The Intersection of Student Engagement and Student Achievement: A Study to Determine the Strength of the Relationship Between the Level of Athletic Participation and Student Achievement

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The Intersection of Student Engagement and Student Achievement:
A Study to Determine the Strength of the Relationship Between the Level of Athletic
Participation and Student Achievement

BY

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APPROVAL FOR SUCCESSFUL DEFENSE

<u>Matthew Kukoda</u> has successfully defended and made the required modifications to the text of the doctoral dissertation for the **Ed.D.** during this Spring 2022 Semester.

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ABSTRACT

The purpose of this study was to examine the relationship between high school students' athletics participation, mediated by engagement, and their academic achievement. The study sought to determine if increased athletics participation, and a self-reported increased sense of engagement at school, resulted in higher SAT test scores for high school students. In addition to this, predicators of race and gender were also incorporated into the statistical analysis of the relationship between sports participation and SAT scores. Using the High School Longitudinal Study of 2009 (HSLS:09), this study analyzed the survey respondents scale of student engagement, participation in organized sports and average SAT reading, math and writing scores. This study utilized the scale of student engagement and participation in organized sports in the base year of the report (2009-2010), and then the student's average SAT scores in the follow-up report. Through the statistical analyses presented in this study, it was found that sports participation had a positive impact on student SAT scores, meaning that as sports participation increased, students were more likely to score better on the SAT. The same goes for the independent variable of student engagement, though not to the same positive degree of sports participation. This data supports the idea that as students participate more in athletics and increase their engagement at school, they will see benefits in their academic performance.

Key Words: Sports participation, Academic achievement, Student engagement, Sense of belonging, SAT, High School Longitudinal Study

ACKNLOWLEDGMENTS

DEDICATION

I dedicate this project to my parents, my siblings, my children, and my bride.

To my parents, Arthur and Michele: Thank you for leading me on my eternal quest to be something that I love and understand; a simple kind of man. Oh yes, I will.

To my siblings, Melissa and Mark: Thank you for being my first angels sent from heaven, my lights which illuminate any darkened path, and my inspiration.

To my children, Adelyn and Austin: *Psalm 127:3-5*. This beautiful verse encapsulates how I feel about each of you; you are our eternal blessing which we will care for and nurture to the best of our ability. Forever.

To my bride, Lisa: Thank you for your unwavering love and support. You made me dream when I just had hope. You made me execute when I simply thought. To everything you are owed, of which I will deliver. Forever.

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CHAPTER 1
MOTIVATION

The need to meet students' psychological and emotional needs while motivating them to succeed academically is a focus of schools nationwide. Due to many social and cultural changes, students have become disaffected with school, and therefore schools face one of the biggest challenges in education: how to keep students engaged and invested in their individual learning and overall school culture.

The lack of motivation in high schoolers has increased in the last ten years and fear of failure, incuriosity, lack of ambition and lack of responsibility have all been found to be contributing factors (Nickolauson, 2021). More students are showing a disinterest in the high school academic experience. Researchers from the Yale Center for Emotional Intelligence and the Yale Child Study Center conducted a nationwide survey of high school students in January 2020, and the results found that nearly 75% of the students' self-reported negative feelings related to school (Belli 2020). The most common emotion reported was tired; feeling stressed and bored were also commonly selected on the rating scale. These student feelings are important to note because the way students feel at school has important implications for their performance and their overall health and well-being (Belli 2020).

So why is it that students are feeling more and more disaffected with their school experience? One of the major contributors discussed by researchers is the growing impact of pop culture on adolescents. This is not a new phenomenon as pop culture has long been called an alternative life.

> It *is* a life; it is not a diversion, a hobby, an amusement. It offers its own disciplines, its own curriculum, its own ethical and cultural values, its own style and language. It works on children

and youths every day, year after year, teaching them, forming them, conditioning them. And it is profoundly opposed to traditional education (Rowen, 1979).

While this concept has been applied for decades, it cannot be truer than in our current society. The impact of the digital world and social media has had a deterring effect on education, and student social-emotional well-being and mental health overall. "The very definition of 'social' may be misleading, according to experts who are finding the more time teens spend on social media, the lonelier and more anxious they are," (Barrett, 2018). In her 2017 study, Jean Twenge drew a similar conclusion. She discovered that students who spend more time using smartphones and other electronic devices are less satisfied with their lives than students who frequently engage in face-to-face interaction (Twenge, 2017). The current state of pop culture and social media is creating a disengagement of students from their peers, influential adults, and their school culture overall. This is leading to a decreased performance in the classroom, an increased concern for student mental health, and a troubling dilemma for leaders in education.

School leaders must determine the best ways to motivate students to develop academically and emotionally. With all the competing channels for adolescent attention, educators must find a way to help students become involved, interested, and engaged active participants in their high school experience. While students and their needs are ever-changing and unique to individual circumstances, there are two constants that are repeatedly researched as positive influences on the student experience. First, athletic participation is directly related to a student's sense of belonging. Secondly, a student's overall sense of belonging and engagement directly impacts academic achievement. While there has been much research and discussion on each of these topics separately, this current study finds that it will be important to look at these two areas together as a continuum of influence on academic achievement.

Past researchers have analyzed the positive impact of sports participation on student engagement and their sense of belonging. It has been found that as students develop skills taught through sports, such as responsibility, teamwork, or overcoming obstacles and failure, they also develop higher self-esteem and improved mental health. Collins et al. (2018) found through their research that "the results indicated that early sport participation plays an important role in adolescent happiness and self-esteem, through mediating variables of sport self-concept and peer acceptance." St-Amand et al. (2017) found that the major qualities of having a sense of belonging included positive emotions, positive relationships with peers and teachers, and a sense of acceptance. This, in combination with developing strong relationships with teammates and coaches, increases the student's overall level of engagement and perceived belonging. Specifically to interscholastic sports, representing their school and community against opposing schools creates a strong tie between students and their school culture (Zayas, 2018; Yanik, 2018). Zayas (2018) continues to argue that as a result of their participation, students felt more connected to their school and had an enhanced sense of belonging. This increased engagement of students as a result of athletics participation has been found to have many benefits on a student's experience in school.

The other commonly researched topic regarding education is how an increased sense of belonging within a school and its culture correlates directly with students' academic performance. It has been found that as students feel more connected to their peers, teachers, and school, they have an increased sense of belonging and develop an internal motivation to perform academically. In addition, highly involved students are part of their school community, as opposed to those who feel like it is an obligation to attend school. Astin's Theory of Student Involvement supports this claim, as an engaged student allocates time for schoolwork, participates in school organizations

and activities, and communicates with peers, teachers, and school administrators (Astin, 1999).

They take a personal investment in the success of the school and are motivated in and outside of

the classroom. Oppositional to this is the uninvolved student, who frequently disregards

assignments, does not spend time on campus, and does not interact often with others at the school

(Astin, 1999). Similarly, in his 2003 report, Willms argues that to have satisfactory academic

outcomes, students need to feel that they belong, and participate, at school. This increased social

and emotional well-being allows them to maximize their academic performance, as they feel good

about what they are doing and the community in which they are involved.

While this previously conducted research demonstrates a positive correlation between

athletics participation and engagement, and a separate correlation between engagement and

academic achievement, there is not a large body of research that aims to make the distinct

connection between athletics participation and academic achievement, through the connecting

variable of engagement. It is this gap in research that this current study aims to fill to provide

school leaders with helpful information to assist with ways to increase student engagement and

academic achievement.

As leaders in education see this benefit between student engagement and academic

achievement, the logical next question is how to increase student engagement. If academic

achievement is dependent on student engagement, and athletics participation increases

engagement and sense of belonging, then there is a direct correlation between athletics

participation and academic achievement. Providing students with the opportunity to participate in

athletics, resulting in the ability to form the interpersonal relationships that are crucial to teenage

development and to strengthen mental health and emotional coping skills, will increase a

student's sense of engagement, thus positively impacting the threshold for academic achievement.

It is the purpose of this current study to determine to what extent does sports participation in high school students impact Math/Reading/Writing SAT scores, as a result of increased sense of belonging. While there are many tools to measure academic achievement, a nationwide assessment, such as the SAT, provides the most uniform source of data across varying demographics. To then compare those scores with the results of a student self-report survey (the High School Longitudinal Study of 2009-2013), which helps depict the relationship between athletics participation and student engagement, will provide a full picture of the impact of athletics participation on academic achievement. Determining this direct relationship will assist school leaders in making decisions regarding ways to increase student engagement and developing a school culture that promotes academic achievement while also considering student mental and emotional well-being.

In a society where schools are now competing with social media, celebrity ideology, and continuing technological advances, educators must find a way to continue to emphasize the value of a quality educational experience to our students. Providing students with a school culture to which they feel connected and engaged is one way to do so. As students who participate in athletics make this connection with their school community at a higher rate than those with minimal participation, school leaders must look to increase these opportunities for their students to provide them with the best opportunity for academic achievement and a successful future as contributing members of society.

CHAPTER 2
REVIEW OF THE LITERATURE

Introduction

This chapter will pertain to the research previously conducted that relates to the topic of this current study.   As this current study's focus is on how a student's participation in sports increases engagement in a school, and influences academic achievement, there are many components to analyze as a foundation. Initially, this current study will review the already established literature concerning academic achievement, sports participation, and student engagement, separately. Following, will be a review of the literature surrounding the relationship between sports participation and student engagement, and then continuing, the relationship between student engagement and academic achievement. It will be the goal of this current study to determine the relationship between the variables emphasized in these past theories and to illustrate that the bridge between sports participation and academic achievement lies in the increase of student engagement and sense of belonging in school.

Academic Achievement

As it is the purpose of this current study to determine the relationship between sports participation and academic achievement, resulting from an increased level of student engagement, it is important to look at the current state of academic achievement in the United States. Many researchers have been hesitant to define what constitutes student success, as it can be argued that there are many factors that influence a student's performance. The term has been applied with increasing frequency as a catchall phrase encompassing numerous student outcomes (York et al., 2015). When referencing academic achievement in this current study, the term is being used to describe the level of a student's academic performance, whether it be below, at, or above grade

level. This can be measured through standardized test scores, grades, GPA, and graduation rates. For the purpose of this current study, looking to analyze academic achievement nationwide, standardized test scores, specifically the SAT, provide the best way to measure achievement across varying school types, populations and demographics, and will be utilized as the main source of data.

To measure academic achievement across the country, it is difficult to utilize any source of data other than a nationwide assessment. College admission tests such as the SAT are a significant source of data for this current study, as the SAT is a uniform test taken by high school students across the country. In Ellrich's (2014) review of the SAT as a strong predictor of college success, she points out that the College Board (originally the College Entrance Examination Board), administered the first standardized exam to high school students in 1901 as a way to assess academic achievement and college readiness. As high schools employ differential grading techniques, it is challenging to assess the qualifications of students from different high schools with different grading standards and course strength, therefore, a standardized exam was developed as the "great equalizer" to be an accurate predictor of first year success for those attending college (Ellrich, 2014). Ellrich does acknowledge, however, the limitations of the SAT for predicting college success, as it does not solely assess all that it takes to be successful. She presents that many colleges are altering their admission process to not only emphasize SAT scores and high school grade point averages, but also student involvement and commitment. Still, Ellrich's analysis of SAT scores as a nationwide equalizer of measuring academic achievement is beneficial for this current study.

Although not all graduating seniors take the SAT, it still serves as a standard way to measure academic achievement in the areas of mathematics and reading/writing.   In their review

of the SAT, Paulson et al. (2009) point out that students' aggregate SAT scores at the high school level are seen as indicators of a high school's educational quality, and at the college or university level, as an indicator of the quality of admissions standards. The SAT allows for comparisons across states because all students are taking the same test, as opposed to utilizing state-standardized test data, where each state uses a different test, making aggregate comparisons less valid (Paulson et al., 2009). The researchers do acknowledge that due to the voluntary nature of the test (it's administered only to students who self-select to take the test), it does create sampling issues unique to the SAT. However, because many graduating seniors aim to continue their academic career at the college level and do elect to take the SAT, it can be assumed that the data from students taking the SAT is still a good measure of academic achievement.

