High-Performing Schools and Athletics in Georgia High Schools

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ABSTRACT

Many studies assessing the intersection of academics and athletics focus on how athletic participation affects the academic achievement of individual student-athletes. Others determine the effects of athletic participation on other academic-related outcomes such as social determination, dropout rates, college graduation rates, and expectations for going to college. However, the purpose of this study was to determine if specific school-level variables predict a high school's academic performance and the success of its athletic department.

A non-experimental multivariate ex post facto correlational design and a group comparison design were used for this study. Georgia public high schools competing in the GHSA classifications AAAAA, AAAA, and AAA during the academic years 2008-2010 were included in the study. Logistic regression determined if the school-level variables predicted a school's academic performance. A Mann-Whitney U test was used to determine if high-performing and low-performing schools were significantly different in terms of athletic department success. Negative binomial and Poisson regression methods were used to determine if the school-level variables correctly predicted athletic department success.

The results of this study found the predictor variables were able to accurately predict academic performance for over 82% of schools. While the percentage of minority students, graduation rate, and GHSGT scores were significant predictors in two out of the three classifications, the percentage of economically disadvantaged students was not a significant predictor. The study found significant differences between high-performing and low-performing schools in terms of overall athletic performance in GHSA classifications AAA and AAAA. Significant differences were also found in baseball and girls soccer. The negative binomial and Poisson regression models significantly predicted athletic department success. The findings suggest that certain academic predictors (GHSGT scores and graduation rate) are also linked to athletic achievement. Demographic variables (percentage of economically disadvantaged students and minority students) were significant in classification AAA, but not in the larger classifications.

Academics and athletics are not mutually exclusive. The results of this study show they are intertwined. While academically high-performing schools generally had more successful athletic departments, academically low-performing schools tended to struggle to compete athletically.

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DEDICATION

I'd like to dedicate this dissertation to my friends and family who always believed in me. It is also dedicated to those who influenced my career as an educator and coach. Mr. David McCormick and Mr. James Lyons heavily influenced me as a person and as an educator. As my high school teachers, they taught me far more than just social studies and Spanish content. They taught me how to conduct myself as a future educator, how to break down difficult concepts so others could understand them, and the true value of integrity. Coaches Joe Harmon, Clarence Hogg, and Christopher Church were my biggest influences as a coach. I patterned my coaching career after the concepts they taught me as a player and assistant coach. The leadership skills and ability to stay cool under pressure learned under their tutelage enabled me to become the leader I am today.

Chapter I

INTRODUCTION

A debate began in the early part of the 20th century over the usefulness and appropriateness of scholastic athletic programs. Cowley (1930) and Stalnaker (1933) argued that athletics had no place in school because it took valuable resources away from academics. Others such as E. J. A. (1925) and Coleman (1961) argued that athletics support the mental and physical development of adolescents and thus has a place in the academic program. Adler and Adler (1988) argued the case for interscholastic athletics is in the tremendous school pride it fosters in the stakeholders of a school. As time went on, the debate evolved from a discussion of the merits of athletics to its effects on student learning.

Until the 1980s, athletics and academics were separate entities within the school (Bukowski, 2001). However, with the passage of "no pass-no play" laws in each state, they have become intertwined. Students are required to pass a certain number of classes or maintain a minimum grade point average in order to be eligible to participate in sports. As such, athletics has become dependent upon academics.

Statement of the Problem

Many studies that have investigated the intersection of academics and athletics focused on how athletic participation affects or predicts the academic achievement of individual student-athletes (Broh, 2002; Coleman, 1961; Eitle & Eitle, 2002; Hanks & Eckland, 1976; Hauser & Lueptow, 1978; Linnenbrink & Pintrich, 2002; Lipscomb, 2006; Maloney & McCormick, 1993; Picou, 1978; Purdy, Eitzen, & Hufnagle, 1982; Spady, 1970; Spreitzer & Pugh 1973). Other studies have been conducted comparing athletic participation at the high school or college level with various other academic-related outcomes such as social determination (Chase & Dummer, 1992; Guest & Schneider 2003), dropout rates (McNeal, 1995), college graduation rates (Long & Caudill, 1991; Mangold, Bean, & Adams, 2003), and expectations for going to college (Otto & Alwin, 1977; Schafer & Rehberg, 1970). Most studies found athletic participation is often correlated with positive academic outcomes for a wide variety of reasons. However, no studies comparing school-level variables that affect the academic and athletic achievement of a high school have been identified.

According to the National Federation of State High School Associations (2011), the vast majority of high schools in the country participate to some extent in interscholastic athletic competitions. Beginning in the 1980s, school districts began to place academic prerequisites on athletic participation (Bukowski, 2001). Theoretically, the implementation of these “no pass-no play” rules linked athletic achievement to academic achievement. Determining the extent to which school-level variables predict a school’s academic success and the success of its athletic department is the problem this study seeks to solve.

Conceptual Framework

Balfanz, Legters, West, and Weber (2007) used a three-pronged framework mapping the sources of influence on the overall academic performance of schools. The first prong is the federal education laws and regulations. Accountability measures put pressure on schools to perform and outlines how schools will be assessed. The second prong consists of state policy decisions. Individual states have tremendous latitude over curriculum standards, graduation rate objectives, and subgroup accountability. Individual schools have little to no control over the first two prongs. The third prong consists of school-level variables. The authors identify five key school variables that predict academic success: resources, enrollment size, geographic location, student demographics, and past academic achievement. These variables differentiate one school from another. The authors used graduation rate instead of Adequate Yearly Progress (AYP) status to distinguish high-performing and low-performing schools since state regulations for AYP varied widely. However, since data from only one state was used in this study, AYP status was used to determine each school's performance level.

For the purposes of this study, school resources were measured using economically disadvantaged subgroup data. The size of each school's economically disadvantaged subgroup provided a glimpse into the resources available in the surrounding community. Minority and students with disabilities demographics were determined using the Elementary and Secondary Education Act (ESEA) subgroup data for each school. Academic achievement was measured using Georgia High School Graduation Test (GHSGT) scores and graduation rate. This study focused on how well these variables predicted a school's overall academic performance and athletic performance as measured by its Directors Cup points. Enrollment data was not used as a predictor variable in this study because the Georgia High School Association (GHSA) classifications were based upon enrollment. Grouping by enrollment size mitigates the affect of enrollment as a predictor of academic and athletic achievement.

One of the key findings of Kim and Sunderman's (2005) study on resources and overall school achievement was that Title I schools and schools that have large numbers of economically disadvantaged students were less likely to be high-performing. Schools that have the most resources and fewer economically disadvantaged students were more likely to be high-performing. Greenwald, Hedges, and Laine's (1996) metastudy on the effects of resources on student achievement found the more resources a school has available, especially money, the greater the chance that school will attain higher levels of success. Similarly, resources are a driving force at all levels of athletic competition. Kavekar and Ford (2010) found that nearly half of college softball coaches rank financial or budgetary resources as their number one necessity. Brackin and Rand (2003) found that "spending — or rather the ability to spend — makes a difference in the success of high school programs" (Bottom Lines section, para. 3).

Student population size is another important variable that affects school performance. Kuziemko (2003) found when controlling for heterogeneity across schools by observing shocks to enrollment (such as when schools open or close), the smaller schools performed better than larger schools in math and attendance. Balfanz, Legters, West, and Weber (2007) also found that smaller schools were more likely than larger schools to be high-performing. They attributed this observation to the ability of smaller schools to lower the student/teacher ratio. Athletically, larger schools should have larger pools of athletes from which to draw. This also enables athletes to further specialize since larger schools would not need athletes to participate in multiple sports in order to be competitive. However, the classification structure of the GHSA is based on school size and therefore mitigates the inherent advantages.

The relative location of a school has also been shown to have an affect on its academic performance (Stanley & Peevely, 2009). Location can affect teacher recruitment (Bacolod, 2007), available resources (Beesley, 2011), school size and demographics, and community expectations that affect student motivation (Capper, 1993). Similarly, location can affect athletics in terms of recruiting coaches, athletic resources, the size of the available pool of athletes, and the performance expectations of the community (Brady & Sylwester, 2004; Heeter, 2011; Holleman, 2003; Sexton, 2012; Simpson, Janssen, Craig, & Pickett, 2005; Williams & Nierengarten, 2011). However, classification divisions and regions often mitigate the effect of school location on athletics. For instance, 52% of rural Georgia schools compete in either the A or AA classifications which were not part of this study. Within each classification, area subdivisions further congregate schools of similar locales and enrollments.

Barker (2009) reported that Douglas County School District in Georgia failed to meet state benchmarks because of the performance of eight of its schools. However, a closer look at the data shows that each of those eight schools missed the mark because of the performance of one demographic subgroup each. According to the Commission on No Child Left Behind at The Aspen Institute (2006), the more subgroups a school has, the less likely it is to successfully meet state benchmarks for academics. The racial and ethnic subgroups also affect athletics. According to Price (1997), certain racial groups dominate participation in some sports while other racial groups participate in other sports in much higher numbers. Since high schools compete in a wide variety of sports, being competitive in as many sports as possible is the key to earning maximum Directors Cup points. Therefore, the absence of particular subgroups can impact the ability of a school to be competitive in certain sports.

One of the key developments of the accountability movement in U.S. education was the rise of standardized testing to measure student achievement. The primary focus of the No Child Left Behind (NCLB) law was the use of testing to hold schools accountable for the achievement of their students. According to the Joint Committee on Standards for Educational and Psychological Testing of the American Educational Research Association (1999), tests that are reliable, valid, and unbiased can provide a sound way of measuring what students know. Theoretically, if test scores can accurately identify academically high-performing schools, they may also predict high-performing athletic departments. Since high-performing schools will have a greater percentage of its student population eligible to participate in athletics, they will have a greater pool of students from which to draw athletes. This makes it much easier to field competitive teams in every sport. Conversely, low-performing schools will have a lower percentage of students eligible to participate, thereby reducing its pool of possible athletes.

It should be noted that the state of Georgia applied for and received a waiver from the provisions of NCLB in May 2012. Under the waiver, schools in Georgia would not be measured by AYP for a 3-year period beginning with the 2012-13 school year. However, accountability measures would still be in place. The waiver replaced the GHSGT with End of Course Tests as the major testing component, but mandated continued use of graduation rates as a major accountability measure. Instead of making AYP or not making AYP, schools would be placed in "Alert" status if their test scores or graduation rate dropped below the mandated levels. While any school could potentially fall into “Alert” status, Title I schools could fall into one of three new accountability levels (Reward, Focus, and Priority) that replaced AYP. Those levels did not apply to non-Title I schools however. For comparison sake, schools that would have been classified as “making AYP” under NCLB would go without a specific label under the waiver or would be classified as a Reward school if it is in the top 10% of Title I schools statewide. A school that would have been classified as “not making AYP” under NCLB would be labeled Priority, Focus, or Alert under the waiver if it is a Title I school or only Alert if it is a non-Title I school. So while Georgia’s mechanism for measuring academic performance changed, the variables affecting a school’s performance identified by Balfanz, Legters, West, and Weber (2007) still apply under the new provisions. A more detailed discussion of the variables and how they affect academic and athletic performance is included in Chapter 2.

Purpose of the Study

This study took the opposite approach from other studies on this topic. Instead of measuring the how well athletic participation predicts academic achievement, it sought to determine if the variables that predict a school’s academic success also predict its athletic department’s success. A cursory look at archival data (2006-2011) showed the schools at the top of the Directors Cup standings tended be academically high-performing. By contrast, nearly all of the schools at the bottom of the list were academically low-performing. Most had been identified as “needs improvement” schools, meaning they had been low-performing for several years.

The purpose of this study was four-fold. First, it measured the ability of selected school-level variables to predict the overall academic success of Georgia public high schools that competed in the GHSA (classes AAAAA, AAAA, and AAA) for the 2010-11 school year. Second, it sought to determine if significant differences existed between high-performing schools and low-performing schools in athletic achievement for the 2011-12 school year. Third, it sought to determine how well the selected school-level variables predicted athletic department success for the 2010-11 school year. Fourth, data from the prior two years (2008-09 and 2009-10 school years) was used to cross-validate the statistical model in order to see if the model holds up over time.

Research Questions

The following questions guided this study:

1. Are selected school level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's academic performance for the 2011-12 academic year?
2. Is there a significant difference between high performing and low performing schools on the total number of Directors Cup points earned for the 2011-12 academic year?
    a. Is there a significant difference between high performing and low performing schools on the total number of Directors Cup points earned in boys football, basketball, baseball, and track for the 2011-12 academic year?
    b. Is there a significant difference between high performing and low performing schools on the total number of Directors Cup points earned in girls basketball, track, softball, and soccer for the 2011-12 academic year?

3. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's total Directors Cup points for the 2011-12 academic year?
    a. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's playoff performance in boys football, basketball, baseball, and track for the 2011-12 academic year?
    b. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's playoff performance in girls basketball, track, softball, and soccer for the 2011-12 academic year?
4. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's total Directors Cup points for the academic years 2008-09 and 2009-10?
    a. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores;

graduation rate) significant predictors of a school's playoff performance in boys football, basketball, baseball, and for the academic years 2008-09 and 2009-10?

b. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's playoff performance in girls basketball, track, softball, and soccer for the academic years 2008-09 and 2009-10?

Procedures

After approval was obtained from the Institutional Review Board (IRB) (see Appendix A), data for each public high school included in this study were gathered from the state accountability report cards, the Georgia Department of Education, and the Georgia Athletic Directors Association. The data set included Special Education data, racial demographic data, economically disadvantaged data, GHSGT scores, graduation rates, and total Directors Cup points. Data were gathered for all Georgia public high schools that participated in the GHSA classifications AAA, AAAA, and AAAAA between the 2008 and 2010 school years.

A nonexperimental, multivariate ex post facto correlational design and a group comparison design were utilized for this study. Logistic regression was used to determine how well the school-level variables predicted a school's academic performance. A Mann-Whitney U test was used to determine if a significant difference exists between high-performing schools and low-performing schools on total Directors

Cup points and the eight most popular sports as measured by participation rates: football, baseball, boys and girls basketball, boys and girls track, softball, and girls soccer. Negative binomial and Poisson regression were used to determine if the school-level variables predicted a school's total Directors Cup points and the number of Directors Cup points earned in each of the eight popular sports.

Significance of the Study

Identifying the variables that predict both academic and athletic achievement would be of particular interest to curriculum and instructional specialists, as well as athletic directors and coaches. Instructional specialists and policy makers will be able to use the findings to guide curriculum planning and policy formulation. Being able to identify key variables at the school level that affect academic performance will allow principals to make informed building-level decisions.

From an athletic standpoint, coaches and athletic directors would find this study informative. Coaches could use this study to inform their decision-making processes in the context of the programs they run. Understanding which variables can be a detriment to athletic success can help a coach plan for ways to minimize their impact. Understanding the variables that predict athletic success would also be a valuable tool for a coach that needed to change schools. Coaches could make informed decisions about which schools give them the best chance to succeed on the field. Also, an athletic director trying to take his or her program to the next level could identify variables that negatively impact athletic success and take steps to overcome them.

Limitations of the Study

According to Cohen, Manion, and Morrison (2000), the nonexperimental ex post facto research design is limited because the variables cannot be manipulated. The lack of control over the variables makes the ex post facto approach susceptible to misleading results and limited conclusions. Since the participants were not randomized, the study has limited generalizability. The results are limited to only those public high schools that competed in the top three GHSA classifications.

The variables studied may have different effects on schools in the lower classifications due to the smaller number of students at those schools. The limitations of the GHSGT's ability to measure academic achievement also limited this study. Other factors such as personnel variables and leadership styles that may contribute to academic performance were not included in the study. Possible explanatory variables related to athletics such as the effectiveness of local youth sports leagues, years of coaching experience, and community support for athletics were not considered.

Definition of Terms

- Accountability Report Cards: These reports supplied assessment and accountability data for every public school in Georgia from 2002-2011.
- Directors Cup: This is an award sponsored by Regions Bank and the Georgia Athletic Directors Association given to the top athletic programs in each of the five Georgia High School Association classifications. The top 32 schools in each sport are awarded points based on their final overall ranking. State champions earn 100 points, runners up receive 90 points, and so on. Points are only earned if a team goes to the playoffs in team sports such as football, basketball, and baseball. Points are awarded

based upon individual finishes in sports such as wrestling, tennis, golf, etc. At the end of the year, the GADA tallies the points for all sports, and the school with the highest point total in their classification wins the Cup.

- Economically Disadvantaged Students: These students are grouped based on their eligibility for free or reduced-cost lunch. Federally defined income guidelines determine eligibility for this program.
- Elementary and Secondary Education Act (ESEA): This was a law initially passed in 1965 that provided federal funding for public schools in the U.S. It sought to ensure that every student had equal access to a free and appropriate education. It also sought to provide accountability measures for schools and tied them to federal funding. ESEA was reauthorized in 2001 as NCLB.
- ESEA Subgroup: Subgroups are a way of breaking down the student population of each school so that majority achievement cannot mask achievement gaps for racial minorities, economically disadvantaged students, English language learners, and students with disabilities. To qualify as a subgroup, the minimum size was forty students or at least 10% of the total student population (whichever is greater).
- Georgia Department of Education (GaDOE): Under the executive branch of the Georgia governmental structure, this body is tasked with overseeing accountability, assessment, and policy for public schools in Georgia.
- Georgia High School Association: The GHSA is the main governing and sanctioning body for high school athletics in the state of Georgia. The GHSA determines athletic season dates, adopts by-laws and rules for each sport, determines which schools will

play in each classification and its regions, and sanctions the regional and state playoffs for each sport.

- Georgia High School Graduation Tests (GHSGT): This was the state assessment that measured the academic performance for Georgia high schools. It consisted of a Mathematics portion and an English Language Arts portion. Prior to 2012, all students were required to pass both sections of the test in order to graduate.
- Graduation rate: the graduation rate. Prior to 2010, Georgia defined a cohort as all the students who graduated in a given year, regardless of how long it took to do so. Since 2010, Georgia has adopted the national graduation rate formula. The newer formula defined a cohort as all of the students who begin high school in a given year. The percentage is calculated as those who graduated within four years.
- High-performing school: a school that met the adequate yearly progress requirements during the years studied under NCLB.
- Low-performing school: a school that failed to meet minimum adequate yearly progress requirements during the years studied under NCLB.
- Minority Students: students identified with one of the four Federal ethnicity codes other than white: American Indian/Alaskan Native, Asian, Black or African American, or Native Hawaiian/Pacific Islander.
- No Child Left Behind Act of 2001 (NCLB): This law, a reauthorization of ESEA, enacted a series of new accountability measures for schools around the nation. It established educational standards and mandated schools meet those standards. The core of this law was the concept of AYP, which measured a schools ability to meet

certain achievement criteria. The criteria had to be met by each ESEA subgroup and by the school overall.

- Students with Disabilities: To qualify as a student with a disability, a student must have an Individualized Educational Program (IEP). This document identifies the student's disability and any modifications a school must make when educating the student.

Organization of the Study

There are five chapters in this study. Chapter 1 serves as an introduction and summarizes the background and reasons for the study, definitions of important terms used, the conceptual framework the study draws from, the research questions, the research procedures, and the limitations of the study. Chapter 2 is a review of existing literature in the athletic vs. academic debate and the effects of school-level variables on academics and athletics. Chapter 3 details the design of the study. It explains the research design, gives a description of the variables, describes the data collection process, identifies the population studied, and explains the data analysis methods and statistical assumptions involved. Chapter 4 is a presentation of the findings of the study. It describes the results and the statistical procedures used to arrive at the results. Chapter 5 discusses the findings and conclusions and makes recommendations for future research in this area.

Chapter II

REVIEW OF LITERATURE

Nearly every high school in the U.S. participates in varsity athletics to some degree. Athletics is interwoven with the high school experience for the students who compete, cheer, play in the band, or just attend the sporting events. Athletics has often been a unifying force and point of pride within a school. That was not always the case. The early days of interscholastic athletics was fraught with controversies related to fairness, amateurism, and misplaced priorities. However, after years of debate over the usefulness and appropriateness of interscholastic athletics, athletics won the day. In the 1980s, academic requirements were placed on athletic eligibility in most states including Georgia. At that point, academics and athletics became intertwined.

The purpose of this study was to determine if selected school-level variables predict both a school's overall academic performance and athletic success. It also sought to determine if high-performing schools are also more successful athletically than low-performing schools. Do school-level variables as suggested by Balfanz, Legters, West, and Weber (2007) predict a school's academic performance? Do they also predict a school's athletic success? Those variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) are what make each school unique.

This review of relevant literature first describes the historical debate over interscholastic athletics. It will discuss how scholarly research into the appropriateness of athletics in a school-based setting eventually moved toward how athletic participation affected the academic aptitude of the athlete. The five key school-level variables are discussed in the context of both academics and athletics.

Academics and Athletics: The Historical Debate

According to Coakley (2010), schools are directly responsible for the rise of competitive sports in the U.S. Beginning in the mid 1800s, sports were introduced in schools as a way to build the body, sharpen the mind, and develop leadership skills. These were important issues during the industrial revolution. Strong young men were needed for the military and for industry. Sports were seen as a way to develop social order and enforce social class norms.

