Fall 2017

Influencing Factors For Academic Tracking In High School Mathematics

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INFLUENCING FACTORS FOR ACADEMIC TRACKING IN HIGH SCHOOL MATHEMATICS

by

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A capstone submitted in partial fulfillment of the
requirements for the degree of Masters of Art in Teaching.

Hamline University

Saint Paul, Minnesota

December 2017

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To Melissa, my wonderful wife. It is without a doubt that I would have not finished this paper without you. You gave me the motivation to work on my research, to never stop asking for information, and to stop procrastinating. To my father. Developing a passion for learning and improving is something that I can never truly thank you for instilling in me. You have explained to me the importance of being the best that one could be and that determination has molded me into who I am today. Thank you both, for without you, I would still be thinking about completing this research instead of doing it.

Parents are the ultimate role models for children. Every word, movement and action has an effect. No other person or outside force has a greater influence on a child than the parent.

–Bob Keeshan (Captain Kangaroo)

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CHAPTER ONE

INTRODUCTION

Research Question

What are prominent influencing factors related to academic tracking in mathematics? This is a question that has been asked, and there has been research to show that there are factors related to academic success, such as family influences and social influences (Argys, Rees, & Brewer, 1996; Carter, 2002; Egalite, 2016; Griffith, 1996). Factors that will be analyzed in this research will be related to family influences, nonacademic school influences, and academic influences in a student's life.

Rationale

Academic tracking is defined in this research as intra-school separation of students into different levels of classes based on factors including but not limited to: standardized test scores, teacher recommendations, behavior, and parent/guardian requests. The National Education Association (NEA) defines tracking as "the practice of grouping children together according to their talents in the classroom" (Research, 2017). The NEA elaborates on the history of tracking by describing it as an outdated early 20th Century means to prepare students for their roles in the workforce. Tracking is practiced by schools and there are many different factors which influence which students are selected for advanced tracks, which students are selected for remedial tracks, and which students are placed into the grade-level track. Many school districts begin tracking in elementary school with pullout tutoring with specialists. Tracking progresses into the secondary level with specialized classes provided for students who are gifted and talented and students who need remediation in certain subjects. Oftentimes there are standardized test scores,

grade reports, and teacher recommendations used to track students into classes but there seems to be little equity in this process. Students who have attended programs prior to kindergarten, attended privatized kindergartens, and have access to tutoring at home have a leg up on their peers and seemingly are more likely to be placed into the gifted/talented tracks due to those students being exposed to habits that create a "good student". A "good student" will be defined as one who understands the process for earning high marks in school and on standardized tests. He/she is one who completes most or all of the assignments with few excuses and on the rare occasion needs to turn in an assignment late.

The achievement gap has been and is currently discussed in graduate level education courses, school districts, communities, local governments, state governments, and the federal government. Initiatives are created in order to attempt to reduce the achievement gap and create equity amongst all students. One issue with some of these initiatives is that socioeconomic issues are sometimes neglected when developing the new initiatives and therefore the initiatives are doomed to fail or not be as successful as intended.

From this study, I hope to identify family factors, nonacademic school factors, and academic factors that have strong influences on student tracking, focusing on math classes. Showing this to school boards, local and state governments, and anyone who can impact student learning will allow for new programs to be created and existing programs to be amended in order to create a system in which as many students as possible have opportunities to be in advanced classes regardless of what opportunities they have been provided. Determining the influencing factors which strongly correlate to tracking and opportunity within schools will help me as a teacher, the school district I work in, and other educational organizations with issues related to school organization and student

success. A goal of this research is to attempt to minimize and/or eliminate unfair tracking practices in which students get misplaced into remedial classes due to certain influencing factors.

Context

My Secondary School Experience as a Student

My introduction to tracking started when I was in the 7th grade. I was tracked into many advanced classes, including math, science, social studies, English, and Spanish. Being that 7th grade is the first time that you are formally introduced to a foreign language in my district, the concept of tracking students into an advanced class with no data directly related to that student's ability in the course was confusing to me. I assumed I was placed into the other advanced classes based on my standardized and state test scores, but the reasons for my tracking were never explained to me, nor did I ever ask about them. Over the course of my secondary schooling, I was always in advanced classes and the thought never crossed my mind as to whether or not I was appropriately placed there or the implications that existed for students who did not receive the opportunity to be in the advanced classes. Being in a regular level class also did not cross my mind because I understood that my GPA would receive a boost due to the multipliers associated with simply being in the class. As I progressed into the more challenging classes in high school, many of my peers who had been in the advanced classes with me since 7th grade remained in the classes regardless of whether they were comprehending the material or simply "faking it to make it". It seemed obvious to me that some students seemed to be in over their head and would have benefitted more from possibly not being asked to learn at a rate that was way too fast for them. It also makes sense to me now that students are

reluctant to change and that moving from an advanced class to a regular class is not in the mindset of an "advanced" student because of implications such as hurting chances to get into college, social pressure from peers and parents, and feelings of failure and being average. What my middle and high school experiences taught me with regards to tracking is that while students may benefit from tracking and that tracking is not something that is going to be eliminated from the school system, tracking of individual students may need to be evaluated on a more frequent basis.

My Pedagogy Experience

The aspect of my pedagogy experience that had the strongest impact on me choosing this topic was when I completed an Intercultural Development Inventory (IDI). According to the website which provides this assessment, "the Intercultural Development Inventory (IDI) assesses intercultural competence—the capability to shift cultural perspective and appropriately adapt behavior to cultural differences and commonalities" (Roadmap, 2016). The results from the IDI communicated to me that I was conflict-averse and that I had limited experience with diversity. Reflecting back on my school district, my experience with diversity generally limited to my interscholastic interactions with students from other schools. My cultural competency class required the book *Hey, Hmong Girl, Whassup?: The Journal of Choua Vang* to be read and reflected upon. Even though the story was fictitious, I was able to visualize how certain student groups feel when progressing through the institutionalized education system. Being expected to perform a certain way in order to receive a grade and being evaluated on how well you follow the directions that each teacher gives is an inequitable system that provides an advantage to those students and families who are most familiar with the system.

My Student Teaching Experience

After learning about special education students, gifted and talented students, English learners, and other types of specialized learners in my pedagogical classes, I was able to practice what I learned in a classroom in a Saint Paul high school. The year that I student taught allowed me to be in one IB Mathematics SL (Calculus I), one IB Mathematics HL (Calculus II), and three Geometry classes. Of those classes, the IB classes would be characterized as advanced track classes and the geometry classes would be the standard track for the majority of students. Being that there were only two IB math classes that the school offered, I was able to see every student who was enrolled in these classes that year. In the IB Mathematics SL class, there were 45 students. Approximately 40 of these students identified with the White/Caucasian demographic. Of the 5 students who did not identify with the White/Caucasian demographic, one student dropped during the first semester. A similar percentage of students in the IB Mathematics HL class were of a different race than White. While I did not get a chance to analyze the learning histories and standardized test scores of all of the students in the 11^{th} and 12^{th} grades(the grades that almost all of the IB Mathematics SL/HL students were in) in that particular school, I believe that there was a gross underrepresentation of students of color in these advanced classes. My Geometry classes had a fairly diverse spread of races and ethnicities which better represented the student population in the high school. Some of the students in the Geometry classes probably should have been tracked into advanced classes at an earlier age but were not. Some of the students in the IB Mathematics SL/HL classes should have been placed back into the standard track before they made it to higher level classes but once again their track was not altered. I was once again observing a trend that I had seen

so often, where once a student is tracked, he/she generally will not be moved into a different track. Hopefully my research allows me to find trends as to why certain students are tracked into higher level classes and others are not and why there seems to be a correlation between race and tracking.

My Teaching Experience So Far

I currently teach high school students enrolled in Advanced Algebra 2, Algebra 2, and Pre-Algebra. Advanced Algebra 2 is the accelerated track and Pre-Algebra is the remedial track. Being that the school is in a rural setting with a population that is roughly 95.5% White (United, 2010), I have not seen as much of a racial division amongst the math tracks but I have observed trends that parallel the tracks. From conversing with my students and learning about their personal lives, I have found that the students in my Pre-Algebra classes are much more likely to living in the lower income houses, apartments, mobile homes, and communities within the school district, while the Advanced Algebra 2 students generally live in single-family homes in the nicer area of town. The students' hardships are evident by the frequency in which they ask me for supplies such as pencils, notebooks, and graph paper. I have had Advanced Algebra 2 parents email me during the weeks of summer preceding the new school year regarding school supplies(calculators, notebooks, graph paper) and if their children can do anything in order to feel better prepared for my class. Every summer, our district provides math packets to all middle school students but in unequal amounts. Twice the amount of practice is provided for students in the advanced tracks in an order to further strengthen their math abilities. I have always questioned why additional material and practice is provided only to one level of student and it seems that the district-wide assumption is that the students who were

placed in advanced classes can handle the material. Do the advanced students benefit from additional attention and practice? I absolutely believe so. Would the students in regular and remedial classes benefit from more practice and higher expectations? This might be the case, and the correlation between influencing factors and tracking will help to show that as certain factors are understood, expectations change and that creates a system where those students have the support and prospects of being placed in advanced tracks. Student performance can be evaluated by standardized tests but other evidence needs to be analyzed in order to fully comprehend the knowledge that a student possesses.

Conclusion

Throughout my educational experience, I have become curious about how certain external influencers affect a student's chance of success. What are the major family factors, nonacademic school factors, and academic factors that have a strong influence on a student's tracking in a math class within the public education system? Throughout my life I have been placed in advanced classes; I have been under a false pretense that everyone is provided the same opportunity to work hard, and I have been relatively oblivious to the effects that influencing factors have on a student's education. My education classes and my teaching experience have awakened me to the inequalities in the education system. Through a review of previous studies, analyzing student archival data, and surveying and interviewing students within my school district, major factors demonstrating a strong correlation between influencing factors and tracking will be uncovered. The literature review will discuss possible factors which correlate with academic achievement and academic tracking and will define academic tracking and explain the reasons behind why it exists and how it is used.

CHAPTER TWO

LITERATURE REVIEW

Introduction

The main purpose of the literature review is to explain what is meant by academic tracking and the influencing factors that are associated with student tracking. In order to define the parameters of the research, it is necessary to identify the family and social factors, behavioral factors, school factors, and other factors related to student performance. These factors are the basis for the research question (What are prominent influencing factors related to academic tracking in mathematics?) and will be studied in order to determine which factors have strong influences with academic tracking. Previous studies are reviewed in order to determine factors that had been previously analyzed with their relation to academic performance in an attempt to determine which parameters and variables can and cannot be researched in my study. Factors which cannot be studied in the research will be identified and explanations will be given for why those factors will not be represented in the research. In addition, the process of academic tracking is researched and defined in order for a common definition to be established. Outcomes resulting from academic tracking are discussed in order to demonstrate the effects that tracking has on students and the necessity for evaluating the factors related to why and how students are tracked.

From evaluating the studies and the other secondary articles and sources, three goals are accomplished. The first goal is to attain answers to questions regarding which topics have previously been studied and to what extent. The second goal is to determine what questions are useful and effective to ask in surveys and interviews when data is collected

in order to limit bias and increase the amount of useful data collected. A final goal is to determine if there is subject matter that is underrepresented in current studies in order to provide some new research in a field with a plethora of research. The three goals are united under the common umbrella goal of sculpting a research collection strategy which uses previous studies in order to determine effective techniques without directly replicating other studies.

The important bibliographic tools that are utilized in the literature review are articles retrieved from the websites of educational organizations at the state and national levels and previous research completed by other researchers related to influencing factors on academic achievement. From the sources, academic tracking is defined and focused within the scope of the research, appropriate factors related to academic tracking are identified, and the academic and social outcomes of academic tracking are discussed.

Academic Tracking

What is tracking? PROM/SE (2008) defines tracking as "the practice of assigning different students to different groups of courses" (p. 1). There are different types of grouping which can be done: (1) grouping within a single classroom and (2) grouping into different classes or sections. Grouping will only be considered academic tracking if it falls into the latter option for this research. Possibilities of tracking include, but are not limited to: taking the same courses as others but in different years, taking a course earlier than one's peers generally would take it (eg. as a freshman instead of as a junior), or taking the same course at a different level of rigor (eg. Algebra 2 vs. Advanced Algebra 2) (Wilding-Martin, 2011). For the purpose of the research, tracking will be defined as taking the same course at a different level of rigor or taking a sequenced math class in a

nontraditional year (eg, taking Pre-Algebra or Advanced Algebra 2 as a freshman instead of Algebra 1).

Sequencing of classes becomes a discussion point because separate districts may have classes with different names that address different standards or could have classes with the same or a similar name which are significantly different in content. There are a few examples of this. One example would be a school in the Saint Paul Public Schools district, Washington Technology Magnet School (2015), offering a course called Algebra 1 and a school in the New Richmond Public Schools district, New Richmond High School (2016), offering a course with the same exact name. One school teaches Algebra 1 as part of a two year sequence with Algebra 1 being the first year and then Intermediate Algebra as the following course, while the other school teaches Algebra 1 as a one year course to prepare students for a Geometry course. This information is important because students transferring districts have the potential to be incorrectly tracked due to miscommunication or misleading course names. Studies by PROM/SE (2008) also show that there is "substantial within-district variation" for the amount of math courses taken by students. The courses a student takes is guided by systematic tracking which is influenced by social, economic, and demographic factors.

Burris and Welner (2005), Wilding-Martin (2011), and the Montgomery County Education Forum (MCEF) (2002) all agree that academic tracking creates the strong possibility of inequity in the classroom based on social factors. Tracking "stems from the fact that tracking is grounded in values, beliefs, and politics as much as it is in technical, structural, or organizational needs" Burris & Welner, 2005, p. 495). This statement alone echoes a belief that tracking is inherently more closely related to factors which are not

controlled by a school rather than an effort to organize and provide an optimal form of education. To understand the history of tracking, one can look at the 19th and 20th centuries. Throughout the 19th and more than half of the 20th centuries, white students were schooled separately from their peers of various racial and ethnic backgrounds. Education for non-Whites had a primary purpose of teaching "American" values to these students and to provide skills necessary for low-wage employment. More money was spent on educating white children than students of color. Up until *Brown vs. Board of Education of Topeka, Kansas* in 1954 overruled the previous doctrine under *Plessy vs. Ferguson*, "separate but equal" schooling was legal. Up to and include the present, many people still believe that "educational equity is an unfulfilled promise" (MCEF, 2002, p. 1).