As Meredith Frey reports in her 2019 review of the relationships among the SAT, intelligence, and achievement, the SAT is a good measure of intelligence. However, she acknowledges that despite scientific consensus around that statement, some are remarkably resistant to accept the evidence of such an assertion (Frey, 2019). In the most recent validity sample of nearly a quarter million students, SAT scores and high school GPA combined offered the best predictor of first year GPA for college students. Including SAT scores resulted in a roughly 15% increase in predictive power than using high school grades alone (Frey, 2019). SAT scores provide an objective measure of ability for students across the country and allow for an in-depth analysis and comparison of academic achievement.

As with Ellrich (2014), Frey (2019) also acknowledges that while SAT scores provide a uniform measure of academic achievement, there are some limitations to note. The noncognitive variables that can improve academic achievement are still being researched, and these are not necessarily measured by the SAT. Research consistently demonstrates that conscientiousness,

study habits, and attitudes, specifically grit, are important for the prediction of academic achievement (Frey, 2019). On top of this, the ability to improve your SAT score by preparing for the test with tutors and test-taking strategies may impact whether the SAT is a true judgement of academic ability. In addition, the growing focus on test anxiety may cast doubt on the SAT as a measuring stick for ability (Frey, 2019).

Similarly in his 2017 report, Christopher Tienken addresses the limitations of utilizing standardized testing as a way to measure student success. He states, "Policies that seek to standardize public education output rarely take into account the variety of inputs involved," (Tienken, 2017). Tienken recognizes human development, the child's home environment, the social capital the child has access to, differing learning needs and passions, and access to quality resources, as all non-school factors that would impact a student's success. Tienken goes on to specifically address how "inequalities of inputs that were baked into the system via increasing poverty and other social problems…directly affect academic output on standardized tests." He dedicates an ample amount of research to the impact of poverty on testing performance and found that "approximately 23 percent of United States public school children lived in poverty in 2012…and the cumulative effects of poverty and its associated issues such as stress and frequent illness coalesce to depress overall academic achievement," (Tienken, 2017). This concept is supported by the 2015 College Board Statistical Report, which addresses the idea that the SAT is biased against minorities. It is reported that the average SAT score between white and African American students is roughly 100-110 points (Letukas, 2015), but that "external factors play a role in quality education and ultimately student achievement, such as access to rigorous course work, books and stable peer groups, family support and resources, and academic preparation," (Letukas, 2015). In his 2015 report, Jay Rosner challenges this concept to argue that the question

development and structure of the SAT is biased. In a 2021 summary of Rosner's report, Sasha Chada writes,

> When analyzing the data for testing questions which have been released, the author found that 99% of the questions chosen favored white students over black and hispanic students. Further, 99% of the math questions chosen favored male students over female students. While the questions have all been written is a way meant to be unbiased, the test questions chosen to go on the official SAT do show a pattern of bias. (Section 4)

This research by Ellrich, Frey, Tienken, Letukas and Rosner support that although standardized tests are a way to measure academic skills across varying demographics, there are so many other factors that may impact success on such a test and there are limitations when utilizing the SAT as a measurement of academic success.

Many of these perceived limitations are directly related to this current study, as the noncognitive variables that may factor into SAT success and the ability to manage anxiety can all be fostered through the skills developed within sports participation. This current study will aim to determine whether students building these skills and increasing their engagement and sense of belonging provides them with a better chance for success on the SAT.

Student Engagement in Schools

There is a growing focus on student engagement, as educators and administrators, in addition to researchers, try to address student low achievement, boredom, and alienation (Fredricks et al., 2004). "Previous literature on student engagement is a mixed bag, with a wide-ranging understanding of the term and considerable variation in the nature and type of work," (Trowler, 2010). With this, it has been found that when referencing engagement in schools, the term has been used to cast a broad net. To categorize these different understandings of the term,

student engagement can be broken apart into three areas: behavioral engagement (a student's involvement in school activities); cognitive engagement (a student's active participation in the classroom and learning); and emotional engagement (a student's sense of belonging within the school and its culture) (Fredricks et al., 2012).   While these three separate areas of engagement have been studied individually, this current study will be looking to determine how students' participation in sports, representing behavioral engagement, increases their attitude and sense of belonging, representing emotional engagement. Further, this current study will look to establish a relationship between this increased emotional engagement and academic achievement. Therefore, it is beneficial for this current study to look at past research conducted in both the areas of behavioral engagement and emotional engagement.

Perhaps the most applicable definition of student engagement for this current study can be found from Willms. In his 2003 report, the term engagement is used to refer to the extent to which students identify with and value school outcomes, and participate in academic and non-academic school activities, emphasizing students' sense of belonging or attachment to school (Willms, 2003). This definition encompasses both the behavioral element and emotional element that this current study will be looking to explore deeper. Willms argues that to have satisfactory outcomes on academic achievement, students need to feel that they belong, and participate, at school. As there is much research on engagement that is focused on academic outcomes, it should be acknowledged that belonging and participation are important outcomes in their own right. "Evidence points to the likelihood that students who are not engaged at school will continue to experience difficulties in adulthood, with a lower chance of participating in further education beyond high school and having a greater chance of experiencing further psychological and social difficulties," (Willms, 2003).

Finn's 1993 report on school engagement also utilizes an understanding of engagement that has both a behavioral component of participation and an emotional component of identification. Finn traces engagement participation back to the primary grades and recognizes four levels of how students participate in school. Beginning with the primary grades, students participate at a basic level, by feeling the need to attend and be prepared for school. This progresses to a desire to initiate questions and dialogue, which is where an enthusiasm for extra time being spent interacting with a school begins. This enthusiasm then translates to the desire to participate in social, extracurricular, and athletic aspects of school life, which in turn, progresses to the final level of participation, an increased identification with the school culture and a governance which may involve academic goal-setting and decision making (Finn, 1993). He recognizes that patterns of behavior have their roots in the early school years and presents the participation-identification model that describes this developmental sequence of engagement. Finn's model of engagement supports the hypothesis of this current study, which aims to show that as students' involvement in the school increases, so too do their identification with and academic achievement in the school.

When looking into the ways to measure student engagement, Fredricks et al. (2011) identify the positives and negatives of varying instruments that can be utilized. The instruments analyzed by Fredricks et al. include student self-report surveys, teacher reports on students, and observational measures. This previous research on the different instruments is beneficial to this current study as it helps provide a lens through which to measure student engagement. As researchers look to study engagement and schools and districts look to increase student engagement, it is important for them to assess the options for measuring it (Fredricks et al., 2011). Fredricks et al. acknowledge that there are many challenges that are presented when

looking to measure student engagement, including the appropriateness of the available instruments and the differing disciplinary perspectives and theoretical frameworks reflected by them. In addition, the reliability, that is the degree to which an instrument produces consistent results, and the validity, that is whether the results obtained from using the instrument actually measure what was intended, are two important psychometric properties to evaluate when determining an instrument used to measure engagement (Fredricks et al., 2011).

As this current study will be utilizing a student self-report survey (the High School Longitudinal Study of 2009-2013) to measure student engagement, Fredricks et al.'s (2011) analysis on engagement and student self-report surveys is beneficial. "Student self-report measures can bring the critical voices and perspectives of students into school reform and improvement efforts," (Fredricks et al., 2011). These self-report surveys can range from 4-item scales to 120+-item questionnaires. Within these student self-report surveys, developers usually aim to gather evidence on students' perceptions of their engagement at school. These are normally broken down into sub-categories, with questions regarding the different areas of what can be considered student engagement. Behavioral survey questions may include content related to participation in athletics, activities, and clubs, as well as attendance and compliance with work required in school. Emotional survey questions are usually related to the students' sense of belonging at school and identification with school culture and norms. The cognitive element of engagement measured through a survey deals with students' motivation and active participation in the classroom. Most student self-report surveys on engagement contain elements of all three areas to provide a complete picture of student engagement, while also allowing for individual breakdown and analysis of specifics and subscales (Fredricks et al., 2011).

Student Participation in Sports

Sport can be defined in many ways, due to the various levels and application of physical exercise. When referencing sports participation, this current study will be inclusive of both interscholastic sports (sports sponsored by the school) and outside sports, which may include club and/or recreational sports teams. Therefore, the most relevant definition can be found from the National Youth Sports Strategy (NYSS), which states that sports are "a form of physical activity that, through recreational or competitive participation, aims to develop or maintain skills, fitness, mental well-being, and social-emotional health," (NYSS, 2019). This current study will look to make the connection that through these developments presented by the NYSS, students increase their engagement at school and in turn, see positive results in academic performance.

Currently, participation in youth sports is a most popular activity for students in the United States (NYSS, 2019). The NYSS found that an estimated 54 percent of high school students report participating in sports (run by schools or community groups), and this estimate has remained relatively stable since 1999 (NYSS, 2019). Specific to interscholastic sports, that is, sports sponsored by a school, the National Federation of State High School Associations (NFHS) reports over 7.5 million high school students participate in interscholastic athletics each year (Zayas, 2018). Additionally, data shows that more twelfth graders are involved in sports than any other extracurricular activity (Veliz et al., 2019). The reasons for participation in sports vary among those who play them. Some simply love sports, others may enjoy the thrill of competition, while others play for the comradery experienced between teammates and friends (Zayas, 2018). Whatever the reason for participation, it is evident that sports have become an important part of youth experience.

Through this participation, many students are experiencing the benefits and positive impact of sports. Researchers have found that sports participation teaches life skills and assists young adults in developing positive character traits and habits for the future (Lumpkin and Stokowski, 2011; Kniffin et al., 2015; Zayas, 2018; Lee et al., 2017). Additionally, sports participation has been found to have many positive effects when it comes to classroom behavior and tendencies (van Boekel et al., 2016; Dumid et al., 2020; Watson et al., 2019; Zaff, 2017; NFHS, 2014). Finally, sports provide players with an opportunity to build strong relationships with their peers and coaches (Camire et al., 2019; Scales, 2016). This previously conducted research emphasizes the positive influence that sports participation can have on the development of our youth, and in turn, demonstrates the correlation between sports participation and academic achievement.

One of the biggest areas of research conducted in correlation with sports participation is the life skills that can be taught and can contribute to the development of a young adult. Athletes learn about responsibility, respect, teamwork, accountability, time-management skills, the difference between right and wrong, how to cope with failure and success, and how to do the right thing despite peer pressure and other situational influences (Lumpkin and Stokowski, 2011). Additionally, student-athletes are expected to have higher levels of leadership, more self-confidence, and greater self-respect than people who did not participate in athletics (Kniffin et al., 2015). Participation in sports may lead adolescents to acquire new skills like organization, planning, time-management, etc., and to develop or strengthen particular attitudes like discipline and motivation (Zayas, 2018). Although the purpose of school and youth sports is not predominantly to teach life skills, ones such as communication skills and coping mechanisms are fostered by coaches in the structured environment provided by sports (Lee et al., 2017). The

Office of the Assistant Secretary for Health (2019), on behalf of the United States Department of Health and Human Services, supports that participation in sports is beneficial for students because it can encourage the development of life skills that can be transferred to outside contexts, such as character- and skill-building in relation to self-regulation, goal-setting, self-confidence, and work performance. In addition, when students participate in sports, they do so during afterschool hours, which is a period of time where students are more likely to be exposed to risk-taking behaviors (Lee et al., 2017). These non-academic outcomes promoted by participation in youth sports allow athletes to experience a well-rounded development during their young adulthood.