Since the vast majority of American high schools now participate to some extent in varsity athletics, it is hard to imagine there was once a popular stance among scholars that athletics should play no role in schools. In the early 1900s, debate raged about the appropriateness of interscholastic athletics. It was widely believed that the mind and body were separate entities to be trained and disciplined separately (Pangle, 1956, p. 360). Some saw athletics as bringing out the worst in students and the community. As Waldo (1903) noted, the rise in popularity of football in the 1890s lead to an increase in gambling, a decrease in attention to scholarship, and an increase in Romanesque blood-lust.

During the first decade of the 20th century, Holmes (1909) identified four views held about athletics. The first stage he called the deprecatory stage. School officials at this stage kept a clear line between that which is academic "business" and athletic "play." Such administrators actively sought to keep athletics out of the school completely. The condescending stage scholars conceded that "boys will be boys" and saw athletics as a necessary evil for boys to work off excess energy that would otherwise manifest itself in misconduct. Those in the recognition stage argued that a well-disciplined mind works best in a well-disciplined body. Therefore, athletics had a role to play in the overall education of the person. The final stage of adoption included those who realize the significance of spontaneous activity in the development of personality. Scholars at this stage believed that athletics and academics should not be merely separate spokes on the same wheel, but should be fully integrated as part of a well-rounded education.

At the turn of the 20th century, there were very few regulations governing high school sports, few official governing authorities, and a general reluctance of schools to sponsor athletics. However, efforts to outlaw sports were not usually successful because the students themselves were the ones organizing most interscholastic athletic teams from 1885 – 1905 (Mirel, 1982). As such, athletics was really outside the purview of the administration. As one administrator put it, "I have done all I can to prevent football, yet football is the ruination of my school" (Parlin, 1903, p. 709).

Some school districts abolished sports at all member institutions. Indianapolis schools abolished interscholastic athletics and replaced them with intramural sports in 1907. Gullick (1910) argued there was a need for athletics that could reach a greater number of boys than team sports that only allows the physically fit to participate. Wade (1909) levied three charges against interscholastic sports. He argued the extra time devoted to sports should be spent studying the curriculum and decried the emotional tension that captivated students prior to rivalry games that often disrupted the learning process. The second charge echoed Gullick's argument. Wade postulated that interscholastic athletics only served the physically fit, and therefore the least in need of physical exercise. The third argument was similar to that of Waldo. Wade asserted that the "spirit of warfare which attends too many of our sports" led to grudges and ill will toward rival schools (p. 40).

Some scholars saw athletics as expressly evil. Tawney (1904) saw athletic activities among young men as evil because they often focus on fine motor skills when the large muscle groups had yet to achieve maturity. This, according to Tawney, was backward from nature and thus immoral. For others (Gould, 1920; Hall, 1905; Howe, 1923; Prettyman, 1905; Wade 1909), the evil was more tangible. Disputes among schools caused by the lawless and unregulated nature of school sports at the time were common. Such disputes often turned violent and required increased security to supervise the rowdy spectators. The payment of ringer athletes was another common evil inherent in athletics at the time. Such payments violated the amateur status of those athletes and made playing teams stacked with them a dangerous proposition. While universities passed regulations to prevent professionalism in collegiate athletics, such regulations were very difficult to enforce at the high school level.

Wade (1909) identified several ethical evils also inherent in interscholastic athletics. Chief among them was the estimation of the overall value of the school itself based on the success of its athletic department. This could lead to teachers overlooking academic abuses to protect star athletes. He also argued athletics led to hero worship of star athletes by the student body and the community. He believed that the attention paid to successful athletes often came at the expense of those who would become more productive members of society. Howe (1923) argued that undue attention was not only paid to athletes, but to star coaches as well. He found that a coach who was able to coach football, basketball, and track could make significantly more money "than the best trained and most successful high-school teacher" (p. 781).

Holmes (1909) blamed the rise in cases of professionalism at the interscholastic level on the general reluctance of schools to regulate athletics. He argued that if schools would embrace athletics, it would counteract the unsavory forces of those outside the school system that would use student-athletes for their own personal gain. Holmes suggested schools take over athletics, take responsibility for running the program, build and maintain proper athletic facilities, and hire coaches who are teachers of the whole student.

Eventually, Holmes views on athletic regulation took hold. School leaders began to get involved in regulating athletics to make it safer. As Parlin (1903) stated, "Opposition does not prevent athletics; it only renders athletics harmful" (p. 709). Districts began to establish guidelines as to who could represent the school and compete in athletics. As early as 1905, New York City schools were establishing eligibility rules based on age, discipline records, academic progress, attendance, and amateurism (Prettyman, 1904). By 1924, all but three states had installed athletic associations to regulate high school athletics (O'Hanlon, 1982).

The tide of opinion on interscholastic athletics began to change with the advent of World War I. The nationalism spurred by the war pushed Americans to be prepared for any future conflicts. Athletics became a way for schools to teach citizenship and leadership skills. Howe (1923) saw great potential in athletic training if promoted properly and believed athletics emphasized the leadership characteristics that were vital to winning a war. Schools began to embrace athletics because it helped prepare students for military service without promoting militarism (O'Hanlon, 1982).

Pickell (1920) found that some schools used the spirit of fair play cultivated by sports as a way to teach citizenship. Wiley (1925) noted that Dalles High School (Oregon) utilized athletics, both interscholastic and intramural, as a major component of its citizenship training program. It was not enough to be a good person for one to be a good citizen. It required action. As such, the administrators actively encouraged athletic participation as a way to engender loyalty, teamwork, and democracy. Administrators held a tight rein over the intramural contests to ensure rivalries did not turn bitter.

Pasadena High School (California) included athletic participation and booster activities in its citizenship program. The school had an attendance problem in the early 1920s. To combat absenteeism, the school did away with the detention system and replaced it with a merit system. As part of the merit system, the school implemented a service point system. Students could earn service points for demonstrating leadership and service in the name of the school. Students earned points for administrative, cultural, and athletic participation. The athletic portion of the system awarded points for playing a sport, being a manager, being a yell leader, etc. Not only did absenteeism go down, but students also learned valuable civic leadership lessons (Hawes, 1924).

O'Hanlon (1982) found parallels between the rise of high school athletics and the needs of the Industrial Revolution. Industry needed workers who could perform a series of tasks in a routine fashion. Schooling became very rote, and the strict training athletics fosters was good training for the job market. Schools were also struggling to create a sense of community as forces of ethnicity, class, and fragmented work roles were working against such efforts. Educators began to accept mass participation in athletics as a way to bolster communal efforts.

Well-regulated interscholastic athletics had gained in popularity with the public and educational leaders. By the early 1930s, 96.4% of schools sampled from across the country participated in athletics. Schools were beginning to solve the problems inherent in athletics without calling for their complete elimination (Wilds, 1932).

Several studies emerged challenging the key assumption that athletics were a detriment to scholarship. These studies resonated with educational leaders. Some studies found athletics had no significant effect on scholarship (Barr, 1929; Beu, 1926; Cormany, 1935; Finch, 1932; Monroe, 1929) while others found that athletes actually scored higher marks in school than non-athletes (Keene, 1925; King, 1926; Lindel, 1924; Shannon, 1938; Swanson, 1924).

Schools addressed the complaint that interscholastic athletics did not reach a larger number of students by adding intramurals and expanding interscholastic sports. This had the effect of making athletic training available to virtually everyone. Schools also found a way to eliminate some of the delinquents who tended to stir up trouble at sporting contests by simply charging admission at the gate (Brammell, 1932).

Robertson (1937) countered Wade's argument that athletics took undue attention away from scholars and put it on athletes. He argued athletics gives students who may not have the mental ability to be recognized for outstanding academic achievement a chance to be recognized for their athletic achievements. He also found that participating in interscholastic sports helped promote enthusiasm for school among the athletes.

Even though interscholastic athletics had gained in popularity, critics of athletics continued to find fault. Booth (1928) found that while school administrators were more accepting of basketball and track than football, overall 61% thought athletics as a whole went too far. Such criticism often centered on the win-at-all-costs mentality. Atkinson (1939) argued the overemphasis on winning led to an arrogance among athletes that made them difficult to deal with in school and at home. Rogers (1929) accused coaches of neglecting their physical education duties to concentrate on winning varsity contests.

By the 1960s, researchers were looking into how the sociological aspects of athletics affect the academic goals of the school. Coleman (1960) released a study on the effects of adolescent subculture on academic achievement. He found that in many schools, athletics is the only aspect that makes the school a cohesive unit. As such, schools tend to put an inordinate amount of time, energy, and resources into the athletic department. He, like Wade, found that the outstanding scholar could not compete with the star athlete in popularity and status because the scholar student cannot bring glory to the school and community in the same way that the athlete can.

Coleman (1961) later asked students at nine midwestern high schools to name the best athlete and the best scholar in the school. A significantly greater number of students could name the star athlete than could name the top scholar. Coleman, unlike Wade, did not think that athletics was inherently evil. Coleman argued that athletics serve a unifying purpose in high schools. However, he notes schools should take a cue from the unifying benefits of athletics and use academic games to increase the visibility of scholarship and academic achievement.

Rehberg and Schafer (1968) found that students who participated in interscholastic athletics were significantly more likely to aspire to attend a four-year college. In a follow up study, Schafer and Rehberg (1972) came to the same conclusion even after controlling for socioeconomic status and parental factors. Based on the idea that success in one area raises aspirations in other areas, they found it was likely that athletic success led to higher aspirations in academics. They also concluded athletes received more prodding from teachers and counselors about college than non-participants. Spreitzer and Pugh (1973) replicated and extended Schafer and Rehberg's work, also coming to the same conclusions. They found that when also controlling for perceived peer status and school value climate, athletes still had higher aspirations for college.

Spady (1970) followed up Rehberg and Schafer's research by looking at not just aspirations, but goal attainment. He likewise found that athletic participation led to higher aspirations for college, however he questioned whether it correlated to actual academic success at the collegiate level. He argued that athletic participation builds up a student's status perception leading to higher goal aspirations. However, athletic participation does not give the student the proper skills to attain those goals. Hauser and Lueptow (1978) found that while athletes overall showed an increase in GPA from 9^{th} grade to graduation, their GPA gains were smaller compared to non-athletes. They contribute the difference to pre-existing differences upon arrival in high school.

Others, such as Eckland and Hanks (1976), found that athletic participation was not detrimental to academic success, and was somewhat helpful with male athletes. Other studies found that when athletes and non-athletes were matched together, athletes showed similar or higher academic achievement compared to non-athletes (Bend, 1968; Jerome & Phillips, 1971; Schafer & Armer, 1968; Snyder & Spreitzer, 1977).

Schafer (1969) noted another view expressed by educational leaders in defense of interscholastic athletics: deterrence to delinquency. Schafer compared athletes and non-athletes from two midwestern high schools. He found that athletes are much less likely to exhibit deviant behavior than non-athletes. However, he noted that this is most likely a socioeconomic issue. He theorizes that since athletes are from predominantly middle-class households, they may be more conforming in their attitudes to begin with regardless of athletic participation. He also noted that junior high coaches might exclude delinquent youths before they enter high school making them less likely to participate in athletics at that level.

Beginning in the late 1970s, sociological researchers examined the roles interscholastic athletics played in a myriad of social phenomena. These include its use by the system to quell non-conformity (Spring, 1974), its role in desegregation (Picou, 1978; Lawson, 1979), and its role in student socialization (Chase & Dummer, 1992; Curtis, 1974; Landers & Landers, 1978; Otto, 1976; Otto & Alwin, 1977).

By 1983, some state legislatures had begun looking into placing state-wide academic restrictions on athletic eligibility (Wolf, 1983). In 1984, Texas passed the "No Pass, No Play" law which banned students from all extracurricular participation for one 6-week period if they did not pass all classes the previous 6-week grading term (White, 1984, para. 3). Other states soon began to put restrictions on athletic participation based on academic achievement standards. These laws inextricably linked academic achievement to athletics.

Since the 1980s, some educational researchers have revisited the subject of athletics' effects on academics with most finding that athletic participation correlates well with positive school outcomes. Steinberg, Brown, Cider, Kaczmarek, and Lazzaro (1988) reported that extracurricular participation, especially interscholastic athletics, "is more likely to enhance than interfere with high school students' academic aspirations or achievement" (p. 5). However, they found that when controlling for background demographics, the effect is more limited. Still, athletic participation seems to have the strongest positive influence on students from backgrounds that correlate to lower achievement. Silliker and Quirk (1997) found athletic participation "does not endanger, and may enhance, academic performance" (p. 289). Particularly, athletes tend to have significantly higher GPAs in-season than in the off-season. Jordan (1999) found athletic participation promotes engagement and academic self-confidence, especially among African-American student athletes.

Athletic participation also positively affects drop out rates. McNeal (1995) found athletic participation, more than any other academic or vocational extracurricular activity, to significantly reduce a student's likelihood of dropping out. McNeal theorizes that athletic participation successfully integrates the athlete into school culture due to the frequency and intensity of meetings (practices) than other activities that meet less frequently or more randomly. Yin and Moore (2004) also confirmed that students who participate in interscholastic athletics reported significantly lower drop out rates than other students.

Eitle and Eitle (2002), as well as Guest and Schneider (2003) found the relationship between athletic participation and academic achievement to be more complex than some earlier studies. Race, socioeconomic status (SES), and cultural capital (exposure to museums, art, music, dance, etc.) often interact to predict athletic participation and academic achievement. However, the benefits of athletic participation vary by sport. Football and basketball correlates to lower standardized test scores, but have little effect on GPA. Athletes mostly outperform non-athletes in schools with low academic expectations, and being athletic is only associated with higher grades and college aspirations in low income and middle-class schools.

Athletic participation has been found to positively impact the academic achievement of individual athletes (Broh, 2002; Carlson et al., 2005; Lipscomb, 2006; Marsh & Kleitman, 2002). Students-athletes tend to feel more in control of their lives and share the same values that schools tend to foster. Athletics helps solidify social skills that can be called upon to further the student-athlete's educational goals. With that in mind, one might expect that strong athletics could lead to higher achieving schools. However, Chen and Ferguson (2002) and Meier et al. (2004) found that investing in athletics could adversely affect a school's academic performance. Their conclusions were disputed by Ward (2008) whose findings showed that investing in athletics neither aided nor detracted from academic performance at the school level.

The Impact of Socioeconomic Resources on Athletics and Academics

Perhaps the greatest predictor of both student achievement and athletic success at the high school level is socioeconomic resources. Harris (2007) compiled a database consisting of nearly every public school in the U.S. He placed the schools into three categories: high-poverty, low-poverty, and a mixture of both. Harris found low-poverty schools were 22 times more likely to reach high academic achievement on a consistent basis than high-poverty schools.

Steinberg et al. (1988) explored the effects of family influences, peer influences, part-time employment, and extracurricular participation on academic achievement. They found that family influence has the greatest impact of those variables, especially when controlling for SES. A very close correlation exists between SES and academic achievement (Duncan & Magnuson, 2005; Ream & Palardy, 2008). This is a world-wide phenomenon (Chudgar & Luschei, 2009). Metastudies by Bond (1981), Epps (1995), and Sirin (2005) found a significant positive correlation between SES and educational outcomes. However, factors related to how SES was measured, race/ethnicity, and how achievement was measured affected the strength of that correlation. For instance, SES explains much of the variance in achievement scores for African-American students according to Easton-Brooks and Davis (2007). Beyond SES, wealth accumulation explains achievement variation for both White and Black students for which SES cannot account.

Not only does SES predict achievement at the student level, but it also predicts school-level achievement (Leonard & Box, 2009; Perry & McConney, 2010; Willms, 2010). This is a key observation given the requirements of accountability laws. In general, having higher numbers of low-SES students correlates to lower overall school achievement when compared to schools composed of mostly high-SES students. Schools serving predominately low-SES students also tend to have trouble maintaining accreditation. Conversely, high-SES schools are more likely to be high-performing. Rumberger and Palardy (2005) compared several factors that affect academic performance. They discovered that controlling for student inputs such as SES, race, and family structure virtually eliminates the variability from school to school of dropout and transfer rates. For example, private school students score significantly higher on mathematics assessments than do public school students. However, and Lubienski (2006) found that when race and SES are controlled, there is no significant difference between the types of schools. As such, SES is a very important variable when trying to predict academic performance.

NCLB was the key piece of accountability legislation affecting public schools in the U.S. Lee and Wong (2004) argue the groundwork for NCLB was laid during the accountability movement of the late 1980s and 1990s. The accountability movement produced "Goals 2000" which eventually led to the NCLB Act. They argued the performance-based measures of NCLB, born out of the "Goals 2000" framework, do not account for pre-existing inequities in achievement. Policy-makers in the 1990s failed to close the equity gap for socioeconomically disadvantaged schools before imposing NCLB objectives requiring all students to meet the same standards, regardless of advantage or disadvantage. As such, there was no net change in equity status due to NCLB requirements. Low-SES schools are therefore at a disadvantage based on those criteria.

Data compiled by Kober, McMurrer, Silva, and Rentner (2011) challenged Lee and Wong's arguments. It found Title I schools (schools with high numbers of low-SES students) showed improvement since the passage of accountability measures under NCLB in 2002. Title I provided funding for initiatives that help mediate the negative impact of low-SES and support the academic mission of the schools (U.S. Department of Education, 2004). Title I helped fund professional development, resource allocation, curriculum implementation, tutoring services, school choice, and corrective actions (including restructuring if necessary). Kober et al. (2011) found that although low-SES schools still lagged behind higher-SES school, achievement scores still improved for Title I schools overall. The achievement gaps between subgroups were also reduced.

A few studies have downplayed the role SES plays in academic achievement. Mayer and Jencks (1989) found SES effects on achievement related variables are weak at best. Mulkey, Crain, and Harrington (1992) found students from one-parent homes had lower rates of achievement than students from two-parent homes. However, that outcome could not be attributed to the lower income rates of the one-parent home.

Other studies have highlighted the ways SES affects students and causes academic deficits. One key aspect is motivation (Alexander, Entwisle, & Bedinger, 1994; Dijkstra, Kuyper, Van der Werf, Buunk, & Van der Zee, 2008; Lewis, 2007). Students from lower SES backgrounds demonstrate less motivation for school in general. They also show less interest in college preparatory tracks and are therefore more likely to be placed in vocational programs. Dijkstra et al. (2008), argued students compare themselves academically to higher performing students with whom they share characteristics, but will also compare themselves against students from higher social classes. In the first case, there is a slightly positive effect on achievement. However, when students compare themselves to higher performing students from a higher social class, they face risks from lowered self-concept and feelings of inferiority.

From a resource standpoint, higher SES households have more resources available to them that can be converted to better academic achievement (Fischer & Kmec, 2004; Payne & Biddle, 1999). This can also been seen at the school and district level (Condron & Roscigno, 2003; Elliott, 1998; Payne & Biddle, 1999; Roscigno & Ainsworth-Darnell, 1999). Schools in low SES areas are more likely to receive inadequate funding. The lack of funding exacerbates the achievement gap between the various SES groups by crippling the ability of schools to hire quality teachers and provide equitable educational resources (Akiba, LeTendre, & Scribner, 2007; Elliott, 1999; Konstantopoulos, 2009; Mangiante, 2011; Pribesh, Gavigan, & Dickinson, 2011; Wayne & Youngs, 2003).

Sometimes the funding difference is caused by the poverty level of the district as a whole. In some cases, significant disparities exist within a district. In the latter case, Condron & Roscigno (2003) detected a racial factor at the local political level. However, middle and upper class parents are more likely to perceive themselves as having a significant measure of political power as a group, regardless of race. As such, they are more likely to engage in the political process to ensure their schools are adequately funded (Gutman & Eccles, 1999; Jeter-Twilley, Legum, & Norton, 2007; Ream & Palardy, 2008)

Lareau (2002) argued differences in motivation are a result of parenting style differences between social classes. The way middle class parents govern their children through reason instead of directives better prepared them for social interaction with adults such as school personnel. Also, middle class parents are much more likely to push their children into organized extracurricular activities than lower SES parents. Lower SES parents tend to be more hands-off when it comes to playtime leaving their children to be self-directed. Lareau argued such organized extracurricular events led students to realize more of their potential. Covay & Carbonaro (2010) found participation in extracurricular activities boosts cognitive and non-cognitive ability, thus helping to mediate SES affects on achievement.

Brady and Sylwester (2004) found socioeconomic factors had a similar impact on athletic department success. “Public schools in the wealthiest neighborhoods win state team championships at more than twice the rate of schools in the least wealthy neighborhoods” (A1). They point to better facilities as one reason why this is true. Schools in higher income areas tend to have better gyms, practice fields, weight rooms, and equipment than schools in lower income areas. Wealthier schools are able to maintain their athletic facilities better than poorer schools.