In order to get a better understanding of tracking, the student perspective must also be heard (Speilhagen, 2010). Speilhagen (2010) discusses five student-based themes in his qualitative research on student perceptions of tracking. The first theme is that "social concerns dominate middle school academics" (Speilhagen, 2010). Students group themselves with peers and form cliques based on commonalities and this creates differences in study habits and perceptions of school. Another perception is that social development was related to their placement in math classes and therefore attached to success. Students are aware that teachers place students into math classes and have differing opinions based on interests in athletics, social groups, and behavior. The two most telling themes that Speilhagen (2010) discusses are "studying algebra in eighth-grade provides long-term benefits" and "regardless of their placement, students felt that eighth-grade algebra was an important experience for all students". Students are aware that being in advanced tracks and rigorous classes are beneficial to their learning and to developing

strong work habits. Even at an elementary age, students are aware of these themes. A Montgomery County Public School fifth grade student makes the assertion that "The children in the gifted classes try really hard. [The other students] they just sort of die" (MCEF, 2002, p. 5). Social maturity and the importance of social life compared to learning, however, may prevent students from selecting rigor and achieving at the highest level possible. When asked about what expectations teachers had of their students in different tracks, a powerful message came to light. A math teacher at a California senior high school expected students in high track students to have the "ability to reason logically in all subject areas" (MCEF, 2002, p.5). "I want them to respect my position – if they get this, I'll be happy" (p. 5) was the response for the expectations of a junior high math teacher of low track students in California (MCEF, 2002). While these two responses cannot represent the beliefs of every math teacher in the state of California, this alarming trend does cause distress when analyzing Bloom's taxonomy. The high track students have the expectation of analysis, evaluation, and synthesis, high level life skills, while the low track students had the expectation of knowledge and following directions, life skills which are related to unskilled labor.

A discussion point that Burris and Welner (2005) suggest as a solution to tracking and the achievement gap is to provide a "high track curriculum to all students" (p. 595). A suburban school district in Rockville Centre, New York tested this idea out by "detracking" students and pushing all students into heterogeneously grouped math classes. Raising the standards and expectations for all students while providing support, such as math support classes and after-school extra help, for the struggling students worked and closed the achievement gap while increasing the percentage of students earning diplomas

across the board (Burris & Welner, 2005). The important idea behind this account is that achievement scores across the board increased, which is a tenet of tracking. Wilding-Martin (2011) further discusses this idea through a democratic approach to math education. She states that the study of mathematics could be student-driven through a problem-solving lens in which students "would not be held back by perceptions about their ability" (p. 97) and therefore minimize the effects of ability-based tracking. "Mathematics should not frustrate anyone to the point of giving up, but beckon the learner with the challenge of a potential solution to a difficult problem" (CPM, 2015). This philosophy of the teaching of and studying of mathematics is one that does exist in harmony with academic tracking, but the parameters that have been used in order to track students for the past century must be inspected as to their purpose, functionality, and any additional outcomes created by the system.

Family and Peer Factors

Family Factors

Family involvement in schoolwork is crucial to a student's success. According to Carter (p. 2), "Parent/family involvement has a significant positive impact on student outcomes throughout the elementary, middle, and secondary years" (2002). Family factors are defined as any element that contributes to but is not limited to physical preparation (eg. supplies), attitudes, behavior patterns, and study habits. These factors are of a magnitude that is more important than internal factors within a school district or an individual school. "Differences among schools in their facilities and staffing 'are so little related to achievement levels of students that, with few exceptions, their effect fails to appear even in a survey of this magnitude'" (Egalite, 2016). Being that family factors are of such

importance to the success of students, they must be analyzed in an attempt to determine which influence academic tracking in a strong manner.

The level of education achieved by the parents/guardians is a factor which correlates with student achievement. Griffith (1996, p. 34) and Egalite (2016) both state that parents who have higher educational attainment demonstrate higher levels of interaction with the schools and teachers. These interactions include attending school events, communicating with teachers and staff at parent-teacher conferences, and volunteering in schools. Studies have shown that parents who have higher educational attainment levels also engage in educational activities with their children at a young age, such as reading and cognitive activities (Morsey & Rothstein, 2015; Egalite, 2016).

In order for parental involvement in education to exist, the family structure itself must be considered. Nord (1997, p. 97), Morsey and Rothstein (2015), and Egalite (2016) all echo a similar point regarding parenthood. There has been a correlation shown between single parenthood and lower average educational outcomes. Whether it is due to incarceration, death, divorce, or other factors, single parent households are on the increase. A Pew Research Center analysis recently compared the family structure to that of 1980 and discovered that only 46% of adolescents are living in a home with parents in their first marriage (15% decrease) and 34% of children are living with an unmarried parent (15% increase) (Livingston, 2014). The different reasons for single parent households must be analyzed in order to determine the level of influence with academic achievement and tracking, but the single parent factor is frequently intertwined with other factors including lower income, limited access to educational resources, and lower parental education levels (Egalite, 2016).

Entwined with family factors which contribute to academic performance is absenteeism. The American Federation of Teachers (2012) defines "chronic absenteeism" as missing 10 percent or more of the school days in a given year. Factors that are related to absenteeism are income-linked and linked to single parenthood and absences can be related to health, preventative care, and inflexible appointments for doctor visits (Morsey & Rothstein, 2015), family responsibilities, housing instability, and familial value of education (American Federation of Teachers [AFT], 2012), and composition and involvement of the family and student perception of school (Indiana Department of Education [IDE], 2014). Regardless of the factors for absenteeism, it is a factor that will be analyzed for its influences on tracking and academic performance. While it is shown that absenteeism has dramatic effects on education, it is rarely in the control of the school and educators. That does not mean, however, that it cannot be curbed if the causes for absenteeism are known and understood. While family factors may be some of the important factors which have the strongest correlations to academic achievement and student tracking, peer factors must be analyzed as well.

Peer Factors

Peer factors cannot be ignored when determining the influence of social factors on academic tracking. Peer factors will be defined as any measurable nonfamily factor that a student is exposed to on a consistent basis. Studiable factors will include gender of students, racial and ethnic grouping, and peer achievement. From looking at these factors, it will be determined which have non-negligible correlations with student achievement and which factors can be researched within the given population. "Our basic estimation of elementary school achievement growth indicates that the achievement level of peers has a

positive effect on achievement that is roughly constant across quartiles of the school achievement distribution" (Hanushek, E. A., Markman, J. M., & Rivkin, S. G, 2001). This statement repeats what other research has attempted to show; there is a general belief about a positive correlation between the ability of one's peers and the ability of that individual. Lavy, Silva, and Weinhardt (2009) state that there is "no simple answer" to the question of whether their results can show support for the tracking of students because there are many factors which would be necessary for analysis first. It is challenging to analyze the effects of peer interaction and peer factors on academic achievement because academic achievement is affected by many intertwined factors. Multiple studies all accept and identify that student and peer selection and achievement themselves tend to have strong correlations (Hanushek, Markman, and Rivkin, 2001; Hoxby, 2000; Lavy, Silva, & Weinhardt, 2009; Neidell & Waldfogel, 2008). There are multiple confounding variables in a study such as this one since students choose to interact with peers who share similarities with themselves and therefore the predicament of whether one factor is a cause for another factor exists. Hanushek, Markman, and Rivkin (2001) also address the issue that complete histories of students or the complete knowledge of "relevant inputs" generally are unknown or limited. They state that "current characteristics will generally be correlated with unobserved past determinants of achievement, introducing the standard problem of omitted variables bias" (Hanushek, Markman, and Rivkin, 2001, p. 6).

Gender is a topic that has been thoroughly studied and gender differences and interactions due to gender must be analyzed along with its correlation with academic achievement and tracking. Cognitive abilities of elementary school and middle school students can be analyzed to show possibilities for academic performance around the age which students

begin to be tracked. While females tend to outperform males in verbal skills and comprehension, males tend to outperform females in spatial reasoning, mathematical reasoning, and geometry skills (Zembar & Blume, 2011). A study in a rural area was completed and the results contrasted the gender performance trends. In the study conducted by Sparks-Wallace (2007), it was calculated that in 1998 and 2003, the percent of females who took advanced math classes was higher than that of their male counterparts. The grade average was also higher for the female students than the male students. "Males also perform better on mathematical achievement tests than females" (Zembar & Blume, 2011). An interesting aside to this statement is Hoxby's (2000) research that "both male and female students perform better in math when they are in more female classes" (p. 24). How could it be that the presence of females in a classroom increase the performance of all students yet the males outperform the females when tested for mathematical proficiency? Testing bias is something that can be attributed to the measurements of mathematical achievement and perception of whether males or females are "better" at math but testing bias will not be analyzed in this research. A confounding variable that exists within these studies that does not exist as prevalently in family factors is the teacher. "Teacher characteristics and the classroom environment also have been identified as contributors to this gender gap" (Zembar & Bloom, 2011). In the research, this confounding variable will be identified further and analyzed in order to attempt to determine the influence that gender has on academic achievement and tracking.

Race is another influencing factor of tracking and academic achievement. The achievement gap is discussed within states, cities, districts, and individual schools and is generally defined as the gap between the average scores on standardized tests by students

of different races. In order to understand the issues related to race and its correlation with academic tracking, one must look at some generalized social standards. While Rothstein and Morsey (2015) are not stating that all families of color lack books in their homes and also do not read to their children, they empirically show a 1.36:1 white-black ratio for time spent reading to their children, a 3.20:1 ratio for non-sports playing, and a 3.25:1 ratio for talking/listening. There is also roughly a 2:1 ratio for the average amount of books in the household when comparing white and black families of comparable same socioeconomic statuses. Hoxby (2000) provides data which shows that there is a negative correlation between amount of black students in a classroom and reading scores for all students. An interesting and shocking statistic that she states is "that the effect of black peers appear to have the greatest effect on other black students; this difference in the size of the effect is largely confirmed by the results for grades four, five, and six" (p. 26). The effects of peer achievement tend to be intra-racial. Confounding variables will exist among interracial and intraracial peer factors being that race is often tied to cultural values and economic status and family structure as well, but the existence of a correlation between race and academic tracking is important to explore.

From the studied research though, it appears that there is a greater amount of quantitative data collected compared to qualitative methods such as interviews, surveys, and observations. Interviews will be conducted with students in addition to the more traditional surveys and collection of standardized testing results in order to use an explanatory sequential qualitative analysis model to separate and analyze the possible correlations of individual confounding variables on student achievement which leads to academic tracking. It will be important to analyze the peer factors which correlate to

academic achievement and tracking since students are highly influenced by their peers in multiple ways, both apparent and non-directly.

Student Performance in Schools

Tracking Outcomes

An important concept that must be understood about tracking is that "implementing educational tracking neither guarantees high average scores nor does it necessarily lead to greater score inequality" (Leicht, 2013, p. 10). The intended outcomes of academic tracking are to increase the academic achievement of all students but Leicht's (2013) study "merely shows that between-school tracking sometimes is associated with higher math scores and larger math score disparities, and between-class tracking sometimes is associated with higher reading scores and larger reading score disparities" (p.10). When students are academically tracked within schools, there are educational and social outcomes, intended and unintended.

The educational outcomes for academic tracking are expected to be evident in a school and should outweigh any negative outcomes that arise due to tracking. An interesting academic outcome that came out of research conducted by Argys, Rees, and Brewer (1996) was "in lower level tracks an increase in class size is associated with an increase in achievement, whereas in other tracks the opposite (and expected) relationship between class size and achievement is found" (p. 634). This is attributed to the different teaching and learning styles of advanced track classes and average track classes. A way to analyze the effects of tracking would be to look at the possibility of detracking schools. Students in below average classes would see increases in test scores, while students in average

classes or advanced classes would see decreases in test scores. Overall, the student population would see a general decrease in test scores overall (Argys, Rees, & Brewer, 1996). Gamoran (1992) completed research which detailed effects of tracking within different subjects. For math, he determined that the variability of the effects of tracking are greater in the subject of mathematics because of "instructional differentiation". There also may be a greater gap in the effects of tracking if the mobility between the academic tracks is limited, which exists within the mathematics track since math courses tend to build on each other and enable less mobility. Nomi and Allensworth (2010) were able to conclude:

> Consistent with prior literature, this study shows that grouping students into classes by incoming skills can lead to detriments for low-ability students. The more low-ability students are concentrated together, the lower the academic demands of instruction, and the lower students' learning gains. (p.31)

A possible cause for low-performance in the below average classes is the amount of students in the class with absentee or behavioral problems. Students in these classes are provided lower expectations which correlate to reduced academic outcomes. These confounding variables make it difficult to ascertain whether the learning struggles are due to factors controllable by the teacher or outside of the scope of the classroom. An issue where both Argys, Rees, and Brewer (1996) and Nomi and Allensworth (2010) agree upon is that the high achieving students see greater positive outcomes from tracking than do low achieving students see positive outcomes from detracking. Overall, the academic implications of tracking are that high achieving students tend to see increase educational

advantages while students in below average tracked classes tend to see neutral or negative academic impacts.

In addition to academic outcomes, there are also social consequences that can be attributed to academic tracking. Pallas, Entwisle, Alexander, and Stluka (1994) found that "first-grade ability-group placement can have persistent effects on children's achievement in school over a period of several years and may shape the expectations of the children's performance held by significant others, such as parents and teachers" (p. 43). This social outcome would undoubtedly have a wider ranging effect on a student since self-perception is a critical factor for success. In their research related to the inclusion of special education students, Fisher and Shogren (2016) stated:

> Overall, an individual who has different networks of friends across environments (e.g., drama club, English class, or homeroom) with stronger effective size may have increased opportunities to learn about potential social activity, receive academic assistance (peer-mediated assistance), and even other information or support regarding community involvement or employment (e.g., part-time jobs, volunteer work). (p. 97)

This statement shows support for detracking at the lower levels in order to create social skills and opportunities for individuals who are otherwise restricted to a small grouping of students due to academic limitations. A troubling discovery at the other end of the achievement spectrum, the gifted and talented students, was that students in the high ability group preferred homogeneous grouping for both academic and social interactions. "Almost one quarter of the participants claimed that homogeneous grouping had no

disadvantages" (Adams-Byers, Whitsell, & Moon, 2004, p. 16). From their research, Adams-Byers, Whitsell, and Moon (2004) reported that two-thirds of the gifted and talented students perceived a high-achieving homogeneous group of peers as advantageous, a "safe haven", and a place where they could be themselves. A possible social implication of academic tracking is a creation of segregation based on perceived knowledge and power. Creating academic groups for the purpose of academic success for all students also provides the unintended consequences where families and teachers view students based on implied abilities and "may structure the educational opportunities that parents and teachers subsequently make available to children, as well as the social-psychological resources they extend to such children" (Pallas, Entwisle, Alexander, & Stluka, 1994, p. 43).