There has been much research on the benefits of sports participation relating to the classroom as well. van Boekel et al. (2016) found a correlation between the impact of sports participation on the variables of students' perceptions of school safety, teacher and community support, and perceptions of familial support. Drawing from the data, the researchers found that students who participated in school sports generally displayed higher GPAs, coupled with a more auspicious outlook toward school safety, and heightened perceptions of teachers, community, and familial support, compared with students who did not participate in school sports (van Boekel et al., 2016). Additionally, one of the points concluded by Dumid et al.'s (2020) study is that participating in youth sports may improve students' physical condition, thereby improving their levels of energy. With heightened energy levels, students may have more attention by which to focus on the classroom and on assigned tasks, such as homework and projects, thus increasing their engagement in the classroom. Because participating in organized sports also requires attention, students also learn important lessons such as how to adhere to rules and policies, how to develop plans to win, and how to focus, which may encourage transference of similar behavior in the classroom (Dumid et al., 2020). Watson et al. (2019) support that participation in organized sports, particularly for

younger students, can also serve to positively influence their in-class conduct. In their quantitative study, Watson et al. (2019) found that when compared to students who did not participate in sports, children who did participate showed lower instances of lack of attention and hyperactivity, and less of acting without thinking. The National Federation of High School Sports (2014) found that students who participate in activity programs tend to have high grade-point averages, better attendance records, lower dropout rates and fewer discipline problems than students generally (NFHS, 2014). The findings of Zaff et al. (2017), support that interscholastic sports participation may lower the incidence of student dropout. As concluded from this previous research, those students who experience active participation in sports may see many benefits in the school and classroom setting as well.

Camire et al. (2019) characterized participation in sports as a developmental experience and explains that coaches can help teach students basic life skills through the information they learn in the sport. The researchers explained that coaches can provide student-athletes with a stronger understanding of what is occurring both on and off the field, court, or mat, and connect these greater contexts to the act of playing the sport and life itself. With conversations taking place throughout the act of learning and modifying sports-related activities and actions, coaches have the chance to truly understand young adults and learn about what is going on in their lives; something that can be especially integral for students who are lacking a role model. This research and the associated findings point to a larger discussion on the influence and role of coaches in history that have made a major difference in the lives of student-athletes.

Coaches play a unique role in students' personal and social development in the sports environment. According to Scales (2016), coaches can influence students' academic achievement, life skills, and athletics by finding opportunities to teach students important lessons to aid in

character development. This factor is so significant that Scales (2016) suggests helping to teach coaches how to develop their relationships with student-athletes is one of the chief ways that schools can benefit from sports. The researcher argues that instead of reducing budgetary spending on youth sports, schools should invest in the development of coaches, improve and increase access for students, and improve equity (Scales, 2016). While youth sports may be seen as a separate institution from education, working jointly together, they can provide student-athletes with a well-rounded developmental experience.

While there are many benefits to participating in youth sports, there are clear disparities in sports participation rates and those who have access to participate. In 2020, researchers with the Women's Sports Foundation conducted a national survey about the participation and experiences of youth in sports to gain a greater understanding of the disparities that are present. For the purpose of the study, organized sport was defined as an athletic activity that had a coach/instructor and regularly scheduled practices (or trainings) and competitions (interscholastic sports, community and recreational organizations, or travel/club teams) (Zarrett et al., 2020). Findings from this report provide important insights into the gender and socio-economic disparities found in sports participation. The study found that girls and students from low-income households were significantly more likely to have never played a sport and if they were to start playing, the drop-out rates for each were significantly higher. The study concluded that the cost of sports, safety, and lack of access were the primary factors driving gender and income-based disparities (Zarrett et al., 2020). Specifically, youth from low-income households cited the inability to get to practice and cost as the primary reasons to have never played sports. The Aspen Institute's State of Play 2017: Trends and Developments supports the findings of Zarrett et al. In this report, researchers concluded that money continues to be a major driver of sports

participation, as 29.9% of kids from homes in the lowest income bracket were physically inactive, compared to only 11.5% of children in the wealthiest households (Aspen Institute, 2019).   This research is important to consider for this current study, as those with less access to sports are less likely to experience the benefits from participation.

The Aspen Institute focused its research even further in 2020, specifically analyzing the racial inequalities when it comes to access to sports. Survey results showed that African-American children who participate in sports play less than three years and they start in organized sports nearly a year later than White children (Aspen Institute, 2020). Additionally, the survey found that the three most expensive sports to play are ice hockey, field hockey, and skiing/snowboarding, and that fewer than 2 percent of African-American children play these sports. Dr. Travis Dorsch, lead investigator in the Aspen study, states, "Despite many communities' and organizations' efforts at subsidizing minority participation in traditionally White sports, it seems there is still a large gap in the access...minority children have," (Aspen Insitute, 2020). The Women's Sports Foundation report on Race and Sports supports this idea, citing Butler et al.'s 2003 data, which found that over 60% of total male student-athletes of color compete in two sports: basketball and football, while only 28% of total male White student-athletes compete in the same two sports. Even more so, Butler et al. found that "Female athletes of color remain underrepresented compared to their enrollment in the student body, and their participation is concentrated primarily in two sports, basketball and track and field," (2003). This lack of access for African-American children and other minorities limits the ability for them to have greater access to the benefits of playing sports, such as academic achievement and a stronger sense of belonging.

When analyzing research results on the perceptions of the positive benefits of sports participation, Zarrett et al. (2020) found that the high majority of parents (84%) across youth status stated that sports promote positive body image, and that a majority of youth reported liking sport as a great way to make and spend time with friends (Zarett et al., 2020). In addition to this, many parents report having a positive perception on the impact a coach can have on youth in sports, with 81.5% of parents saying that their children's coaches are focused on team members having fun and developing life skills. Therefore, while there are definite disparities in access to sports, there are much less disparities in parents and children viewing the benefits of participation.

Although there is still a disparity in access for these groups, the country is making great strides in providing opportunities for these underserved populations. Organizations like the National Youth Sports Strategy, the Women's Sports Foundation and The Aspen Institute are focused on finding solutions to increase access for sports participation for all children. As stated by the NYSS, society must look to "reorient U.S. youth sports culture around a shared vision: that one day all youth will have the opportunity, motivation, and access to play sports," (NYSS, 2019). By doing so, more students in school will be able to experience the benefits that come along with sports participation, such as an increased sense of belonging with their peers and at school and an increased level of academic achievement.

Theoretical Framework

As past studies have aimed to determine what may impact student academic achievement, there has been much research conducted in the areas of sports participation and student engagement. There has been evidence that, individually, each of these areas positively impacts academic achievement (Figure 1).

Figure 1: Basis of Previous Research Theories

Positive Benefits of Sports Participation	• Academic Achievement
Positive Benefits of Student Engagement	• Academic Achievement
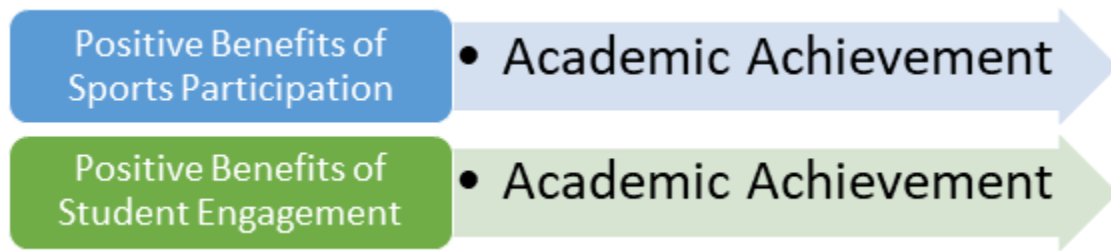
The theoretical review conducted below is broken down into two parts. First, this current study will focus on the relationship between sports participation and student engagement in schools, and then secondly, a discussion around the relationship between student engagement and academic achievement will be presented. As it is not often that research jointly looks at these two areas together, this current study will aim to determine whether the positive impact of sports participation allows students to develop an increased sense of belonging and overall engagement in their school, which results in academic achievement (Figure 2).

Figure 2: This Current Study's Basis for Research

The benefits of sports participation → Impacts a sense of belonging and engagement → Results in an increase in academic achievement
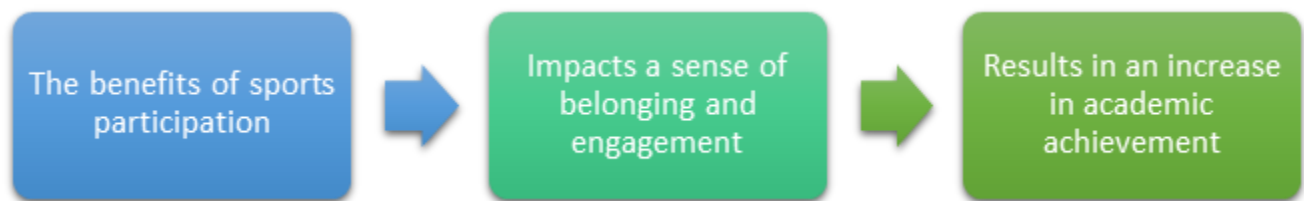
The Relationship Between Sports Participation and Engagement

While there has been much research regarding the positive influence of sports participation on our youth, the most relevant research for this current study is that which pertains to the increased level of engagement and sense of belonging that results from sports participation. An increased sense of belonging at school can simply be the result of higher self-esteem and improved mental health (Collins et al, 2018; Donaldson & Ronan, 2006; Veliz, 2019; St-Amand

et al., 2017). As athletes strengthen mental health strategies through their participation in sports, both in and out of school, their increased mental state can be transferred to the school environment. Additionally, in regard to interscholastic sports specifically, as student-athletes participate in school-sponsored athletics, they create a strong connection with the identity of the school, thus increasing their engagement in the school culture and values (Zayas, 2018; Yanik, 2018). Furthermore, students' sense of belonging cannot be presented without a discussion of coaches and teammates. As youth participate in sports and develop these relationships, their sense of belonging is dramatically increased (Ross et al., 2021; Eccles & Gootman, 2002). The benefit of participation in athletics, whether it be through interscholastic sports or recreational teams/clubs, is evident for young adults, especially when it comes to the increased level of engagement and belonging that they experience as a result of this participation.

One of the positive benefits of sports participation is an increased level of mental health and self-esteem, which directly impacts a student's level of engagement and perceived belonging. Collins et al. (2018) conducted a study to determine the relationship between sports participation and self-esteem. The researchers concluded, "the results indicated that early sport participation plays an important role in adolescent happiness and self-esteem, through mediating variables of sport self-concept and peer acceptance," (Collins et al., 2018). There is strong evidence that sports directly affect youth's mental and emotional health from the findings of this study. Donaldson and Ronan (2006) supported this theory and found that those youth who participated in sports reported enhanced emotional well-being. Veliz et al. (2019) also supported that students who are highly involved in sports had lower incidences of depression and higher self-esteem compared to students who participated in non-sport extracurricular activities.

As students' level of happiness, self-esteem, and peer acceptance are increased, so too is their sense of belonging. St-Amand et al. (2017) found that the defining attributes of belongingness were found to include positive emotions, positive relations with peers and teachers, and a sense of acceptance by those around us. Positive emotions were found to be a fundamental element that defines a sense of belonging and it cannot be understated the impact of peer relationships on an individual's overall sense of belonging. The relationships that can be established through sports participation and being a member of a team are an important piece to student engagement and belonging. Ross et al. (2021) studied how relationships developed between students, their peers, and their coaches in school sports influences students' perceptions of the academic environment. From survey results, Ross et al. analyzed students' outlooks toward their relationships between their peers and coaches, and notions about school climate. Drawing from the data, students felt that feeling as if they were part of a team, and feeling their coaches personally cared about them, were positively linked to students' engagement in school. This notion directly supports the idea that participation in sports can directly influence and improve students' engagement in their academia, thus encouraging higher academic performance. This suggests that students' experience in sports may transfer to that of the school environment. The influences of these coaches arguably provide students and players with an enriched developmental experience. Additionally, Eccles and Gootman (2002) bring attention to the impact supportive adults (coaches) and academically focused peers have on students who participate because they provide encouragement to comply with school values and established norms. Based on this, coaches and teammates can be considered a major influence in a student-athlete's sense of belonging

Specifically, participation in interscholastic sports has a direct influence on a student's connectedness to the school. Zayas (2018) argued that students who participate in extracurricular

activities felt more connected to their school and had an enhanced sense of belonging. The research found that creating more opportunities for students to develop relationships and gain a sense of belonging through extracurricular activities, specifically interscholastic sports and additional sport programs such as intramurals and clubs, had a positive impact on the school culture. Non-participating students "have no sense of belonging. They're not connected to anything that exists within the building. They either come here because they have to or they're just programmed to wake up and go to school" (Zayas, 2018). It was presented through the study that the greatest benefit of sports participation is the opportunity to be a part of a group and have an increased sense of belonging.