State athletic officials from several states have become sensitive to those concerns (Monaghan, 2012). The GHSA decided to reclassify its member schools. At the core of the reclassification issue was the perceived advantage private schools have over small public schools. Proponents of reclassification argued since GHSA regions were based on school population numbers, private schools in the lower classifications had a built-in funding advantage over their public school opponents. Public schools in the lower classifications tended to be small, rural schools with very little funding support. Private schools in those same classifications were typically found in more urban settings, and their athletic departments were substantially better funded (Heeter, 2011; Rosen, 2011). According to Rosen (2011), a small collection of private schools has dominated the Directors Cup points. Marist in Atlanta won the AAAA cup 11 straight times, while Westminster won 11 out of 12 years in AA. Weslyan won four straight Directors Cups in A, and St. Pius X won three in a row in AAA. Not surprisingly, in 2009, 15 of the top 20 schools in the lowest classification's Directors Cup standings were private schools. In fact, a private school finished in first place in Class A every single year since the Georgia Athletic Directors Association began sponsoring the award in 1999 (Georgia Athletic Directors Association, 2011).

Another key observation made by Brady and Sylwester (2004) has to do with specialization. For many years, it was not uncommon for high school athletes to letter in multiple sports. However a trend to stick with one sport year round has developed. Off-season leagues in sports such as baseball, volleyball, soccer, basketball, wrestling, track, and even football now give athletes an avenue to focus on just one sport. Such off-season leagues tend to be very expensive. The authors found that some parents spend upwards of $5,000 per year for their children to play on traveling teams in the off-season. Parents from lower SES backgrounds have a much harder time finding the resources to support such athletic specialization.

Students from lower SES neighborhoods also lack equitable athletic resources in general. According to Powell, Slater, Chaloupka, and Harper (2006), lower SES areas are less likely to have gym-type facilities or outdoor athletic fields. Their survey found a significant difference in physical activity between high and low SES populations. The authors suggested the primary reason for this was the lack of suitable facilities in low SES areas.

In their study on associations between SES and adolescent injury, Simpson, Janssen, Craig, and Pickett (2005) discovered a similar link between SES and athletic participation. They found adolescents from low SES homes are more likely to be injured in fights while those from high SES backgrounds are more likely to be injured playing sports. As they explain, “Adolescents from lower socioeconomic families have less opportunity to participate in sport or recreational activities because of cost or access barriers; therefore these adolescents are less vulnerable to these types of [athletic] injuries” (p. 1076).

Enrollment Size

Former Harvard University president James Conant (1959) argued there were too many high schools. According to Conant, it was necessary to consolidate small high schools into larger, more cost-effective “comprehensive” schools that would have the resources to offer a wider variety of courses. According to Nguyen (2004), 25% of American high schools had enrollments in excess of 1,000 students. The number of schools enrolling over 1,500 students doubled between 1989 and 1999. The rise of large enrollment high schools coincided with a dramatic drop in the total number of schools. Funding restraints cause states and school districts to place an emphasis on the cost-effectiveness of schools. Barnett, Glass, Snowden, and Stringer (2002) found that larger schools do tend to be the most cost-effective. However, a preponderance of the evidence suggests that large high schools stifle academic performance, especially for racial minorities and economically disadvantaged students.

A school's enrollment size has an effect on its academic performance. Studies have found that larger enrollments are detrimental to achievement (Fowler & Walberg, 1991; Kershaw and Blank, 1993; Kuziemko, 2006; Robinson-Lewis, 1991; Sander, 1993; Walberg, 1992; Walberg & Walberg, 1994). Lee and Smith (1995) found large high schools reduce engagement and achievement. They found that such settings lead to unequal gains across subgroups creating greater achievement gaps. Lee and Smith (1997) extended that study and found large populations have a stronger negative effect in schools that also serve low-SES and minority populations. The authors aimed to find the balance point between small and large schools. Schools with populations from 600 to 900 students were tabbed as ideally sized to maximize academic performance. They found that these medium sized schools were better for minorities and low-SES students in terms of achievement gains. Weiss, Carolan, and Baker-Smith (2010) also found the size of a school's student body has an impact on the engagement level of its students, especially for African-American students. Agreeing with Lee and Smith, they found high schools with populations of around 600 with grade level cohorts of less than 400 tend to perform better academically. They found larger schools having more than 1,600 students had lower levels of student engagement when compared to smaller schools.

As noted by Lee and Smith (1997) and Weiss, Carolan, and Baker-Smith (2010), mid-sized schools with enrollments between 600 and 900 schools tend to have less trouble closing achievement gaps between subgroups. McMillen (2004) found that school size tends to interact with student-level variables, especially SES and race, to affect achievement gaps. Large enrollment sizes have a negative effect on those gaps. In large high schools, the achievement gaps between subgroups tend to be greater. Ready, Lee, and Welner (2004) noted minority students are very likely to attend the largest schools, thus exacerbating the issue. However, Weiss, Carolan, and Baker-Smith (2010) noted that high schools can become too small. Once enrollment drops below the optimal 600, academic performance begins to suffer.

The interaction of SES and enrollment size is important for rural areas. The Rural School and Community Trust (2002) investigated this interaction in Alaska, Arkansas, California, Georgia, Montana, Ohio, Texas, and West Virginia. It found that the effects of enrollment size found by Lee and Smith (1997) also applied to rural schools. The smaller schools in rural areas were able to also mediate the effects of low-SES on academic performance. It suggested that if the level of poverty in a rural area increases, schools should become smaller in order to maximize achievement. It also found that larger rural districts exacerbated the problem. Smaller schools, if located in large districts, were less effective at improving academic achievement. According to Stockard and Mayberry (1992), the impact on achievement is related to the smaller enrollment size and not the rural location of the school.

Athletics and extracurricular activities are also affected by enrollment size. Coladarci and Cobb (1996) found large high schools have smaller per-student participation in extracurricular activities including athletics. It is simply a numbers game. Students have more of an opportunity to participate in those activities in smaller high schools. For instance, varsity basketball teams usually carry about fifteen members. In the largest high schools, that equates to nearly 2000 students vying for those slots. There just are not enough slots available for everyone who might want to participate. While larger enrollment sizes restrict the opportunities for students to participate athletically, the larger pool of available athletes actually give schools somewhat of an advantage over smaller schools. As noted by Tyson (2009), smaller public schools are less likely to be athletically successful due to the smaller pool from which teams may draw athletes.

The Role of Racial Demographics

An achievement gap exists between racial subgroups, especially in math and reading (Strutchens, Lubienski, McGraw, & Westbrook, 2004). Aud, Fox, and KewalRamani's (2010) report to the U.S. Department of Education quantified the gaps. On the reading portion of the 2005 National Assessment of Educational Progress (NAEP), 79% of White high school seniors earned scores at or above basic level. Only 52% of Black students (a 27% gap) and 60% of Hispanic students (a 19% gap) reached the same level. The math portion showed an even more pronounced gap: 70% for White students, 31% for Black students, and 40% for Hispanic students.

According to Kim and Sunderman (2007), a strong correlation exists between race and SES. As such, high poverty schools are more likely to also to have high minority populations that are less likely to meet minimum requirements on state standardized tests. Harris (2007) found that racial demographics positively correlate with student achievement. As discussed in the previous section, Harris discovered that schools serving low SES populations are 22 times less likely to be high-achieving schools than schools that serve high SES populations. However, if a low SES school predominantly serves a minority population, they are 89 times less likely to be high achieving.

Kim and Sunderman (2005) gathered data on six states including Georgia. In all six states, they found a strong correlation between race and low academic performance. States such as Arizona and California with large Latino populations had difficulty meeting accountability requirements in schools with Latino subgroups. In states with large Latino and Black populations such as New York and Illinois, schools with those subgroups were much less likely to be high performing. In Georgia, Black students made up 54% of students in low-performing schools. White students only accounted for 38% of the population in those schools. By contrast, high-performing schools in Georgia were comprised of 58% White students and 34% Black students on average. Similar results were documented for Virginia. In those states, Black and Latino students comprised 87% of all students in schools that were subject to corrective action or restructuring according to accountability mandates.

Due to the high stakes and consequences for schools and districts that fail to meet accountability requirements, districts often do whatever it takes to limit those consequences. According to Dworkin (2005), districts often accomplish this by manipulating racial demographics. In districts where a minority student population is small or moderate, a district will simply spread individuals out across the district so that no one school has enough minority students to constitute a subgroup. If the minority population is too large for this tactic, districts have segregated students to concentrate minority students into as few schools as possible thus limiting the number of schools facing consequences (Dworkin, Toenjes, Purser, & Sheik-Hussin, 2000; Kane & Staiger, 2002; Popham, 2005). Of course, this defeats the purpose of NCLB. Instead of those schools doing whatever they can to bridge the achievement gap, they are doing an end-run around the law using loopholes.

The debate over the role race plays in sports is fraught with political rhetoric (Ballad, 1988; Edwards, 1972; Lapchick & Mathews, 1999; Seligman, 1988; Wilhelm, 1987). On one hand, researchers such as Rushton (1995) and Entine (2000) argue the perceived dominance of African-American athletes is the result of biological factors such as higher testosterone levels. Such stereotypical explanations for perceived athletic success in sports such as basketball is widely accepted by the public as well as by collegiate coaches (Harrison & Lawrence, 2004; Johnson, Hallinan, & Westerfield, 1999; Azzarito & Harrison, 2008).

Critics castigate researchers who find physiological and psychological differences between races and attempt to use those differences to explain perceived dominance in one sport or another (Harrison, Lawrence, & Bukstein, 2011; Seligman, 1988; Skinner, 2006; Younge, 2000). Such research, they claim, allows racist arguments to be made. Young (2000) and Sheldon, Jayaratne, and Petty (2007) in particular argued such research feeds into harmful stereotypes that Black students are less intelligent than White students. Indeed, Rushton's (1995) own testosterone theory led him to conclude Black youth are better sprinters than Whites, but are less likely to be able to pay attention in school and more likely to turn to crime. Such conclusions serve to further pre-existing social expectations and prejudices (Davis, 1990; King, 2007; McDonald, 2005).

In an attempt to find the truth behind the stereotypes, Begley (1995) analyzed data from the Human Genome Diversity Project. Begley argued there is very little genetic difference between races. In fact, the findings showed more variation between individuals who share the same race than between individuals of different races. By contrast, two professional athletes of similar size and build, but from different racial backgrounds will be more alike genetically than athletes of the same race but with different body types. For example, African-American quarterback Michael Vick (6' tall, 215 lbs) would have more in common genetically with Caucasian quarterback Drew Brees (6' tall, 210 lbs) than he does with African-American defensive lineman Terrance Cody (6'4" tall, 350 lbs). Cody, by extension, would be genetically similar to Caucasian offensive lineman Michael Roos (6'7" tall, 320 lbs).

Carter et al. (2010) found limited serious research into physiological differences between athletes of different races within the same sport. They conclude that it is actually quite difficult extend conclusions about elite athletes (whose physical makeup allow them to be elite in the first place) to the population as a whole and vice versa. Differences in athletic performance is likely due to a combination of physical and non-physical factors yet to be fully understood.

Yet, there is a quantifiable difference between the racial communities in terms of the importance placed on sports and which sports are important. The question then becomes, what causes these differences? Lapchick and Mathews (1999) found African-Americans are disproportionately represented in professional and collegiate basketball, football, and boxing, as well as collegiate track based overall percentage of the population. Whites are disproportionately represented in sports such as hockey, swimming, wrestling, and golf. Price (1997) theorized two reasons for this dichotomy. The first is White flight. Whites tend to perceive Black athletes, perhaps due to stereotypical reasoning, to be dominant in basketball, football, track, and boxing. As such, White athletes gravitate to sports with less competition from African-Americans. Price reported a Sports Illustrated poll showed nearly half of White athletes believed they had a better chance of success in sports other than traditional team sports.

> "The White kid has found other things to do," says Carlos Cespedes, president of the Dade County Coaches Association and an assistant football coach at Miami's Palmetto High. "My school is very affluent, and our enrollment is only 17% Black. But our football team is usually 50-50. Why? A lot of the White kids wouldn't bother doing the work we require of our football players. They're skiing in Colorado. They're flying over to Europe. I go to every national convention. I hear the same thing from the coaches: The White athlete is not as hungry as the Black athlete. Period" (p. 36).

Even some coaches reinforce this stereotypical view (Johnson et al., 1999; Turner & Jones, 2007).

The second reason Price postulates is the cultural significance placed on certain sports, particularly basketball and football, within the Black community. "'Suburban kids tend to play for the fun of it,' says William Ellerbee, basketball coach of national power Simon Gratz High in Philadelphia. 'Inner-city kids look at basketball as a matter of life or death.'" (Price, 1997, p. 36).

Eitle and Eitle (2002) found high-level football and basketball skills often serve as social capital in the Black community. For example, pop-culture "coolness" has played an important role in the development of African-American boys (Kirkland & Jackson, 2009). Possessing skill in these sports can provide the athlete with a certain coolness they may not achieve without their athletic abilities. However, basketball and football also play important roles within the community in terms of defining masculinity and increasing self-esteem (Broh, 2002; Eitle & Eitle, 2002; Messner, 1989; Watkins & Montgomery, 1989).

Comeaux and Harrison (2004) found the increase in basketball and football participation over the years correlates with the decline of baseball within the Black community. The authors point to the absence of baseball youth leagues and summer camps in areas with predominately African-American populations as a key reason for the decline of the game among Black youth. The proliferation of basketball and football leagues/camps in those same areas has led to the rise of popularity for those sports. They also found that Black youth who play baseball also see football and basketball as important sports. Conversely, Black youth who only play football and/or basketball show little to no interest in baseball.

Sports tend to play a major role in the socialization processes of many cultures and can be a force for social change (Frey & Eitzen, 1991). In particular, basketball has played a significant cultural role in the Black community for decades. It serves as an escape from the realities of life for the disenfranchised. It serves as an art form or mode of self-expression. For those fortunate enough to play the game in college or the professional ranks, it can provide a way to escape the cycle of poverty. Wideman (2001) expressed the cultural meaning associated with basketball in the Black community this way:

> Playground hoop is partially a response to the mainstream's long, determined habit of stipulating Blackness as inferiority, as a category for discarding people, letting people crash and burn, keeping them outsiders. And if that's what race means out there in the mainstream, and it surely does appear to mean all that from the point of view of an insider, here within the cage where playground ball is

> contested, then…forget it. Let's start here. Keep it here. In the house. Do our thing…God *blesses* the child who got his own (p. 173).

These differences in the ways Black inner-city youth and White suburban youth play the game could account for much of the proliferation of Black basketball players at the highest levels of the game.

Carlston (1986) examined the differences between urban and suburban playground basketball. Playgrounds in the city tend to be very crowded. Due to overcrowding, the rules of the court are if you win, you keep playing. Losers have to sit out and wait until their turn comes back around. The competition is fierce. The players with the best ability tend to group themselves together in teams. These teams tend to win more than they lose, so the best players get the most court time. Those players put in hours of time learning their skills in the heat of high-level competition.

Carlton found basketball is less important in suburban areas. The courts are not as crowded, so the competition is less rigorous. There are fewer good players willing to play, so the competition suffers. Even players with above average natural skill do not develop in the same way inner-city athletes do. According to Ericsson, Krampe, and Tesch-Romer (1993), this is a key point. They analyzed expertise in several areas of endeavor. They discovered it takes at least 10 years of rigorous training to become an expert in any given field, even for those considered to have prodigious talent. For world class athletes, natural ability only takes one so far. It takes hours of training beginning at a young age. Carlton's (1986) analysis of playground basketball habits bears out the training discrepancy.

As reported by Lapchick and Mathews (1999) and Price (1997), student athletes of different races participate in athletics at different rates depending on the sport being played. Racial participation rates could play a role in the overall success of an athletic department as measured by the Directors Cup points system since the GADA compiles points in 17 different sports (GADA, 2011). As such, schools limited to one racial subgroup could be at a disadvantage athletically. Schools with smaller Black populations could be at a disadvantage in track, basketball, and football due to lower participation rates. Conversely, schools with smaller White populations could be at a disadvantage in golf, wrestling, and tennis for the same reason. In fact, many schools did not even field teams in all 17 GHSA sports (GADA, 2011). As a result, schools with the resources and ability to field all 17 teams held a distinct advantage.

Further complicating this issue is on-going segregation in schools in the southeastern U.S. Though forced segregation was outlawed in 1955, *de facto* segregation still exists in large cities in the South. Atlanta is no different according to Keating (2001). According to Frankenberg, Lee, and Orfield (2003), the average black student in Atlanta attends a school with a white population of only 3%. However, Norcross High School in Gwinnett County is an exception. According to Burns and Dyer (2013), its racial breakdown was 32% Black, 32% Hispanic, 24% White, 8% Asian, and 4% other. Over 60% of students qualified for free or reduced lunch. The school earned a top 15 ranking in the state from *U.S. News & World Report* and consistently placed in the top third of the Directors Cup rankings. The authors believed the success on the field and in the classroom enjoyed by Norcross High could be partially explained by the racially and economically diverse student body it has.

Students with Disabilities

Students with disabilities subgroups seriously affect the prospects for meeting accountability requirements placed upon schools. Schools with a SWD subgroup were much less likely to be high-performing (Cawthon, 2007; Eckes & Swando, 2009). Just like all other ESEA subgroups, students with disabilities must meet the same minimum standard on state standardized tests that regular education students do. Since a school can fail to meet accountability requirements based on one subgroup's failure to meet the standard, finding ways to help those students meet the standards has become a vital issue.

Special education mandates present unique challenges when compared to those of other subgroups. Eckes and Swando (2009) argued expecting students with disabilities to close their achievement gap at the same rate as other subgroups is not a realistic goal. Firstly, students with disabilities had a much larger achievement gap to close than any other subgroup. Additionally, students in other subgroups face circumstantial challenges to learning. Students with disabilities have tangible physical or mental limitations on their ability to learn that other students do not have. Not surprisingly, students who have intellectual disabilities are the lowest performing of all demographic categories (Cho & Kingston, 2011).

However, accountability laws have forced schools to focus on finding ways to help students with disabilities meet standards. This includes hiring more highly qualified teachers, using alternative assessments, shifting from functional and life skills instruction to a more academic curriculum, co-teaching, and mainstreaming students with disabilities (Cawthon, 2007; Eckes & Swando, 2009; Hodge & Krumm, 2009; Karvonen, Wakeman, Browder, Rogers, & Flowers, 2011; McLaughlin, Embler, Hernandez, & Caron, 2005;

Robinson, 2011). The steps schools took to meet accountability standards have resulted in small to moderate gains by students with disabilities across the board (Wei, Blackorby, & Schiller, 2011).

Horn, Berktold, and Bobbitt (1999) reported that students with disabilities participate in athletics at nearly the same rate as regular education students. As the population of students with disabilities rose 30% from 2001-2010, overall athletic participation rose precipitously as well (IDEA Accountability Center, 2011; National Federation of High School Athletics [NFHS], 2011). Not surprisingly, athletic participation rates by students with disabilities also rose during that time.

A student's special education status does not automatically disqualify that student from athletic participation (Simeonsson, Carlson, Huntington, McMillen, & Brent, 2001). On the contrary, schools could face litigation for denying equal participation to students with disabilities on the basis of their special education status (Fetter-Harrott & Steketee, 2008). According to Sullivan, Lantz, and Zirkel (2000), there have been several cases brought to the courts over the exclusion of students with disabilities from athletic participation. Such cases often hinge on two major points: the student is eligible and able to compete despite the disability, and the request to be allowed to compete is a reasonable accommodation under the student's Individualized Education Plan or Section 504 plan. The Americans with Disabilities Act specifically states that students with disabilities who are otherwise eligible and able with or without reasonable modifications should be allowed to participate. However, over the years students with disabilities have been denied access to athletics based age, participation time limits, academic eligibility, paired-organ requirements, and other school district policies. Courts around the nation have had differing opinions on access rules, sometimes upholding school district policies and sometimes backing the student.

Age restrictions are often put in place to protect younger, less physically developed athletes. Age restrictions are also put in place to prevent a team from using older athletes to achieve a competitive advantage. According to Sullivan et al. (2000), such rules also prevent a coach from intentionally holding athletes back academically in order to gain such an advantage. In most cases, courts have upheld the age restriction (usually capped at age 19) on the basis that such policies are essential to scholastic athletics. In cases where the age restriction was not upheld, courts have been careful to note that such a decision was based on an individual analysis of the particular case taking into consideration the student's size and ability. Such cases are seen as waivers and not precedent. As a result of the waiver cases, some state athletic associations have codified a waiver process. However, the GHSA does not allow such waivers. According to the GHSA by-laws, if an ineligible student competes under court order, but then the order is rescinded for any reason, any accomplishments or team wins must be vacated or forfeited (GHSA, 2012, p. 14).

Participation time limits establish a maximum amount of time a student may be eligible to participate in athletics. In most states, including Georgia, the limit is set at eight semesters or four years (GHSA, 2012, p. 15). Sullivan et al. (2000) found that courts usually uphold maximum participation time limits. Once again, fear of coaches intentionally deterring educational progress for athletic means is one major basis for such rulings. Courts rarely grant waivers in cases challenging this rule.