Extracurricular Activities

Additional factors that also have an effect on student performance and tracking in schools is the "connectedness" that a student feels towards his/her school. Ample opportunities are provided to students before, during, and after school which are both directly and indirectly related to classroom learning. Extracurricular activities are found throughout all levels of our schools in most schools across the country (O'Brien & Rollefson, 1995; Massoni, 2011). Amongst these opportunities are social clubs, academic clubs, and interscholastic sports. Students who participate in these activities are under the supervision of teachers, staff, and other adults dedicated to student success. Intra-school interaction is a correlating factor to student success.

What possible influences do the statistics behind extracurricular participation and student engagement show? Data collected and compiled by O'Brien and Rollefson (1995)

supports the belief that participation in extracurricular activities increase a student's attachment to the school. According to the study, participation in extracurricular activities showed a positive correlation with no unexcused absences, never skipping class, and a GPA above 3.0. There is no statistically significant data that shows an inability for less affluent schools to offer extracurricular activities as compared to their more affluent counterparts. Other school factors that do not seem to have an impact on whether or not a school offers extracurricular activities are school size, school setting, and demographics of students. When completing the nationwide survey, the results showed that "about four of every five seniors said they participated in at least one extracurricular activity" (O'Brien & Rollefson, 1995). This statistic of 80% of students can be broken down into categories of extracurricular activity ranging from sports (highest participation rate amongst students) to hobby and service clubs (lowest participation rate). Throughout these studies, it is seen that there is a positive correlation between participating in activities outside of the traditional classroom and success in the classroom.

What are some of the positive outcomes of participating in extracurricular activities? While every club, group, and team has a goal-specific purpose related to the individual activity, there are more meaningful skills and qualities that students receive from participating. Behavior is a main quality that is able to be addressed when a student participates in extracurricular activities. "Students that participate in extracurricular activities have reduced behavior problems" (Massoni, 2011). To look at student behavior in extracurriculars from a negative light, participation in extracurricular activities is generally voluntary and can be regulated by the school. If a student's behavior becomes problematic, the student can be suspended from the activity or removed entirely. From the

other perspective, extracurricular activities teach positive behavior. Adolescents involved in school-based activities are under adult supervision, are engaged in learning experiences, and are interacting with peers who are similar to them. Engagement in extracurriculars decreases the amount of time that a student is home alone, the amount of time a student has to make poor life decisions, and the amount of time a student needs to avoid peer pressure (Massoni, 2011). Behavior is learned through interaction with instructors (both teachers and other leaders) and peers and learning positive behavior traits is seemingly as easy to learn as negative traits. Students who participate in extracurriculars have higher self-esteem. Self-esteem and motivation to be a part of school has the possibility of increasing a student's academic performance (Massoni, 2011). One of the biggest challenges that a teacher faces is to motivate a student and provide positive experiences for students who see continued struggles in a classroom. Leadership and teamwork are two qualities that are developed through extracurricular activities as well. Clubs have a president and leaders who organize the efforts of a club, determine the supplies that the organization needs, and communicate with the members. Athletics have captains who have to keep the team focused on competing at a high level and also to manage the personalities of the team. These traits show up in the classroom as well when dealing with group work, organization of time, and pride in competing with oneself to be the best student possible.

How do students who participate in organized school athletics perform in the classroom compared to their peers who do not play school sports? Greene (2013) found that Ohio high schools with greater student participation and greater success in sports saw higher test scores and academic achievement. The stereotypes of athletes such as being dumb,

jocks, and other negative qualities come from memories of some and are unfairly attributed to the subgroup of high school athletes. While Greene (2013) does statistically show a correlation between athletic participation and success and academic success, he clearly states that the research is not an attempt to demonstrate causation. From the data compiled by O'Brien and Rollefson (1995), there is a greater than 10% gap in the percentage of students who participate in athletics by high socioeconomic status and low socioeconomic status. This may hold true due to there being a cost associated with athletics. Athletics hold many benefits to students that have impacts both inside and outside of the classroom. Participation in sports encourages discipline. Students learn how to practice a skill, develop self-improvement strategies, and establish routines (Massoni, 2011). These skills are all crucial to academic success in addition to athletic success because focus and determination are major components in individual prosperity for most parts of life.

Why might student engagement in extracurricular activities have a positive correlation with student success? "When students participate in extracurricular activities, especially at a young age, it teaches them about long term commitments. If they want to participate in a certain activity, they sign up for a long time. Not just for a week or a few days." (Massoni, 2011). Students who learn about commitment and dedication to an activity can translate it to the classroom. Just like in the classroom, students learn to deal with success and failure, struggles, disorganization, and learning throughout their participation in an extracurricular activity. Another factor with extracurricular activities that is important to student success in the classroom is the "pass to play" rule. Schools have different rules and regulations for who can participate in athletics and clubs based on their grades in

school and the rules often prohibit participation by failing students. While negative reinforcement and punitive measures do not always provide success and growth, stern rules do provide the students with expectations for participation in the extracurricular and success in the classroom. Engagement in extracurricular activities has a positive correlation with academic success due to its effects on behavior, self-esteem, positive personality traits, and commitment to goals, along with other positive benefits of these school-organized activities.

Conclusion

Are there factors which correlate to academic tracking? Absolutely. Which factors demonstrate the strongest influences on academic tracking and can we control any of these factors? The literature review allowed for the identification and definition of factors related to achievement. Some of these factors include family factors (family involvement, education level of parents, family structure, and attendance/absenteeism), peer factors (social groups, gender, and race), and school factors related to student participation. Negative correlations have been shown between single-parent households and academic achievement, chronic absenteeism and academic accomplishment are negatively correlated, and positive correlations have been shown for participation in extracurricular activities and academic success. Much of the research analyzed in the literature review was able to show a correlation to academic success but was clear to elaborate on the fact that correlation is not causation. To reiterate, factors that may exist in a student's family life and social life are not singled out as the causes for why a student may or may not see academic success, but merely as factors that are more often associated with success or failure.

Academic tracking was defined as grouping students into different classes based on intellectual ability and shown to be distinct from ability grouping within a single class. Academic tracking for the purpose of this research is interpreted as a single school separating students into different classes. Effects of academic tracking were discussed to further express the need for understanding the factors related to tracking.

Chapter 3 discusses the methods for the research and the plans for collection of data and discusses the qualitative approach I will take for my research to answer the research question: What are prominent influencing factors related to academic tracking in mathematics? It will expound on the setting and participants of the study and the rationale for those subgroups, my data collection methods using archival documents, surveys, and interviews, and contains the data collection tools (survey template and interview questions).

Chapter 4 is centered around the results of my research and an analysis of trends and themes that exist within the data. Chapter 4 has tables and plots which organize the collected data (attendance records, behavioral records, emergency contact information) from the archival sources, a table which organizes the responses from the student surveys, and an analysis of the student interviews. Collecting and organizing the data will provide an analysis of the factors which most strongly correlate with academic tracking.

CHAPTER THREE

RESEARCH METHODS

Introduction

In this chapter I explain the methods that I used to answer my research question: What are prominent influencing factors related to academic tracking in mathematics? This question has caused distress and confusion in the minds of teachers as it is impossible for a teacher to change certain family factors that affect a student (eg. family structure), but these factors still play a part in the student's life. The purpose of the study is to use a qualitative method to identify prevalent factors related to student achievement and academic tracking in order to increase understanding of why trends exist within the public school system.

As a part of this methods chapter, my research model is explained and supported by other researchers along with a rationale for why a qualitative method will provide important and accurate data during research. This chapter contains a discussion on the setting in which the research was collected, identifies the participants who are a part of this study, contains methods for data collection, has explanations for rationale for this method of collecting data, and discusses how I analyze the data when it was collected.

Research Paradigm

John Creswell (2014) discusses qualitative critical theory as perspectives that are "concerned with empowering human beings to transcend the constraints placed on them by race, class, and gender" (p. 65). The paradigm which I chose is a qualitative approach which will identify and explore factors related to a student's life and determine the influences they have on academic tracking. This research is an attempt to demonstrate the nonacademic factors faced by students and families which constrain them from the same

successes as their peers. Michael Harwell (2011) defines a qualitative research method as one that can "focus on discovering and understanding the experiences, perspectives, and thoughts of participants" (p. 148). He also discusses how inquiry is flexible and is guided by participants. My interviews were guided by the participants and the structure and questions were guided by the surveys/questionnaires. I chose this paradigm because I have many confounding variables that I want to analyze and I do not have a set control group for my research in order to conduct a quantitative analysis. This research may possibly lead to a future quantitative study on these identified factors to quantify the magnitude of each factor. I also want to conduct interviews and administer surveys to students to get an understanding for tracking on an individual level as opposed to a purely data-driven approach which focuses on the entire student population. On a personal level, I have come to find that there is often a high value placed on data when it comes to academic tracking within a school, and I feel that underlying factors related to student success are oftentimes neglected, hence the qualitative analysis in this study.

Setting and Participants

The research took place in a high school in a rural school district which is also considered by some within the district to be an outer ring suburb of a Midwestern city. According to U.S. News and World Report (2016) the setting for the school district is "fringe rural". The high school serves approximately 850 students in the 9th through 12th grades. Most of these students, about 93%, identify as White, while the remaining 7% are split between Black, Hispanic, Asian, American Indian, and Other/Multiple Races. Less than 15 students in the school (and 2 of the 122 participants in my study) receive English language support. Therefore, English language proficiency is not a discussed or studied factor in

this research. About 30% of the students qualify to receive free and reduced lunch. The high school does not currently receive Title I funding or services, however one of the elementary schools in the district does. In the high school, there are about 50 teachers, making the student-to-staff ratio about 17:1.

The research took place during the Spring and Fall 2017 semesters. Archival data was collected during Summer 2017 for the 2013-2014, 2014-2015, 2015-2016, and 2016-2017 school years. Student surveys were completed in class in May 2017. Before completing interviews, the interview questions were formulated from the responses received from the student surveys and the archival data that was collected. Student interviews took place in September 2017.

The participants in this study existed within subsections of the Class of 2020 and the Class of 2021 in the high school in the school district and myself. Reasons for not including the Class of 2018 and Class of 2019 include: 1) Pre-Algebra was a new class during the freshmen year of the Class of 2018, 2) Selection for Pre-Algebra during the first two years of the course was not as precise as it currently is due to the amount of sections allocated for it, 3) Students entering Advanced Algebra 2 as a freshman from these two classes utilized a different curriculum during their middle school years than they do now. Criteria which needed to be met for student inclusion in the research was that the student needs to be/have been currently enrolled in a Pre-Algebra or an Advanced Algebra 2 math class during their 9^{th} grade year and the student must have been in the school district at the time of his/her 5th and 6th grade years or have adequate student data from prior schools in other school districts. Adequate student data consisted of accurate attendance records, report cards, and standardized test scores. The rationale for these criteria was

multifaceted. The study focused on the influencing factors of students and how those factors related to academic tracking, hence the requirement that a 9th grade student was/is enrolled in either Pre-Algebra or Advanced Algebra 2. In order for students to have been accurately placed according to the methods set forth by the school district, a student would have had to be attending an elementary school in the district during his/her 5th grade year and then placed into the appropriate math class the following year or have had accurate records from a district that he/she transferred from. According to these specifications, 71 Pre-Algebra students and 51 Advanced Algebra 2 students are included in the research.

Procedure and Data Collection

Archival Data

In order to determine the protocols for the interviews, archival data was collected with regards to the qualifying students. A benefit of archival documents is that "these data sources are naturally occurring and require only that teachers locate them within their school setting" (Mills, 2014, p. 94). This is important to the research because the data that was collected provided accurate information that might not have been reported in the surveys or the interviews. The archival data helped to determine what questions were asked and the amount of questions that were asked related to each section of my research. From the school's database, information was collected with regards to attendance, emergency contact information, gender, race, free-and-reduced lunch status, history in the district, and standardized test scores. This data allowed for the determination of which students meet the criteria, as previously stated, and provided a baseline for an initial assessment of factors which have influences on academic tracking.

Surveys

Student surveys were completed in a classroom setting. The completion of these surveys took place during multiple days to ensure that student absences and student behavior did not impact the response rate. Any students not present during the days which the survey was completed had ample opportunity before school, during lunch, and after school to complete the survey. All of the students in the Pre-Algebra and Advanced Algebra 2 classes completed the surveys and only the responses from the freshmen in these classes were used in this study. Responses from the students who did not meet the research criteria were discarded. Surveys were constructed using attitude scales in order to determine the opinions and viewpoints of the subjects in the research. Attitude scales "are useful tools for the action researcher" (Mills, 2014, p. 102) because they delve into how the subjects feel about particular topics in addition to what the numerical data shows. The surveys were then used to mold questions used during the following step: the interviews. Mills (2014) agrees with conducting interviews based off of data that has already been collected and compiled as "observational data...can suggest questions that can be asked in subsequent interviews with children, parents, teachers" (p. 88).

Interviews

Interviews will be an important tool for data collection because of the detail in the information exchange that will take place. In addition to collecting and analyzing large amounts of data, interviews will allow for specific questions to be answered and more in-depth responses to certain questions that are extremely important as per the surveys. Interviews will allow personal responses to questions related to correlating factors with academic tracking and also the effects of the tracking. The answers recorded from the

interviews will build on the foundation that was established from the archival data and the surveys.

Data Collection

Table 3.1

Data Collection Type	Description
Archival Data	From the school's database I will obtain student records for the following data: 1. Attendance 2. Behavior and Discipline 3. Family Information 4. Standardized Test Scores
Surveys	Surveys will be given to students and will ask about factors related to student achievement and tracking. Questions will be related to but not limited to: 1. Family Influences 2. School Factors 3. Extracurricular Activities 4. Mathematics Classes
Interviews	Interviews will be conducted with students in order to determine which factors each group feels has greatest effects on academic success and tracking. Interviews will be audio recorded, notes will be taken by interviewer during the interview, and the audio will be transcribed after the interview.

Conclusion

Which factors demonstrate the strongest correlations with academic tracking? Chapter 3 discussed the methods for the research and the plans for collection of data. The methods for data collection that will be used in this research design will be archival documents, surveys, and interviews. The qualitative approach I took for my research to answer the research question was also discussed. Creswell (2014) and Harwell (2011) state that a purpose of qualitative research is to identify constraints that are placed on groups of

people through discovery and understanding. Chapter 3 also expounded on the setting and participants of the study and the rationale for those subgroups. My participants in the study included Pre-Algebra and Advanced Algebra 2 freshmen and myself. The data collection tools (survey questions and interview questions) are listed in the data collection section and appendices. Chapter 4 is centered around the results of my research and an analysis of trends and themes that exist within the data. It contains the numerical data obtained from the archival documents, results from the surveys, and important quotes and comments from the interviews. Graphs and tables are provided to summarize archival data and survey questions and the results from this data are explained. A comparison of the different answers given during the interviews is also provided in Chapter 4.