Similarly, Yanik (2018) presents the theory that school teams provide students with the opportunity to represent their own school outside of the classroom, and that being part of such events outside of the school makes it possible for students to increase their sense of ownership of the organization and to make themselves feel more like they belong there. This increased pride and ownership of representing your school against other schools when participating in interscholastic sports helps student-athletes identify with the school culture and gain a sense of belonging within the school. Yanik's study contains another important finding to consider. Much literature in the past has concluded that as students age, their sense of engagement in a school decreases (Collier, 2015; Eccles & Gootman, 2002; MacIver & Reuman, 1994). However, in Yanik's study, the fact that school engagement is higher in students in higher grade levels, who are known to participate more in school teams, reveals an important effect of sports participation. If, in general, students' engagement or connection to a school decreases as they get older, perhaps due to lack of motivation, resistance to authority and school rules, or difficulty of work, but those students who participate in sports actually feel more connected to the school

culture and values, then researchers and administrators may want to investigate ways that they can increase sports participation to advance the sense of belonging by students at a school.

As a result of these previous studies, it can be determined that sports positively impact a student's sense of belonging and engagement in school. As students experience these benefits from sports participation, their performance in the classroom is likely to improve.

The Relationship Between Engagement and Academic Achievement

As this current study is aimed to determine the relationship between emotional student engagement (or sense of belonging), resulting from behavioral engagement (specifically athletic participation), and academic achievement, it is important to look at past research conducted on the relationship between engagement and academic performance. "A sound body of literature has established robust correlations between student involvement and positive outcomes of student success and development, including satisfaction, persistence, academic achievement, and social engagement," (Trowler, 2020). Thus, it has been previously established that having a greater sense of belonging at school may promote students' academic motivation and achievement (Knifsend & Graham, 2011). Looking at the previous research conducted on the relationship between engagement and academic achievement will provide this current study the framework to determine whether a student's participation in sports and resulting increased engagement will impact a student's academic achievement.

The positive influence of emotional engagement on academic achievement is illustrated by Willms (2003), who characterized students by their engagement and performance, based off the 2000 Programme for International Student Assessment (PISA) survey results. He found what he called "Top Students"—those who had a high reading literacy and mathematical literacy as well as an above average sense of belonging and participation, and "Engaged Students"—those having

a high sense of belonging and above-average participation, along with close to average literacy scores, (Willms, 2003), experienced a much higher academic achievement level than their peers. This helps depict the academic achievement that engaged students achieve throughout their schooling.

The positive impact of behavioral engagement is supported by Alexander Astin's (1999) Theory of Student Involvement, discussing the impact of student involvement on academic success. Astin's (1999) Theory of Student Involvement is used to describe students' active participation in their schooling and learning experience. When considered through the lens of Astin's (1999) theory, a highly dedicated student (a student who is involved/engaged) allocates ample time for homework and studying, participates in on-campus organizations and activities, and communicates often with fellow students, as well as teachers and school administrators. On the contrary, students who are not involved in their schooling frequently disregard assignments, do not spend much time on campus, and are not involved in organizations and/or activities, and do not interact often with fellow students, teachers, and administrators. He argues that students who are highly involved are part of the school community, rather than simply participating in school. Astin found that students' development and academic achievement is the result of being involved in the school curriculum and involvement in ongoing activities.

In Finn's (1989) Frustration-Self-Esteem Model, students who have minimal relationships with teachers and their peers, or a minimal level of engagement, are negatively impacted in the school setting. As students minimally create an emotional engagement to their schooling, according to Finn (1989), problem behavior may be pursued. "Consistent patterns of scholastic failure may threaten one's self-view, resulting in a search for alternate activities that may be less sanctioned socially but through which the youngster can experience success," (Finn, 1989). It

was found that students who have a higher absentee rate (often, as a result of lack of engagement to the school and learning), are more likely to exhibit deviant behaviors, ranging from minor acts (e.g., cheating) to those with more serious consequences (e.g., engaging in fights or theft) (Finn, 1989). Finn continues the Frustration-Self-Esteem Model to argue that as students seek alternative avenues for success, they associate with peers who have like behaviors. As students who are experiencing low self-esteem become disengaged with the school environment, they will associate with others who exhibit the same behaviors, thus influencing them to continue down the path of low academic achievement. As the frustration increases, the student's behavior becomes the focus of attention, reducing learning opportunities even further (Finn, 1989). Finn's 1989 Frustration-Self-Esteem Model is important to this current study as it emphasizes the impact of low self-esteem and a low sense of belonging on a student's learning experience. As this current study will argue that mental health and sense of belonging are increased through sports participation, the lack of emotional engagement referenced throughout Finn's research can be improved as student-athletes learn the skills necessary to become more connected to their school environment.

The Current Study: Participation in Sports Increases a Sense of Belonging and Engagement, which in turn, Results in Academic Achievement

It is the focus of this study to determine the relationship, if any, between the previous relevant research noted above. While there has been an area of research focused on the positive impact of sports participation, and a separate research focus on the benefits of student engagement on academic achievement, there has been limited research on the connection between these two separate areas. The goal of this current study will be to determine whether sports participation

directly impacts student engagement and a sense of belonging, thus resulting in academic achievement.

Based on the research provided, it is expected that this current study will find that the relationship between academic achievement and sports participation is actually connected by a student's sense of engagement. As mental health is increased, relationships are formed, and life skills are developed, students will see an increase in a sense of belonging in their community. As a result of this, students become more connected to and invested in their schooling, resulting in increased academic achievement.

CHAPTER 3
METHODOLOGY

Overview of Research Purpose and Questions

The purpose of this quantitative study is to examine the relationship between student engagement, developed through athletics participation, and academic achievement. Although student engagement is a broad term which includes many potential components, it is critical to both academic and behavioral success for students in schools. Various research studies have linked positive student engagement to an increase in school success, a decrease in adolescent troubles, and a decrease in dropout risk (Skinner et al., 2008; Fredricks, Blumenfeld, & Paris, 2004; O'Farrell & Morrison, 2003; Stout & Christenson, 2009). Additionally, past researchers have studied the positive impact of athletics participation on student engagement in schools, as a result of improved mental health, increased self-esteem, and an overall sense of belonging and connection to the identity of a school (Collins et al, 2018; Donaldson & Ronan, 2006; Veliz, 2019; St-Amand et al., 2017; (Zayas, 2018; Yanik, 2018). This current study aims to determine if there is a statistically significant relationship between high school students' SAT scores and their athletics participation mediated by engagement. Schools that understand student engagement can actively work to improve academic achievement in school by increasing student engagement.

Hypothesis and Null-Hypothesis

Hypothesis

1. High school students who participated in sports during their high school years, had their sense of engagement increase and perform better academically by achieving higher SAT scores.

Null-hypothesis

1. High school students' sports participation, when mitigated by engagement, had no impact on student achievement as measured by the SAT.

Research Questions

Research Question 1

1. As determined by the 2009-2013 High School Longitudinal Study, to what extent does 2009 sports participation by high school students predict 2012 SAT scores?

> 1a. As determined by the 2009-2013 High School Longitudinal Study, to what extent does 2009 sports participation by high school students predict Math SAT scores in 2012?

> 1b. As determined by the 2009-2013 High School Longitudinal Study, to what extent does 2009 sports participation by high school students predict Critical Reading SAT scores in 2012?

> 1c. As determined by the 2009-2013 High School Longitudinal Study, to what extent does 2009 sports participation by high school students predict Writing SAT scores in 2012?

Research Question 2

2. To what extent is the relationship between sports participation and academic achievement, defined by 2012 Math, Critical Reading, Writing SAT scores, mediated by student engagement scores, as determined by the 2009-2013 High School Longitudinal Study?

> 2a. To what extent does the 2009-2013 High School Longitudinal Study student engagement scores mediate 2009 sports participation and academic achievement, as defined by 2012 Math SAT scores?

2b. To what extent does the 2009-2013 High School Longitudinal Study student engagement scores mediate the 2009 sports participation and academic achievement, as defined by 2012 Critical Reading SAT scores?

2c. To what extent does the 2009-2013 High School Longitudinal Study student engagement scores mediate 2009 sports participation and academic achievement, as defined by 2012 Writing SAT scores?

Research Question 3

3. To what extent does 2009 sports participation by high school students predict 2012 SAT scores, when controlling for gender and race of the students who took the SAT?

    3a. To what extent does 2009 sports participation by high school students predict Math SAT scores in 2012, when controlling for gender and race, as determined by the 2009-2013 High School Longitudinal Study?

    3b. To what extent does 2009 sports participation by high school students predict Critical Reading SAT scores in 2012, when controlling for gender and race, as determined by the 2009-2013 High School Longitudinal Study?

    3c. To what extent does 2009 sports participation by high school students predict Writing SAT scores in 2012, when controlling for gender and race, as determined by the 2009-2013 High School Longitudinal Study?

Figure 3

Conceptual Model

2009 Level of Athletic Participation	Student Achievement: 2012 SAT Score • Critical Reading • Mathematics • Writing

Survey Controls:
2009
Student Engagement Score

Demographic Controls:
• Gender
• Race
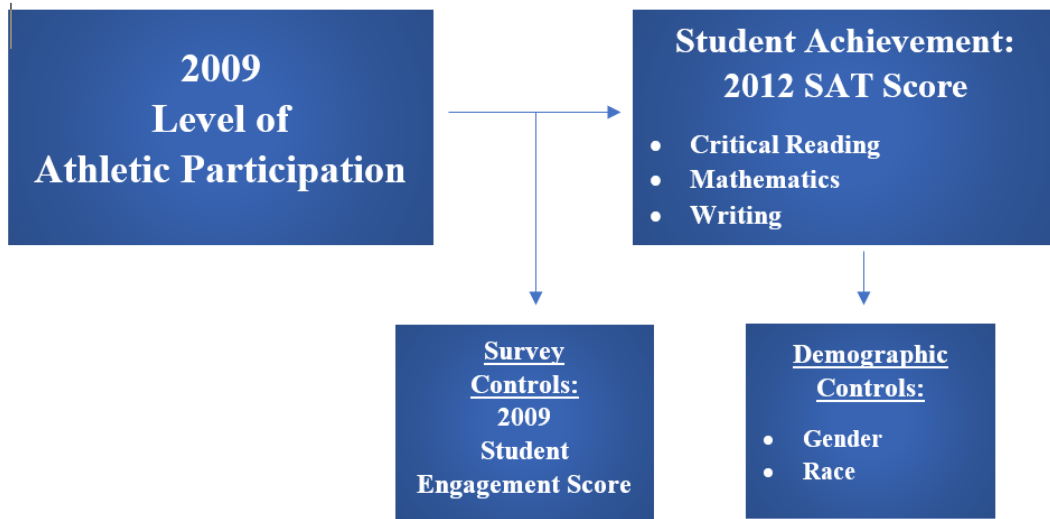
Measurement and Data

Using the High School Longitudinal Study of 2009 (HSLS:09), this study will analyze the survey respondents scale of student engagement, participation in organized sports and average SAT reading, math and writing scores. The High School Longitudinal Study of 2009 (HSLS:09) includes a total of 23,503 students who responded from over 900 high schools both public and private. This study utilizes the scale of student engagement and participation in organized sports in the base year of the report, then the student's average SAT scores in the follow-up report.

Fueled by the United States Department of Education, the purpose of the High School Longitudinal Study of 2009 (HSLS:09) is to monitor the transition of national samples of young people from their high school experiences through their postsecondary years, including further

education, participation in the work force, and the assumption of other adult roles. The High School Longitudinal Study of 2009 (HSLS:09) is a collection of non-restricted data.

In the base-year survey of HSLS:09, students were sampled through a two-stage process. First, stratified random sampling and school recruitment resulted in the identification of 1,889 eligible schools. A total of 944 of these schools participated in the study, resulting in a 55.5 percent (weighted) or 50.0 percent unweighted response rate. In the second stage of sampling, students were randomly sampled from school ninth-grade enrollment lists, with 25,206 eligible selections (or about 27 per school).