The “no pass/no play” rules require students to meet minimum academic progress goals in order to be eligible to participate in scholastic athletics. The GHSA (2012) requires student-athletes in Georgia earn at least 2.5 credits per semester. Accordingly, freshmen entering the 9th grade are immediately eligible, but must earn at least five credits to be eligible as sophomores. From there, not only must students earn at least 2.5 credits per semester, they must accumulate a minimum of eleven credits to maintain eligibility for their junior year. For seniors to be eligible, they must have accumulated seventeen credits. However, special education often has varying academic progress requirements. According to Sullivan et al. (2000), court cases have been brought against state athletic associations challenging academic progress rules for students with disabilities. However, courts have routinely agreed with athletic associations on matters of academic requirements when it can be established that schools equally apply such rules to all students regardless of disability.

Some school districts place paired-organ requirements on athletic participation that can limit access for some students. Paired-organ requirements involve limiting access for athletes missing one of a paired-organ such as an eye, kidney, arm, or leg. Often such rules are put in place to protect the individual with the disability. However, athletes with prosthetic limbs could possibly pose a danger to their opponents in some regard. GHSA by-law 1.49 states, “Schools having students participate in athletic activities with artificial limbs must certify that the artificial limb is no more dangerous to participants than a natural limb” (p. 16). In all such cases, the GHSA must grant permission for such a student to participate. Sullivan et al. (2000) found courts usually rule in favor of the student in cases involving paired-organ restrictions. Courts often cite section 504 of the Rehabilitation Act of 1973, which was established to allow students with disabilities to fully participate in any activity they are able to without interference from governmental agencies.

Most students with disabilities can fully participate in regular athletic events because 79% of them are not physically disabled (U.S. Department of Education and National Center for Education Statistics, 2012). Some physically disabled students can still participate fully and even excel in their chosen sport (Gough, 2011; Mihoces, 2011). For physical and emotional reasons, some pediatricians recommend athletic participation when possible for disabled students. To that end, the American Academy of Orthopedic Surgeons created a chart for identifying the types of athletic participation possible for students with various disabilities (Murphy & Carbone, 2008).

Physically disabled students also have the opportunity to pursue athletics in adapted sports. Nearly 5,000 disabled students participate nationally in adapted sports such as basketball, bowling, floor hockey, soccer, softball, and track. In 2011, 248 disabled athletes from 14 Georgia schools participated in adapted basketball and track (NFHS, 2011). Adapted sports do not qualify for Director's Cup points however.

The Effect of Multiple Subgroups on Academic Performance

What happens if a school has multiple subgroups? The more subgroups a school has, the less likely it is to be high performing. Balfanz et al. (2007) found the best predictor of a school's academic performance is the number of subgroups it has. Similarly, Kim and Sunderman (2005) found 78% of schools with only one subgroup met accountability standards. Adding another subgroup dropped the rate to 75%. At three subgroups, the rate dropped dramatically to 54%. The rate continued to drop with each subsequent subgroup until only 25% of schools with six subgroups met accountability standards.

Compounding the issue of multiple subgroups is multiple subgroup membership. Many students are members of more than one subgroup. According to Lauen and Gaddis (2012), because Black and Hispanic students are disproportionately poor and are disproportionately labeled as special needs, it is not uncommon for a student to be a member of three different subgroups (race/ethnicity, economically disadvantaged, and students with disabilities). This can lead to schools failing to meet academic expectations for several subgroups at once.

Each subgroup has its own set of unique obstacles when it comes to student achievement. When more than one subgroup is present, a school faces a major challenge in manpower, resources, and support. Each additional subgroup puts more and more pressure on a school as its limited resources get stretched further and further (Rogosa, 2003; Wiley & Allen, 2007). However, research into the effects of the accountability system within NCLB showed that it resulted in increases in student test scores overall (Dee & Jacob, 2011; Figlio, & Rouse, 2006; Reback, Rockoff, & Schwartz 2011; Wong, Cook, & Steiner, 2009) and for minority subgroups (Ballou & Springer, 2008; Lauen & Gaddis, 2012; Springer, 2008).

There were provisions within the law to help mediate those obstacles. Safe Harbor was a safety net for schools with failing subgroups. If a school could reduce the number of underperforming students in a given subgroup by 10% over the previous year, the school would still be considered high-performing if all other requirements were met (NCLB, 2001; Ryan & Shepard, 2008). This is especially useful if a given subgroup has relatively few students as schools have found it easier to focus energy into promoting the required gains within smaller subgroups. The elements provided under Safe Harbor guided Georgia's accountability revisions in 2012.

Summary

Critics of interscholastic athletics were unsuccessful in preventing its spread prior to World War II. Today, nearly every high school in America participates to some extent in varsity athletics. Several studies have looked at the effects of athletic participation on the academic performance of the athlete (Broh, 2002; Coleman, 1961; Eitle & Eitle, 2002; Hanks & Eckland, 1976; Hauser & Lueptow, 1978; Linnenbrink & Pintrich, 2002; Lipscomb, 2006; Maloney & McCormick, 1993; Picou, 1978; Purdy, Eitzen, & Hufnagle, 1982; Spady, 1970; Spreitzer & Pugh 1973), usually finding at least some benefits. A few studies have examined the impact of a school's athletic department on the academic performance of the school (Chen & Ferguson, 2002; Meier et al., 2004; Ward, 2008) with mixed results. However no studies have evaluated the effects of academic predictors on athletic department success. This study will attempt to fill the gap in the literature from this perspective.

Socioeconomic Resources is perhaps the greatest predictor of academic performance (Bond; 1981, Chudgar & Luschei, 2009; Duncan & Magnuson, 2005; Epps, 1995; Ream & Palardy, 2008; Sirin; 2005). Studies have consistently found that SES predicts academic achievement, even when other variables are controlled. High-SES students score significantly higher on most academic indicators. This creates a significant achievement gap between high-SES and low-SES students. By extension, schools that serve a large number of socioeconomically disadvantaged students are much more likely to be considered low-performing under accountability measures. Socioeconomic resources also predict a school's athletic success. Schools that are perennially competitive in all sports usually serve a large number of high-SES and middle class students (Brady & Sylwester, 2004; Heeter, 2011; Monaghan, 2012; Rosen, 2011).

The enrollment size of a school has been found to predict academic performance (Fowler & Walberg, 1991; Kershaw and Blank, 1993; Kuziemko, 2006; Robinson-Lewis, 1991; Sander, 1993; Walberg, 1992; Walberg & Walberg, 1994). According to Lee and Smith (1997), schools with enrollments between 600 and 900 students are of the ideal size from an academic performance standpoint. Schools with fewer than 600 or more than 900 students tend to underperform. Athletically, larger schools would tend to be more competitive due to the larger pool from which to choose athletes. However, the effect of enrollment size is often mitigated by breaking schools into divisions based up

Along with socioeconomic resources, racial demographics are a significant predictor of academic performance. A significant achievement gap exists between Black and Hispanic students and their White counterparts (Harris, 2007; Kim & Sunderman, 2007; Strutchens, Lubienski, McGraw, & Westbrook, 2004). When athletics and race are discussed, it becomes difficult to separate stereotypes from reality. However, once the political rhetoric is removed, one finds there are gaps in participation rates along racial lines for certain sports (Comeaux & Harrison, 2004; Eitle & Eitle, 2002; Lapchick & Mathews, 1999; Price, 1997). Since Directors Cup points are accumulated in 17 different sports, schools with diverse racial populations have an easier time fielding competitive teams in all sports.

Under accountability mandates such as NCLB, having a students with disabilities subgroup often means a school will not meet the accountability standards (Cawthon, 2007; Eckes & Swando, 2009). This is often the result of the difficulties students with disabilities have that other subgroups do not have. However, students with disabilities often participate in athletic activities, especially if they are not limited physically (Fetter-Harrott & Steketee, 2008; Simeonsson, Carlson, Huntington, McMillen, & Brent, 2001). Limiting access to athletics for students with disabilities often leads to litigation (Sullivan, Lantz, & Zirkel, 2000).

Schools having multiple subgroups are far less likely to be high performing, though accountability mandates seem to be forcing schools to take the issue seriously (Dee & Jacob, 2011; Figlio, & Rouse, 2006; Reback, Rockoff, & Schwartz 2011; Wong, Cook, & Steiner, 2009). According to Kim and Sunderman (2005), the likelihood of a school becoming a high performing school drops precipitously with each subgroup it is accountable for. Further complicating the issue according to Lauen and Gaddis (2012) is the number of students who are members of more than one subgroup (minority students, economically disadvantaged students, and students with disabilities).

Chapter III

METHODOLOGY

This study sought to determine if selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) were able to predict a school's academic and athletic performance. Additionally, the study sought to determine if a significant difference exists on athletic performance between academically high-performing and low-performing schools. This chapter details the research methods that were employed to complete the study. A description of the research design, including descriptions of the independent variables, dependent variables, and measurement level of the variables are discussed. Additionally, the participants, instrumentation, methods for data collection, data analysis, and statistical assumptions are discussed.

Research Design

This study utilized a nonexperimental multivariate ex post facto correlational design and a group comparison design. These methods allowed the researcher to explore the differences between high and low performing schools and to identify the variables most likely to predict group membership. This design was needed since variables could not be manipulated, samples could not be randomized, and the events happened in the past.

The predictor variables were percentage of minority students, percentage of students with disabilities, percentage of economically disadvantaged students, combined math and English/Language Arts GHSGT scores, and the graduation rate. Graduation data for the 2010-11 school year tracked the percentage of students who finished their diploma requirements within 4 years. Earlier graduation data was calculated by subtracting the percentage of students who dropped out from the percentage of students who graduated from high school in a given year regardless of how many years it took to do so. GHSGT scores were reported as the sum of the percentage of students who met or exceeded standards on the Math and Language Arts tests. The graduation rates and GHSGT scores were ratio-level data.

The dependent variables were academic performance, Directors Cup points, and playoff performance. As nominal data, academic performance was coded 1 for high-performing schools and 0 for low-performing schools. The Directors Cup points are ratio-level data and were reported as the total number of points earned by each school for each academic year. The points were rounded to the nearest integer to allow SPSS to perform negative binomial regression for Research Questions 3 and 4.

Eight individual sports were chosen for analysis in Questions 2, 3, and 4 (football, baseball, boys and girls basketball, boys and girls track, girls soccer, and softball). These eight sports are the top four boys and girls sports measured by participation. The points awarded to each school in six of the individual sports included in this study were based upon how far a team advanced in the playoffs for that particular sport. Points were awarded at intervals of 25 for round one, 53 for round two, 70 for the quarter finals, 83 for the semifinals, 90 for the runner up, and 100 for the state championship. For

Questions 3 and 4, the Directors Cup points for six of those sports were converted to counts of the number of playoff games the teams appeared in. Boys and girls track points were earned at the state track finals based upon how well the teams performed in the different events. Count data based upon the number of events each school placed at the state finals were collected.

Participants

The population examined in this study included all Georgia public high schools competing in the GHSA classifications AAAAA, AAAA, and AAA during the academic years 2008-2010. The GHSA bases these divisions on student population numbers. Schools in AAAAA had a student population greater than 1,850. Small schools with fewer than 525 students competed in Class A. The GHSA evenly distributed the rest of the schools between AA, AAA, and AAAA. The mean population during the years covered by this study was 2,201 for schools in AAAAA, 1,593 for AAAA, and 1,192 for AAA.

The GHSA usually reorganizes the classifications every 2 years. However, the GHSA added to and subtracted from the various classifications during the interim years due to school openings, closures, and mergers. In some instances, schools requested to move up in classification through an appeals process. The most common reasons for this were travel expenses and uniformity in larger school districts. The GHSA does not allow larger schools to move down in classification. Classifications AA and A will be excluded from the study due to the large numbers of private schools in those divisions. Private schools were not bound by the same accountability restrictions and therefore do not fit in the study.

The number of schools in each classification was relatively stable from 2008-2009, but realignment before the 2010 school year produced a relatively high amount of movement between classifications. Seventy-four schools competed in AAAAA in 2008; that number dropped by 3 schools in 2009. However, after realignment in 2010, the number dropped to 62 schools and 60 schools over the next 2 years. The number of schools competing in AAAA was 82 in 2008 and 2009, but increased to 91 in 2010 and 93 in 2011. AAA also saw an increase in numbers to 83 in 2010 and 2011 from 78 in 2009 and 76 in 2008. For AA, the 4 year numbers from 2008-2010 were 75, 76, 81, and 80. There were 82, 83, 88, and 89 schools competing in A during the time period studied.

Instrumentation

The GHSGT was developed by the Georgia Department of Education (2011b) using the *Standards for Educational and Psychological Testing*. The purpose of the test was to measure how well high school students have mastered the state curriculum. Committees of educators from around the state developed the test blueprint that identified which aspects of the curriculum would be tested. Test specifications were also created to guide test item development. After the elements of the curriculum were grouped into domains, assessment specialists constructed the test items. Once vetted by content experts, the test items were field-tested and reviewed for bias. Test items that cleared all reviews were banked for inclusion on the GHSGT.

GaDOE (2011b) went to great lengths to establish the validity of the GHSGT. Evidence was gathered for content, construct, and external validity. Evidence for the content validity of the GHSGT lies in the way each test was meticulously developed with input from committees of educators and assessment specialists. By determining the scope of curriculum and developing test items for all aspects within that scope, designers ensured a high degree of content validity. Committees of teachers conduct a curriculum review, create test blueprints and test specifications for the different content areas. Specific reviews and field testing helped make sure test items were free of bias, which bolstered the construct validity of the assessment. The GaDOE also reported the constructs measured by the GHSGT were compared with other assessments to establish external validity.

GaDOE (2011b) reported three reliability measures for the GHSGT program: Chronbach's alpha, standard error of measurement (SEM), and conditional standard errors of measurement (CSEM). The alpha scores for fall 2010 administration of the GHSGT were .88 for English/Language Arts and .90 for Math. The SEM for English/Language Arts was 3.28 and was 3.54 for Math. These scores represent a high degree of reliability. The spring 2011 measures were very similar. The alpha for Language Arts was .89, and the SEM was 2.91. For Math, the alpha score was .90 again, and the SEM was 3.09. The department stated the "reliabilities and SEMs for the Fall 2010 and Spring 2011 GHSGT administrations are consistent with previous administrations and suggest that the GHSGT assessments are sufficiently reliable for their intended purpose" (GaDOE, 2011b, p. 6).

The CSEM were reported at the cut scale scores specified for classification as Basic Proficiency, Advanced Proficiency, and Honors. For the Fall 2010 and Spring 2011 administrations of the English/Language Arts test, the average SEM was 14 with a CSEM of 9 at Basic Proficiency for both tests. The CSEM scores were 11 and 10 at Advanced Proficiency, and 16 and 15 at Honors. Mathematics switched from the Quality

Core Curriculum (QCC) to the Georgia Performance Standards (GPS) between these two test administrations. As a result, the CSEM scores were quite different from one administration to the next. Under the QCC-driven test, the average SEM score was 8 with CSEM scores of 5 at Pass and 7 at Pass Plus. During that time, Honors was not listed as a classification. The GPS-driven test produced an average SEM of 16 with CSEM scores of 10 at Basic Proficiency, 11 at Advanced Proficiency, and 16 at Honors. "These 2010-11 CSEM are consistent with prior administrations and suggest that the scores reported to students in fall 2010 and spring 2011 are well estimated and provide an accurate picture of student performance" (GaDOE, 2011, p. 7).

Data Collection

After the Institutional Review Board (IRB) for Valdosta State University determined the research was exempt from IRB oversight (see Appendix A), the data for this study was collected from three main sources: the Accountability Report Cards for each school as reported by the GaDOE, NCES, and the Regions Directors Cup rankings as reported by the GADA. Each school's accountability report card gave a detailed view of the school's GHSGT results by subgroup, graduation rate by subgroup, and GHSGT participation rate. Accountability reports for all schools in Georgia are published on the GaDOE.

The accountability reports used for this study also reflect changes in the original data as a result of an investigation performed by the Governor's office into alleged doctoring of test results in two school districts. The investigation found wide-spread evidence that tests had been erased and re-marked in those districts (Wilson, Bowers, &

Hyde, 2011a; Wilson, Bowers, & Hyde, 2011b). The Department of Education revised the data to reflect the outcome of the Governor's investigation (GaDOE, 2012).

The total Directors Cup points and final rankings were gathered from the GADA. Specific point totals for individual sports are found on the website for the 2009-10 and 2010-11 academic years. Hardcopies of the individual sport totals for the 2008-09 academic year were obtained from the GADA.

Data Analysis

Descriptive statistics were used to summarize each of the independent variables. Means, standard deviations, minimum, maximum, skewness, and kurtosis were reported for the percentage of minority students, percentage of students with disabilities, percentage of students identified as economically disadvantaged, summed GHSGT scores, graduation rates, and overall Directors Cup points. Descriptive statistics were reported for the overall sample and for groups based on academic performance.

Logistic regression was used to analyze the data for Research Question 1. This statistical approach allowed combinations of the continuous and categorical independent variables to be analyzed in order to identify the best predictors of academic performance. High-achieving schools were coded "1" while low-achieving schools were coded "0".

Field (2009), Lund and Lund (2013), and Mertler and Vannatta (2002) identified the SPSS outputs that needed to be analyzed. The "Omnibus Tests of Model Coefficients" output reports the significance of the overall model. The "Hosmer and Lemeshow Test" measures the model's goodness of fit. The "Model Summary" reports the results of the Nagelkerke R Square which shows how much of the variance can be explained by the model. The "Classification Table" reports the statistics used to determine the sensitivity, specificity, positive predictive value, and negative predictive values. Sensitivity is the percentage of high-performing schools that the model correctly predicts as high-performing. Specificity is the percentage of low-performing schools the model correctly predicts as low-performing. Positive predictive value is the percentage of schools correctly predicted to be high-performing compared to the total number of schools predicted to be high-performing. Negative predictive value is the percentage of schools correctly predicted to be high-performing compared to the total number of schools predicted to be high-performing. The "Variables in the Equation" output reported the overall contribution from each variable to the model. The *B* coefficient and Standard Error of *B* show the effects of the predictor variables on the criterion variable. The *Wald* statistic (including degrees of freedom and level of significance) determined the significance of each predictor variable's contribution to the model. For this study, the significance level was set at .05. Also, the exponentiation of the *B* coefficient calculated the odds ratio for each predictor variable. The odds ratio shows the effect size for each variable.

Using the nonparametric tests function within SPSS, a Mann-Whitney U test was utilized to analyze the data in Research Question 2. Because Directors Cup points are count data and are not normally distributed, the Mann-Whitney U test was the best way to identify if significant differences exist between high-performing schools and low-performing schools (categorical data) on the Directors Cup points (quantitative data) at a .05 level. The median values, Mann-Whitney *U* values, standardized test statistic, significance values, and effect sizes were reported for overall Directors Cup points and points earned in each of the eight sports included in the study.

For Questions 3 and 4, the Generalized Linear Models function in SPSS was used to run count model regression. The two types of regression used were negative binomial regression and Poisson regression. Those models were used to identify which school-level variables best predict total Directors Cup points and the Directors Cup points earned in each of the selected sports. Ordinary Least Squares Regression was first considered, however the data are nonnegative integer count data. As is often an issue with count data, the data violated the assumptions of normal distribution and homoscedasticity.

The choice of which type of regression analysis to use was based on model fit estimates. Model fit estimates were calculated by dividing the Pearson's chi-square value by the degrees of freedom. The model fit estimates needed to be near a value of 1 for the model to be considered a good fit for the data (UCLA Statistical Consulting Group, n.d. a). In most cases, the negative binomial model was the better fit due to overdispersion. One of the key assumptions of Poisson regression is the data should not be overdispersed (UCLA Statistical Consulting Group, n.d. b). Overdispersion happens when the conditional mean is considerably less than the conditional variance causing the parameter estimates of the standard errors produced by the Poisson model to be biased. Descriptive statistics revealed the data for several sports was overdispersed. When data is overdispersed, negative binomial regression is the better choice (Zawacki et al., 2000). Poisson regression was used in the instances where the data was not overdispersed or when the validity of the model fit values for the negative binomial model was uncertain. The model fit estimates were approaching 1 in each instance.

The Generalized Linear Models function in SPSS was used to run negative binomial regression and Poisson regression. The "Value/df" column of the "Goodness of

Fit" output reported the value of the Pearson's chi-square divided by the degrees of freedom. The "Omnibus Test" output reported the overall significance of the model. The "Tests of Model Effects" reported the significance of each of the predictor variables to the model as well as the odds ratio for each.

Statistical Assumptions

Lund and Lund (2013) identified five assumptions for logistic regression: (a) independent cases/errors, (b) linear relationships between the predictor variables and the logit of the dependent variables. (c) no multicollinearity, (d) no outliers or influential points, and (e) the categories are mutually exclusive and exhaustive. Tolerance and VIF statistics were examined to check for multicollinearity. Z-scores and Mahalanobis Distance were examined to identify outliers. Cook's D and leverage scores were used to identify influential cases. The SWD variables for Johnson High School and Savannah Arts Academy were transformed due to the z-score falling just below -3. Banneker and Douglass high schools were eliminated due to z-scores exceeding ±4 and high Mahalanobis Distances. Beach, Alpharetta, and Parkview high schools were eliminated due to high Cook's D scores.