CHAPTER FOUR

DATA ANALYSIS

Introduction

Chapter 3 discussed the rationale for a qualitative approach to my data collection and the methods used to obtain information in order to answer my research question: What are prominent influencing factors related to academic tracking in mathematics? I was able to obtain archival data from the school district database, surveys were completed by students, and interviews were conducted. Throughout the study, data was collected for 71 Pre-Algebra students and 51 Advanced Algebra 2 students from the graduating classes of 2020 and 2021. Also, student responses were collected via survey and interviews were conducted with two Pre-Algebra students and two Advanced Algebra 2 students. The surveys and individual survey questions were optional for the students and information was sent home regarding the anonymity of the results. No names or other identifying qualities were used from the surveys or archival data as part of these results. The informational forms were sent home to the families and all participants were made aware that the surveys in their entirety and individual survey questions could be left blank. This chapter includes reports of the different information that was obtained, analyzes the results, and determines the identifiable factors which influence tracking into the students' 9^{th} grade mathematics classes.

Overview

This chapter explains the data that I collected, provides visual representations of information, and an analysis of the results. The chapter has been divided into four sections. The first section reports the family influences in a student's life that have an

impact on academic tracking in mathematics classes. The second section reports the nonacademic influences (eg. attendance). The third section reports the academic influences (eg. standardized test scores). The fourth section analyzes the interviews and surveys to obtain opinions and attitudes of students and their families towards school and academic tracking. This chapter concludes with a synthesis of the data in order to determine which factors are the most prevalent for the participants in this study.

Family Influences

Family factors will be defined, for this study, as any reported factors related to a student's family that were collected from the archival data and from the surveys. This section discusses the parents/guardians in the households of the students, the race and genders of the students, and the free-and-reduced lunch status of the families.

In the school that the research was completed, there were 71 Pre-Algebra students and 51 Advanced Algebra 2 students. While almost 85% of the Advanced Algebra 2 students live with both of their biological parents (Figure 2), only slightly more than half of the Pre-Algebra students live with both biological parents (Figure 1). Even when looking at two-parent homes (homes including both biological parents or a biological parent and a step parent), 86% of the Advanced Algebra 2 students live in homes with two adults (Figure 2) compared to 70% of the Pre-Algebra students (Figure 1). "Parent/family involvement has a significant positive impact on student outcomes throughout the elementary, middle, and secondary years," (Carter, 2002, p. 2) and not having a parent in the household limits the significant positive impact. The Pew Research Center analysis (Livingston, 2014) study that found that only 46% of adolescents are living in a home with both biological parents is comparable to the Pre-Algebra classes. The difference between the Pew Center analysis

and the Advanced Algebra 2 classes, however, is staggering. The Advanced Algebra 2 percentage is 84%.

Figure 1

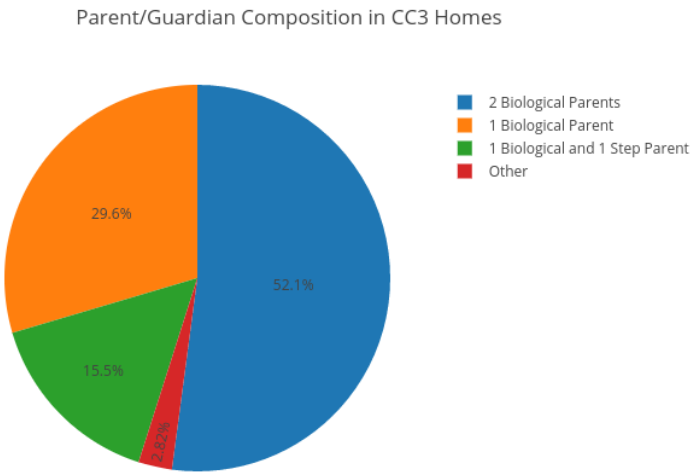


Table 2

Parent/Guardian Composition in CC3 Homes	
2 Biological Parents	37
1 Biological Parent	21
1 Biological/ 1 Step Parent	11
Other	2

Figure 2

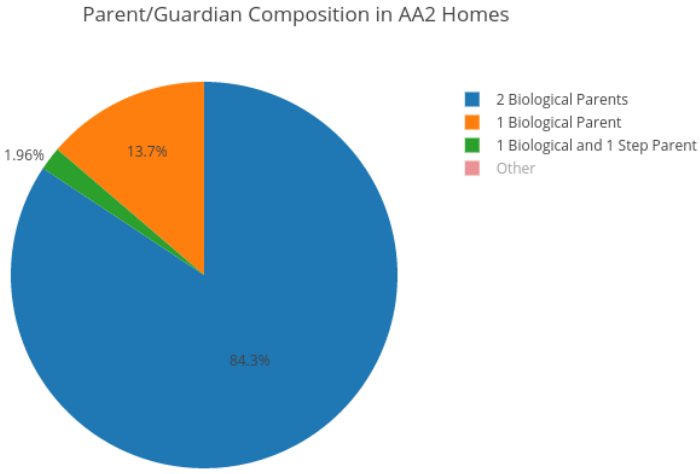


Table 2

Parent/Guardian Composition in AA2 Homes	
2 Biological Parents	43
1 Biological Parent	7
1 Biological/ 1 Step Parent	1
Other	0

Another influencing factor for students is race. 91.4% of all of the students in the two graduating classes (Class of 2020 and Class of 2021) are classified as White. The results are shown on the following page (Figures 3, 4, and 5).

Figure 3

Local Race (All Students)

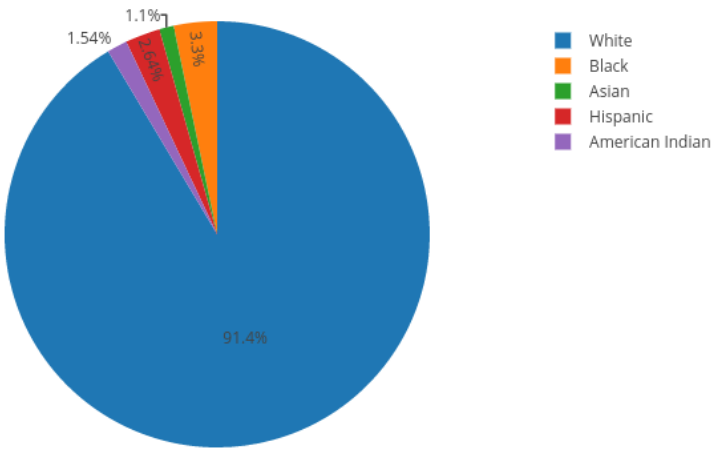


Table 3

Federally Identified Race (All Students)	
White	416
Black	15
Asian	5
Hispanic	12
American Indian	7

Figure 4

Local Race for CC3 Students

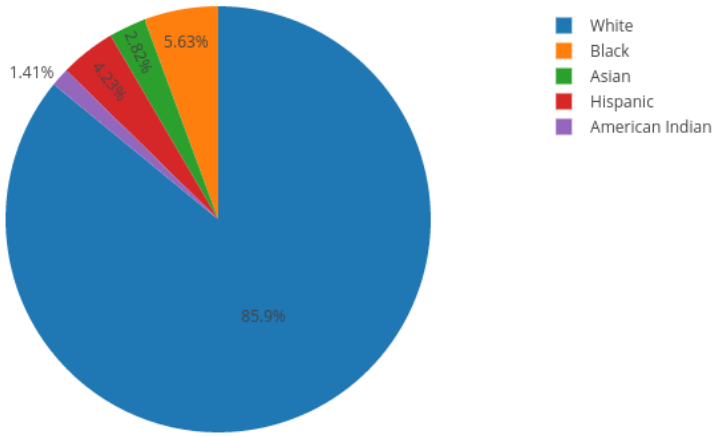


Table 4

Federally Identified Race for CC3 Students	
White	61
Black	4
Asian	2
Hispanic	3
American Indian	1

Figure 5

Local Race for AA2 Students

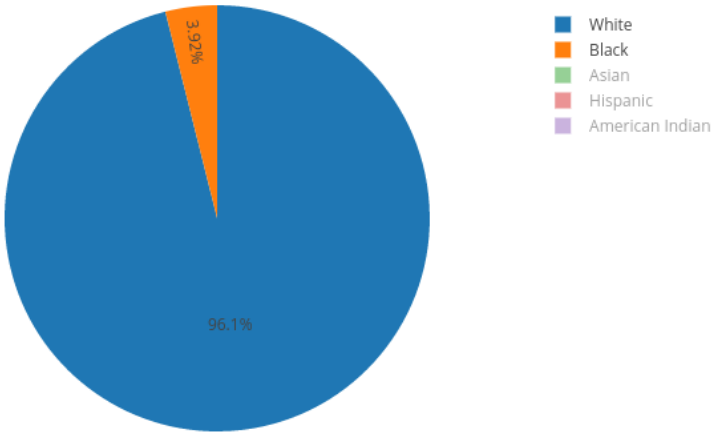


Table 5

Federally Identified Race for AA2 Students	
White	49
Black	2
Asian	0
Hispanic	0
American Indian	0

While the charts show that there is a 10% different in the makeup of the Pre-Algebra freshmen and the Advanced Algebra 2 freshmen, looking at the data in terms all of the students (Figure 3) and comparing them to Pre-Algebra (Figure 4) and Advanced Algebra 2 (Figure 5) show more prominent differences. Advanced Algebra 2 freshmen comprise 11.2% (51/455) of the total population and 13% (2/15) of the Black student population, but there were no students who identified as Asian, Hispanic, or American Indian. Pre-Algebra freshmen comprise 15.6% (71/455) of the total population, but 26.7% (4/15) of the Black student population, 40% (2/5) of the Asian student population, 25% (3/12) of the Hispanic student population, and 14.3% (1/7) of the American Indian population. The White student population in Pre-Algebra is 85.9 % (61/71) of the entire student population which is lower than the ratio of all White students to the entire population (91.4%, 416/455).

A third influencing factor that falls under the category of family influences is economic status. Economic status will be measured in this research by the income-based free and reduced-price meals which students receive at school. Wisconsin Department of Public Instruction (2016) defines the income eligibility parameters for free lunch to be a family which earns less than 130% of the federal poverty level. For the 2016-2017 school year, this figure was $20,826 for a household size of two, $26,208 for a household size of three, $31,590 for a household size of four, and increases by approximately $5,400 for every additional member. Reduced-price lunch qualification for families was between 130% and 185% of the federal poverty level. For the 2016-2017 school year, this figure was up to $29,637 for a household size of two, $37,296 for a household size of three, $44,955 for a household size of four, and increases by approximately $7,696 for every additional

member. Students can also receive free lunch if their families belong to certain other groups as outlined in the application process. Applications are generally provided to families at time of registration and at the beginning of the school year, but can be completed at any time (Wisconsin, 2016). In 2016, Wisconsin State Superintendent Tony Evers stated that "federal school and day care meal programs are designed to support students and children from low-income families so they are fed and can be eager and attentive learners throughout the day" (Wisconsin). The free and reduced-price lunch statistics from the researched district are based only on those families who choose to complete the application, so more students' families may qualify financially.

Figure 6

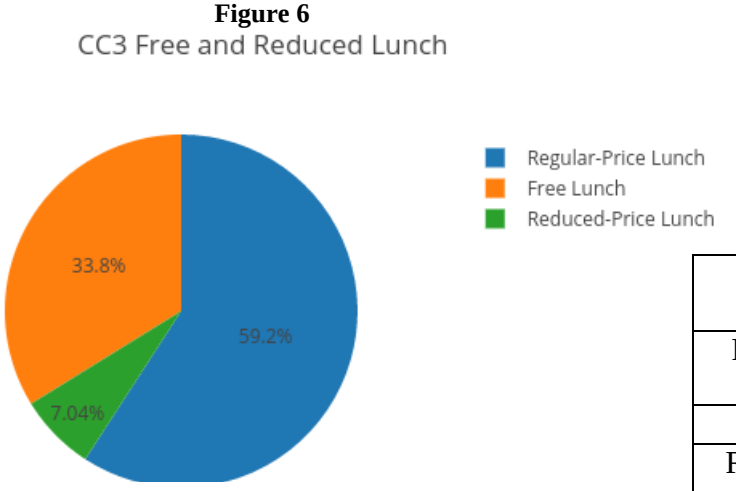


Table 6

CC3 Free and Reduced Lunch (# of Students)	
Regular-Price Lunch	42
Free Lunch	24
Reduced-Price Lunch	5

Figure 7

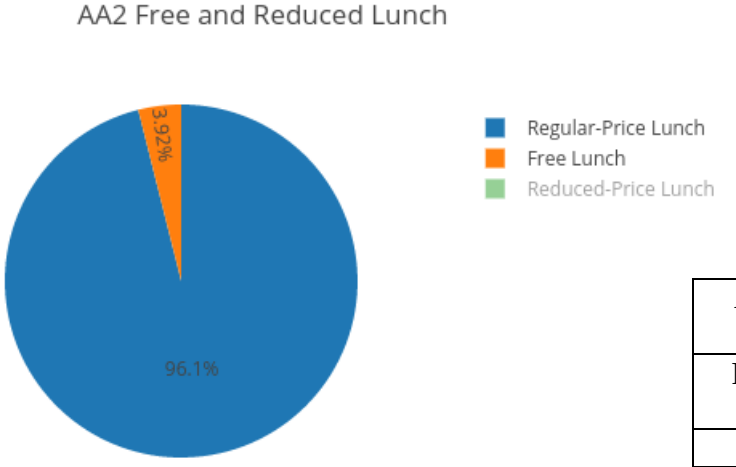


Table 7

AA2 Free and Reduced Lunch (# of Students)	
Regular-Price Lunch	49
Free Lunch	2
Reduced-Price Lunch	0

According to the archival data provided by the district, more than 40% of the Pre-Algebra (CC3) students receive free or reduced-price lunch (Figure 6, Table 6). This is compared to less than 4% of the Advanced Algebra 2 (AA2) students who receive free or reduced-price lunch (Figure 7, Table 7). These numbers indicate that a Pre-Algebra freshman is ten times more likely to come from a low-income family than an Advanced Algebra 2 freshman. Providing students free or reduced-price lunch can nourish students for at least one meal during the day, and this influencing factor shows the dichotomy in economic status between the CC3 and AA2 students.

Nonacademic School Influences

Nonacademic school factors will be defined, for this study, as any reported factors related to a student's school history, but not directly in the mathematics classroom. This section discusses the attendance of students in their middle school years and the behavior data obtained from the archival data provided by the school district.

Attendance data was collected for every year that the students were in Grades 6, 7, 8, and 9. The numbers are shown in the box plots on the following page (Figures 8, 9, and 10) in an attempt to organize the data and find an arithmetic average (median) while identifying the outliers. The minimum/maximum numbers in the tables and figures identify the attendance of the student who had the least/most absences for that particular class. The Lower Quartile (LQ)/Median/Upper Quartile (UQ) numbers in the tables and figures identify the 25^{th}, 50^{th}, and 75^{th} percentiles for the absences of the students in those classes.

