once the trend is established and analyzed, school leaders can use that data to develop and implement staff development for teachers of gifted students and allocate necessary resources for program development efforts to ensure all students' needs are being met. This study, by examining performance trends by gender, ethnicity, and socioeconomic status, gave light to subpopulations that are underrepresented among high achievers. It also revealed that the number of high achieving students in math declined overtime whereas the number of reading high achievers increased overtime. Being that these are the same students, school leaders can explore why this cohort gained high achievers in reading while losing them in math.

The big loss of high-achieving math and reading students from 6<sup>th</sup> to 7<sup>th</sup> grade sparks the need to look at vertical curriculum alignment, transitions from elementary to middle school, structures of courses at the 7<sup>th</sup> grade level, passing standards for the 7<sup>th</sup> grade tests, professional development for 7<sup>th</sup> grade teachers, development of adolescent students, or more. Perhaps previous grade levels need to better lay the foundation for 7<sup>th</sup> grade concepts. Perhaps the vertical alignment and transition between elementary to middle school needs to be examined. High achieving students sank in 7<sup>th</sup> grade in both subject areas. Perhaps school leaders need to examine the middle school setting for students at this age. There may be more successful school models for gifted or advanced students for adolescents. Those are all implications for school leaders to consider.

Reading experienced a growth in high achievers from 5<sup>th</sup> to 6<sup>th</sup> grade, a large loss of high achievers in 7<sup>th</sup> grade, and then a large gain back of high achievers in 8<sup>th</sup> grade.

Again, this sparks the need to examine the achievement in 7<sup>th</sup> grade. School leaders should also look at what is working at the 6<sup>th</sup> and 8<sup>th</sup> grade levels in reading to try to duplicate that growth. When looking at the growth and decline of high achievers, it is also important to consider the passing standards to ensure the rigor of the test was consistent from year to year.

Another implication for school leaders is to look at the achievement status of students from the initial year to final year. This gives an overall look at which students maintained status along the way, gained status later, lost status they once had, or never had high achieving status. For those that maintained or gained status, there are insights to what works for them. School leaders can look at the characteristics of those students in the effort to duplicate those characteristics for other students. For those that were once high achieving but lost status along the way, information must be gained to minimize the drop in achievement of these students. These students were once high achieving alongside their peers. The identification of those that lost status will help school leaders focus on tailoring retention programs for these students in future years. For the students who were never high achieving during the study, the resources, efforts, and strategies used to lift lower performing students to the proficiency levels should be applied relatively to these students who have the potential to reach advanced levels.

School systems should include advanced levels as an accountability measure for school success. If schools are to be accountable for closing achievement gaps, the achievement gaps at all levels should be addressed and deemed important (Dougherty, Mellor, & Smith, 2006). School systems need not wait for mandates to make these students a priority. School systems and school leaders should track and identify their

high-performing students, apply effort and resources to maintain and grow more high achievers, and work to close the achievement gaps of economically disadvantaged, African American, and Hispanic subpopulations (Beilke & Burney, 2008). As the United States continues to be more of a minority majority country, it is critical that the minority high-achieving population grows.

### **Implications for Further Research**

Research on high achievers at the individual student level is minimal. Any research on high achieving students and their performance would add to a necessary body of research.

One implication for further research would be to extend the longitudinal study of high achieving students by going back to the elementary years or by going forward to the high school and post high school years. Texas has a longitudinal database to track the education of its students from elementary to post high school. To truly track the longitudinal trend of high-achieving students from the start to the end of their educational career at the individual student level would be extremely insightful.

Additional research could go even further back to the educational experiences these high achievers were exposed to prior to entering school as young children. Did these students experience any pre-K, Montessori, or any schooling at all prior to entering school? Studies show that economically disadvantaged students enter school at the Kindergarten level with a deficiency (Fryer & Levitt, 2004). If certain subpopulations enter school with achievement gaps and their performance gaps remain similar as they continue through school, then schools are making a difference for those students. They are gaining and losing high achievers at similar percentages as the other subpopulations

which indicate that schools are affecting the subpopulations in the same way. It would indicate that schools, however, are not able to recover the achievement gap that the students come with when they start school.