Lund and Lund (2013) identified four assumptions for the Mann-Whitney U test used to answer Question 2. First, the predictor variables should be either continuous or ordinal. The Directors Cup points were continuous data. Second, the dependent variable must be dichotomous and categorical. The academic achievement variable was divided into two categories (high-performing and low-performing). Third, each case or observation should be independent from the others cases. In this study, each school was independent from the other schools. Fourth, the distributions of the two independent variable groups should have similar shapes. The distribution assumption, when met, allows the researcher to compare differences in median values (a measure of central tendency) and mean ranks. If this assumption is violated, only differences in mean ranks can be compared. In most cases, this assumption was met. Mean ranks were reported when the assumption was violated.

There were two statistical procedures that could be used to answer Questions 3 and 4: Poisson regression and negative binomial regression. The UCLA Statistical Consulting Group (n.d. b) identified a key assumption for Poisson regression: the data should not be overdispersed. In several instances, the data violated this assumption. Negative binomial regression contains a parameter that makes it robust against overdispersion and thus was used in cases where overdispersion was detected. However, in cases where the data was not overdispersed or the validity of the model fit statistics was unreliable for the negative binomial regression, Poisson regression was used. Therefore, the results of the Poisson regression are reported for those cases.

Summary

A nonexperimental multivariate ex post facto design was used to examine group differences that have already occurred. This design allowed for the measurement of variable data collected from the GaDOE, GADA, and the NCES. Data were collected for every Georgia public high school that participated in the top three GHSA classifications for the years 2008-2010. The collected data included Directors Cup points, percentage of minority students, percentage of students with disabilities, percentage of economically disadvantaged students, Math and English GHSGT pass rates, and graduation rates.

Information on the development of the GHSGT was discussed with evidence presented for the validity and reliability of that instrument. Data analysis varied based on the research questions. Logistic regression was used to determine how well the school-level variables predict a school's academic performance. A Mann-Whitney U test was utilized to determine if a significant difference exists between high-performing and low-performing schools on overall Directors Cup points as well as points earned in eight selected sports. Negative binomial regression was used to determine how well the school-level variables predict a school's Directors Cup points and playoff performance. Statistical assumptions for these three data analysis techniques were examined.

Chapter IV

RESULTS

The purpose of this study was to determine if the selected school-level variables predict academic and athletic success at the school-level. The study sought to determine how well the selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) predict the overall academic success of Georgia public high schools that competed in GHSA classes AAAAA, AAAA, and AAA for the 2010-11 school year. The study also determined if a significant difference exists between academically high-performing and low-performing schools in their athletic departments' achievement for the 2011-12 school year. Finally, the study determined if the selected school-level variables predicted athletic department success for the 2010-11 school year. The statistical model was cross-validated using data from the prior two school years (2008-09 and 2009-10).

This study addressed the following questions:

1. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's academic performance for the 2010-11 academic year?

2. Is there a significant difference between high performing and low performing schools on the total number of Directors Cup points earned for the 2010-11 academic year?
    a. Is there a significant difference between high performing and low performing schools on the total number of Directors Cup points earned in boys football, basketball, baseball, and track for the 2010-11 academic year?
    b. Is there a significant difference between high performing and low performing schools on the total number of Directors Cup points earned in girls basketball, track, softball, and soccer for the 2010-11 academic year?
3. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's total Directors Cup points for the 2010-11 academic year?
    a. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's total Director Cup points earned in boys football, basketball, baseball, & track between high performing schools and failing schools for the 2010-11 academic year?
    b. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores;

graduation rate) significant predictors of a school's total Directors Cup points earned in girls basketball, track, softball, and soccer between high performing schools and failing schools for the 2010-11 academic year?

4. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's total Directors Cup points for the academic years 2008-09 and 2009-10?
    a. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's total Director Cup points earned in boys football, basketball, baseball, & track between high performing schools and failing schools for the 2008-09 and 2009-10 academic years?
    b. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's total Directors Cup points earned in girls basketball, track, softball, and soccer between high performing schools and failing schools for the 2008-09 and 2009-10 academic years?

This chapter reports the findings of the quantitative data analysis for each research question. An alpha level of .05 was set for each statistical analysis in this study. For Question 1, a logistic regression model comprised of the selected school-level variables was used to measure how well those variables predict a school's academic performance. For Question 2, a Mann-Whitney U analysis was utilized to determine if a significant difference exists on the Directors Cup points earned by a school's athletic programs between academically high-performing and low-performing schools. As an extension, Mann-Whitney U analysis was also used to determine if significant differences exist between academically high-performing and low-performing schools on the success of the top four boys and girls sports. The top four boys sports by number of students participating were football, basketball, baseball, and track. The top four girls sports were basketball, track, softball, and soccer. For Questions 3 and 4, a negative binomial regression model was used to measure how well the selected school variables predict the number of Directors Cup points a school's athletic programs earned. By extension, the negative binomial regression model was also used to measure the predictive ability of the school-level variables on the success of a school's football, boys basketball, baseball, boys track, girls basketball, girls track, softball, and girls soccer programs.

Descriptive Statistics

Descriptive statistics for the selected school level variables percentage of minority students, percentage of students with disabilities, percentage of economically disadvantaged students, math and English/Language Arts GHSGT scores, and graduation rate for the schools that competed in the GHSA classifications AAA, AAAA, and AAAAA was collected (see Table 1). For the schools in AAA during the 2010-11 school year (n = 78), the mean percentage of minority students was 54.42% ranging from 6% to

100%. The mean percentage of student with disabilities was 10.4% (range = 0% - 18%), while the mean percentage of students identified as economically disadvantaged was 55.44% (range = 17% - 95%). The mean of the summed Math and English GHSGT scores was 175.41 (range = 137.08 – 200), and the mean graduation rate was 69.75% (range = 43.9% - 100%). The mean Directors Cup points for those schools was 287.71 points, ranging from as few as 14 points to as many as 909 points. The skewness and kurtosis values for all variables were less than or very near ± 1.0 indicating a normal distribution for those variables. Additionally, histograms and Q-Q plots showed no or only minor deviations from normality. While a Shapiro-Wilk test indicated a nonnormal distribution for the percentage of minority students, $W(77) = .950$, $p = .004$, and GHSGT scores, $W(77) = .942$, $p = .002$, the overall evidence indicated the variables had normal distributions.

For the schools in AAAA during the 2010-11 school year ($n = 89$), the mean percentage of minority students was 52.89% (range = 10% - 100%). The mean percentage of student with disabilities was 10.65% (range = 4% - 22%), and the mean percentage of economically disadvantaged students was 46.46% (range = 6% - 87%). The mean of the summed Math and English GHSGT scores was 179.32 (range = 132.71 - 198.16). The mean graduation rate was 73.25% (range = 42.5% - 97.5%). The mean Directors Cup points for those schools was 291.14 and ranged from as few as 7.3 points to as many as 1066.5 points. The skewness and kurtosis values were less than or very near ± 1.0 indicating a normal distribution for each variable. The histograms and Q-Q plots indicated the either a normal distribution or only slight deviation from normality for each variable. The Shapiro-Wilk test showed the percentage of minority students, $W(87)$

= .905, $p < .001$, as well as the percentage of economically disadvantaged students, $W(87) = .967$, $p = .024$, may not fit a normal distribution, but the overall evidence indicated a normal distribution for each variable.

For the schools in AAAAA during the 2010-11 school year ($n = 60$), the mean percentage of minority students was 58.43% with a range from 14% to 100%. The mean percentage of student with disabilities was 10.25% (range = 3.77% - 14%). The mean percentage of students identified as economically disadvantaged was 42.88% (range = 5% - 88%). The mean of the summed Math and English GHSGT scores was 182.74 (range = 154.17 – 200), and the mean graduation rate was 72.64% (range = 47.7% - 100%). The mean Directors Cup points for those schools was 465.08 with a range of 22 points to as many as 1220.5 points. The skewness and kurtosis values for each variable were near or less than ± 1.0, while the histograms and Q-Q plots showed most variables fit a normal distribution. Only slight deviation from normality in the percentage of economically disadvantaged students was detected. A Shapiro-Wilk test indicated a nonnormal distribution for the percentage of minority students, $W(60) = .953$, $p = .021$. The evidence overall indicated the variables fit a normal distribution.

Table 1

Descriptive Statistics for the Variables Related to Academic and Athletic Performance during the 2010-11 School Year

	M	*SD*	Min	Max	Skewness	Kurtosis
% of Minority Students						
AAA	54.42	28.98	6.00	100.00	-0.04	-1.10
AAAA	52.89	27.77	10.00	100.00	0.49	-1.11
AAAAA	58.43	25.71	14.00	100.00	0.00	-1.17
% of SWD						
AAA	10.40	3.32	0.00	18.00	-0.41	0.44
AAAA	10.65	2.66	4.00	22.00	-0.15	0.04
AAAAA	10.25	2.12	3.77	14.00	-0.47	0.52
% of EconDis Students						
AAA	55.44	16.34	17.00	95.00	0.09	0.21
AAAA	46.46	21.82	6.00	87.00	-0.08	-0.99
AAAAA	42.88	21.47	5.00	88.00	-0.07	-1.02
GHSGT Scores						
AAA	175.41	13.59	137.08	200.00	-0.89	0.87
AAAA	179.32	11.63	132.71	198.16	-0.19	-0.84
AAAAA	182.74	10.44	154.17	200.00	-0.53	-0.19
Graduation Rate						
AAA	69.75	12.30	43.90	100.00	0.07	-0.30
AAAA	73.25	11.38	42.50	97.50	-0.60	0.29
AAAAA	72.64	12.75	47.70	100.00	-0.03	-0.64

Note. % of SWD = percentage of students with disabilities; % of EconDis Students = percentage of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

Almost half of the schools in classification AAA (n = 37 or 48.1%) were academically high-performing for the 2010-11 school year. Descriptive statistics revealed high-performing schools in AAA had a lower percentage of minority students, economically disadvantaged students, and students with disabilities. Those schools also had higher GHSGT scores and a higher graduation rate. Descriptive statistics showed the mean Directors Cup points of high-performing schools competing in classification AAA was 180 points higher than low-performing schools. The range of skewness and kurtosis values for the variables were approximately ± 1.0 indicating the variables fit a normal distribution (see Table 2).

Table 2

Descriptive Statistics for Variables Related to Academic and Athletic Performance during the 2010-11 School Year for High-Performing and Low-Performing Schools Competing in Classification AAA

	n	*M*	*SD*	Min	Max	Skewness	Kurtosis
Minority Students							
High-Performing	36	50.54	25.63	6.00	100.00	0.02	-0.97
Low-Performing	40	58.00	31.67	7.00	100.00	-0.20	-1.22
SWD							
High-Performing	36	9.16	3.37	0.00	16.00	-0.45	0.54
Low-Performing	40	11.55	2.86	5.00	18.00	-0.09	-0.40
EconDis Students							
High-Performing	36	48.35	15.08	17.00	83.00	-0.08	0.30
Low- Performing	40	62.00	14.79	30.00	95.00	0.40	-0.28
GHSGT Scores							
High-Performing	36	184.01	8.09	164.52	200.00	-0.17	0.29
Low-Performing	40	167.46	12.82	137.08	186.30	-0.94	0.10
Graduation Rate							
High-Performing	36	76.39	10.72	59.22	100.00	0.25	-0.82
Low-Performing	40	63.60	10.40	43.90	81.79	-0.18	-0.90
Directors Cup Points							
High-Performing	36	381.15	257.66	45.00	909.00	0.53	-0.73
Low-Performing	40	201.36	134.64	14.00	589.00	0.86	0.55

Note. Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

Nearly half of the schools in classification AAAA (n = 43 or 49.4%) were academically high-performing for the 2010-11 school year. Much like AAA, the descriptive statistics revealed high-performing schools in AAAA had a lower percentage of minority students, economically disadvantaged students, and students with disabilities. Those schools also had higher GHSGT scores and a higher graduation rate. Descriptive statistics showed the mean Directors Cup points of high-performing schools competing in classification AAAA was 217 points higher than low-performing schools. The skewness and kurtosis values were less than or near ± 1.0 indicating normal distributions for each variable (see Table 3).

Table 3

Descriptive Statistics for Variables Related to Academic and Athletic Performance during the 2010-11 School Year for High-Performing and Low-Performing Schools Competing in Classification AAAA

	n	*M*	*SD*	Min	Max	Skewness	Kurtosis
Minority Students							
High-Performing	43	42.65	23.76	10.00	99.00	0.97	-0.03
Low-Performing	44	60.77	27.52	18.00	100.00	0.10	-1.47
SWD							
High-Performing	43	9.37	2.19	4.00	13.00	-0.36	-0.61
Low-Performing	44	11.61	2.05	7.00	16.00	0.21	-0.20
EconDis Students							
High-Performing	43	32.98	18.83	6.00	74.00	0.52	-0.56
Low-Performing	44	57.98	15.72	25.00	84.00	-0.19	-0.92
GHSGT Scores							
High-Performing	43	186.35	8.43	164.55	198.16	-0.79	0.00
Low-Performing	44	173.64	8.60	154.37	194.12	0.06	-0.30
Graduation Rate							
High-Performing	43	79.65	8.95	58.50	97.50	-0.53	-0.21
Low-Performing	44	67.27	10.38	42.50	81.90	-0.87	0.18
Directors Cup Points							
High-Performing	43	403.31	245.12	25.00	1066.50	0.84	0.10
Low-Performing	44	186.28	134.80	7.30	578.00	0.95	0.98

Note. Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

A majority of the schools in classification AAAAA (*n* = 32 or 53.3%) were academically high-performing for the 2010-11 school year. Descriptive statistics revealed high-performing schools in AAAAA had a lower percentage of minority students, economically disadvantaged students, and students with disabilities than low-performing schools. Those schools also had higher GHSGT scores and a higher graduation rate. The mean Directors Cup points of high-performing schools competing in classification AAAAA was 149 points higher than low-performing schools. The skewness and kurtosis values for each variable were approximately ± 1.0 indicating the variables fit a normal distribution (see Table 4).

Table 4

Descriptive Statistics for the Variables Related to Academic and Athletic Performance during the 2010-11 School Year for High-Performing and Low-Performing Schools Competing in Classification AAAAA

	n	*M*	*SD*	Min	Max	Skewness	Kurtosis
Minority Students							
High-Performing	32	52.44	28.13	14.00	100.00	0.38	-1.10
Low-Performing	28	65.29	21.08	27.00	99.00	-0.23	-1.15
SWD							
High-Performing	32	9.21	2.08	3.77	14.00	-0.30	0.64
Low-Performing	28	11.43	1.48	9.00	14.00	0.23	-0.88
EconDis Students							
High-Performing	32	34.38	21.14	5.00	73.00	0.39	-1.05
Low-Performing	28	52.61	17.62	13.00	88.00	-0.30	-0.16
GHSGT Scores							
High-Performing	32	187.19	9.31	162.24	200.00	-0.88	0.34
Low-Performing	28	177.65	9.40	154.17	191.69	-0.58	0.09
Graduation Rate							
High-Performing	32	78.46	11.24	51.90	100.00	-0.36	-0.23
Low-Performing	28	65.98	11.14	47.70	93.60	0.35	0.16
Directors Cup Points							
High-Performing	32	534.78	351.75	25.00	1220.50	0.27	-1.12
Low-Performing	28	385.42	276.64	22.00	932.50	0.50	-0.92

Note. Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

Results by Question

Research Question 1: Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's academic performance for the 2010-11 academic year?

Logistic regression was employed to ascertain the predictive value of the percentage of minority students, the percentage of students with disabilities, the percentage of economically disadvantaged students, math and English/Language Arts GHSGT scores, and graduation rate on the likelihood that a school was classified as high-performing. This logistic regression model included schools that competed in GHSA classifications AAA, AAAA, and AAAAA.

The statistical significance of the model, the explained variance as measured by Nagelkerke R Square, sensitivity, specificity, positive predictive value, and negative predictive values are reported. The Nagelkerke R Square is a pseudo R square test used to measure how much of the variance in the dependent variable can be explained by the logistic regression. Sensitivity is the measure of true positives or schools correctly identified as high-performing, whereas specificity is the measure of true negatives or schools correctly identified as low-performing. The positive predictive value is the measure of schools correctly identified as high-performing compared to the total number of schools predicted to be high-performing. The negative predictive value is the number of schools correctly identified as low-performing compared to the total number of school predicted to be low-performing (Lund & Lund, 2013).

For the schools in classification AAA, the logistic regression model was a good fit for the data as determined by a Hosmer and Lemeshow test. The model was statistically significant, $\chi^2(5) = 54.822$, $p < .001$. The model explained 67.9% (Nagelkerke R^2) of the variance in academic performance and correctly classified 83.1% of cases. Sensitivity was 78.4%, specificity was 87.5%, positive predictive value was 85.3%, and negative predictive value was 81.4%. Of the five predictor variables, three were statistically significant: percentage of minority students, GHSGT scores, and graduation rate. The percentage of minority students was associated with a slight increase in the likelihood of a school being classified as high-achieving (B = .054, p = .008, odds ratio = 1.06, 95% CI = 1.01 to 1.09). Higher graduation percentages (B = .132, p = .012, odds ratio = 1.14, 95% CI = 1.03 to 1.27) and GHSGT scores (B = .214, p = .003, odds ratio = 1.24, 95% CI = 1.08 to 1.43) were more likely to be associated with high-performing schools (see Table 5).

Table 5

Summary of Logistic Regression Analysis for Variables Predicting a School's Academic Performance for Schools Competing in Classification AAA

					95% Confidence Interval for Exp(B)	
Variable	B	*SE*	*p*	*OR*	*LL*	*UL*
Minority Students	0.05	0.02	.008	1.06	1.01	1.10
SWD	-0.03	0.15	.840	0.97	0.73	1.29
EconDis Students	-0.03	0.04	.380	0.97	0.90	1.04
GHSGT Scores	0.21	0.07	.003	1.24	1.08	1.43
Graduation Rate	0.13	0.05	.012	1.14	1.03	1.27

Note. Model was significant at the .001 level. *LL* = lower limit; *UL* = upper limit; Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

For AAAA schools, the logistic regression model was a good fit for the data as determined by a Hosmer and Lemeshow test. The model was statistically significant, $\chi^2(5) = 46.228$, $p < .001$. The model explained 55% (Nagelkerke R^2) of the variance in academic performance and correctly classified 82.8% of cases. Sensitivity was 81.4%, specificity was 84.1%, positive predictive value was 83.3%, and negative predictive value was 82.2%. Only the GHSGT scores variable was statistically significant. It was associated with an increased likelihood of a school being classified as high-performing (*B* = .114, *p* = .047, odds ratio = 1.12, 95% CI = 1.00 to 1.25) (see Table 6).

Table 6

Summary of Logistic Regression Analysis for Variables Predicting a School's Academic Performance for Schools Competing in Classification AAAA

Variable	B	*SE*	*p*	*OR*	95% Confidence Interval for Exp(B) *LL*	*UL*
Minority Students	0.01	0.02	.366	1.02	0.98	1.05
SWD	-0.26	0.19	.158	0.77	0.54	1.11
EconDis Students	-0.01	0.04	.801	0.99	0.91	1.07
GHSGT Scores	0.11	0.06	.047	1.12	1.00	1.25
Graduation Rate	0.06	0.05	.195	1.06	0.97	1.17

Note. Model was significant at the .001 level. *LL* = lower limit; *UL* = upper limit; Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

For the schools in AAAAA, the logistic regression model was a good fit for the data as determined by a Hosmer and Lemeshow test. The model was statistically significant, $\chi^2(5) = 54.909$, $p < .001$. The model explained 82.7% (Nagelkerke R^2) of the variance in academic performance and correctly classified 87.7% of cases. Sensitivity was 87.1%, specificity was 88.5%, positive predictive value was 90%, and negative predictive value was 85.2%. Of the five predictor variables three were statistically significant: percentage of minority students, percentage of students with disabilities, and graduation rate. Percentage of minority students (*B* = .130, *p* = .023, odds ratio = 1.14, 95% CI = 1.02 to 1.27) and graduation rate (*B* = .368, *p* = .007, odds ratio = 1.44, 95% CI

= 1.10 to 1.89) were associated with an increased likelihood of a school being classified as high-performing, while the percentage of students with disabilities (*B* = -1.820, *p* = .043, odds ratio = 0.16, 95% CI = 0.03 to 0.94) was associated with a decreased likelihood of being classified high-performing (see Table 7).

Table 7

Summary of Logistic Regression Analysis for Variables Predicting a School's Academic Performance for Schools Competing in Classification AAAAA

					95% Confidence Interval for Exp(B)	
Variable	B	*SE*	*p*	*OR*	*LL*	*UL*
Minority Students	0.13	0.06	.023	1.14	1.02	1.27
SWD	-1.82	0.90	.043	0.16	0.03	0.94
EconDis Students	-0.05	0.06	.390	0.95	0.84	1.07
GHSGT Scores	0.18	0.11	.101	1.20	0.97	1.49
Graduation Rate	0.37	0.14	.007	1.44	1.10	1.89

Note. Model was significant at the .001 level. *LL* = lower limit; *UL* = upper limit; Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

Research Question 2: Is there a significant difference between high performing and low performing schools on the total number of Directors Cup points earned for the 2010-11 academic year?

a. Is there a significant difference between high performing and low performing schools on the total number of Directors Cup points earned in boys football, basketball, baseball, and track for the 2010-11 academic year?

b. Is there a significant difference between high performing and low performing schools on the total number of Directors Cup points earned in girls basketball, track, softball, and soccer for the 2010-11 academic year?