Figure 8

Grade 6 Attendance

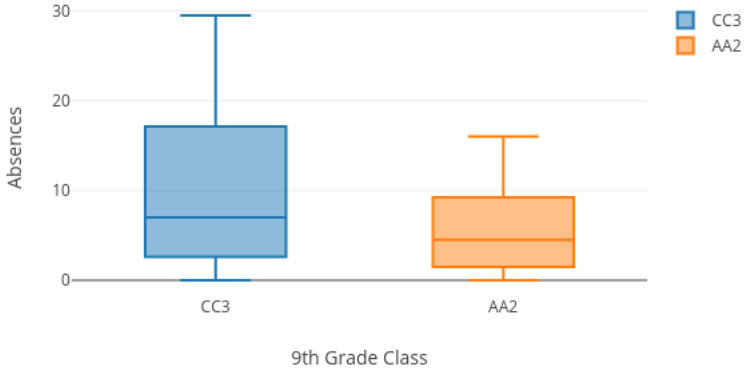


Table 8

Grade 6 Attendance (Absences)		
	CC3	AA2
Minimum	0	0
LQ	3.5	2
Median	7	4.5
UQ	13	7
Maximum	29.5	16

Figure 9

Grade 7 Attendance

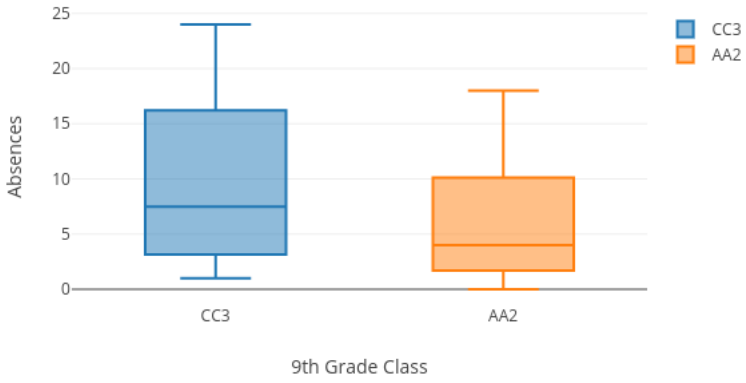


Table 9

Grade 7 Attendance (Absences)		
	CC3	AA2
Minimum	1	0
LQ	3.88	2.25
Median	7.5	4
UQ	13.63	7.5
Maximum	24	18

Figure 10

Grade 8 Attendance

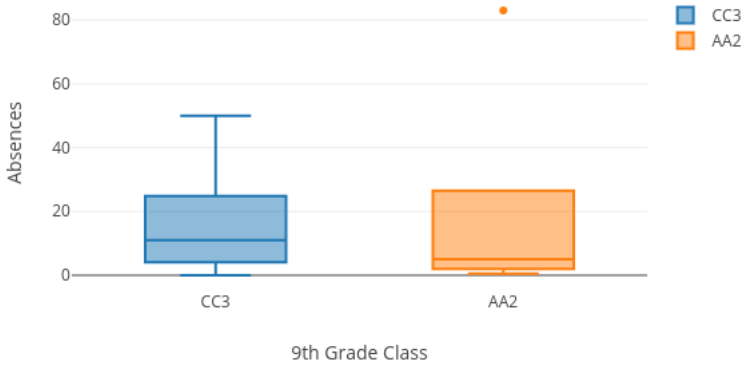


Table 10

Grade 8 Attendance (Absences)		
	CC3	AA2
Minimum	0	0.5
LQ	5.5	2.5
Median	11	5
UQ	16.5	7.75
Maximum	50	83

6th grade is the first grade in which the students are in the middle school and also is the beginning of tracking in the district. According to the data (Figure 8, Table 8), half of the students who were in the Pre-Algebra (CC3) course in their 9th grade year were absent for at least 7 days. Comparatively, half of the Advanced Algebra 2 (AA2) students had 4.5 or more absences. This difference of 2.5 days spikes to a difference of 6 days (13 days compared to 7 days) when looking at the upper quartile of data for the two classes when they were in Grade 6 (Figure 8, Table 8). Missing 6 more days of school per year than another student would result in 18 more days during the middle school years (grades 6-8) and 54 more days if this average held from every grade from kindergarten to Grade 8. While 13 absences is not "chronic absenteeism" according to the American Federation of Teachers (2012), only 2 out of the 51 AA2 students had more than 13 absences in their 6th grade year compared to 18 of the 71 CC3 students.

Grade 7 (Figure 9, Table 9) and Grade 8 (Figure 10, Table 10) show similar data for the CC3 students and the AA2 students. The CC3 students have a small increase in lower quartile, median, and upper quartile data records from Grade 6 (Figure 8, Table 8) to Grade 7 (Figure 9, Table 9) and then see a larger increase in lower quartile, median, and upper quartile data in Grade 8 (Figure 10, Table 10). Attendance data for the AA2 students shows relative consistency between all three years. Half of the AA2 students are absent from school less than 5 times a year and 75% of the AA2 students are absent from school less than 8 times a year. Overall, the Pre-Algebra students miss more school days that that of their Advanced Algebra 2 peers. A noteworthy statistic when looking at the students is that one of the students in Advanced Algebra 2 missed 83 school days when he was in Grade 8 and was not moved from his math track. This statistic demonstrates that

while attendance is an influencing factor, it was not the primary influencing factor for this student's math class tracking.

There is a large disparity in referrals and suspensions for Pre-Algebra students and Advanced Algebra 2 students. Students can earn one or more days of detention from actions such as profanity, destruction of property, excessive tardiness, lack of cooperation, or cheating/plagiarism. For the majority of the incidents only one detention was given to a student, unless that student is a repeat offender or the level of misbehavior is outlandish and further discipline is thought necessary. Students can earn one or more days of suspension from actions such as violence/fighting, banned substances (drugs, alcohol, and weapons), and verbal or written threats.

According to archival data, over 30% of Pre-Algebra students (22/71) received at least one detention in their 6th grade year (Table 11). This number is comparable to only about

Table 11

Behavior Data (Detentions)						
	Grade 6		Grade 7		Grade 8	
	CC3	AA2	CC3	AA2	CC3	AA2
Students with at least 1 detention	22	7	36	2	36	4
Students with at least 5 detentions	4	0	15	0	15	0
Total detentions per year	48	9	166	3	159	4

14% (7/51) of the Advanced Algebra 2 students. The total number of CC3 detentions, the number of unique CC3 students who received at least one detention, and the amount of CC3 students who earned multiple detentions in their 7th and 8th grade years all see noticeable upticks compared to the first year of middle school. The AA2 students earn the

most detentions in their 6th grade year and see a 50% decrease in detentions after that. A startling trend in the data is that greater than 50% (36/71) of the CC3 students receives a detention in Grade 7 and then the same percentage receives a detention in Grade 8. Some of these students have previous behavior records and that is one reason as to why 15 of the Pre-Algebra students have more than 5 detentions in Grade 7 and then another 15 students repeat this tendency in Grade 8. There is not one Advanced Algebra 2 student who received more than 2 detentions in a single year throughout middle school.

Suspensions are another statistic that is imbalanced between Pre-Algebra students and Advanced Algebra 2 students. There were no suspensions of any of the Advanced Algebra 2 students when they were in middle school. While there were only 2 Pre-Algebra students who were suspended from school during their 6th and 7th grade years, the number increased to 8 students the year preceding their placement in a high school math class. Also, the number of suspension days for the CC3 students jumped from 4 in their 7th grade year to 24.5 in their 8th grade year (Table 12).

Table 12

Behavior Data (Suspensions)						
	Grade 6		Grade 7		Grade 8	
	CC3	AA2	CC3	AA2	CC3	AA2
Students with at least 1 suspensions day	2	0	2	0	8	0
Students with at least 5 suspension days	0	0	0	0	2	0
Total suspension days per year	3	0	4	0	24.5	0

Academic School Influences

Academic school factors will be defined, for this study, as any reported factors related to a student's history related to his/her performance in the mathematics classroom. This section discusses the grades the students earned in their middle school mathematics classes and the Measure of Academic Progress (MAP) testing completed by the students.

The grades that are awarded to the students when they are in middle school (Grades 6, 7, and 8) are determining factors for their tracking into a high school math class. When looking at the grades, letter grades that have plusses (+) and minuses (-) are recorded without the symbols (i.e. B+, B, and B- are all recorded as a grade of "B") in order to condense the amount of possible grades that a student could earn. For the purposes of this research, a grade of "A" is defined as a semester percentage of 89.5-100%, "B" as 79.5-89.5%, "C" as 69.5-79.5%, "D" as 59.5-69.5%, and "F" as below 59.5%. It can be

Figure 11

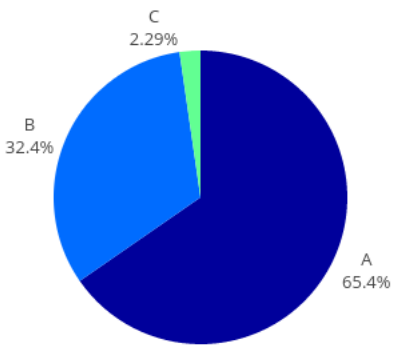
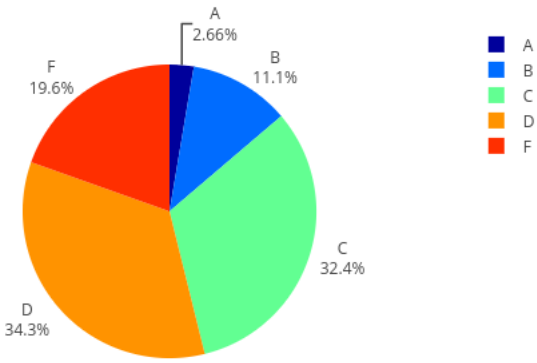


Figure 12



seen that none of the AA2 students received a grade lower than "C" throughout their middle school careers (Figure 11), while more than half of the grades received by the CC3 students were either a "D" or an "F" (Figure 12). Looking at the grade distribution of "A" grades also shows a startling difference: most of the grades given to the students who went

on to Advanced Algebra 2 as freshmen were a grade of "A", whereas the "A" was the grade least likely to show up on a Pre-Algebra student's middle school report card for math. These grades are used by the teachers in order to track the students and the grade of "F" is definitely an influencing factor for the students' transition from middle school mathematics to high school mathematics.

Measures of Academic Progress (MAP) scores are another influencing factor for placing students into their high school mathematics courses. MAP Growth testing is provided by the Northwest Evaluation Association (NWEA) and the students complete two assessments every year. "MAP Growth reveals how much growth has occurred between testing events and, when combined with our norms, shows projected proficiency. Educators can track growth through the school year and over multiple years" (NWEA, 2017). According to the NWEA (2017) website, the yearly average test score increases about 13 points from the beginning of 6th grade to the end of 8th grade with the average scores being lower at the beginning of a school year compared to the end of the previous year. The yearly student growth also decreases as the student moves throughout middle school.

Table 13

NWEA (MEAN)			
	First Yearly RIT Score	Second Yearly RIT Score	Yearly Student Growth
Grade 6	217.6	225.3	7.7
Grade 7	222.6	228.6	6.0
Grade 8	226.3	230.1	4.6

Comparing the national data (Table 13) to the Pre-Algebra MAP data (Tables 14, 15, and 16), the average national scores are about 2 points higher at the beginning of the school year and more than 6 points higher by the end of the school year. Median RIT scores for Pre-Algebra students tend to increase very little for students between tests within a single school year but increase from the end of one school year to the beginning of another, which is contrary to the national data.

Looking at the Advanced Algebra 2 scores, it can be seen that the lowest scoring 6th grade student received a score of 236 (Table 14). This score is in the 83rd percentile of students nationwide (NWEA, 2017). Differing from the Pre-Algebra Scores, the Advanced Algebra 2 median scores (Tables 14, 15, and 16) increase by either 5 or 6 points during each school year. The Advanced Algebra 2 median scores also increase from the end of one school year to another. Overall, both groups of students show constant growth, however the Advanced Algebra 2 group begins 6th grade at a considerably advanced level compared to their Pre-Algebra classmates. The 38 point difference in median RIT score at the beginning of 6th grade (Table 14) is a percentile difference of 55 points (97th percentile vs. 42nd percentile). MAP Growth testing therefore can only be one of the influencing factors in mathematics tracking of these two subsets of students.

Figure 13
Grade 6 MAP Testing

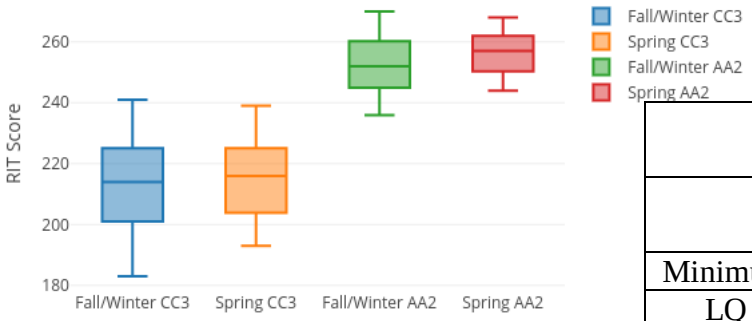


Table 14

Grade 6 MAP Testing (RIT Score)				
	F/W CC3	S CC3	F/W AA2	S AA2
Minimum	183	193	236	244
LQ	207	208	248	253
Median	214	216	252	257
UQ	220	221	257	260
Maximum	241	239	270	268

Figure 14
Grade 7 MAP Testing

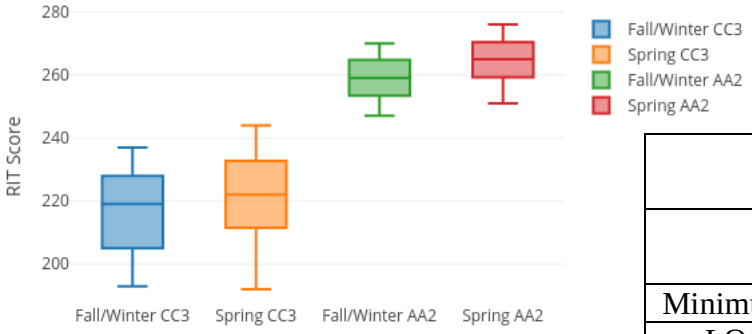


Table 15

Grade 7 MAP Testing (RIT Score)				
	F/W CC3	S CC3	F/W AA2	S AA2
Minimum	193	192	247	251
LQ	209	218	256	262
Median	219	222	259	265
UQ	225	229	263	269
Maximum	237	244	270	276

Figure 15
Grade 8 MAP Testing

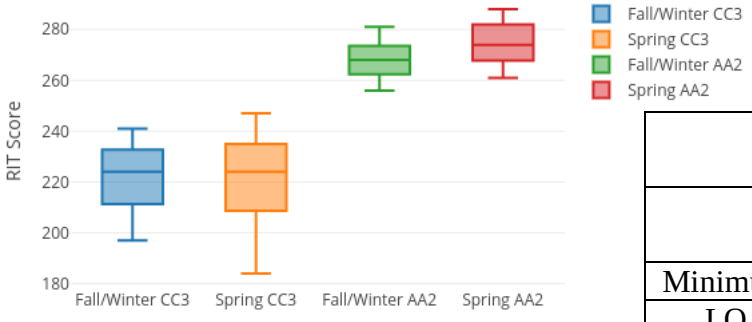


Table 16

Grade 8 MAP Testing (RIT Score)				
	F/W CC3	S CC3	F/W AA2	S AA2
Minimum	197	184	256	261
LQ	216	217	265	270
Median	224	224	268	274
UQ	230	231	271	280
Maximum	241	247	281	288

Surveys and Interviews

Surveys

During this research, students in the Pre-Algebra and Advanced Algebra 2 classes were asked to complete a survey. The survey contained questions which were sorted into four categories: family influences questions, general school questions, extracurricular activity questions, and math class questions. 38 Pre-Algebra students and 38 Advanced Algebra 2 students completed the survey and their responses are exhibited in Appendix F.