The data collection for HSLS:09 base year took place in the 2009-10 school year, with a randomly selected sample of fall-term 9th-graders in more than 900 public and private high schools with both a 9th and an 11th grade. Students took a mathematics assessment and survey online. Students' parents, school principals, teachers of mathematics and science, and the school's lead counselor completed surveys on the phone or on the Web.

The first follow-up of HSLS:09 took place in the spring of 2012 when most sample members were in the spring of their 11th grade. Dropouts and transfer students were followed, as well as those who remain in the base-year school. A postsecondary update took place in the summer of 2013, to learn about the cohort's postsecondary plans and decisions. High school transcripts were collected in the fall of 2013. Subsequent data collections occurred three years after the expected graduation year (in 2016) to learn about students' postsecondary experiences, and again in 2021 to learn about participants' choices, decisions, attainment, and experiences in adulthood.

To represent school engagement, the HSLS:09 represents the variable as X1SCHOOLENG. This variable is a scale of the sample member's school engagement, with higher values representing greater school engagement. This variable, measured numerically, was created through four principal factor components. These components asked the following questions:

- How often student goes to class without their homework done.
- How often student goes to class without pencil or paper.
- How often student goes to class without books.
- How often student goes to class late.

The variable of sports participation, represented in HSLS:09 as S2SPORTS and measured categorically, is defined as whether the survey respondent had participated in sports outside of school since the fall of 2009. The variables of achievement on the SAT, represented in HSLS:09 as C2AVGSATREAD, C2AVGSATMATH, C2AVGSATWRIT and measured numerically, are defined as the overall mean SAT Critical Reading Score, overall mean SAT Math score, and the overall mean SAT Writing score.

Specific to the mediating variables represented in HSLS:09 as X1RACE and X1SEX and measured categorically, the control variable of race characterizes the sample member's race/ethnicity by summarizing the six dichotomous race/ethnicity composites of Hispanic, White, Black, Asian, Pacific Islander, and American Indian. The dichotomous race/ethnicity composites are based on data from the student questionnaire. Finally, the control variable of gender is the sex of the sample member, taken from the base year student questionnaire, parent questionnaire, and/or school-provided sampling roster.

Data Methods

Using a regression model, the research questions will be answered to determine the relationship, if any, that sports participation has to performance on the SAT, in the areas of

critical reading, math, and writing. Similarly, this model will determine the level, if any, that sports participation can affect engagement in school. As such, if sports participation affects engagement, does sports participation affect performance on the SAT when controlling for engagement, race and gender?

Delimitations and Limitations

Due to the chosen research design of this current study, there are some limitations to be acknowledged. Firstly, the population only includes students and their perspectives of engagement and participation and does not include the perspectives of the students' teachers or the parents of the students responding to the survey. Secondly, the sample is limited to students who took the SAT at this point in the study. Another limitation to the sample of students is that the researcher is unable to filter results based on geographic location, school demographics, or other descriptive components. In addition to this, future perspectives of engagement and participation are not considered, as school engagement was only measured in the base year of the study.

In addition to these limitations, the delimitations that follow were set to achieve the current study's objectives and maintain the chosen research design. The first being the reliance on survey responses from students across the country, with perspectives perhaps varying based on location. Considering the validity of this data, the researcher accepts this risk. The researcher also chose to select the SAT as a measurement for academic success, when there are many assessments to choose from. Citing the uniform nature of the SAT across varying demographics, it was determined that this would be the best assessment to minimize variations in the data.

Additionally, there are other factors that could be considered to impact academic success, sports participation, and a student's sense of engagement. However, the data is too broad and diving into each of these topics presents an entirely new focus of research. This current study chose to determine the direct relationship between participation and academic achievement and not to consider the following: 1) the instructional practices in different schools may limit the ability to make a clear assessment of how academic performance in reading, writing and mathematics is linked to sports participation and engagement; 2) the numerous programs and initiatives that are in place at schools across the country and may affect student outcomes. As examples, curricular programs, before-and-after school learning opportunities and training sessions for teaching staff, including many others, it is obvious that countless factors can contribute to the success of a school. Considering such, while this study may highlight that a relationship exists between sports participation, engagement and student achievement, it must be stated that many other factors are also affecting student progress at the same time; 3) all the demands that are placed on students' time other than sports; 4) the additional factors that may determine success on the SAT, such as preparation and natural academic level. While the researcher acknowledges that these are important components to understanding the student as a whole, presenting research on each of these topics and trying to determine a cohesive relationship between them would be an endless task. For this reason, this current study chose to focus primarily on the relationship between student engagement and academic outcomes.

Motivation Summary

Presenting this data and determining a possible relationship between these variables will provide an important area of focus for school leaders. If a positive correlation can be found between sports participation and academic achievement, this can assist educators in providing

students with a quality, meaningful, and engaging educational experience. While academic achievement is a main focus of any educational setting, student well-being as a result of an increased sense of belonging, is a significant byproduct of expanded opportunities for student participation. Utilizing the results of this current study, providing these opportunities, and emphasizing the importance of involvement in school culture, school leaders can assist students in achieving their goals academically, and socially-emotionally, which should be one of the primary missions of any educational setting.

CHAPTER 4
RESULTS

Introduction

The purpose of this quantitative study is to examine the relationship between student engagement, developed through athletics participation, and academic achievement. This current study aimed to determine if there is a statistically significant relationship between high school students' SAT scores and their athletics participation mediated by engagement.

Using the High School Longitudinal Study of 2009 (HSLS:09), this study analyzed the survey respondents scale of student engagement, participation in organized sports and average SAT reading, math and writing scores. The High School Longitudinal Study of 2009 (HSLS:09) includes a total of 23,503 students who responded from over 900 high schools both public and private. This study utilized the scale of student engagement and participation in organized sports in the base year of the report, then the student's average SAT scores in the follow-up report.

In the base-year survey of HSLS:09, students were sampled through a two-stage process. First, stratified random sampling and school recruitment resulted in the identification of 1,889 eligible schools. A total of 944 of these schools participated in the study, resulting in a 55.5 percent (weighted) or 50.0 percent unweighted response rate. In the second stage of sampling, students were randomly sampled from school ninth-grade enrollment lists, with 25,206 eligible selections (or about 27 per school).

The data collection for HSLS:09 base year took place in the 2009-10 school year, with a randomly selected sample of fall-term 9th-graders in more than 900 public and private high

schools with both a 9th and an 11th grade. The first follow-up of HSLS:09 took place in the spring of 2012 when most sample members were in the spring of their 11th grade.

The following research questions, with subsidiary questions to examine the different components of the SAT, were analyzed through a linear regression. In each regression, sports participation served as the independent variable, while student achievement, defined by SAT scores remained the dependent variable. The mediators of student engagement, gender, and race were introduced into the equation, serving as independent variables.

1. As determined by the 2009-2013 High School Longitudinal Study, to what extent does 2009 sports participation by high school students predict 2012 SAT scores?

2. To what extent is the relationship between sports participation and academic achievement, defined by 2012 Math, Critical Reading, Writing SAT scores, mediated by student engagement scores, as determined by the 2009-2013 High School Longitudinal Study?

3. To what extent does 2009 sports participation by high school students predict 2012 SAT scores, when controlling for gender and race of the students who took the SAT?

Research Question 1 Analysis

To discover the extent that 2009 sports participation may or may not predict 2012 SAT scores, a linear regression analysis was run. For all models, the effect size was 9826 respondents. Beginning with 2012 Math SAT scores, the dependent variable of "Average Math SAT" representing the 2012 Math SAT scores of the survey respondents. In this case, the higher the score, the better the student performed on the Math portion of the SAT in the year 2012. The independent variable as identified as "Sports Participation", refers to whether the survey respondent participated in sports during the 2009 school year, with a response of "1" representing yes, and a response of "0" as no. The R-square in this model is 0.010, which indicates that 1.0% of the variance in Math SAT scores is explained by sports participation. This regression was

found to be statistically significant. $F_{(1,8823)} = 90.817$, p=.001. The predictor of sports participation had a significant effect on Math SAT scores in survey respondents, Beta=.101, t=9.530, p=<.001. This positive beta shows that as sports participation increased, Math SAT scores increased, as evidenced by the fact that for every unit of change in sports participation, there was a corresponding increase of 11.9 percentage points in Math SAT scores.

Next, the dependent variable of "Average Critical Reading SAT" representing the 2012 Critical Reading SAT scores of the survey respondents was examined. In this case, the higher the score, the better the student performed on the Critical Reading portion of the SAT in the year 2012. The independent variable as identified as "Sports Participation", refers to whether the survey respondent participated in sports during the 2009 school year, with a response of "1" representing yes, and a response of "0" as no. The R-square in this model is 0.010, which indicates that 1.0% of the variance in Critical Reading SAT scores is explained by sports participation. This regression was found to be statistically significant. $F_{(1,8823)} = 87.324$, p=.001. The predictor of sports participation had a significant effect on Critical Reading SAT scores in survey respondents, Beta=.099, t=9.345, p=<.001. This positive beta shows that as sports participation increased, Critical Reading SAT scores increased, as evidenced by the fact that for every unit of change in sports participation, there was a corresponding increase of 11.1 percentage points in Critical Reading SAT scores.

Finally, the dependent variable of "Average Writing SAT" representing the 2012 Writing SAT scores of the survey respondents was examined. In this case, the higher the score, the better the student performed on the Writing portion of the SAT in the year 2012. The independent variable as identified as "Sports Participation", refers to whether the survey respondent participated in sports during the 2009 school year, with a response of "1" representing yes, and a

response of "0" as no. The R-square in this model is 0.012, which indicates that 1.2% of the variance in Writing SAT scores is explained by sports participation. This regression was found to be statistically significant. $F_{(1,8543)} = 105.645$, $p=.001$. The predictor of sports participation had a significant effect on Writing SAT scores in survey respondents, Beta=.111, t=10.278, p=<.001. This positive beta shows that as sports participation increased, Writing SAT scores increased, as evidenced by the fact that for every unit of change in sports participation, there was a corresponding increase of 12.9 percentage points in Writing SAT scores.

Table 1A: Math SAT and Sports Participation

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.101[a]	.010	.010	58.518

a. Predictors: (Constant), Sports Participation

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	310993.099	1	310993.099	90.817	<.001[b]
	Residual	30213323.717	8823	3424.382		
	Total	30524316.816	8824			

a. Dependent Variable: Average Math SAT

b. Predictors: (Constant), Sports Participation

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	522.277	.917		569.666	.000
	S2SPORTS	11.908	1.250	.101	9.530	<.001

a. Dependent Variable: Average Math SAT

Table 1B: Critical Reading SAT and Sports Participation

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.099[a]	.010	.010	55.916

a. Predictors: (Constant), Sports Participation

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	273032.917	1	273032.917	87.324	<.001[b]
	Residual	27586466.800	8823	3126.654		
	Total	27859499.717	8824			

a. Dependent Variable: Average Critical Reading SAT

b. Predictors: (Constant), Sports Participation

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	515.999	.876		589.006	.000
	S2SPORTS	11.157	1.194	.099	9.345	<.001

a. Dependent Variable: Average Critical Reading SAT

Table 1C: Writing SAT and Sports Participation

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.111[a]	.012	.012	58.228

a. Predictors: (Constant), Sports Participation

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	358187.008	1	358187.008	105.645	<.001[b]
	Residual	28964833.004	8543	3390.476		
	Total	29323020.012	8544			

a. Dependent Variable: Average Writing SAT

b. Predictors: (Constant), Sports Participation

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	503.468	.927		543.220	.000
	S2SPORTS	12.987	1.263	.111	10.278	<.001

a. Dependent Variable: Average Writing SAT

Research Question 1 Summary

The statistical analyses of the relationship between sports participation in the year 2009 and student achievement as defined by the performance on the math, critical reading and writing portions of the SAT in the year 2012 were deemed statistically significant. The positive beta for each regression associated with different portions of the SAT indicates that the predictor of sports participation positively impacted the variable of interest, SAT performance. Students who participated in sports during their freshman year of high school were more likely to score better on each portion of the SAT during their 11th grade year, than those students who did not participate in sports.