Data for Research Question 2 were analyzed using a Mann-Whitney U test. Due to the nature of the data, the assumptions for independent means *t* test were not met. The data for Directors Cup points and the points earned in each sport do not follow a normal distribution. For this reason, the Mann-Whitney U test was the better analytical choice. The test sought to determine if a significant difference exists between high-performing and low-performing schools on total Directors Cup points and points earned in eight selected sports: football, boys basketball, baseball, boys track, girls basketball, girls track, softball, and girls soccer.

Descriptive statistics for AAA (n = 78) revealed the mean Directors Cup points was 284.34 (*Mdn* =221.50) with a range of 14 to 909 points. For high-performing schools (n = 36), the mean for the Directors Cup was 381.15 points (*Mdn* = 345.15). The mean points earned in football were 19.58, 14.22 points in boys basketball, 26.74 points in baseball, and 21.72 points in boys track. The mean for girls basketball was 18.31 points, and the mean for girls track was 21.08 points. The mean points for softball was 20.75, and the mean for girls soccer was 26.22 points. The median for football, boys and girls basketball, boys track and softball was 0 points. The median for baseball and girls soccer was 25 points, while the median was 7 points for girls track. The skewness and kurtosis values for most sports were near ± 1.0 indicating the data fit a normal distribution. Girls soccer had a kurtosis value of 5.05 indicating this sport fit a nonnormal distribution. The results of the Shapiro-Wilk test indicated nonnormal distributions for each variable: Directors Cup points, $W(36) = .932$, $p = .029$, football, $W(36) = .703$, $p < .001$, boys basketball, $W(36) = .677$, $p < .001$, baseball, $W(36) = .809$, $p < .001$, boys track, $W(36) = .736$, $p < .001$, girls basketball, $W(36) = .722$, $p < .001$, girls track, $W(36) = .796$, $p < .001$, softball, $W(36) = .720$, $p < .001$, and girls soccer, $W(36) = .828$, $p < .001$. Q-Q plots and histograms indicated normal distributions for each sport except girls soccer. Overall, the evidence indicated each sport fit a normal distribution except girls soccer.

For low-performing schools ($n = 42$) in classification AAA, the mean for the Directors Cup was 201.36 points (*Mdn* = 183). The mean points earned in football were 14.19, 19.64 points in boys basketball, 11.29 points in baseball, and 9.79 points in boys track. The mean for girls basketball was 16.21 points, and the mean for girls track was 13.83 points. The mean for softball was 14.52 points, and the mean for girls soccer was 7.76 points. The median for all sports was 0 points. Skewness and kurtosis values were less than or near $\pm$ 1.0 indicating a normal distribution for Directors Cup points, boys basketball, baseball, girls basketball, and softball. The other sports had skewness and/or kurtosis values well outside $\pm$ 1.0 indicating deviation from normality for those. Q-Q plots and histograms indicated some deviation from normality for some sports. The results of the Shapiro-Wilk test indicated nonnormal distributions for each sport: Directors Cup points, $W(42) = .939$, p = .026, football, $W(42) = .651$, p < .001, boys basketball, $W(42) = .713$, p < .001, baseball, $W(42) = .642$, p < .001, boys track, $W(42) = .559$, p < .001, girls basketball, $W(42) = .654$, p < .001, girls track, $W(42) = .593$, p < .001, softball, $W(42) = .659$, p < .001, and girls soccer, $W(42) = .525$, p < .001. The overall evidence indicated Directors Cup, boys basketball, baseball, girls basketball, and softball fit normal distributions while football, boys and girls track, and girls soccer fit nonnormal distributions (see Table 8).

Table 8

Descriptive Statistics for Athletic Performance during the 2010-11 School Year in Classification AAA

	n	*Mdn*	*M*	*SD*	Min	Max	Skew	Kurtosis
High Performing Schools								
Directors Cup	36	345.15	381.15	257.66	45	909.00	0.53	-0.73
Football	36	0.00	19.58	29.79	0	100.00	1.42	0.92
Boys Basketball	36	0.00	14.22	22.64	0	83.00	1.61	1.88
Baseball	36	25.00	26.47	31.07	0	100.00	0.87	-0.46
Boys Track	36	0.00	21.72	30.81	0	100.00	1.14	0.05
Girls Basketball	36	0.00	18.31	26.28	0	90.00	1.30	0.61
Girls Track	36	7.00	21.08	25.98	0	82.50	0.92	-0.44
Softball	36	0.00	20.75	30.28	0	100.00	1.33	0.61
Girls Soccer	36	25.00	26.22	27.69	0	83.00	0.66	5.05
Low Performing Schools								
Directors Cup	42	183.00	201.36	134.64	14	589	0.86	0.55
Football	42	0.00	14.19	23.26	0	83	1.71	2.07
Boys Basketball	42	0.00	19.64	29.14	0	100	1.38	0.83
Baseball	42	0.00	11.29	19.13	0	70	1.60	1.62
Boys Track	42	0.00	9.79	20.43	0	85	2.39	5.44
Girls Basketball	42	0.00	16.21	27.29	0	100	1.66	1.87
Girls Track	42	0.00	13.83	26.68	0	100	1.93	2.70
Softball	42	0.00	14.52	23.91	0	83	1.52	1.18
Girls Soccer	42	0.00	7.76	16.92	0	70	2.33	5.05

Note. Skew = skewness

A Mann-Whitney U test was used to determine if there were differences in Directors Cup points between high-performing and low-performing schools. The mean rank of Directors Cup points for high-performing schools (mean rank = 47.99) was higher than for low-performing schools (mean rank = 32.23) in classification AAA. Directors Cup points for high-performing schools (*Mdn* = 345.75) were statistically significantly higher than for low-performing schools (*Mdn* = 183.00), $U = 1062$, $z = 3.06$, $p = .002$, $r = .35$.

In the sport of football, there was very little difference in playoff performance between high-performing and low-performing schools. The mean ranks in Directors Cup points earned in football were very similar between high-performing (mean rank = 40.83) and low-performing schools (mean rank = 38.36) in classification AAA. The distributions of the football Directors Cup points for high-performing and low-performing schools were also similar. A Mann-Whitney U test found the Directors Cup points earned in football were not statistically significantly different between high-performing (Mdn = 0) and low-performing schools (Mdn = 0), U = 804, z = 0.56, p = .577, r = .06.

There was a similar result for boys basketball. Though low-performing schools slightly outperformed high-performing schools overall, the mean ranks were similar between high-performing (mean rank = 38) and low-performing (mean rank = 40.79) schools. The distributions of the boys basketball Directors Cup points for high-performing and low-performing schools were similar. Directors Cup points earned in boys basketball were not statistically significantly different between high-performing (Mdn = 0) and low-performing schools (Mdn = 0), U = 702, z = -0.62, p = .534, r = -.07.

High-performing (mean rank = 45.24) significantly outperformed low-performing schools (mean rank = 34.58) in baseball. Distributions of the Directors Cup points earned in baseball for high-performing and low-performing schools were similar. Median Directors Cup points earned in baseball were statistically significantly higher for high-performing (Mdn = 25) than for low-performing schools (Mdn = 0), U = 963, z = 2.33, p = .02, r = .26.

In boys track, high-performing schools (mean rank = 43.57) outperformed low-performing schools (mean rank = 36.01) in AAA, though not significantly. Distributions of the boys track Directors Cup points for high-performing and low-performing schools were similar. There was no significant difference in Directors Cup points earned in boys track between high-performing (*Mdn* = 0) and low-performing schools (*Mdn* = 0), U = 903, z = 1.75, p = .08, r = .20.

Performance in girls basketball was similar between high-performing (mean rank = 40.99) and low-performing schools (mean rank = 38.23) in AAA. Distributions of the girls basketball Directors Cup points for high-performing and low-performing schools were similar. Directors Cup points earned in girls basketball were not statistically significantly different between high-performing (*Mdn* = 0) and low-performing schools (*Mdn* = 0), U = 810, z = 0.62, p = .534, r = .07.

While not statistically significant, high-performing schools (mean rank = 43.64) tended to perform better than low-performing schools (mean rank = 35.95) in girls track. Distributions of the Directors Cup points earned in girls track for high-performing and low-performing schools were somewhat different. The median Directors Cup points earned in girls track were not statistically significantly higher for high-performing (*Mdn* = 7) than for low-performing schools (*Mdn* = 0), U = 905, z = 1.71, p = .088, r = .19.

High-performing schools (mean rank = 41.58) tended to have slightly higher Directors Cup points in softball than low-performing schools (mean rank = 37.71) in AAA. Distributions of the Directors Cup points earned in softball for high-performing and low-performing schools were similar. However, median Directors Cup points earned in softball were not statistically significantly higher for high-performing (*Mdn* = 0) than for low-performing schools (*Mdn* = 0), *U* = 831, *z* = 0.87, *p* = .384, *r* = .10.

In girls soccer, there was a significant difference in Directors Cup points between high-performing (mean rank = 47.83) and low-performing schools (mean rank = 32.36) in AAA. Distributions of the Directors Cup points earned in girls soccer for high-performing and low-performing schools were similar. The median Directors Cup points earned in girls soccer were statistically significantly higher for high-performing (*Mdn* = 25) than for low-performing schools (*Mdn* = 0), *U* = 1056, *z* = 3.46, *p* = .001, *r* = .39 (see Table 9).

Table 9

Mann-Whitney U Results for Athletic Performance in High-Performing and Low-Performing Schools Competing in Classification AAA during the 2010-11 School Year

	High Performing Schools		Low Performing Schools					
	Median	Mean Rank	Median	Mean Rank	*U*	*z*	*p*	*r*
Directors Cup	345.75	47.99	183.00	32.23	1062	3.06	.002	.35
Football	.00	40.83	.00	38.36	804	0.56	.577	.06
Boys Basketball	.00	38.00	.00	40.79	702	-0.62	. 534	-.07
Baseball	25.00	45.24	.00	34.58	963	2.33	.020	.26
Boys Track	.00	43.57	.00	36.01	903	1.75	.080	.20
Girls Basketball	.00	40.99	.00	38.23	810	0.62	.534	.07
Girls Track	7.00	43.64	.00	35.95	905	1.71	.088	.19
Softball	.00	41.58	.00	37.71	831	0.87	.384	.10
Girls Soccer	25.00	47.83	.00	32.36	1056	3.46	.001	.39

Note: *U* = Mann-Whitney U; *z* = standardized test statistic; *p* = asymptotic significance; *r* = effect size.

Descriptive statistics for AAAA (*n* = 89) revealed the mean Directors Cup points was 291.14 (*Mdn* = 234) with a range of 7.3 to 1066.5 points. For high-performing schools (*n* = 43), the mean for the Directors Cup was 403.31 points (*Mdn* = 332.5). The mean points earned in football were 17.65, 16.33 points in boys basketball, 21.35 points in baseball, and 15.92 points in boys track. The mean points earned in girls basketball was 16.05 points, 25.65 points for girls track, 22 for softball, and 25.21 points for girls soccer. The median for girls track was 7.33 points, while the median for all other sports was 0 points. Skewness and kurtosis values for each sport were near ± 1.0 except for girls basketball (kurtosis = 2.35). Q-Q plots and histograms indicated each sport fit a normal distribution with only slight deviation from normality for girls basketball. The Shapiro-Wilk test indicated nonnormal distributions for each variable: Directors Cup points, $W(43) = .935$, $p = .017$, football, $W(43) = .683$, $p < .001$, boys basketball, $W(43) = .653$, $p < .001$, baseball, $W(43) = .748$, $p < .001$, boys track, $W(43) = .714$, $p < .001$, girls basketball, $W(43) = .680$, $p < .001$, girls track, $W(43) = .793$, $p < .001$, softball, $W(43) = .752$, $p < .001$, and girls soccer, $W(43) = .783$, $p < .001$. Overall, normal distributions were found for each sport except girls basketball.

For low-performing schools ($n = 46$) in classification AAAA, the mean for the Directors Cup was 186.28 points (*Mdn* = 171.5). The mean points earned in football were 14.09, 16.78 points in boys basketball, 9.61 points in baseball, and 14.87 points in boys track. The mean for girls basketball was 16.2 points, and the mean for girls track was 7.18 points. The mean points for softball was 10.09, and the mean for girls soccer was 6.65 points. The median for all sports was 0 points. Skewness and kurtosis values for Directors Cup points, football, and boys and girls basketball were approaching ± 1.0 indicating that they fit a normal distribution. The other sports fell outside the ± 1.0 range indicating a deviation from normality. Q-Q plots and histograms also indicated nonnormal distributions for baseball, boys and girls track, softball, and girls soccer. The Shapiro-Wilk test indicated nonnormal distributions for each variable: Directors Cup points, $W(46) = .928$, $p = .007$, football, $W(46) = .644$, $p < .001$, boys basketball, $W(46) =$

.692, $p < .001$, baseball, $W(46) = .575$, $p < .001$, boys track, $W(46) = .620$, $p < .001$, girls basketball, $W(46) = .653$, $p < .001$, girls track, $W(46) = .513$, $p < .001$, softball, $W(46) = .525$, $p < .001$, and girls soccer, $W(46) = .533$, $p < .001$. Overall, only half of the variables fit a normal distribution (see Table 10).

Table 10

Descriptive Statistics for Athletic Performance during the 2010-11 School Year in Classification AAAA

	n	*Mdn*	*M*	*SD*	Min	Max	Skew	Kurtosis
High Performing Schools								
Directors Cup	43	332.50	403.31	245.12	25.00	1066	0.84	0.10
Football	43	0.00	17.65	27.96	0.00	100	1.55	1.42
Boys Basketball	43	0.00	16.33	27.10	0.00	90	1.61	1.42
Baseball	43	0.00	21.35	28.47	0.00	90	1.02	-0.34
Boys Track	43	0.00	15.92	23.70	0.00	80	1.39	0.89
Girls Basketball	43	0.00	16.05	25.62	0.00	100	1.70	2.35
Girls Track	43	7.33	25.65	31.68	0.00	100	0.89	-0.60
Softball	43	0.00	22.00	28.87	0.00	90	0.94	-0.55
Girls Soccer	43	0.00	25.21	31.28	0.00	100	0.92	-0.48
Low Performing Schools								
Directors Cup	46	171.50	186.28	134.80	7.30	578	0.95	0.98
Football	46	0.00	14.09	23.94	0.00	83	1.68	1.85
Boys Basketball	46	0.00	16.78	25.46	0.00	100	1.49	1.50
Baseball	46	0.00	9.61	18.90	0.00	83	2.20	4.83
Boys Track	46	0.00	14.87	27.08	0.00	100	1.77	2.11
Girls Basketball	46	0.00	16.20	26.92	0.00	90	1.48	0.86
Girls Track	46	0.00	7.18	16.27	0.00	66	2.36	4.85
Softball	46	0.00	10.09	22.21	0.00	100	2.68	7.34
Girls Soccer	46	0.00	6.65	13.81	0.00	53	2.10	3.91

Note. Skew = Skewness.

A Mann-Whitney U test was conducted to determine if there were differences in Directors Cup points between high-performing and low-performing schools in classification AAAA. High-performing schools (mean rank = 57.88) earned significantly more Directors Cup points than low-performing schools (mean rank = 32.96), though the distributions of Directors Cup points were not similar. Directors Cup points for high-performing schools (*Mdn* = 332.50) were statistically significantly higher than for low-performing schools (*Mdn* = 171.50), $U = 1543$, $z = 4.55$, $p < .001$, $r = .48$.

Like classification AAA, football performance was similar for both high-performing (mean rank = 46.28) and low-performing schools (mean rank = 43.8) in AAAA. Distributions of the football Directors Cup points for high-performing and low-performing schools were similar. The Mann-Whitney U test found the Directors Cup points earned in football were not statistically significantly different between high-performing (*Mdn* = 0) and low-performing schools (*Mdn* = 0), $U = 1044$, $z = .533$, $p = .594$, $r = .06$.

In boys basketball, low-performing schools (mean rank = 45.35) earned slightly more Directors Cup points than high-performing schools (mean rank = 44.63) in AAAA. The distributions of the boys basketball Directors Cup points for high-performing and low-performing schools were similar. Directors Cup points earned in boys basketball were not statistically significantly different between high-performing (*Mdn* = 0) and low-performing schools (*Mdn* = 0), $U = 973$, $z = -.154$, $p = .878$, $r = -.02$.

High-performing schools (mean rank = 49.93) significantly outperformed low-performing schools (mean rank = 40.39) in AAAA baseball. Distributions of the Directors Cup points earned in baseball for high-performing and low-performing schools were similar. High-performing schools (*Mdn* = 0) earned significantly higher Directors Cup points in baseball than low-performing schools (*Mdn* = 0), $U = 963$, $z = 2.33$, $p = .04$, $r = .25$.

For the boys track portion of the first subset question, there was little difference in Directors Cup points earned in boys track between high-performing (mean rank = 46.64) and low-performing schools (mean rank = 43.47) in AAAA. Distributions of the boys track Directors Cup points for high-performing and low-performing schools were similar. The Directors Cup points earned in boys track were not statistically significantly different between high-performing (*Mdn* = 0) and low-performing schools (*Mdn* = 0), $U = 1060$, $z = .681$, $p = .496$, $r = .07$.

In girls basketball, high-performing schools (mean rank = 45.57) earned slightly more Directors Cup points than low-performing schools (mean rank = 44.47) in AAAA. Distributions of the girls basketball Directors Cup points for high-performing and low-performing schools were similar. Directors Cup points earned in girls basketball were not statistically significantly different between high-performing (*Mdn* = 0) and low-performing schools (*Mdn* = 0), $U = 1014$, $z = .237$, $p = .812$, $r = .03$.

There was a significant difference in girls track between high-performing (mean rank = 52.72) and low-performing schools (mean rank = 37.78) in AAAA. Distributions of the Directors Cup points earned in girls track for high-performing and low-performing schools were similar. Median Directors Cup points earned in girls track were significantly higher for high-performing (*Mdn* = 7.33) than for low-performing schools (*Mdn* = 0), $U = 1321$, $z = 3.18$, $p = .001$, $r = .34$.

There was also a significant difference in AAAA softball. High-performing schools (mean rank = 50.21) earned more softball points than low-performing schools (mean rank = 40.13). Distributions of the Directors Cup points earned in softball for high-performing and low-performing schools were similar. The Directors Cup points earned in softball were statistically significantly different between high-performing (*Mdn* = 0) and low-performing schools (*Mdn* = 0), *U* = 1213, *z* = 2.19, *p* = .028, *r* = .23.

Girls soccer also had a significant difference between high-performing (mean rank = 52.42) and low-performing schools (mean rank = 38.07) in AAAA. Distributions of the Directors Cup points earned in girls soccer for high-performing and low-performing schools were similar. Directors Cup points earned in girls soccer were statistically significantly higher for high-performing (*Mdn* = 25) than for low-performing schools (*Mdn* = 0), *U* = 1308, *z* = 3.09, *p* = .002, *r* = .33 (see Table 11).

Table 11

Mann-Whitney U Results for Athletic Performance in High-Performing and Low-Performing Schools Competing in Classification AAAA during the 2010-11 School Year

	High Performing Schools		Low Performing Schools					
	Median	Mean Rank	Median	Mean Rank	*U*	*z*	*p*	*r*
Directors Cup	332.50	57.88	171.50	32.96	1543.00	4.55	.000	.48
Football	.00	46.28	.00	43.80	1044.00	.53	.594	.06
Boys Basketball	.00	44.63	.00	45.35	973.00	-.15	.878	-.02
Baseball	.00	49.93	.00	40.39	1201.00	2.06	.040	.25
Boys Track	.00	46.64	.00	43.47	1059.50	.68	.496	.07
Girls Basketball	.00	45.57	.00	44.47	1013.50	.237	.812	.03
Girls Track	.00	52.72	7.33	37.78	1321.00	3.18	.001	.34
Softball	.00	50.21	.00	40.13	1213.00	2.19	.028	.23
Girls Soccer	.00	52.42	.00	38.07	1308.00	3.09	.002	.33

Note: *U* = Mann-Whitney U; *z* = standardized test statistic; *p* = asymptotic significance; *r* = effect size.