The first set of questions that the students were asked in the survey was regarding the students' family influences. 23 of the AA2 students selected "Agree" or "Strongly Agree" when asked about their families' involvement in student performance. This is compared to only 18 of the CC3 students who were asked the same question. A student's perception of family involvement in school is interesting to note because while it is an opinion, students are influenced every day by their families. Two of the questions in this section asked if people in the students' homes were "willing" and "able" to help with math homework. The responses to these questions were interesting because double the amount of Pre-Algebra students disagreed or strongly disagreed about people being "willing" to help them compared to the Advanced Algebra 2 students (8 CC3 to 3 AA2), but almost twice the amount of Advanced Algebra 2 students disagreed or strongly disagreed about people being "able" to help them (7 CC3 to 13 AA2). In both groups, however, about 60% of the students were in agreement that there are people at home who are "able" to help with homework. An overwhelmingly majority of students (>90%) in both groups also agreed that their parents/guardians communicated to them that school is important.

The next category of questions that students responded to was about general school questions. When asked if the students perceived as "fun", only 1 Pre-Algebra student and 2 Advanced Algebra 2 students strongly agreed with this sentiment. Many more Pre-Algebra students, 7, chose "strongly disagree" and 8 Pre-Algebra students chose "disagree" with relation to this same question. Only 1 Advanced Algebra 2 student chose "strongly disagree". The perception of how enjoyable an activity, like school, is for a student may affect their willingness to put forth their best effort. A possible factor for school not being "fun" for the Pre-Algebra students may be a feeling of anxiety. 23 of the CC3 students affirmed that they "get anxious in school", with 13 of those students strongly agreeing with the statement. 17 of the AA2 students feel anxiety in school, but only 2 of them were in the "strongly agree" category. An interesting response was received when the students were asked about absences. There were only 4 Advanced Algebra 2 students who believed that they were absent more than their peers. 1 of the Pre-Algebra students strongly agreed he/she was absent more than his/her peers and 8 Pre-Algebra students agreed with this statement as well. It is interesting to note that based on the archival data, the median number of absences for a Pre-Algebra student is near double that of an Advanced Algebra 2 student. The "value" of education was another statement that had an intriguing response. 16 of the Pre-Algebra students chose "Neutral" when asked if they valued what they learned in school. This was nearly half of those who were surveyed. Only 8 of the Advanced Algebra 2 students chose the "neutral" response for this statement. Overall, the results seemed to show that the Pre-Algebra students have an negative attitude towards school factors which may contribute towards their placement in their mathematics classes.

Another group of questions that are not directly related to mathematics classes gained insight into other activities students participate in. When asked about how many extracurricular activities the students participate in, 16 of the CC3 students chose the option of "0 Activities" while only 2 of the AA2 students chose this option. A majority of the Advanced Algebra 2 students who were surveyed, 20, chose the option of "3 or More Activities" for how many extracurricular activities they participate in. Being that many of the CC3 students do not participate in extracurricular activities, it would be possible that the reason for this would be because of holding a job during the school year. 24 of the CC3 students do not hold a job either, along with 19 of the AA2 students, according to the survey. The final extracurricular activities question was related to the family influences questions. The responses reiterated that parents are interested in their students' success in school and that academics are more important to the families than extracurricular activities.

The questions about student perceptions of math classes provided some interesting insight. 20 of the Pre-Algebra students affirmed the statement that "Math class is boring". This opinion of the Pre-Algebra students was not unexpected, however, it drastically differed from the opinion of Advanced Algebra 2 students who only had 8 students agree with it. One of the responses which was relatively surprising was that more AA2 students than CC3 students admitted to not trying their hardest in math class. The same amount of students in both classes, 6, indicated that they strongly agreed with the statement that they tried their hardest. For the statement, "I feel confident in my basic math skills needed to complete my classwork and homework", 7 of the Pre-Algebra students admitted through their responses that they lacked the confidence to complete their work compared to 5

Advanced Algebra 2 students. There were 10 Pre-Algebra students who responded to this statement with a choice of "Neutral" which also indicates that confidence is potentially an issue facing the students' abilities. When asked about the potential for using the mathematics that they are learning now, only 14 of the CC3 students believed that they would use it in the future compared to 24 of the AA2 students. All of these opinions about family influences, school, and mathematics classes led to a deeper understanding of issues that Pre-Algebra and Advanced Algebra 2 students face.

Interviews

Four interviews were completed during this research. Two interviews were completed with students who were enrolled in Pre-Algebra as freshmen and two interviews were completed with students who were enrolled in Advanced Algebra 2 as freshmen. One of the Advanced Algebra 2 freshman, Student 1 (Appendix A), and one of the Pre-Algebra freshman, Student 4 (Appendix D), are identified as students who live with one biological parent. Student 2 (Appendix B) and Student 3 (Appendix C) live with both biological parents. Being that the data for regular-price lunch and free lunch was provided for this research with student names being confidential, it was not possible to determine any of these students' families' economic statuses.

All of the students were asked the same questions, however the interviewer (myself) prompted the students at certain points to gather more in-depth responses. All of the students were familiar with the interviewer in an attempt to create an atmosphere in which the students could provide honest, detailed responses. Students were given the interview questions approximately three days prior to the interview in order to think about their responses and be able to provide meaningful responses on the day of the interview. All

interviews were completed after a school day during the school year. The questions focused around the students' histories with school and math classes, goals for high school and beyond, who in the students' lives are helpful to their successes, and how the students view assessment. The list of questions that the students were provided prior to the interview can be seen below (Table 17).

Table 17

1. What is your opinion about school?
2. What are your goals for high school?
3. How do you feel about math classes?
4. Tell me a little about your history with learning math.
5. If you are struggling with math, what do you do/who do you go to for help?
6. Are there people at home who are willing and able to help you with learning math?
7. How do you feel when you take the MAP tests?
8. How do you feel if you get a poor grade on a math test?
9. What do you see math being used for in your future?

Students gave varied responses to the interview questions, however some similar themes were prevalent. When asked about goals for high school, every student discussed wanting a certain GPA and about attaining "good" grades. When prompted about what "good" grades are, the Advanced Algebra 2 students, Student 1 (Appendix A) and Student 2 (Appendix B), had goals that were related to earning "A"s. The Pre-Algebra students, Student 3 (Appendix C) and Student 4 (Appendix D), both talked about earning grades that were "at least" a certain level.

Both of the Advanced Algebra 2 students stated that they enjoy school. Student 1 said that he likes "the opportunity to learn" (Appendix A). Student 2 said that she likes "understanding and learning new things because it comes in handy" (Appendix B). These

statements are in contrast to the Pre-Algebra students who were not as optimistic about the offerings of high school. Student 4 was convinced the he is "really, really bad at math" (Appendix D) and Student 3 had the mindset that "I'm not very good at math" (Appendix C). The student histories with school and learning math also showed some similarities. Both Pre-Algebra students mentioned homework as a challenge for them and Student 4 was self-aware enough to say that "I don't do my homework that much, that is why I haven't been doing the best" (Appendix D). Student 2 had a different outlook on homework and math classes and she indicated this when she said that "I feel like they are necessary, I don't enjoy them enjoy them, but I like how they are necessary for other classes and other classes are easier when you know math" (Appendix B). The difference between a student thinking that a class or assignment is "easy" or "hard" was an intriguing sentiment to hear, but students choosing to embrace the challenges of school aligns with influencing factors into their placement into high school math classes.

Some of the interview questions provided surprising answers. For the questions related to people at home who are willing and able to help with math, all of the students mentioned family members. Only Student 4 mentioned a family member, his mother, that he does not like to ask because he believes that she struggles with math as well. One Advanced Algebra 2 student, Student 2, and one Pre-Algebra student, Student 4, also mentioned that their grandmothers were helpful to their learning of math as well. Family influences are important factors in how the students were tracked and hearing about the students' histories in their own words was insightful.

When it came to discussing overcoming poor marks on an assessment, whether it be a class assessment or standardized test, all of the students admitted to feeling guilt or

anxiety when they do not perform well. Student 1's reaction to the question was "I feel guilty cause I should have studied more" (Appendix A). During this question, the topic of comparing scores with others and competing also came up. When asked about standardized tests, Student 2 stated that "I like them. I think it's fun to see how much you progress and honestly, like, you're not supposed to compete but people in advanced classes compete to see who gets the highest" (Appendix B). While Student 2 was under the impression that sharing scores and competing is restricted to the advanced classes, Student 4 shared that "I really don't want to mess up on it and get a really low score because like everyone compares their scores after they are done. So, I want to be able to say that I got a good score on math or any other ones" (Appendix D). Therefore, while standardized test scores and class grades are influencing factors used to track students, they are also viewed as a stage to compete.

The final question that students were asked during their interviews was how math factored into the students' future plans. This question was asked in an attempt to understand the student perception of math class and it's utility outside of the classroom. Three out of the four students, all except Student 3, stated that they were planning on entering a STEM (Science, Technology, Engineering, and Mathematics) field after high school. They seemed to understand the need for successfully completing mathematics courses in high school and Student 2 explained her effort and dedication to success in math class by saying "I'm probably going to go into sciences and so like I assume that you are going to need it in chemistry and I just assume that you are going to need it in other subjects" (Appendix B). Student 1 has a goal where he "would really like to be an engineer and engineering revolves around math, knowing your numbers, knowing your equations, and

that's going to be a pretty big part" (Appendix A). The future goal of Student 4 was "I want to be an engineer, so I am going to have to be do good pretty good with math to be an engineer. So, you know, I am going to have to improve a lot" (Appendix D). These goals helped to show that students in both the Pre-Algebra and Advanced Algebra 2 classes have aspirations of using math in their future careers and studies.

Conclusion

Which factors demonstrate the strongest correlations with academic tracking? Chapter 4 presented the data that was collected from the research. The data from the archival documents, the surveys, and the interviews was organized into tables and graphs and analyzed in order to compare trends between the Advanced Algebra 2 students and Pre-Algebra students. Chapter 4 also elaborated on specific details for the surveys and the interviews. My participants in the study included Pre-Algebra and Advanced Algebra 2 freshmen and myself. Chapter 5 summarizes the results and trends that exist from collecting the data. It connects the new findings to the previously existing literature. Chapter 5 also discusses limitations of this study, possible plans for future research, and implications for the stakeholders affected by this study.

CHAPTER FIVE

CONCLUSION

Throughout the research, the goal of this project was to gather a deeper insight into influencing factors which exist within the students' lives and the school district in an attempt to answer the question: What are prominent influencing factors related to academic tracking in mathematics? The research helped to determine the three most prominent factors for the students in this district as family structure, family income, and attendance, all of exist outside of the realm of the mathematics classroom. From continuing to study factors which influence student success, we can continue to work towards understanding how to create the most equitable environment for all students. Chapter 4 categorized important data which was collected in order to answer my research question: What are prominent influencing factors related to academic tracking in mathematics? I was able to categorize archival data from the school district database, student surveys were completed and answers were compiled into manageable data, and interviews were analyzed. Throughout the study, data was collected for 71 Pre-Algebra students and 51 Advanced Algebra 2 students from the Class of 2020 and the Class of 2021 and the interviews of two Pre-Algebra students and two Advanced Algebra 2 students.

Chapter 5 includes a synopsis of my findings from the different information that was obtained, analyzes the results, and concludes with a determination of factors which have the most prominent influence on tracking into the students' 9^{th} grade mathematics classes. In this chapter I reflect on what I found to be true within the community of students that I researched. I also compare my findings with the research I discussed at in the literature

review. Looking at my research and the literature review also allows me to determine limitations of my research study. Lastly, I analyze possible next steps that could benefit the placement of students and the school district as a whole.

Up to this point, a great amount of information has been covered. From the archival data, the surveys, and the interviews, some of the prominent influences for academic tracking in mathematics became evident. Many of the influencing factors seemed to be nonacademic but do affect the students with their performance at school. The family influences amongst the students that had the greatest disparities between the Pre-Algebra and Advanced Algebra 2 students were family structure and family income. These factors are possibly interrelated but based on the anonymity of the results, a correlation between these factors could not be shown. A nonacademic school factor which had a large gap between the Pre-Algebra students and Advanced Algebra 2 students was attendance. The median CC3 student was absent almost twice the amount of days that an AA2 student was. The Pre-Algebra students earned significantly more detentions and suspensions than the Advanced Algebra 2 students did, which contributes to missing even more classroom time on top of the absences. Academic influences that had an influence on academic tracking were standardized tests and middle school grades. Being that there was a large gap in standardized test scores when the students enter the 6^{th} grade, this may be an influence that has been confounded by previous influences. In brief, there are multiple prominent influencing factors that cause the students to be tracked academically.

Personal Reflection

Before beginning this research, I was blinded from what I view as inherent inequalities in the education system. I believed that it was a student's decision whether to be a "good"

student or not, and I believed that students control more than they actually do. While students are able to control their actions, decide whether or not to attempt to complete assignments, choose social groups, and develop interests, students are drastically influenced by their surroundings more than I was aware. Starting as early as preschool, some students are provided opportunities for learning and advancement that others are not. Students have different levels of parental involvement in their academics. Some students endure watching parents go through a divorce. There are students who are chronically absent and miss an average of 20 or more days of school every year. Students come from different economic backgrounds and identify with different races. Students exhibit different behaviors in school which also influences teachers' perceptions of their abilities. All of these influencing factors have an effect on student learning and academic tracking, yet two of the main factors that are discussed when placing a student are MAP scores and classroom grades. Neither of those barometers is deeper than a numerical value and sometimes unfairly place a stigma on a student who is not "good" at school. In an ideal situation, we would be able to disaggregate the student learning and knowledge from all of the other factors that cloud a student's placement in a mathematics class.