Research Question 2 Analysis

To determine the extent of the relationship between sports participation and academic achievement, defined by 2012 Math, Critical Reading, Writing SAT scores, mediated by student engagement scores, as determined by the 2009-2013 High School Longitudinal Study, a linear regression was run. For all models, the effect size was 9826 respondents. In the first model, the dependent variable was identified as "Average Math SAT", representing the 2012 Math SAT scores of the survey respondents. In this case, the higher the score, the better the student performed on the Math portion of the SAT in the year 2012. The independent variables include, first, as "Sports Participation", refers to whether the survey respondent participated in sports during the 2009 school year, with a response of "1" representing yes, and a response of "0" as no. A second independent variable is included, identified as "School Engagement". This variable is a scale of the sample member's school engagement; higher values represent greater school engagement. The scale minimum was -3.38 and the scale maximum was 1/39. The school engagement score was created through principal factor components analysis, with the inputs to

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this scale identifying how often the responding student goes to class without their homework done, how often the responding student goes to class without pencil or paper, how often the responding student goes to class without books, and how often the responding student goes to class late.

The R-Square for this model is .016. This indicates that 1.6% of the variance in Math SAT scores is explained by the two predictors of sports participation and student engagement. This regression model is statistically significant $F_{(2,7773)}=63.954$, p=<.001. The variable of sports participation is a significant predictor of Math SAT scores with the Beta=.097, t=8.645, p=<.001. This positive beta shows that as sports participation increased, Math SAT scores increased, as evidenced by the fact that for every unit of change in sports participation, there was a corresponding increase of 11.5 percentage points in Math SAT scores. The predictor of school engagement is also a significant predictor of Math SAT scores with the Beta=.077, t=6.836, and p=<.001. This positive beta shows that by engaging themselves in school, a positive impact was shown on Math SAT scores. In fact, for every increase in student engagement, there was an increase in 4.836 percentage points on the Math portion of the SAT.

In comparing the variables of sports participation and student engagement as predictors of Math SAT performance, sports participation is a stronger predictor than student engagement because the standardized coefficient of sports participation is 1.25 times stronger than student engagement.

In the next model, the dependent variable was identified as "Average Critical Reading SAT", representing the 2012 Critical Reading SAT scores of the survey respondents. In this case, the higher the score, the better the student performed on the Critical Reading portion of the SAT in

the year 2012. The independent variables include, first, as "Sports Participation", refers to whether the survey respondent participated in sports during the 2009 school year, with a response of "1" representing yes, and a response of "0" as no. A second independent variable is included, identified as "School Engagement". This variable is a scale of the sample member's school engagement; higher values represent greater school engagement. The scale minimum was -3.38 and the scale maximum was 1/39. The school engagement score was created through principal factor components analysis, with the inputs to this scale identifying how often the responding student goes to class without their homework done, how often the responding student goes to class without pencil or paper, how often the responding student goes to class without books, and how often the responding student goes to class late.

The R-Square for this model is .015. This indicates that 1.5% of the variance in Critical Reading SAT scores is explained by the two predictors of sports participation and student engagement. This regression model is statistically significant $F(2,7773)=59.231$, $p=<.001$. The predictor of sports participation is a significant predictor of Critical Reading SAT scores with the Beta=.095, t=8.467, p=<.001. This positive beta shows that as sports participation increased, Critical Reading SAT scores increased, as evidenced by the fact that for every unit of change in sports participation, there was a corresponding increase of 10.8 percentage points in Critical Reading SAT scores. The variable of school engagement is also a significant predictor of Critical Reading SAT scores with the Beta=.072, t=6.393, and p=<.001. This positive beta shows that by engaging themselves in school, a positive impact was shown on Critical Reading SAT scores. In fact, for every increase in student engagement, there was an increase in 4.322 percentage points on the Critical Reading portion of the SAT.

In comparing the variables of sports participation and student engagement as predictors of Critical Reading SAT performance, sports participation is a stronger predictor than student engagement because the standardized coefficient of sports participation is 1.31 times stronger than student engagement.

In the final model for this research question, the dependent variable was identified as "Average Writing SAT", representing the 2012 Writing SAT scores of the survey respondents. In this case, the higher the score, the better the student performed on the Writing portion of the SAT in the year 2012. The independent variables include, first, as "Sports Participation", refers to whether the survey respondent participated in sports during the 2009 school year, with a response of "1" representing yes, and a response of "0" as no. A second independent variable is included, identified as "School Engagement". This variable is a scale of the sample member's school engagement; higher values represent greater school engagement. The scale minimum was -3.38 and the scale maximum was 1/39. The school engagement score was created through principal factor components analysis, with the inputs to this scale identifying how often the responding student goes to class without their homework done, how often the responding student goes to class without pencil or paper, how often the responding student goes to class without books, and how often the responding student goes to class late.

The R-Square for this model is .019. This indicates that 1.9% of the variance in Writing SAT scores is explained by the two predictors of sports participation and student engagement. This regression model is statistically significant $F_{(2,7533)}=72.291$, $p=<.001$. The variable of sports participation is a significant predictor of Writing SAT scores with the Beta=.106, t=9.242, p=<.001. This positive beta shows that as sports participation increased, Writing SAT scores increased, as evidenced by the fact that for every unit of change in sports participation, there was

a corresponding increase of 12.4 percentage points in Writing SAT scores. The predictor of school engagement is also a significant predictor of Critical Reading SAT scores with the Beta=.082, t=7.185, and p=<.001. This positive beta shows that by engaging themselves in school, a positive impact was shown on Writing SAT scores. In fact, for every increase in student engagement, there was an increase in 5.1 percentage points on the Writing portion of the SAT.

In comparing the variables of sports participation and student engagement as predictors of Writing SAT performance, sports participation is a stronger predictor than student engagement because the standardized coefficient of sports participation is 1.29 times stronger than student engagement.

Table 2A: Math SAT, School Engagement and Sports Participation

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.127[a]	.016	.016	58.536

    a.   Predictors: (Constant), School Engagement, Sports Participation

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	438269.872	2	219134.936	63.954	<.001[b]
	Residual	26633806.488	7773	3426.451		
	Total	27072076.360	7775			

a. Dependent Variable: Average Math SAT

b. Predictors: (Constant), School Engagement, Sports Participation

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	521.336	.987		528.239	.000
	S2SPORTS	11.539	1.335	.097	8.645	<.001
	X1SCHOOLENG	4.836	.707	.077	6.836	<.001

a. Dependent Variable: Average Math SAT

Table 2B: Critical Reading SAT, School Engagement and Sports Participation

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.123[a]	.015	.015	55.940

a. Predictors: (Constant), School Engagement, Sports Participation

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	370703.664	2	185351.832	59.231	<.001[b]
	Residual	24323960.521	7773	3129.289		
	Total	24694664.185	7775			

a. Dependent Variable: Average Critical Reading SAT

b. Predictors: (Constant), School Engagement, Sports Participation

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	515.322	.943		546.375	.000
	S2SPORTS	10.801	1.276	.095	8.467	<.001
	X1SCHOOLENG	4.322	.676	.072	6.393	<.001

a. Dependent Variable: Average Critical Reading SAT

Table 2C: Writing SAT, School Engagement and Sports Participation

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.137[a]	.019	.019	58.128

a. Predictors: (Constant), School Engagement, Sports Participation

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	488513.024	2	244256.512	72.291	<.001[b]
	Residual	25452561.923	7533	3378.808		
	Total	25941074.947	7535			

a. Dependent Variable: Average Writing SAT

b. Predictors: (Constant), School Engagement, Sports Participation

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	502.804	.995		505.212	.000
	S2SPORTS	12.444	1.346	.106	9.242	<.001
	X1SCHOOLENG	5.129	.714	.082	7.185	<.001

a. Dependent Variable: Average Writing SAT

Research Question 2 Summary

The statistical analyses of the relationship between sports participation, student engagement and student achievement as defined by the performance on the math, critical reading and writing portions of the SAT in the year 2012 was deemed statistically significant. The positive beta for each regression associated with different portions of the SAT indicates that the predictors of sports participation and student engagement positively impacted the variable of interest, SAT performance. Students who participated in sports during their freshman year of high school and considered themselves engaged in school were more likely to score better on each portion of the SAT during their 11th grade year. By comparison, sports participation was a stronger predictor of SAT success, compared to a student's engagement score, than those students who did not participate in sports.

Research Question 3 Analysis

To determine the extent of the relationship between sports participation and academic achievement, defined by 2012 Math, Critical Reading, Writing SAT scores, when controlling for race and gender as determined by the 2009-2013 High School Longitudinal Study, a linear regression was run. For all models, the effect size was 9826 respondents. In the first model, the dependent variable is identified as "Average Math SAT", representing the 2012 Math SAT scores of the survey respondents. In this case, the higher the score, the better the student performed on the Math portion of the SAT in the year 2012. The independent variables include, first, as "Sports Participation", refers to whether the survey respondent participated in sports during the 2009 school year, with a response of "1" representing yes, and a response of "0" as no. A second independent variable "White/Non-White" has been added to sports participation. "White/Non-White" represents the student's race; classified as white or non-white, with a response of "1"

representing white and a response of "0" as non-white. A third independent variable has been introduced to the model as "Sex" represents the student's gender. Responses were coded as "0" for male and "1" for female.

The R-Square for this model is .017. This indicates that 1.7% of the variance in Math SAT scores is explained by the predictors of sports participation, gender and race. This regression model is statistically significant $F_{(3,8374)}=48.168$, p=<.001. The variable of sports participation is a significant predictor of Math SAT scores with the Beta=.095, t=8.730, p=<.001. This positive beta shows that as sports participation increased, Math scores increased, as evidenced by the fact that for every unit of change in sports participation, there was a corresponding increase of 11.3 percentage points in Math SAT scores. The variable of gender was not a significant predictor of Math SAT scores with the Beta= -.007, t= -.617, and p=.537. It can be concluded that gender shows no effect on the Math SAT score. The variable of race is a significant predictor of Math SAT scores with the Beta=.080, t=7.349, p=<.001. The positive coefficient indicates that White students performed higher on the Math portion of the SAT.

In comparing sports participation and race as significant predictors of Math SAT performance, sports participation is a stronger predictor than race because the standardized coefficient of sports participation is 1.18 times stronger than race.

In the next model, the dependent variable was identified as "Average Critical Reading SAT", representing the 2012 Critical Reading SAT scores of the survey respondents. In this case, the higher the score, the better the student performed on the Critical Reading portion of the SAT in the year 2012. The independent variables include, first, as "Sports Participation", refers to whether the survey respondent participated in sports during the 2009 school year, with a response

of "1" representing yes, and a response of "0" as no. A second independent variable "White/Non-White" has been added to sports participation. "White/Non-White" represents the student's race; classified as white or non-white, with a response of "1" representing white and a response of "0" as non-white. A third independent variable has been introduced to the model as "Sex" represents the student's gender. Responses were coded as "0" for male and "1" for female.

The R-Square for this model is .022. This indicates that 2.2% of the variance in Critical Reading SAT scores is explained by the predictors of sports participation, gender and race. This regression model is statistically significant $F_{(3,8374)}=63.995$, p=<.001. The variable of sports participation is a significant predictor of Critical Reading SAT scores with the Beta=.092, t=8.401, p=<.001. This positive beta shows that as sports participation increased, Critical Reading SAT scores increased, as evidenced by the fact that for every unit of change in sports participation, there was a corresponding increase of 10.4 percentage points in Critical Reading SAT scores. The variable of gender was not a significant predictor of Critical Reading SAT scores with the Beta= -.005, t= -.484, and p=.628. It can be concluded that gender shows no effect on the Critical Reading SAT score. The variable of race is a significant predictor of Critical Reading SAT scores with the Beta=.110, t=10.183, p=<.001. The positive coefficient indicates that White students performed higher on the Critical Reading portion of the SAT.