Descriptive statistics for the schools competing in classification AAAAA (*n* = 60) revealed the mean Directors Cup points was 465.08 (*Mdn* = 396) with a range of 22 to 1220.5 points. For high-performing schools (*n* = 32), the mean for the Directors Cup was 534.78 points (*Mdn* = 501.5). The mean points earned in football were 22.25 (*Mdn* = 0), 22.5 points in boys basketball (*Mdn* = 25), 20.84 points in baseball (*Mdn* = 12.5), and

28.49 points in boys track (*Mdn* = 19). The mean points earned in girls basketball was 24.63 points (*Mdn* = 25), 24.44 points for girls track (*Mdn* = 15), 25.31 for softball (*Mdn* = 25), and 30.47 points for girls soccer (*Mdn* = 25). The skewness and kurtosis values for each sport were near ± 1.0 indicating the data fit normal distributions. Q-Q plots and histograms also indicated the distributions for each of the variables were normal. However, the results of the Shapiro-Wilk test indicated possible deviations from a normal distribution for Directors Cup points, $W(43) = .945$, $p = .106$, football, $W(43) = .747$, $p < .001$, boys basketball, $W(43) = .804$, $p < .001$, baseball, $W(43) = .781$, $p < .001$, boys track, $W(43) = .846$, $p < .001$, girls basketball, $W(43) = .797$, $p < .001$, girls track, $W(43) = .801$, $p < .001$, softball, $W(43) = .782$, $p < .001$, and girls soccer, $W(43) = .837$, $p < .001$. Overall, the variables fit a normal distribution.

For low-performing schools ($n = 28$) in classification AAAA, the mean for the Directors Cup was 186.28 points (*Mdn* = 171.5). The mean points earned in football were 29.5 (*Mdn* = 25), 23.04 points in boys basketball (*Mdn* = 0), 25.54 points in baseball (*Mdn* = 12.5), and 19.47 points in boys track (*Mdn* = 0). The mean for girls basketball was 24 points (*Mdn* = 25), and the mean for girls track was 24.11 points (*Mdn* = 11). The mean for softball was 25.11 points (*Mdn* = 25), and the mean for girls soccer was 17.32 points (*Mdn* = 0). The skewness and kurtosis values for each variable were within or near ± 1.0 indicating the variables fit a normal distribution. The Q-Q plots and histograms also indicated normal distributions for each variables. However, the Shapiro-Wilk test indicated nonnormal distributions for each variable: Directors Cup points, $W(46) = .921$, $p = .036$, football, $W(46) = .872$, $p < .001$, boys basketball, $W(46) = .756$, $p < .001$, baseball, $W(46) = .785$, $p < .001$, boys track, $W(46) = .770$, $p < .001$, girls basketball, $W(46) = .793$, $p < .001$, girls track, $W(46) = .818$, $p < .001$, softball, $W(46) = .813$, $p < .001$, and girls soccer, $W(46) = .736$, $p < .001$. Overall, the variables fit a normal distribution (see Table 12).

Table 12

Descriptive Statistics for Athletic Performance during the 2010-11 School Year in Classification AAAAA

	n	*Mdn*	*M*	*SD*	Min	Max	Skew	Kurtosis
High Performing Schools								
Directors Cup	32	501.50	534.78	351.75	25	1220	0.27	-1.12
Football	32	0.00	22.25	30.24	0	100	1.25	0.44
Boys Basketball	32	25.00	22.50	26.26	0	90	0.94	-0.09
Baseball	32	12.50	20.84	25.94	0	90	1.10	0.31
Boys Track	32	19.00	28.49	31.36	0	100	0.80	-0.58
Girls Basketball	32	25.00	24.63	28.57	0	83	0.81	-0.73
Girls Track	32	15.00	24.44	29.71	0	90	0.95	-0.43
Softball	32	25.00	25.31	31.28	0	100	1.10	0.07
Girls Soccer	32	25.00	30.47	31.90	0	100	0.76	-0.68
Low Performing Schools								
Directors Cup	28	333.15	385.42	276.64	22	932	0.50	-0.92
Football	28	25.00	29.50	26.40	0	90	0.46	-0.72
Boys Basketball	28	0.00	23.04	31.03	0	100	1.19	0.25
Baseball	28	12.50	25.54	31.91	0	100	0.98	-0.33
Boys Track	28	0.00	19.47	26.04	0	85	1.11	0.09
Girls Basketball	28	25.00	24.00	29.25	0	100	1.18	0.68
Girls Track	28	11.00	24.11	28.95	0	100	0.99	0.12
Softball	28	25.00	25.11	26.02	0	70	0.48	-1.29
Girls Soccer	28	0.00	17.32	23.01	0	70	0.96	-0.52

Note. Skew = skewness.

A Mann-Whitney U test was run to determine if there were differences in Directors Cup points between high-performing and low-performing schools. Distributions of the Directors Cup points for high-performing and low-performing schools in AAAAA were not similar. High-performing schools (mean rank = 33.88) tended to earn more Directors Cup points than low-performing schools (mean rank =

26.64), though not significantly. Directors Cup points for high-performing schools (*Mdn* = 501.50) were not statistically significantly different than for low-performing schools (*Mdn* = 333.15), $U = 556$, $z = 1.6$, $p = .110$, $r = .21$.

For football, the Directors Cup points earned by low-performing school (mean rank = 33.59) were higher than those earned by high-performing schools (mean rank = 27.8) in AAAAA. Distributions of the football Directors Cup points for high-performing and low-performing schools were not similar. Directors Cup points earned in football were not statistically significantly different higher for low-performing (*Mdn* = 25) than for high-performing schools (*Mdn* = 0), $U = 362$, $z = -1.36$, $p = .175$, $r = -.18$.

The differences in Directors Cup points earned in boys basketball between high-performing (mean rank = 30.69) and low-performing schools (mean rank = 29.23) in AAAAA were very similar. The distributions of the boys basketball Directors Cup points for high-performing and low-performing schools were similar as well. The Directors Cup points earned in boys basketball were not statistically significantly higher for high-performing (*Mdn* = 25) than for low-performing schools (*Mdn* = 0), $U = 456$, $z = .351$, $p = .725$, $r = .05$.

Low-performing schools (mean rank = 31.29) earned slightly more Directors Cup points in baseball than high-performing schools (mean rank = 29.81) in AAAAA. Distributions of the Directors Cup points earned in baseball for high-performing and low-performing schools were similar. Median Directors Cup points earned in baseball were not statistically significantly different for high-performing (*Mdn* = 12.5) and low-performing schools (*Mdn* = 12.5), $U = 426$, $z = -.352$, $p = .725$, $r = -.05$.

Directors Cup points earned in boys track between high-performing (mean rank = 32.77) and low-performing schools (mean rank = 27.91). Distributions of the boys track Directors Cup points for high-performing and low-performing schools were similar. Directors Cup points earned in boys track were not statistically significantly higher for high-performing (Mdn = 19) than for low-performing schools (Mdn = 0), U = 521, z = 1.13, p = .257, r = .15.

For the girls basketball, the Directors Cup points earned in girls basketball between high-performing (mean rank = 30.69) and low-performing schools (mean rank = 30.29) in AAAAA were almost identical. The distributions of the girls basketball Directors Cup points for high-performing and low-performing schools were similar. Directors Cup points earned in girls basketball were not statistically significantly different between high-performing (Mdn = 25) and low-performing schools (Mdn = 25), U = 454, z = .10, p = .924, r = .10.

Like girls basketball, the Directors Cup points earned in girls track between high-performing (mean rank = 30.48) and low-performing schools (mean rank = 30.52) in AAAAA were nearly identical. Distributions of the Directors Cup points earned in girls track for high-performing and low-performing schools were similar. Median Directors Cup points earned in girls track were not statistically significantly higher for high-performing (Mdn = 15) than for low-performing schools (Mdn = 11), U = 448, z = -.008, p = .994, r = -.001.

Low-performing schools (mean rank = 31) slightly outperformed high-performing schools (mean rank = 30.06) in AAAAA softball. Distributions of the Directors Cup points earned in softball for high-performing and low-performing schools were similar.

Median Directors Cup points earned in softball were not significantly different for high-performing (*Mdn* = 25) and low-performing schools (*Mdn* = 25), $U = 434$, $z = -.220$, $p = .826$, $r = -.03$.

High-performing schools (mean rank = 33.81) earned more Directors Cup points in girls soccer than low-performing schools (mean rank = 26.71), though the difference was not significant. Distributions of the Directors Cup points earned in girls soccer for high-performing and low-performing schools were similar. Median Directors Cup points earned in girls soccer were not statistically significantly different for high-performing (*Mdn* = 25) and low-performing schools (*Mdn* = 0), $U = 554$, $z = 1.68$, $p = .093$, $r = .22$ (see Table 13).

Table 13

Mann-Whitney U Results for Athletic Performance in High-Performing and Low-Performing Schools Competing in Classification AAAAA during the 2010-11 School Year

	High Performing Schools		Low Performing Schools					
	Median	Mean Rank	Median	Mean Rank	*U*	*z*	*p*	*r*
Directors Cup	501.50	33.88	333.15	26.64	556.00	1.60	.110	.21
Football	0.00	27.80	25.00	33.59	361.50	-1.36	.175	-.18
Boys Basketball	25.00	30.69	0.00	29.23	455.50	.35	.725	.05
Baseball	12.50	29.81	12.50	31.29	426.00	-.35	.725	-.05
Boys Track	19.00	32.77	0.00	27.91	520.50	1.13	.257	.15
Girls Basketball	25.00	30.69	25.00	30.29	454.00	.10	.924	.10
Girls Track	15.00	30.48	11.00	30.52	447.50	-.01	.994	.00
Softball	25.00	30.06	25.00	31.00	434.00	-.22	.826	-.03
Girls Soccer	25.00	33.81	0.00	26.71	554.00	1.68	.093	.22

Note: U = Mann-Whitney U; z = standardized test statistic; p = asymptotic significance; r = effect size.

Research Question 3: Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's total Directors Cup points for the 2010-11 academic year?

a. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's total Director Cup points earned in boys football, basketball, baseball, and for the 2010-11 academic year?

b. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's total Directors Cup points earned in girls basketball, track, softball, and soccer for the 2010-11 academic year?

Data for Research Question 3 were analyzed using count regression models (negative binomial and Poisson regression), and sought to determine how well the selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) predict total Directors Cup points. Count model regression was also used to determine how well the school-level variables predicted athletic success in eight selected sports: football, boys basketball, baseball, boys track, girls basketball, girls track, softball, and girls soccer. The choice of regression models was based upon how well the model fit the data. Models were run without the intercept included in the model.

For total Directors Cup points in AAA schools, the negative binomial regression model was statistically significant, $\chi^2(5) = 870.22$, $p < .001$. The percentage of minority students, percentage of economically disadvantaged students, combined math and Language Arts GHSGT scores, and graduation rate variables were statistically significant (see Table 14). The percentage of minority students (*B* = 0.09, *p* = .024, odds ratio = 1.01, 95% CI = 1.00 to 1.02), combined math and Language Arts GHSGT scores (*B* = 0.26, *p* < .001, odds ratio = 1.02, 95% CI = 1.02 to 1.04), and graduation rate (*B* = 0.02, *p* = .040, odds ratio = 1.02, 95% CI = 1.00 to 1.04) were associated with a slight increase in Directors Cup points. However, economically disadvantaged students (*B* = -0.01, *p* = .049, odds ratio = 0.99, 95% CI = 0.98 to 1.00) were associated with a slight decrease in Directors Cup points (see Table 14).

Table 14

Negative Binomial Regression Estimates on Total Directors Cup Points for Schools Competing in Classification AAA

						95% Confidence Interval for *OR*	
	B	SE	Wald χ^2	*p*	*OR*	*LL*	*UL*
Minority Students	.01	.00	5.07	.024	1.01	1.00	1.02
SWD	-.01	.03	0.04	.835	1.00	0.95	1.05
EconDis Students	-.01	.01	3.88	.049	0.99	0.98	1.00
GHSGT Scores	.03	.00	34.91	.000	1.03	1.02	1.04
Graduation Rate	.02	.01	4.22	.040	1.02	1.00	1.04

Note: The overall model was significant at the .001 level. *LL* = lower limit; *UL* = upper limit; Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

Count model (Negative Binomial and Poisson) regression models was employed to determine if the selected school-level variables predict Directors Cup points earned in the selected boys sports in AAA (see Table 15). The negative binomial regression model was not significant for football, $\chi^2(5) = 3.76$, $p = .585$. However, the negative binomial regression model was statistically significant for baseball, $\chi^2(5) = 20.30$, $p = .001$, and track, $\chi^2(5) = 18.75$, $p = .002$. For baseball, the percentage of minority students ($B = -0.02$, $p = .035$, odds ratio = .985, 95% CI = .97 to .99) and percentage of students with disabilities ($B = 0.09$, $p = .034$, odds ratio = .91, 95% CI = .84 to .99) were statistically significant to the model. Both variables were associated with lower odds of being successful in baseball. For track, the percentage of minority students ($B = 0.02$, $p = .018$, odds ratio = 1.02, 95% CI = 1.00 to 1.04) and percentage of economically disadvantaged students ($B = -0.03$, $p = .024$, odds ratio = .97, 95% CI = .95 to .99) were statistically significant to the model. A Poisson regression model was used to analyze the data for boys basketball, $\chi2(5) = 39.24$, $p < .001$, and was statistically significant. However, none of the predictors were significant to the model for boys basketball.

Table 15

Negative Binomial and Poisson Regression Model Estimates for Directors Cup Points Earned in Selected Boys Sports for Schools Competing in Classification AAA

						95% Confidence Interval for *OR*	
	B	SE	Wald χ^2	*p*	*OR*	*LL*	*UL*
Football (NegBin)							
Minority Students	.00	.01	0.26	.607	1.00	0.99	1.02
SWD	-.06	.06	1.27	.261	0.94	0.84	1.05
EconDis Students	-.00	.02	0.04	.833	1.00	0.97	1.03
GHSGT Scores	.00	.01	0.00	.968	1.00	0.98	1.02
Graduation Rate	.01	.02	0.05	.827	1.01	0.96	1.05
Basketball (Poisson)*							
Minority Students	.01	.00	1.56	.212	1.01	1.00	1.01
SWD	.02	.03	0.56	.455	1.02	0.97	1.07
EconDis Students	-.00	.01	0.08	.774	1.00	0.99	1.01
GHSGT Scores	.00	.00	0.37	.541	1.00	1.00	1.01
Graduation Rate	-.00	.01	0.16	.689	1.00	0.98	1.01
Baseball (NegBin)*							
Minority Students	-.02	.01	4.46	.035	0.99	0.97	1.00
SWD	-.09	.04	4.52	.034	0.91	0.84	0.99
EconDis Students	-.02	.01	2.35	.125	0.98	0.96	1.01
GHSGT Scores	.01	.01	1.83	.176	1.01	0.99	1.04
Graduation Rate	.00	.02	0.01	.933	1.00	0.96	1.04
Track (NegBin)*							
Minority Students	.02	.01	5.64	.018	1.02	1.00	1.04
SWD	-.01	.06	0.01	.912	0.99	0.89	1.12
EconDis Students	-.03	.01	5.11	.024	0.97	0.95	1.00
GHSGT Scores	-.01	.01	1.06	.304	0.99	0.97	1.01
Graduation Rate	.04	.02	3.20	.074	1.04	1.00	1.08

Note: *Overall model was significant; NegBin = Negative Binomial Regression; Poisson = Poisson Regression; *LL* = lower limit; *UL* = upper limit; Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

Negative binomial regression was employed to determine if the selected school-level variables predict Directors Cup points earned in the selected girls sports in AAA (see Table 16). The negative binomial regression model was not statistically significant for basketball, $\chi^2(5) = 5.52$, $p = .356$. However, the model was significant for track,

$\chi^2(5) = 19.52$, $p = .002$, softball, $\chi^2(5) = 26.00$, $p < .001$, and soccer, $\chi^2(5) = 19.12$, $p = .002$. For track, the percentage of minority students ($B = 0.03$, $p < .001$, odds ratio = 1.03, 95% CI = 1.01 to 1.04) was significant to the model and was associated with a small increase in Directors Cup points earned in track. For softball, the percentage of minority students variable ($B = -0.03$, $p < .001$, odds ratio = 0.97, 95% CI = 0.96 to 0.99) was statistically significant and was associated with a slight decrease in softball Directors Cup points. For soccer, the percentage of economically disadvantaged students variable ($B = -0.04$, $p = .001$, odds ratio = 0.97, 95% CI = 0.95 to 0.99) was significant and was associated with a slight decrease in Directors Cup points for that sport.

Table 16

Negative Binomial Regression Estimates for Directors Cup Points Earned in Selected Girls Sports for Schools Competing in Classification AAA

	B	SE	Wald χ^2	*p*	*OR*	95% Confidence Interval for *OR* *LL*	*UL*
Basketball							
Minority Students	.01	.01	1.17	.280	1.01	0.99	1.03
SWD	-.09	.06	2.03	.154	0.92	0.81	1.03
EconDis Students	-.00	.01	0.02	.898	1.00	0.97	1.02
GHSGT Scores	-.00	.01	0.03	.871	1.00	0.98	1.02
Graduation Rate	.01	.02	0.07	.787	1.01	0.97	1.05
Track*							
Minority Students	.03	.01	12.81	.000	1.03	1.01	1.04
SWD	.02	.04	0.15	.696	1.02	0.93	1.11
EconDis Students	-.02	.01	3.06	.080	0.98	0.96	1.00
GHSGT Scores	-.01	.01	0.63	.428	0.99	0.98	1.01
Graduation Rate	.02	.01	0.96	.327	1.02	0.99	1.05
Softball*							
Minority Students	-.03	.01	12.82	.000	0.97	0.96	0.99
SWD	-.04	.05	0.69	.405	0.96	0.87	1.06
EconDis Students	-.02	.01	1.39	.239	0.98	0.96	1.01
GHSGT Scores	.01	.01	0.91	.339	1.01	0.99	1.03
Graduation Rate	.01	.02	0.15	.702	1.01	0.97	1.05
Soccer*							
Minority Students	.00	.01	0.12	.729	1.00	0.99	1.02
SWD	-.04	.05	0.54	.461	0.96	0.87	1.07
EconDis Students	-.04	.01	11.09	.001	0.97	0.95	0.99
GHSGT Scores	.00	.01	0.15	.697	1.00	0.99	1.02
Graduation Rate	.02	.02	0.63	.427	1.02	0.98	1.05

Note:* = Overall model was significant; *LL* = lower limit; *UL* = upper limit; Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

For total Directors Cup points in AAAA schools, the negative binomial regression model was statistically significant, $\chi^2(5) = 997.21$, $p < .001$. The percentage of minority students ($B = 0.01$, $p = .031$, odds ratio = 1.01, 95% CI = 1.00 to 1.02), percentage of economically disadvantaged variables ($B = -0.02$, $p = .011$, odds ratio = 0.98, 95% CI = .969 to .996), and math/Language Arts GHSGT scores ($B = 0.03$, $p < .001$, odds ratio =

1.03, 95% CI = 1.02 to 1.04) were statistically significant to the model (see Table 17). The percentage of minority students and GHSGT scores were associated with a slight increase in Directors Cup points. However, the percentage of economically disadvantaged students was associated with a decrease in Directors Cup points.

Table 17

Negative Binomial Regression Estimates on Total Directors Cup Points for Schools Competing in Classification AAAA

						95% Confidence Interval for *OR*	
	B	SE	Wald χ^2	*p*	*OR*	*LL*	*UL*
Minority Students	.01	.00	4.67	.031	1.01	1.00	1.02
SWD	.03	.04	0.41	.522	1.03	0.95	1.11
EconDis Students	-.02	.01	6.40	.011	0.98	0.97	1.00
GHSGT Scores	.03	.01	29.55	.000	1.03	1.02	1.04
Graduation Rate	.01	.01	0.93	.336	1.01	0.99	1.03

Note: The overall model was significant at the .001 level; *LL* = lower limit; *UL* = upper limit; Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

Negative binomial regression was used to determine how well the selected school-level variables predict the number of Directors Cup points earned in selected boys sports in classification AAAA (see Table 18). The negative binomial regression model for AAAA football, $\chi^2(5) = 7.11$, $p = .212$, was not statistically significant. The model was significant for basketball, $\chi^2(5) = 12.93$, $p = .024$, baseball, $\chi^2(5) = 21.20$, $p = .001$, and track, $\chi^2(5) = 17.62$, $p = .003$. The percentage of minority students variable was significant to the basketball model ($B = 0.03$, $p = .033$, odds ratio = 1.03, 95% CI = 1.00 to 1.05) and was associated with a small increase in Directors Cup points earned in basketball. However, none of the predictor variables were statistically significant for the baseball or track models.