This research also allowed me to think about myself as a researcher, a writer, and a learner. As a researcher, I discovered a confidence and comfort with interviewing students that I was unaware of. Collecting and organizing archival data was something that excited me and was a major part of my original plans for data collection. Numbers are concrete and tend to tell a story but are often impersonal and there is generally a "why" behind data. Surveys and interviews allowed me to explore the "whys" that I had when looking at archival data and seeing trends. As a writer, I developed skills with

regards to writing a thesis and connecting prior learning and a literature review with data that I collected. Personally, I believe that I am strong when it comes to writing a persuasive piece but do not have the best transitions and organization. This thesis allowed me to improve on those skills in order to complete a research project that could be used in the future. As a learner, I have definitely grown after accepting the idea of the "growth mindset". Learning to listen and reflect on the information provided to me has also become part of my new learning process. Whereas before this research I had a habit of looking for who or what to place blame on, this process has taught me that learning needs to be done in order to improve a situation and that placing blame generally prohibits growth. Meeting people at a level that is comfortable for all parties involved is a major theme of my learning from this research and it will be something I continue to do in my teaching and in my life.

From working with Pre-Algebra freshmen for a few years now, I have seen the dedication that some of my Pre-Algebra students put into their learning and also how some of them do not have control of priorities in their own lives. It is hard to watch a student struggle to find success while competing with the challenges of a single-family home, lacking transportation home from school if he/she wants to stay after school for extra help, feeling the need to have a part-time job to help his/her family with expenses, and dealing with the difficulties associated with frequently changing living situations. Some of these students are extremely resilient and factors outside of school inhibit their abilities to perform in school at the level needed to be considered "advanced".

Working with the Advanced Algebra 2 freshmen has allowed me to see what I, like many of those students, have been gifted with, a financially stable family who can provide

academic opportunity instead of never-ending change. A major dissimilarity between Advanced Algebra 2 freshmen and Pre-Algebra freshmen seems to be what types of goals are set. During the interviews I asked students about goals both during and after high school. The responses were telling, as the Pre-Algebra students had goals that were less defined than the Advanced Algebra 2 students. Both Advanced Algebra 2 students which I interviewed have aspirations of going to college and pursuing careers in the STEM (Science, Technology, Engineering, and Mathematics) fields. The Pre-Algebra students are not as set on their ideas for college or potential careers in their futures. All of this insight will allow me to begin planning where and how I can use this research.

Connections to Literature Review

The literature review allowed me to determine the factors that I wanted to study in my research. Discovering previously studied factors for academic tracking such as "chronic absenteeism" (AFT, 2012), family structure (Morsey & Rothstein, 2015; Egalite, 2016), extracurricular activities (O'Brien & Rollefson, 1995), and race (Hoxby, 2000) allowed me to identify some of the influencing factors that I wanted to study. Being that "chronic absenteeism", family structure, and race were all information that I could obtain from the district's archival database, these factors were topics that I wanted to study. The influencing factors that were discussed in the literature review that had the biggest impacts on academic tracking in mathematics classes were family structure, parent income, and attendance. These factors all existed in the nonacademic influences category of my research. The influencing factor of race which was researched in the literature review was not as prominent of a factor in my research, being that the district has a smaller percentage of students who identify as races other than White as compared to urban districts. The

literature review also gave me ideas when creating survey and interview questions since some of the literature discussed topics which are not pieces of archival data collected by the district. One of the other ideas that the literature review provided to me was to ask the students for their point of view. Many of the decisions that are made for the best interests of the students are data-driven, but very few resources that I reviewed came from the voice of the students. After completing the literature review, influencing factors that were not able to be studied from the archival data and that I felt were not studied as thoroughly in literature that I read were extracurricular activities, student goals, and parental involvement. Overall, the literature helped me immensely to focus my research on influencing factors that I could study and determine which factors may have the largest impact on academic tracking in mathematics.

Limitations and Suggestions for Possible Future Research

While I was able to study many potential factors in this research, there were a number of limitations that could provide future research opportunities. One of the limitations of this research was the size of the study body of the district. Being that there were less than 150 students overall who qualified for this research between the two graduating classes, the population that was sampled was relatively small. One area that this could be seen as distorting data is the fact that an individual Advanced Algebra 2 student accounts for about 2% (1/51) of the total Advanced Algebra 2 population. Possible future research could look at the tracking of freshmen in neighboring districts to compare similarly sized districts, or research could study districts in urban or suburban areas.

Another limitation of the study was the scope of the interviews I completed. Being that it is unknown as to which 6th grade students are going to be Pre-Algebra or Advanced

Algebra 2 students , I had to interview the students after they had already entered freshman year. It would be an interesting longitudinal study to analyze student progress through their middle school years and into 9th grade. If possible, interviewing a student each year from his/her 6th grade year to his/her 9th grade year would provide fascinating insight into the mindset of a student at different times of his/her educational career. Other interviews that could be completed in order to gain insight into tracking would be interviews with the middle school teachers and the parents/guardians of the students who were interviewed. Hearing the viewpoints of the different stakeholders of a student's success would be important in order to learn about as many determining factors for the student's placement as possible.

Other possible factors not analyzed in this study include the gender and EL (English language learner) status of students. Gender could have been discussed as a factor, however other factors were studied which seemed to have a greater influence on a student's mathematics placement based on available literature. Being that there were only 2 EL students in the studied population, the sample size was too small to receive significant data on English language proficiency as an influencing factor. Both gender and EL status are possible factors to study in future research depending on the student population.

Conclusion

Throughout this journey, I was able to reflect on my ideas of what student success looks like. My own personal experiences as a student led me to think that success is defined by getting "good" grades, being in advanced classes, and going to a four-year college. I have learned from studying my students that true success is overcoming challenges that are

created from situations that sometimes you cannot control, true success is working to do better than you have in the past, and true success does not need an extrinsic prize associated with it. Some of the Pre-Algebra students have seen great amounts of success in their academic careers but are viewed in a different light than their Advanced Algebra 2 peers solely due to tangible measurements from tests.

What I would like to do with my research is begin to craft a new system in which students are placed in middle school and high school mathematics courses based on the current factors (standardized test scores, class grades, and teacher recommendations) and also input by the students. I believe that if students are given the opportunity to challenge themselves, many will meet or exceed the challenge. By creating a culture in which students aim for the biggest challenges, remediation can be slowly added if students need it. Tracking will still exist, but not in its current form. My ideas for the new placement system would have the following elements: (1) Standardized test scores, (2) Grades from previous math classes, (3) Teacher recommendations, (4) Meeting with student, guidance counselor, and parent in which the options for future mathematics classes are discussed as challenges and goals. The choice of math class would ideally be in the hands of the student and the parent provided that the student has taken all requisite math classes up until that point. An expectation would exist that if the student was not meeting the expectations, extra help would be provided and an honest discussion could be had to change a student's mathematics class if necessary. In order to make these changes, discussion with the superintendent of the district, the principals of the middle and high school, and meeting with members of the district's mathematics department is necessary to determine the feasibility of this goal.

This research and next steps will benefit many members of the school district. The members that will benefit include, but are not limited to, future students who may have input into the classes into which they are tracked, guidance counselors and teachers who have a better insight into factors which influence academic tracking, and administrators and the school district as a whole who may see a reduction in the achievement gap. All of these benefits are possible due to adding the student voice into tracking and dispelling any mysteries that students have as to why they are tracked into certain math classes while their peers may be tracked into others.

Appendix A- Advanced Algebra 2 Student (Student 1) Transcription

Me (0:04): Hi [Student 1], um, I am going to ask you a few questions today, um, regarding my research about how you feel about school, um, your interactions at school, math classes in general, just to see what your opinions are and how you feel about them. So my first question is, what is your general opinion about school?

Student (0:25): You know, I really like school. I like going to school, I like the opportunity to learn, and what high school offers to you. I think the thing that really, uh, bothers me about school is how early it is. I don't like that, but other than that I love going here. I get to see my friends, um, I get to learn pretty fun things.

Me (0:48): What are your current goals for high school?

Student (0:51): You know, everyone talks about how high school is the best four years of their life so I want to be able to experience that and have fun but still not have so much fun that I'm not focused on getting my good grades, preparing myself for college, and further in life.

Me (1:08): And what do you consider good grades?

Student (1:10): Um, you know, taking challenging classes, you try your best, um, I want a strong "B". Um, but there are classes in high school that I feel like I can, if you work, if you study, then you can get a good "A". So "B"s and "A"s.

Me (1:28): And how do you feel about math class this year, last year, um, and in general?

Student (1:36): Math has always come really easy to me. Um, I feel like I can be challenged a little bit more and that the things that I do learn, um, could be taught, they are taught well, but I feel like they could be taught more in depth and how everything works and try to get further, get a better, uh, better point across.

Me (2:00): And you said more of a challenge.

Student (2:03): Yeah, I feel like that math has always come really easy to me and that I'd rather have, I'd rather be in a class that's hard and that pushes me to work than one where I just float through.

Me (2:18): Um, so speaking of challenges. If you happen to be struggling with math, uh, what do you do or who do you go to for help or what avenues do you take?

Student (2:29): Um, I would, I'd stay after class and I'll ask the teacher. Um, I am very adamant about raising my hand in class, and if I am confused I will ask a question right there. Um, if I am still confused afterwards there's, I sometimes go online for help.

Me (2:46): And are there people at home who are willing and able to help you with learning math?

Student (2:52): Yeah, both my parents were teachers so that helps when I am having a hard time.

Me (3:00): Um, shifting focus a little bit. Um, when you take standardized tests like the MAPs, how do they make you feel, what is you mentality towards it?

Student (3:11): You know I feel, I try to put a confident mindset in or I try to keep that in myself cause I don't want to get too nervous, it's not the end of the world if I get a bad score, and I just, I remember the simple things in math when the simple things that sometimes have a big effect on your score.

Me (3:30): Um, now if you get a poor grade on a math test or you are not understanding something, what is your mentality or how do you feel about that?

Student (3:38): You know, I feel guilty. I've taken that, uh, obviously I feel like math is one of those where if you study enough, if you just try enough you can understand what the teacher is trying to get out to you and I feel like that I just, I feel guilty cause I should have studied more.

Me (3:55): Okay. And looking into the future, how do you see math being involved in your life.

Student (4:04): Um, in the future I would really like to be an engineer and engineering revolves around math, knowing your numbers, knowing your equations, and that's going to be a pretty big part.

Appendix B- Advanced Algebra 2 Student (Student 2) Transcription

Me (0:02): Hi [Student 2], um, today I am going to ask you a few questions about your opinions about school, how you feel coming to school, life as a student, just to get an idea of how school has been going for you, um, and you as an Advanced Algebra 2 freshman. My first question is, what is your opinion about school?

Student (0:25): Um, I generally enjoy school. I like the classes more than the people here, I guess. I like, I like working on the classes and like understanding and learning new things because it comes in handy.

Me (0:43): Uh, what do you like about learning new things?

Student (0:46): Um, I enjoy progressing and like, I don't really know why, but I like learning new things cause you get progressively smarter and you start understanding other things and other subjects.

Me (1:05): Uh, what are your goals for high school?

Student (1:08): (Inaudible) I want to get my GPA to a good level, probably like around 3.5 or higher. Um, I want to enjoy it. And I want to be mentally prepared for college.

Me (1:25): Now moving on, how do you feel about math classes?

Student (1:29): It's on and off every year (laughs), honestly. But um, I feel like they are necessary, I don't enjoy them enjoy them, but I like how they are necessary for other classes and other classes are easier when you know math.

Me (1:45): Uh, what is an example of a class that you believe you use math in that is not math class?

Student (1:50): Chemistry. Chemistry you need to know how to use exponents, like on my test yesterday I had to know how to subtract exponents and add them.

Me (1:59): Ok, uh, so staying with math, tell me a little bit about your history with math.

Student (2:06): Um, math has been one of my main subjects for a really long time. Like I didn't go to preschool, my grandma started teaching like multiplication when I was like in kindergarten, and so from there I think that's actually one of the main reasons I am in advanced math, because we worked on it so much. And then I have just been in advanced class ever since.

Me (2:30): And if you happen to be struggling with math, what do you do for help?

Student (2:34): I go to my twin. And, I don't know, I go ask her cause most of the time she understands it.

Me (2:42): And if she can't help you, what's another… (student begins speaking)

Student (2:44): I go to the math book. I read through the notes in the math book and then if I don't understand it from there I go online to Khan Academy.

Me (2:54): And are there people at home who are willing to help you with math?

Student (2:57): Yeah, my mom.

Me (2:59): And she is able to help you?

Student (3:00): Yeah.

Me (3:02): And is she a math teacher or?

Student (3:05): She, she's a doctor. She has a chemistry major and we do math together…(inaudible). I think she's just as advanced as I was.

Me (3:15): Of course. Um, now looking at standardized tests. How do you feel when you take tests like the MAP tests?

Student (3:22): I like them. I think it's fun to see how much you progress and honestly, like, you're not supposed to compete but people in advanced classes compete to see who gets the highest.

Me (3:37): And now let's say that you are taking a test and you get a poor grade. What's your reaction to that?

Student (3:45): Anxiety. I, I like good grades.

Me (3:50): Why?

Student (3:52): Cause you need good grades. I, that's just always how I function, you need good grades.

Me (4:01): And where do you see math being used in your future?

Student (4:05): Um, you definitely need it in college and then, I, I'm probably going to go into sciences and so like I assume that you are going to need it in chemistry and I just assume that you are going to need it in other subjects.

Me (4:19): Ok. Well thank you for the interview and I appreciate your answers.

Student (4:24): No problem.

Appendix C- Pre-Algebra Student (Student 3) Transcription

Me (0:02): Hi [Student 3], um, today I am going to ask you a few questions about your opinions about school, um, goals, things you think about math, just to get a better idea from the student perspective of how school and freshman year is going. My first question is, what is your general opinion about school?

Student (0:24): Um, my opinion about school is that it's long and it's a lot of work.

Me (0:30): What do you mean by a lot of work?

Student (0:32): Um, like there is a lot of homework in some classes and others not so much.

Me (0:40): And what are your goals for high school? What do you wish to accomplish?

Student (0:44): To get good grades and have like no missing work.

Me (0:48): And what would you consider good grades?

Student (0:50): Um, above "C" average.

Me (0:57): And let's shift the focus a little bit. How about math class? How do you feel about math class?