In comparing sports participation and race as significant predictors of Critical Reading SAT performance, race is a stronger predictor than sports participation because the standardized coefficient of race is 1.19 times stronger than sports participation.

In the final model for this research question, the dependent variable was identified as "Average Writing SAT", representing the 2012 Writing SAT scores of the survey respondents. In

this case, the higher the score, the better the student performed on the Writing portion of the SAT in the year 2012. The independent variables include, first, as "Sports Participation", refers to whether the survey respondent participated in sports during the 2009 school year, with a response of "1" representing yes, and a response of "0" as no. A second independent variable "White/Non-White" has been added to sports participation. "White/Non-White" represents the student's race; classified as white or non-white, with a response of "1" representing white and a response of "0" as non-white. A third independent variable has been introduced to the model as "Sex" represents the student's gender. Responses were coded as "0" for male and "1" for female.

The R-Square for this model is .019. This indicates that 1.9% of the variance in Writing SAT scores is explained by the predictors of sports participation, gender and race. This regression model is statistically significant $F(3,8119)=53.412$, $p=<.001$. The variable of sports participation is a significant predictor of Writing SAT scores with the Beta=.108, $t=9.723$, $p=<.001$. This positive beta shows that as sports participation increased, Writing SAT scores increased, as evidenced by the fact that for every unit of change in sports participation, there was a corresponding increase of 12.74 percentage points in Writing SAT scores. The variable of gender was not a significant predictor of Writing SAT scores with the Beta= .012, $t= 1.061$, and $p=.289$. It can be concluded that gender shows no effect on the Writing SAT score. The variable of race is a significant predictor of Writing SAT scores with the Beta=.080, $t=7.349$, $p=<.001$. The positive coefficient indicates that White students performed higher on the Writing portion of the SAT.

In comparing sports participation and race as significant predictors of Writing SAT performance, sports participation is a stronger predictor than race because the standardized coefficient of sports participation is 1.35 times stronger than race.

Table 3A: Math SAT, Gender, Race, and Sports Participation

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.130[a]	.017	.017	58.695

a. Predictors: (Constant), White/Non-White, Sex, Sports Participation

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	497825.603	3	165941.868	48.168	<.001[b]
	Residual	28849261.387	8374	3445.099		
	Total	29347086.990	8377			

a. Dependent Variable: Average Math SAT

b. Predictors: (Constant), White/Non-White, Sex, Sports Participation

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	517.224	1.354		381.909	.000
	S2SPORTS	11.338	1.299	.095	8.730	<.001
	X1SEX1	-.796	1.290	-.007	-.617	.537
	WNW	9.513	1.295	.080	7.349	<.001

a. Dependent Variable: Average Math SAT

Table 3B: Critical Reading SAT, Gender, Race, and Sports Participation

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.150[a]	.022	.022	55.966

a. Predictors: (Constant), White/Non-White, Sex, Sports Participation

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	601325.107	3	200441.702	63.995	<.001[b]
	Residual	26228780.181	8374	3132.169		
	Total	26830105.288	8377			

a. Dependent Variable: Average Critical Reading SAT

b. Predictors: (Constant), White/Non-White, Sex, Sports Participation

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	509.181	1.291		394.304	.000
	S2SPORTS	10.403	1.238	.092	8.401	<.001
	X1SEX1	-.596	1.230	-.005	-.484	.628
	WNW	12.569	1.234	.110	10.183	<.001

a. Dependent Variable: Average Critical Reading SAT

Table 3C: Writing SAT, Gender, Race, and Sports Participation

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.139[a]	.019	.019	58.317

a. Predictors: (Constant), White/Non-White, Sex, Sports Participation

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	544943.879	3	181647.960	53.412	<.001[b]
	Residual	27611656.121	8119	3400.869		
	Total	28156600.000	8122			

a. Dependent Variable: Average Writing SAT

b. Predictors: (Constant), White/Non-White, Sex, Sports Participation

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	497.209	1.365		364.191	.000
	S2SPORTS	12.740	1.310	.108	9.723	<.001
	X1SEX1	1.382	1.302	.012	1.061	.289
	WNW	9.497	1.305	.080	7.276	<.001

a. Dependent Variable: Average Writing SAT

Research Question 3 Summary

The statistical analyses of the relationship between sports participation and student achievement as defined by the performance on the math, critical reading and writing portions of the SAT in the year 2012, when controlling for race and gender was deemed statistically significant for race and sports participation. When gender was added the results were not statistically significant. However, the positive beta for each regression associated with different portions of the SAT indicates that the predictors of sports participation and race positively impacted the variable of interest, SAT performance, than those students who did not participate in sports. Of everyone that participated in sports and took the SAT, there is a significant difference between the performance of white and non-white students.

CHAPTER 5
CONCLUSIONS and RECOMMENDATIONS

Purpose of the Study

The purpose of this study was to examine the relationship between high school students' athletics participation, mediated by engagement, and their academic achievement. While there has been an ample amount of past research conducted separately on the positive impact of athletics participation, the dynamic of student engagement, and the influences on student academic achievement, there has been limited research, if any, that aimed to connect all three elements together. If there is a statistically significant relationship between students' SAT scores and their reported participation in athletics, then this can be an important area for school leaders to focus their attention when trying to improve student academic achievement and overall sense of belonging at school. This comes at a crucial time in education, as students are becoming more and more disaffected with school. As students are showing a disinterest in the high school academic experience, this current study aims to assist school leaders in finding ways to motivate students for success.

Interpretation of Results

Using the High School Longitudinal Study of 2009 (HSLS:09), this study analyzed the survey respondents scale of student engagement, participation in organized sports and average SAT reading, math and writing scores. The HSLS:09 includes a total of 23,503 students from over 900 high schools. This study utilized the scale of student engagement and participation in organized sports in the base year of the report (2009-2010), and then the student's average SAT scores in the follow-up report. The following research questions were analyzed, with subsidiary

questions to examine the different components of the SAT. Sports participation served as the

independent variable, while student achievement (defined by SAT scores) was the dependent

variable, with mediators of student engagement, gender and race being introduced as independent

variables.

Research Question 1: *As determined by the 2009-2013 High School Longitudinal Study, to what extend does 2009 sports participation by high school students predict 2012 SAT scores?*

Research Question 2: *To what extent is the relationship between sports participation and academic achievement, defined by 2012 Math, Critical Reading, Writing SAT scores, mediated by student engagement scores, as determined by the 2009-2013 High School Longitudinal Study?*

Research Question 3: T*o what extent does 2009 sports participation by high school students predict 2012 SAT scores, when controlling for gender and race of the students who took the SAT?*

In regard to Research Question 1, the statistical analyses of sports participation in the year

2009 and student achievement as defined by the performance on the math, critical reading, and

writing portions of the 2012 SAT were deemed statistically significant. In all three components

of the SAT, a positive beta demonstrated that as sports participation increased, SAT scores

increased, as evidenced by the fact that for every unit of change in sports participation, there was

a corresponding increase of 11.9, 11.1, and 12.9 percentage points in the math, critical reading,

and writing portions of the SAT, respectively. This indicates that the predicator of sports

participation positively impacted the variable of SAT performance, demonstrating that students

who indicated their participation in sports during the 2009-2010 school year were more likely to score better on each portion of the 2012 SAT.

Specific to Research Question 2, which analyzes the impact of the mediating variable of student engagement on academic achievement, the analyses of sports participation, student engagement and student achievement was deemed statistically significant. For each regression associated with the different portions of the SAT (math, critical reading, and writing), the positive beta indicates that the predicator of student engagement positively impacted the dependent variable of academic achievement. For every increase in student engagement, there was an increase of 4.836 percentage points on the Math portion of the SAT, 4.322 percentage points on the Critical Reading portion of the SAT, and 5.1 percentage points on the Writing portion of the SAT. This indicates that students who participated in sports during their freshman year of high school and considered themselves engaged in school were more likely to score better on each portion of the SAT during their junior year. However, by comparison, sports participation was a stronger predictor of SAT success in each analysis, as the standardized coefficient of sports participation was greater than 1.2 times stronger than student engagement for each.

Finally, Research Question 3 incorporated the predicators of gender and race into the statistical analyses of the relationship between sports participation and SAT scores. The positive beta shows that as sports participation increased, Math, Critical Reading, and Writing SAT scores increased, and that gender was not a significant predicator of scores for each portion of the SAT, but the predictor of race was deemed statistically significant. When gender was added, the results were not statistically significant. However, the predicators of sports participation and race positively impacted the dependent variable of student SAT scores.

For all three separate statistical analyses, it was determined that sports participation had a positive impact on student SAT scores, when utilizing the High School Longitudinal Study of 2009, meaning that as sports participation increased, students were more likely to score better on each portion of the SAT. The same goes for the independent variable of student engagement, although not to the same positive degree of sports participation. The greater the school engagement, the higher the SAT score for each portion of the exam. This data supports the idea that as students' sports participation and school engagement increases, so too does their academic performance, measured by their SAT score.

Limitations

There are a few limitations to note in this study. The first set of limitations is related to the sample of students the data is based on. First, the sample is limited to only students, and does not include the perspective of parents and educators. Secondly, even more specific, the sample is limited to only those students who took the SAT and does not account for additional students in high school who did not participate in the SAT exam. Similarly, much has changed in the educational landscape since the high school longitudinal study of 2009-2013. Educational instructional norms such as online testing and virtual instruction were hardly mainstream as they are today. Lastly, there was an inability to filter based on geographic location, school demographics or other descriptive components, such as specific sports offered within schools and to what age groups, limiting the breakdown of data and statistics even further.

There are a few limitations to the study to note in regard to the possibility of additional factors influencing student success. Specific to standardized testing, SAT prep or programs and initiatives in place at different schools can impact the performance of students on tests. Access to

resources such as tutors, test-taking preparation programs, or even mental performance trainers can positively influence a student's score. Additionally, the school a student attends can impact SAT scores. Differences in programs, level of courses offered, efficacy of teachers, and overall school performance can impact the preparation and performance of a student on standardized tests. When looking specifically at the impact of sports on academic achievement, the school a child attends can also present limitations to the study. The sports being offered by a school, performance and expectations of teams, resources for coaches, and programs such as academic support for student-athletes can all impact SAT performance. These are all additional factors that can impact student success on the SAT exam, in addition to athletics participation and sense of engagement at school.

Recommendations for Future Research

There are a number of areas that future research studies could focus on in relation to this current study. First, an in-depth analysis of participation in specific sports could provide additional insight to student success. In addition to this, categorizing sports into individual or team sports and the perceived sense of engagement by students participating in each and the correlating academic achievement rate would help researchers understand which types of sports best benefit students in school. Another area that could be researched is the academic achievement of students when participating in sports in-season versus out-of-season. Are students more academically motivated while in-season, with better attendance rates and class performance, or do they struggle with balancing the demands of an in-season sport with academic responsibilities?

Aside from breaking down athletic participation into deeper categories, future researchers could also look to analyze student academic achievement when participating in additional

extracurricular activities aside from sports. This can be broken down into types of activities, such as community service clubs, academic societies, or visual/performing arts memberships. Determining if all participation in school extracurriculars benefits students academically, or if certain types of participation has added benefits over others could assist school leaders in determining ways to motivate students.

A final area of focus for future research would be to look to utilize other measures of academic achievement. While this current study determined student SAT scores as the best source of data, there are many ways to measure academic achievement. Looking at GPA, class rank, overall school performance, or other standardized tests could provide additional insight to what impacts and eventually determines student academic success.

Recommendations for Policy and Practice

It has long been a focus of school leaders and educators to determine ways to improve student academic performance. Lately, the focus of these leaders has turned to improving student overall well-being and sense of belonging. With the continued trend of students lacking motivation in a school setting, it would be beneficial for school leaders to determine what best motivates students that can be controlled by a school. Based on the findings of this current study, the level of sports participation by a student is a strong predictor of academic performance. It would be beneficial for school administrators to focus future efforts in this area when looking to improve individual student, and therefore overall school, academic performance.