Another implication for further research would be to extend the content areas beyond math and reading. Math and reading standardized tests are taken each school year whereas science and social studies standardized tests are not. It would be interesting and meaningful to track the performance of students at advanced levels on content areas that are assessed only every few years. It would be interesting to see if and how gender, ethnicity, and socioeconomic status affects performance in science and social studies. Currently, legislators in Texas are debating the number of high-stakes standardized tests students should have to take in K-12 public schools. A research study to show if the frequency and subjects of standardized tests will affect the performance of students over time could be conducted.

Another implication for further research would be to compare the achievement trends for subpopulations at the proficiency and advanced levels of performance for the same cohort of students at the individual student level. It would be interesting to find out if the percentage gaps are proportional or if the gains and losses at the proficiency level are the same as at the advanced level in this study.

A study could also look further at the population of minority students and the population of economically disadvantaged students to compare if they are the same students. How are students affected by having both factors?

This study could also be further extended by adding factors that can affect or define high achievement. This study used commended performance on a standardized,

criterion-referenced test to define high achievement. Researching academic history, course grades, grade point average (GPA), or Advanced Placement (AP) test results of the students at the individual level would allow for a different analysis of high achievers. Using different instruments to measure academic achievement or high performance could give school leaders a different perspective on issues in their school system.

Another implication would be to consider on-campus or off-campus intervening factors that could affect the achievement of students. On-campus factors such as teacher expertise, climate of schools, discipline of students, course offerings, and programs available to high achievers could certainly make a difference. Off-campus factors such as private tutorial programs outside of school, enrichment programs, or other external factors could certainly make a difference in high achievers. By adding these elements when researching high achievement in school could be insightful. School leaders may find that achievement in their schools can be affected by many factors, perhaps both in positive and negative ways.

Further research could be conducted on high achievers on campuses that have programs designed specifically for them. These could include Advanced Placement (AP) programs, Gifted and Talented (GT) programs, Advancement Via Individual Determination (AVID), or college centers. Research on how these high achievers have been affected by these programs could be conducted. This research could examine effects on achievement levels using quantitative analysis. It could also examine effects on the affective domain of students using qualitative analysis.

Studies on the affective domain and the whole child of high achievers are also important to guiding programs designed to meet their needs. This could include



examining how gifted students feel in classrooms that are behind pace. It could include how minority students or low-income students feel being in advanced classes. A researcher could investigate what barriers high-achieving students face in public schools. A study could also examine at the pressures placed on students to perform at consistently high-levels with their peers to find if students are affected in a positive or negative way from these pressures.

Research on high achieving students at the individual level over time is minimal. Any further research on this population would add to a necessary body of research. School leaders will gain insights and determine actions to provide a rigorous and meaningful education for students at all levels, especially the future of the nation - the high-achieving students in our schools.

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**Appendix A**  
APPROVAL FROM THE UNIVERSITY OF HOUSTON HUMAN SUBJECT  
RESEARCH COMMITTEE

**UNIVERSITY of HOUSTON**  
DIVISION OF RESEARCH

February 28, 2013

Mrs. Jennifer Nichols  
c/o Ms. Rayyan Amine  
Curriculum and Instruction

Dear Mrs. Jennifer Nichols,

Based upon your request for exempt status, an administrative review of your research proposal entitled "WHAT DO SCHOOL LEADERS NEED TO KNOW ABOUT THE PERFORMANCE OF HIGH-ACHIEVING STUDENTS ON STANDARDIZED TESTS" was conducted on November 14, 2012.

At that time, your request for exemption under **Category 4** was approved pending modification of your proposed procedures/documents.

The changes you have made adequately respond to the identified contingencies. As long as you continue using procedures described in this project, you do not have to reapply for review. \* Any modification of this approved protocol will require review and further approval. Please contact me to ascertain the appropriate mechanism.

If you have any questions, please contact Alicia Vargas at (713) 743-9215.

Sincerely yours,



Kirstin Rochford, MPH, CIP, CPIA  
Director, Research Compliance

\*Approvals for exempt protocols will be valid for 5 years beyond the approval date. Approval for this project will expire **November 1, 2017**. If the project is completed prior to this date, a final report should be filed to close the protocol. If the project will continue after this date, you will need to reapply for approval if you wish to avoid an interruption of your data collection.

Protocol Number: 13132-EX