Student (1:01): Um, math has been kind of hard for me in the past a little bit until now, otherwise it's improving.

Me (1:11): Why do you think math has been hard for you?

Student (1:13): Um, I don't know, I guess it's just that I'm not very good at math and I don't really like math but…

Me (1:21): So tell me a little bit about your history with math. How has math been in the past?

Student (1:25): Um, it's been hard, like I said and I haven't done so well like on tests, I don't get good grades, and yeah.

Me (1:37): And is it because…What do you attribute it to? What do you attribute not getting good grades to?

Student (1:47): Um, I don't really know. I guess like the homework and stuff is hard but if I need help with that.

Me (1:57): That moves very well into our next question. Um, if you are struggling, what do you do?

Student (2:02): Um, I ask my parents and if they like don't have an answer then I ask my teacher for help.

Me (2:10): And are your parents generally able to help you with math?

Student (2:12): Yeah.

Me (2:14): And do they have the time a lot of times?

Student (2:16): Yeah.

Me (2:20): And you would say they are the first ones you generally go to for help?

Student (2:25): Yeah.

Me (2:27): Um, now the ever-fun question, um, how do you feel about the MAP tests, like the standardized tests?

Student (2:36): Um, some of them are easy and some of them are kind of hard?

Me (2:41): And where would the math one fall under?

Student (2:44): Um, kind of easy, kind of hard, like when there is a calculator, that's useful. And when there's not, that's kind of hard.

Me (2:54): Ok. Um, and how do you feel if you get a poor grade, like on a math test or a standardized test?

Student (3:04): I feel like kind of down at first but then I see if I can do corrections.

Me (3:14): And, where do you see math being used in your future, maybe at the end of high school or after high school?

Student (3:23): Um, well if like I get a job at a bank or something and like getting a job at a restaurant. To count the tip and stuff.

Me (3:35): Um, and do have any goals for after high school of things you might want to be?

Student (3:41): Hmm, I don't know. Maybe go to college.

Me (3:48): Well, I thank you very much for this interview.

Appendix D- Pre-Algebra Student (Student 4) Transcription

Me (0:02): Hi [Student 4], um, today I am going to ask you a few questions related to your opinions about school, math classes, goals for high school, goals for after high school, uh, just to get a glimpse into how you feel about being a freshman and being in the high school. So my first question is, what is your opinion about school?

Student (0:26): Um, it's for education and, um, people are lucky to be able to be here but not really students like it because I feel that they don't like it because they don't try and once they don't try and fall behind then they just get bad grades.

Me (0:46): And you personally, how do you feel about school?

Student (0:49): Um, it's I don't really dislike it and I don't like it, so it's like it's in between. And like, I can tolerate it.

Me (0:58): Ok. What are your goals for high school?

Student (1:01): Um, well I want to have a pretty good GPA for so I can go to college and hmm…

Me (1:13): And what do you consider a good GPA?

Student (1:15): Um, like a 3.2, 3.2 something like that. In the 3 range for sure.

Me (1:23): And do you know what letter a 3 range is?

Student (1:26): It's like "B"s, "B-" to a "B+".

Me (1:29): Perfect. And how do you feel about math classes?

Student (1:33): Um, I don't, I dislike math, um, I don't know.

Me (1:42): What parts about math do you dislike?

Student (1:44): Fractions. It's…not many, I feel like not many people in the real world actually use them like actually use them like a very few percentage use them every day.

Me (2:00): So tell me a little bit about your history with learning math in middle school, elementary school.

Student (2:04): Like I started elementary school and I was really, really bad at math and I always, I got behind. And I started and I just failed it and I, once I got behind, I wouldn't, once I got behind I just stopped doing it, so I got really behind and that was always my worst grade.

Me (2:26): Ok. And did anyone push you to say "Hey, we can do it?".

Student (2:30): Yeah (laughs). Well, um, my wrestling coach so I could, cause I had to get eligible for wrestling, um, pushed me to pass math and make up a bunch of missing work, and then I did and I got to wrestle again.

Me (2:46): Good. So if you are struggling with math, because you've said you struggled, who do you go to or what do you do for help?

Student (2:53): I mostly ask my friends because most of my good friends are in Geometry and so they have already done this and they can help me it.

Me (3:02): Anyone else you go to?

Student (3:04): Um, sometimes my grandma. And I go to my grandma's house on Wednesdays for church.

Me (3:13): So there are people at home who are able to help you with math?

Student (3:16): Yeah, they do. Like, I don't really need help that much. It's only like, I don't know, it's, it feels weird to ask my parents for help on math homework because…

Me (3:29): Why? What's weird about it?

Student (3:30): I don't know. Math wasn't my mom's best thing either, so it's hard for her too. But mostly I just wait, I just wait until the next day to ask my teacher about it.

Me (3:48): Now, when you are taking the MAP tests or standardized tests, how do those make you feel?

Student (3:56): Um, not nervous, but like kind of it gives me anxiety I guess because I really don't want to mess up on it and get a really low score because like everyone compares their scores after they are done. So, I want to be able to say that I got a good score on math or any other ones.

Me (4:17): So if you do get a poor grade on a standardized test or a test in class, how does that make you feel?

Student (4:24): It doesn't feel too good. Um, it makes you feel like, like you have been doing all the work for nothing and that you need to work harder so that the work actually pays off.

Me (4:39): Does it make you study more or change what you are doing?

Student (4:42): Change what I am doing.

Me (4:45): Ok. What specifically would you change?

Student (4:46): Um, I don't really, I don't do my homework that much, that is why I haven't been doing the best on those. So change the homework habits, that should affect with the tests.

Me (4:49): And, where do you see math being used in your future?

Student (5:02): Well, I want to be an engineer, so I am going to have to be do good pretty good with math to be an engineer. So, you know, I am going to have to improve a lot.

Me (5:16): That is a pretty lofty goal. I like it. Thank you for this interview.

Appendix E- Consent Form for Interview

You are invited to participate in an interview on factors which may influence placement in a 9th grade mathematics class. This is a research project being conducted by Matthew Minowitz, a graduate student at Hamline University. The interview should take approximately 20 minutes to complete.

PARTICIPATION

Participation in this interview is voluntary. You may refuse to take part in the research or end the interview at any time without penalty. You are free to decline to answer any particular question you do not wish to answer for any reason.

BENEFITS

You will receive no direct benefits from participating in this research study. However, your responses may help us learn more about factors that influence academic tracking related to 9th grade mathematics classes and how to better facilitate the placement of students into appropriate math classes.

RISKS

The possible risks or discomforts of the study are minimal. You may feel a little embarrassed answering personal interview questions but can choose to decline to answer any questions asked of you.

CONFIDENTIALITY

If you choose to be interviewed by the researcher, your responses will remain anonymous and your name will not be used in the project.

CONTACT

If you have questions at any time about the study or the procedures, you may contact my research supervisor, Dr. Rebecca Neal via phone at 651-523-2170 or via email at rneal01@hamline.edu.

CONSENT: Please sign and return this form if you would like to be interviewed.

I,_____, WILLING AGREE TO PARTICIPATE IN THE INTERVIEW. I UNDERSTAND THAT NOT PARTICIPATING IN THE STUDY WILL HAVE NO IMPACT ON MY GRADE IN CLASS.

_____ _____

(Student Signature) (Date)

_____

(Parent/Guardian Signature)

Appendix F- Survey Questions and Responses

Family Influences Statement 1-	My parent(s)/guardian(s) are actively involved in my performance at school	
	CC3	AA2
Strongly Disagree	5.26% (2)	2.63% (1)
Disagree	15.79% (6)	13.16% (5)
Neutral	31.58% (12)	23.68% (9)
Agree	28.95% (11)	36.84% (14)
Strongly Agree	18.42% (7)	23.68% (9)

Family Influences Statement 2-	I live with people who are WILLING to help me with my math homework.	
	CC3	AA2
Strongly Disagree	10.53% (4)	2.63% (1)
Disagree	10.53% (4)	5.26% (2)
Neutral	23.68% (9)	21.05% (8)
Agree	36.84% (14)	39.47% (15)
Strongly Agree	18.42% (7)	31.58% (12)

Family Influences Statement 3-	I live with people who are ABLE to help me with my math homework.	
	CC3	AA2
Strongly Disagree	10.53% (4)	15.79% (6)
Disagree	7.89% (3)	18.42% (7)
Neutral	18.42% (7)	7.89% (3)
Agree	44.74% (17)	50.00% (19)
Strongly Agree	18.42% (7)	7.89% (3)

Family Influence Statement 4-	My parent(s)/guardian(s) tell me that school is important.	
	CC3	AA2
Strongly Disagree	2.63% (1)	0.00% (0)
Disagree	0.00% (0)	2.63% (1)
Neutral	5.26% (2)	2.63% (1)
Agree	39.47% (15)	31.58% (12)
Strongly Agree	52.63% (20)	63.16% (24)

Family Influences Statement 5-	I get rewarded by my family for performing well in school.	
	CC3	AA2
Strongly Disagree	7.89% (3)	5.26% (2)
Disagree	26.32% (10)	13.16% (5)
Neutral	23.68% (9)	34.21% (13)
Agree	34.21% (13)	28.95% (11)
Strongly Agree	7.89% (3)	18.42% (7)

General School Statement 1-	School is fun for me.	
	CC3	AA2
Strongly Disagree	18.42% (7)	2.63% (1)
Disagree	21.05% (8)	23.68% (9)
Neutral	42.11% (16)	39.47% (15)
Agree	15.79% (6)	28.95% (11)
Strongly Agree	2.63% (1)	5.26% (2)

General School Statement 2-	I am motivated to put forth my best effort in school.	
	CC3	AA2
Strongly Disagree	7.89% (3)	0.00% (0)
Disagree	15.79% (6)	7.89% (3)
Neutral	26.32% (10)	28.95% (11)
Agree	28.95% (11)	28.95% (11)
Strongly Agree	21.05% (8)	34.21% (13)

General School Statement 3-	I get anxious in school.	
	CC3	AA2
Strongly Disagree	2.63% (1)	7.89% (3)
Disagree	10.53% (4)	10.53% (4)
Neutral	26.32% (10)	36.84% (14)
Agree	26.32% (10)	39.47% (15)
Strongly Agree	34.21% (13)	5.26% (2)

General School Statement 4-	I am absent from school more than my peers.	
	CC3	AA2
Strongly Disagree	34.21% (13)	42.11% (16)
Disagree	23.68% (9)	34.21% (13)
Neutral	18.42% (7)	13.16% (5)
Agree	21.05% (8)	5.26% (2)
Strongly Agree	2.63% (1)	5.26% (2)

General School Statement 5-	I value what I learn in school.	
	CC3	AA2
Strongly Disagree	2.63% (1)	0.00% (0)
Disagree	7.89% (3)	2.63% (1)
Neutral	42.11% (16)	21.05% (8)
Agree	36.84% (14)	57.89% (22)
Strongly Agree	10.53% (4)	18.42% (7)

Extracurricular Activities Statement 1-	How many school-based after-school activities do you participate in(sports, clubs, etc.)?	
	CC3	AA2
0 Activities	42.11% (16)	5.26% (2)
1Activity	18.42% (7)	7.89% (3)
2 Activities	28.95% (11)	34.21% (13)
3 or More Activities	10.53% (4)	52.63% (20)

Extracurricular Activities Statement 2-	How many hours do you work a part-time job each week during the school year?	
	CC3	AA2
I do not have a part-time job during the school year.	63.16% (24)	50.00% (19)
1-7 Hours Per Week	5.26% (2)	15.79% (6)
8-14 Hours Per Week	15.79% (6)	21.05% (8)
15-21 Hours Per Week	13.16% (5)	10.53% (4)
More Than 21 Hours Per Week	2.63% (1)	2.63% (1)

Extracurricular Activities Statement 3-	When I participate in an extracurricular activity, I would describe myself as a leader.	
	CC3	AA2
Strongly Disagree	15.79% 6)	0.00% (0)
Disagree	13.16% (5)	15.79% (6)
Neutral	44.74% (17)	26.32% (10)
Agree	21.05% (8)	50.00% (19)
Strongly Agree	5.26% (2)	7.89% (3)

Extracurricular Activities Statement 4-	I enjoy extracurricular activities more than classes in school.	
	CC3	AA2
Strongly Disagree	10.53% (4)	2.63% (1)
Disagree	10.53% (4)	0.00% (0)
Neutral	18.42% (7)	23.68% (9)
Agree	23.68% (9)	39.47% (15)
Strongly Agree	36.84% (14)	34.21% (13)

Extracurricular Activities Statement 5-	My family is more interested in my extracurricular activities than they are in my academic classes.	
	CC3	AA2
Strongly Disagree	31.58% (12)	13.16% (5)
Disagree	50.00% (19)	44.74% (17)
Neutral	34.21% (13)	31.58% (12)
Agree	7.89% (3)	7.89% (3)
Strongly Agree	2.63% (1)	2.63% (1)

Math Class Statement 1-	I feel confident in my basic math skills needed to complete my classwork and homework.	
	CC3	AA2
Strongly Disagree	10.53% (4)	2.63% (1)
Disagree	7.89% (3)	10.53% (4)
Neutral	26.32% (10)	15.79% (6)
Agree	47.37% (18)	52.63% (20)
Strongly Agree	7.89% (3)	18.42% (7)

Math Class Statement 2-	I ask questions and seek help from others when I am struggling in math class.	
	CC3	AA2
Strongly Disagree	2.63% (1)	0.00% (0)
Disagree	21.05% (8)	10.53% (4)
Neutral	34.21% (13)	36.84% (14)
Agree	34.21% (13)	42.11% (16)
Strongly Agree	7.89% (3)	10.53% (4)

Math Class Statement 3-	I will use the math I am learning in school in a future situation (college, career, etc.)	
	CC3	AA2
Strongly Disagree	10.53% (4)	10.53% (4)
Disagree	15.79% (6)	5.26% (2)
Neutral	36.84% (14)	21.05% (8)
Agree	26.32% (10)	39.47% (15)
Strongly Agree	10.53% (4)	23.68% (9)

Math Class Statement 4-	I try my hardest when working in math class.	
	CC3	AA2
Strongly Disagree	0.00% (0)	0.00% (0)
Disagree	7.89% (3)	13.16% (5)
Neutral	50.00% (19)	36.84% (14)
Agree	26.32% (10)	34.21% (13)
Strongly Agree	15.79% (6)	15.79% (6)

Math Class Statement 5-	Math is boring.	
	CC3	AA2
Strongly Disagree	2.63% (1)	13.16% (5)
Disagree	10.53% (4)	23.68% (9)
Neutral	34.21% (13)	42.11% (16)
Agree	28.95% (11)	7.89% (3)
Strongly Agree	23.68% (9)	13.16% (5)

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