First and foremost, aiming to increase student participation in athletics through the school would be a beneficial practice. While many students are motivated by the high level of competition of interscholastic sports, schools will need to look to broaden the opportunities available to the entire student body. Creating intramural sports within the school, or sport clubs

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with less pressure of competition, may appeal to a different type of student, while also providing the benefits of athletic participation. Varying opportunities to include less traditional sports, such as ping-pong or ultimate frisbee, may also broaden the opportunities for student participation.   As the number of students participating in sports throughout the school increases, it is likely, based off the findings of this current study, that academic performance will also see an upward trend.

School districts will need to make budgetary considerations when planning for athletics. Based off student interest surveys and athletics signups, schools must designate an ample amount towards their interscholastic athletic teams and sports clubs. Providing multiple teams within a specific sports program, such as providing sub-varsity levels, will help expand student interest and participation. Training coaches and offering professional development opportunities to continue to learn and improve their methods may assist with generating student interest as well. When coaches are people that players want to play for, the motivation to participate increases. Allocating enough funds to support a thriving sports program will allow for maximum student participation. Furthermore, future studies should review the strength of the sport within schools, providing an analysis of the impact that specific sports in particular may have on standardized tests such as the SAT.

Lastly, building an overall school culture that promotes its student-athletes, embraces their success as a representation of the school, and encourages peer support and building relationships, can help school leaders generate interest in sports participation and create an overall school environment with which students are engaged. When planning for an upcoming school year, school districts should be sure to include methods, activities and events that assist in building this school culture. Incorporating key stakeholders on a committee, such as students, staff members,

parents and community members, will ensure that all components of a school community are working together to support its student-athletes.

Conclusion

It was demonstrated through this current study that the relationship between sports participation and academic achievement, mediated by student engagement, is a positive one. Many past research studies have argued the positive effects of sports participation and student engagement, such as increased physical and mental health, increased sense of belonging, better attendance, and a more positive attitude towards schooling, resulted in increased academic performance. The data collected by this current study, through The High School Longitudinal Survey of 2009, supports this idea, as students who participated in sports were more likely to score higher on the SAT. With the lack of motivation and lack of connection by high school students to their school environment, this is an important area for school districts to focus their attention. Schools are at a critical point of maintaining student engagement and emphasizing the value of the high school learning experience. The purpose of this current study was to determine if sports participation was a way to do so, and based off the statistical analyses of the data presented, the positive impact of sports participation on academic achievement demonstrates the importance of student involvement when it comes to overall success.

REFERENCES

Aspen Institute, (2020, February 25). Survey: African-American youth more often play sports to chase college, pro dreams. Project Play. https://www.aspenprojectplay.org/national-youth-sport-survey/african-american-youth-more-often-play-sports-to-chase-college-pro-dreams

Astin, A. W. (1999). Student involvement: A developmental theory for higher education. Journal of College Student Development, 40(5), 519-529.

Barrett, K. (2018, September 27). Social Media's Impact on Students' Mental Health Comes Into Focus. neaToday. Retrieved from https://www.nea.org/advocating-for-change/new-from-nea/social-medias-impact-students-mental-health-comes-focus

Belli, B. (2020). National survey: Students' feelings about high school are mostly negative. Yale University, Office of Public Affairs and Communication. Yale News. Retrieved from https://news.yale.edu/2020/01/30/national-survey-students-feelings-about-high-school-are-mostly-negative

Butler, J. and D. Lopiano. (2003). The Women's Sports Foundation Report: Title IX and Race In Intercollegiate Sport. Women's Sports Foundation, Eisenhower Park, East Meadow, NY 11554.

Camire, M., Rathwell, S., Tugeon, S., & Kendellen, K. (2019). Coach-athlete relationships, basic psychological needs satisfaction and thwarting, and the teaching of life skills in Canadian high school sport. International Journal of Sports Science & Coaching, 14(5).

Chada, Sasha. (2011, June 11). *Are the SATs Biased?* Ivy Scholars. https://www.ivyscholars.com/2021/06/11/are-the-sats-biased

Collier, L. (2015, June). Grabbing students. *Monitor on Psychology*, *46*(6).

Collins, N. M., Cromartie, F., Butler, S., Bae, J., & is an Adjunct, N. M. C. (2018). Effects of early sport participation on self-esteem and happiness. *The sport journal*, *20*, 1-20.

Donaldson, S. J., & Ronan, K. R. (2006). The effects of sports participation on young adolescents' emotional well-being. Adolescence, 41(162),

Dumid, D., Wilson, R., Olds, T., & Evans, J. R. (2020). Sport and academic performance in Australian indigenous children. Australian Journal of Education, OnlineFirst, 1-14. 10.1177/00049441209137

Eccles, J., & Gootman, J.A. (Eds.). (2002). Community programs to promote youth development. Washington, DC: National Academy Press.

Ellrich, Lisa Marie, "Are SAT Scores a Strong Predictor of Student Success? A Study of

Education Majors, Admission Variables and the Impact of Leadership Development"
(2014). All Theses & Dissertations. 28.

Finn, J. D. (1989). Withdrawing from school. Review of Educational Research, 59.
NAIS: National Association of Independent Schools (2017). NAIS report on the 2016 high
school survey of student engagement. NAIS Research Retrieved from
http://www.nais.org/

Finn, J. D. (1993). School Engagement & Students at Risk. Washington DC: National Center for
Education Statistics.

Frey, Meredith. (2019). What We Know, Are Still Getting Wrong, and Have Yet to Learn about
the Relationships among the SAT, Intelligence and Achievement. Journal of Intelligence.
7. 26. 10.3390/jintelligence7040026.

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School Engagement: Potential of the
Concept, State of the Evidence. Review of Educational Research, 74(1), 59–
109. 10.3102/00346543074001059

Fredricks, J. A., & McColskey, W. (2012). In S.L. Christenson et al. (eds.), Handbook of
Research on Student Engagement, 763-782. 10.1007/978-1-4614-2018-7_37

Fredricks, J., McColskey, W., Meli, J., Mordica, J., Montrosse, B., and Mooney, K. (2011).
Measuring student engagement in upper elementary through high school: a description of
21 instruments. (Issues & Answers Report, REL 2011–No. 098). Washington, DC: U.S.
Department of Education, Institute of Education Sciences, National Center for Education
Evaluation and Regional Assistance, Regional Educational Laboratory Southeast.
Retrieved from http://ies.ed.gov/ncee/edlabs.

Kniffin, K. M., Wansink, B., & Shimizu, M. (2015). Sports at work: anticipated and persistent
correlates of participation in high school athletics. *Journal of Leadership &Organizational
Studies. 22*(2), 217-230.

Knifsend, Casey & Graham, Sandra. (2011). Too Much of a Good Thing? How Breadth of
Extracurricular Participation Relates to School-Related Affect and Academic Outcomes
During Adolescence. Journal of youth and adolescence. 41. 379-89. 10.1007/s10964-011-
9737-4.

Lee, O., Park, M., Jang, K., & Park, Y. (2017). Life lessons after classes: investigating the
influence of an afterschool sport program on adolescents' life skills development.
International Journal of Qualitative Studies on Health and Well-being, 12(1).
10.1080/17482631.2017.1307060

Letukas, Lynn. (2015). Nine Facts About the SAT That Might Surprise You. Statistical Report.
New York: College Board. https://files.eric.ed.gov/fulltext/ED562751.pdf

Lumpkin, A., & Stokowski, S. (2011). Interscholastic sports: A character-building privilege.
Kappa Delta Pi Record, 47(3), 124-128.

MacIver, D.J., & Reuman, D.A. (1994). Giving their best: Grading and recognition practices that motivate students to work hard. American Educator, 17(4), 24-31.

Nickolauson, Alexandra L., "Lack of Motivation in High School Students: REACH Curriculum" (2021). Dissertations, Theses, and Projects. 487.

NFHS- National Federation of State High School Associations. (September 6, 2017). High School Sports Participation Increases for 28th Straight Year, Nears 8 Million Mark. Retrieved from http://www.nfhs.org/articles/high-school-sports-participationincreases-for-28th-straight-year-nears-8-million-mark/

O'Farrell, S. L., & Morrison, G. M. (2003). A Factor Analysis Exploring School Bonding and Related Constructs Among Upper Elementary Students. *California School Psychologist, 8,* 53–72.

Paulson, S. E., & Marchant, G. J. (2009). Background variables, levels of aggregation, and standardized test scores. *Education Policy Analysis Archives, 17*(22).

Rosner, Jay. (2012). "The SAT: Quantifying Unfairness Behind the Bubbles," Chapter 6 in SAT Wars. New York: Teachers College Press.

Ross, A., Legg, E., & Wilson, K. (2021). The influence of peer and coach relationships in after-school sports on perceptions of school climate. Health Education Journal, OnlineFirst, 1. 10.1177/00178969202988750

Rowen, A. (1979, June 13). The Classroom's Ubiquitous Rival: Pop Culture. The New York Times, p. 25.

Scales, P. (2016). The crucial coaching relationship. Phi Delta Kappan, 97(8), 19-23.

Skinner, E., Furrer, C., Marchand, G., & Kindermann, T. (2008). Engagement and disaffection in the classroom: Part of a larger motivational dynamic? *Journal of Educational Psychology, 100*(4), 765–781

St-Amand, Jerome & Girard, Stéphanie & Smith, Jonathan. (2017). Sense of Belonging at School: Defining Attributes, Determinants, and Sustaining Strategies. IAFOR Journal of Psychology & the Behavioral Sciences. 5. 105-119. 10.22492/ije.5.2.05.

Sports & Society Program. (2019). *State of Play 2019: Trends and Development.* The Aspen Institute.

Stout, K. E., Christenson, S. L., & Storm, K. J. (2009). Staying on track for high school graduation: Promoting student engagement. *The Prevention Researcher*, *16*, 17-20.

The High School Longitudinal Study of 2009 (HSLS:09). A First Look at .. Washington, DC; U.S. Dept. of Education, Institute of Education Sciences, National Center for Education Statistics.

Tienken, Christopher H. (2017). *Defying Standardization: Creating Curriculum for an Uncertain Future.* The Rowman & Littlefield Publishing Group, Inc.

Twenge, J. M. (2017, September). Have Smartphones Destroyed a Generation? *The Atlantic*.

Trowler, V. (2010). Students Engagement Literature Review. The Higher Education Academy.

van Boekel, M., Bulut, O., Stanke, L., Palma Zamora, J. R., Jang, Y., Kang, Y., & Nickodem, K. (2016). Effects of participation in school sports on academic and social functioning. Journal of Applied Developmental Psychology, 46, 31-40. 10.1016/j.appdev.2016.05.002

Veliz, P., Snyder, M., & Sabo, D. (2019). The State of High School Sports in America: An Evaluation of the Nation's Most Popular Extracurricular Activity. New York, NY: Women's Sports Foundation.

Watson, A., Timperio, A., Brown, H., Hinkley, T., & Hesketh, K. (2019). Associations between organised sport participation and classroom behaviour outcomes among primary school-aged children. PLoS ONE, 14(1). 10.1371/journal.pone.0209354

Willms, J.D. (2003). Student Engagement at school: a sense of belonging and participation. Results from PISA (Programme for International Student Assessment) 2000. OECD: Organisation for Economic and Co-operation and Development.

Yanık, Mehmet. (2018). Effect of Participation in School Sports Teams on Middle School Students' Engagement in School. Education Sciences. 8. 123. 10.3390/educsci8030123.

York, Travis T.; Gibson, Charles; and Rankin, Susan (2015) "Defining and Measuring Academic Success," Practical Assessment, Research, and Evaluation: Vol. 20, Article 5.

Zaff, J. F., Donlan, A., Gunning, A., Anderson, S. E., McDermott, E., & Sedaca, M. (2017). Factors that promote high school graduation: A review of the literature. Educational Psychology Review, 29(3), 447–476.

Zarrett, N., Veliz, P.T., & Sabo, D. (2020). Keeping Girls in the Game: Factors that Influence Sport Participation. New York, NY: Women's Sports Foundation.

Zayas, R.J. (2018). Examination of the Impact Interscholastic Athletics Has on Participating Student-Athletes from the Perspective of the High School Principal, Athletic Director and School Counselor. University of New Mexico Digital Repository.

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