Table 18

Negative Binomial Regression Estimates for Directors Cup Points Earned in Boys Sports for Schools Competing in Classification AAAA

	B	SE	Wald χ^2	*p*	*OR*	95% Confidence Interval for *OR*	
						LL	*UL*
Football							
Minority Students	.01	.01	1.63	.202	1.01	0.99	1.03
SWD	-.01	.08	0.02	.882	0.99	0.85	1.15
EconDis Students	-.02	.02	1.27	.260	0.98	0.95	1.01
GHSGT Scores	-.01	.01	0.65	.421	0.99	0.97	1.01
Graduation Rate	.02	.02	0.77	.380	1.02	0.98	1.06
Basketball*							
Minority Students	.03	.01	4.56	.033	1.03	1.00	1.05
SWD	.00	.06	0.00	.989	1.00	0.90	1.12
EconDis Students	-.02	.02	0.65	.421	0.99	0.95	1.02
GHSGT Scores	-.00	.01	0.01	.908	1.00	0.98	1.02
Graduation Rate	-.01	.02	0.25	.616	0.99	0.94	1.04
Baseball*							
Minority Students	-.02	.01	3.16	.075	0.98	0.96	1.00
SWD	.04	.08	0.31	.575	1.04	0.90	1.21
EconDis Students	-.01	.02	0.20	.655	0.99	0.96	1.02
GHSGT Scores	-.01	.01	1.28	.258	0.97	0.96	1.01
Graduation Rate	.04	.03	1.72	.190	1.04	0.98	1.09
Track*							
Minority Students	.00	.01	0.41	.522	1.00	0.99	1.01
SWD	.05	.05	1.09	.297	1.06	0.95	1.17
EconDis Students	-.01	.01	0.30	.583	1.00	0.98	1.01
GHSGT Scores	-.01	.01	1.66	.198	0.99	0.98	1.01
Graduation Rate	.02	.02	2.04	.153	1.02	0.99	1.06

Note:* = overall model was significant; *LL* = lower limit; *UL* = upper limit; Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

Negative binomial regression was employed to determine if selected school-level variables predicted Directors Cup points earned in the selected AAAA girls sports (see Table 19). The negative binomial regression model was not statistically significant for basketball, $\chi^2(5) = 9.83$, $p = .080$, but was significant for track, $\chi^2(5) = 24.09$, $p < .001$, softball, $\chi^2(5) = 19.53$, $p = .002$, and soccer, $\chi^2(5) = 48.63$, $p < .001$. For track, the percentage of minority students variable ($B = 0.02$, $p = .001$, odds ratio = 1.02, 95% CI = 1.01 to 1.04) and the percentage of economically disadvantaged students ($B = -0.02$, $p = .038$, odds ratio = 0.98, 95% CI = .958 to .999) were significant to the model. The percentage of minority students was associated with a slight increase in Directors Cup points, while the percentage of economically disadvantaged students was associated with a decrease in Directors Cup points earned in track. For softball, the percentage of minority students variable ($B = -0.24$, $p = .016$, odds ratio = 0.98, 95% CI = .957 to .995) was statistically significant and was associated with a slight decrease in Directors Cup points. For soccer, the percentage of economically disadvantaged students ($B = -0.05$, $p = .016$, odds ratio = 0.95, 95% CI = 0.91 to 0.99) and graduation rate ($B = -0.04$, $p = .022$, odds ratio = 0.96, 95% CI = 0.92 to 0.99) were statistically significant and were associated with a earning slightly fewer soccer Directors Cup points. The GHSGT scores variable was also significant to the soccer model and was associated with an increase in soccer Directors Cup points.

Table 19

Negative Binomial Regression Estimates for Directors Cup Points Earned in Selected Girls Sports for Schools Competing in Classification AAAA

						95% Confidence Interval for *OR*	
	B	SE	Wald χ^2	*p*	*OR*	*LL*	*UL*
Basketball							
Minority Students	.03	.01	6.80	.009	1.03	1.01	1.05
SWD	.05	.10	0.30	.582	1.06	0.87	1.28
EconDis Students	-.03	.02	3.24	.072	0.97	0.94	1.00
GHSGT Scores	-.00	.01	0.03	.859	1.00	0.98	1.02
Graduation Rate	-.01	.02	0.28	.600	0.99	0.95	1.03
Track*							
Minority Students	.02	.01	10.36	.001	1.02	1.01	1.04
SWD	-.04	.05	0.71	.400	0.96	0.86	1.06
EconDis Students	-.02	.01	4.31	.038	0.98	0.96	1.00
GHSGT Scores	-.00	.01	0.15	.696	1.00	0.99	1.01
Graduation Rate	.01	.01	1.18	.277	1.01	0.99	1.04
Softball*							
Minority Students	-.024	.01	5.85	.016	0.98	0.96	1.00
SWD	.072	.08	0.75	.387	1.08	0.91	1.27
EconDis Students	-.012	.01	0.67	.412	0.99	0.96	1.02
GHSGT Scores	.001	.01	0.01	.936	1.00	0.98	1.03
Graduation Rate	.003	.03	0.01	.921	1.00	0.95	1.05
Soccer*							
Minority Students	.01	.01	0.87	.350	1.01	0.99	1.03
SWD	-.03	.05	0.34	.558	0.97	0.87	1.08
EconDis Students	-.07	.01	25.34	.000	0.94	0.91	0.96
GHSGT Scores	.03	.01	12.24	.000	1.03	1.01	1.05
Graduation Rate	-.04	.02	5.27	.022	0.96	0.92	0.99

Note:* = overall model was significant; *LL* = lower limit; *UL* = upper limit; Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

For total Directors Cup points in AAAAA schools, the negative binomial regression model was statistically significant, $\chi^2(5) = 734.04$, $p < .001$ (see Table 20). The combined GHSGT scores ($B = 0.02$, $p < .001$, odds ratio = 1.03, 95% CI = 1.01 to 1.04) and graduation rate variables ($B = 0.03$, $p = .017$, odds ratio = 1.03, 95% CI = 1.01

to 1.05) were statistically significant to the model. Both variables were associated with a slight increase in total Directors Cup points.

Table 20

Negative Binomial Regression Estimates on Total Directors Cup Points for Schools Competing in Classification AAAAA

	B	SE	Wald χ^2	*p*	*OR*	95% Confidence Interval for *OR*	
						LL	*UL*
Minority Students	-.01	.01	0.96	.326	0.99	0.98	1.01
SWD	-.03	.05	0.34	.559	0.97	0.89	1.06
EconDis Students	.00	.01	0.17	.683	1.00	0.99	1.02
GHSGT Scores	.02	.01	20.68	.000	1.03	1.01	1.04
Graduation Rate	.03	.01	5.68	.017	1.03	1.01	1.05

Note: The overall model was significant at the .001 level; *LL* = lower limit; *UL* = upper limit; Minority Students = percentage of students identified as minority; SWD = percentage of students with disabilities; EconDis Students = percentage of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

A negative binomial regression model was used to determine how well the selected school-level variables predicted Directors Cup points earned in football, basketball, and track in classification AAAAA (see Table 21). The negative binomial regression model was not statistically significant for football, $\chi^2(5) = 3.98$, $p = .553$, or basketball, $\chi^2(5) = 2.81$, $p = .729$. The negative binomial regression model was significant for baseball, $\chi^2(5) = 12.25$, $p = .032$, and track, $\chi^2(5) = 36.21$, $p < .001$. However none of the predictor variables were significant to the model. Table 21 contains a summary of the model outcomes for the boys sports.

Table 21

Negative Binomial Regression Estimates on Directors Cup Points Earned in Selected Boys Sports for Schools Competing in Classification AAAAA

	B	SE	Wald χ^2	*p*	*OR*	95% Confidence Interval for *OR*	
						LL	*UL*
Football							
Minority Students	-.01	.01	1.27	.259	0.99	0.97	1.01
SWD	.13	.08	2.49	.115	1.14	0.97	1.33
EconDis Students	.00	.02	0.00	.977	1.00	0.97	1.03
GHSGT Scores	-.01	.01	0.26	.609	0.99	0.97	1.02
Graduation Rate	.01	.02	0.12	.731	1.01	0.96	1.05
Basketball							
Minority Students	.00	.01	0.10	.747	1.00	0.98	1.03
SWD	-.11	.10	1.22	.270	0.89	0.73	1.09
EconDis Students	.01	.02	0.30	.581	1.01	0.97	1.06
GHSGT Scores	-.01	.01	0.46	.497	0.99	0.97	1.02
Graduation Rate	.03	.02	1.19	.275	1.03	0.98	1.07
Baseball*							
Minority Students	-.02	.01	2.96	.086	0.98	0.96	1.00
SWD	.03	.09	0.12	.722	1.03	0.86	1.24
EconDis Students	.01	.01	0.77	.381	1.01	0.99	1.04
GHSGT Scores	-.02	.01	1.83	.176	0.98	0.96	1.01
Graduation Rate	.05	.03	2.98	.084	1.05	0.99	1.10
Track*							
Minority Students	.01	.01	0.97	.324	1.01	0.99	1.03
SWD	-.00	.08	0.00	.970	1.00	0.86	1.16
EconDis Students	-.02	.02	1.10	.295	0.98	0.95	1.02
GHSGT Scores	.00	.01	0.05	.816	1.00	0.98	1.02
Graduation Rate	.01	.02	0.12	.733	1.01	0.97	1.05

Note:* = overall model was significant; *LL* = lower limit; *UL* = upper limit; Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

A negative binomial regression model was used to analyze the Directors Cup points earned in AAAAA girls basketball and track (see Table 22). The negative binomial regression model was not significant for basketball $\chi^2(5) = 1.39$, $p = .926$. However the model was significant for track, $\chi^2(5) = 38.74$, $p < .001$. None of the predictors were significant to the model.

Poisson regression was used to analyze the Directors Cup points earned in softball and soccer in classification AAAAA (see Table 22). The Poisson regression model was statistically significant for softball, $\chi^2(5) = 28.59$, $p < .001$ and soccer, $\chi^2(5) = 41.35$, $p < .001$. For softball, the percentage of minority students variable ($B = -0.02$, $p = .015$, odds ratio = 0.98, 95% CI = 0.96 to 1.00) and the percentage of students with disabilities variable ($B = 0.13$, $p = .035$, odds ratio = 1.14, 95% CI = 1.01 to 1.30) variables were statistically significant. The percentage of minority students variable was associated with a small decrease in total Directors Cup points for softball, while the percentage of students with disabilities variable was associated with an increase in Directors Cup points. For soccer, none of the predictor variables were significant.

Table 22

Negative Binomial and Poisson Regression Estimates on Directors Cup Points Earned in Selected Girls Sports for Schools Competing in Classification AAAAA

	B	SE	Wald χ^2	*p*	*OR*	95% Confidence Interval for *OR* *LL*	*UL*
Basketball (NegBin)							
Minority Students	.01	.01	1.84	.175	1.01	0.99	1.03
SWD	.01	.08	0.01	.936	1.01	0.86	1.18
EconDis Students	-.02	.02	1.46	.227	0.98	0.95	1.01
GHSGT Scores	.00	.01	0.02	.885	1.00	0.98	1.02
Graduation Rate	-.00	.02	0.04	.842	1.00	0.97	1.03
Track (NegBin)*							
Minority Students	.02	.01	3.16	.076	1.02	1.00	1.04
SWD	-.09	.07	1.32	.251	0.92	0.79	1.07
EconDis Students	-.02	.02	2.33	.127	0.98	0.95	1.01
GHSGT Scores	.01	.01	1.60	.206	1.01	0.99	1.04
Graduation Rate	-.01	.02	0.31	.579	0.99	0.95	1.03
Softball (Poisson)*							
Minority Students	-.02	.01	5.94	.015	0.98	0.96	1.00
SWD	.13	.06	4.45	.035	1.14	1.01	1.30
EconDis Students	-.00	.01	0.04	.836	1.00	0.98	1.02
GHSGT Scores	-.01	.01	0.69	.407	0.99	0.97	1.01
Graduation Rate	.02	.02	1.06	.302	1.02	0.98	1.06
Soccer (Poisson)*							
Minority Students	-.01	.01	0.96	.328	0.99	0.98	1.01
SWD	-.04	.05	0.56	.453	0.96	0.87	1.07
EconDis Students	-.03	.02	3.57	.059	0.97	0.94	1.00
GHSGT Scores	.01	.01	0.93	.336	1.01	0.99	1.03
Graduation Rate	-.00	.02	0.02	.881	1.00	0.96	1.04

Note: *Overall model was significant; NegBin = Negative Binomial Regression; Poisson = Poisson Regression; *LL* = lower limit; *UL* = upper limit; Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

Research Question 4: Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's total Directors Cup points for the academic years

2008-09 and 2009-10?

a. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's total Director Cup points earned in boys football, basketball, baseball, and track for the 2008-09 and 2009-10 academic years?

b. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's total Directors Cup points earned in girls basketball, track, softball, and soccer for the 2008-09 and 2009-10 academic years?

The purpose of Question 4 was to cross-validate the regression model used in Question 3 using data from the previous 2 years (2008-09 and 2009-10). As in Chapter 3, the data were analyzed using either negative binomial or Poisson regression. Most data fit the negative binomial model, however in some cases the Poisson regression was a better fit. Such cases are noted in the findings. Descriptive statistics for the selected school level variables percentage of minority students, percentage of students with disabilities, percentage of economically disadvantaged students, math and English/ Language Arts GHSGT scores, and graduation rate for the schools that competed in the GHSA classifications AAA, AAAA, and AAAAA was collected (see Table 23). For the schools in AAA during the 2008-09 school year (*n* = 67), the mean percentage of minority students was 51.03% ranging from 5% to 100%. The mean percentage of student with disabilities was 10.30% (range = 2% - 18%), while the mean percentage of students identified as economically disadvantaged was 50.85% (range = 16% - 87%). The mean of the combined Math and English GHSGT scores was 185.48 (range = 149 – 200), and the mean graduation rate was 79.43% (range = 64.5% - 98.5%). The mean Directors Cup points for those schools was 330.04 points with a range from 25 to 996 points. The skewness and kurtosis values for most variables were approximately ± 1.0 indicating the variables fit a normal distribution. The skewness value for GHSGT scores was -1.61 while the kurtosis value score was 3.66 indicating deviation from a normal distribution. The Shapiro-Wilk test showed the percentage of minority students, $W(77) = .950$, $p = .004$, and GHSGT scores, $W(77) = .942$, $p = .002$, exhibited nonnormal distributions. The histograms and Q-Q plots showed deviation from normality in only the GHSGT scores.

For the schools in AAAA during the 2008-09 school year ($n = 76$), the mean percentage of minority students was 55.78% (range = 13% - 100%). The mean percentage of student with disabilities was 10.32% (range = 0% - 17%), and the mean percentage of economically disadvantaged students was 45.99% (range = 6% - 79%). The mean of the summed Math and English GHSGT scores was 186.5 (range = 160 - 198). The mean graduation rate was 79.53% (range = 59.3% - 97.5%). The mean Directors Cup points for those schools was 322.69 points, ranging from as few as 25 points to as many as 994.5 points. The skewness and kurtosis values for each variable (except the GHSGT scores) were approaching ± 1.0 indicating the variables had normal distributions. The GHSGT scores fell outside the ± 1.0 range indicating questionable normality. Appraisal of histograms and Q-Q plots also showed minor deviation from normality for the GHSGT scores. A Shapiro-Wilk test determined only the percentage of economically disadvantaged, $W(76) = .977$, $p = .180$, and the graduation rate, $W(76) = .986$, $p = .561$, had a normal distribution. The evidence indicated each variable fit a normal distribution with the possible exception of GHSGT scores.

For the schools in AAAAA during the 2008-09 school year ($n = 71$), the mean percentage of minority students was 57.93% with a range from 13% to 100%. The mean percentage of student with disabilities was 10% (range = 1% - 15%). The mean percentage of students identified as economically disadvantaged was 41.76% (range = 4% - 87%). The mean of the summed Math and English GHSGT scores was 185.68 (range = 151 – 200), and the mean graduation rate was 85.69% (range = 64.3% - 100%). The mean Directors Cup points for those schools was 427.5 points, ranging from as few as 25 points to as many as 1045.5 points. The skewness and kurtosis values for each variable were near ± 1.0 except the percentage of students with disabilities (kurtosis = 2.19). Assessment of histograms and Q-Q plots also determined each variable fit a normal distribution with only a slight deviation in the percentage of students with disabilities. A Shapiro-Wilk test determined only the graduation rate, $W(74) = .983$, $p = .436$, followed a normal distribution. Overall, the data mostly fit a normal distribution (see Table 23).

Table 23

Descriptive Statistics for the School-Level Predictor Variables Related to Total Directors Cup Points during the 2008-09 School Year

	n	*M*	*SD*	Min	Max	Skew	Kurtosis
Minority Students							
AAA	67	51.03	29.14	5.00	100.00	0.28	-0.10
AAAA	76	55.78	27.47	13.00	100.00	0.11	-1.28
AAAAA	71	58.02	27.52	11.00	100.00	0.10	-1.31
SWD							
AAA	67	10.30	2.94	2.00	18.00	-0.05	0.44
AAAA	76	10.32	2.73	0.00	17.00	-0.51	1.64
AAAAA	71	10.18	2.36	1.00	16.00	-0.52	2.19
EconDis Students							
AAA	67	50.85	17.65	16.00	87.00	0.14	-0.43
AAAA	76	45.99	18.11	6.00	79.00	-0.25	-0.56
AAAAA	71	39.47	22.52	3.00	82.00	0.05	-1.18
GHSGT Scores							
AAA	67	185.48	9.33	149.00	200.00	-1.62	3.66
AAAA	76	186.50	7.33	160.00	198.00	-1.09	2.22
AAAAA	71	175.39	16.94	113.60	199.30	-1.25	1.91
Graduation Rate							
AAA	67	79.43	8.19	64.50	98.50	0.27	-0.61
AAAA	76	79.53	8.94	59.30	97.50	-0.14	-0.56
AAAAA	71	83.42	8.15	58.30	98.90	-0.30	0.32

Note. Minority Students = percentage of students identified as minority; SWD = percentage of students with disabilities; EconDis Students = percentage of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

Descriptive statistics for the selected school level variables percentage of minority students, percentage of students with disabilities, percentage of economically disadvantaged students, math and English/Language Arts GHSGT scores, and graduation rate for the schools that competed in the GHSA classifications AAA, AAAA, and AAAAA was collected (see Table 24). For the schools in AAA during the 2009-10 school year (n = 65), the mean percentage of minority students was 49.4% ranging from 5% to 100%. The mean percentage of student with disabilities was 10.37% (range = 3% -

18%), while the mean percentage of students identified as economically disadvantaged was 53.14% (range = 15% - 93%). The mean of the summed Math and English GHSGT scores was 180.97 (range = 150 – 200), and the mean graduation rate was 82.16% (range = 63.0% - 98.9%). The mean Directors Cup points for those schools was 297.96 points with a range from as few as 31 points to as many as 1072.5 points. The skewness and kurtosis values for the predictor variables were approximately ± 1.0 indicating the data fit a normal distribution. Visual evaluation of histograms and Q-Q plots also found normal distributions for each variable. A Shapiro-Wilk test indicated the percentage of minority students, $W(65) = .946$, $p = .006$, and GHSGT scores, $W(65) = .959$, $p = .031$, had distributions that were nonnormal. Totality of the evidence suggests each variable had a normal distribution.

For the schools in AAAA during the 2009-10 school year ($n = 76$), the mean percentage of minority students was 55.63% (range = 13% - 100%). The mean percentage of student with disabilities was 10.24% (range = 5% - 17%), and the mean percentage of economically disadvantaged students was 49% (range = 6% - 82%). The mean of the summed Math and English GHSGT scores was 181.96 (range = 160 - 197). The mean graduation rate was 81.22% (range = 60.7% - 96.7%). The mean Directors Cup points for those schools was 333.12 points with a range of 25 points to 1059.5 points. The skewness and kurtosis values as well as the histograms and Q-Q plots for each variable showed the data had normal distributions. A Shapiro-Wilk test, $W(76) = .926$, $p < .001$, indicated deviation from normality in the percentage of minority students, but the overall evidence determined the data fit a normal distribution.

For the schools in AAAAA during the 2009-10 school year (*n* = 71), the mean percentage of minority students was 57.93% with a range from 13% to 100%. The mean percentage of student with disabilities was 10% (range = 1% - 15%). The mean percentage of students identified as economically disadvantaged was 41.76% (range = 4% - 87%). The mean of the summed Math and English GHSGT scores was 185.68 (range = 151 – 200), and the mean graduation rate was 85.69% (range = 64.3% - 100%). The mean Directors Cup points for those schools was 427.5 points, ranging from as few as 25 points to as many as 1045.5 points. While the skewness and kurtosis values for each variable (with the exception of GHSGT scores) were near or less than ± 1.0 indicating normal distributions for those variables. Histograms and Q-Q plots also showed some slight deviation from normality for GHSGT scores. A Shapiro-Wilk test determined the only variable that had a normal distribution was graduation rate, $W(71)$ = .988, p = .765. Overall, most of the data had normal distributions with only slight deviation from normality for GHSGT scores (see Table 24).

Table 24

Descriptive Statistics for the School-Level Predictor Variables Related to Total Directors Cup Points during the 2009-10 School Year

	n	*M*	*SD*	Min	Max	Skew	Kurtosis
Minority Students							
AAA	65	49.25	28.47	5.00	100.00	0.27	-0.84
AAAA	76	55.63	26.83	13.00	100.00	0.20	-1.33
AAAAA	71	57.93	26.33	13.00	100.00	0.15	-1.23
SWD							
AAA	65	10.39	3.08	3.00	18.00	0.09	-0.28
AAAA	76	10.24	2.33	5.00	17.00	0.15	-0.19
AAAAA	71	10.00	2.47	1.00	15.00	-0.63	1.44
EconDis Students							
AAA	65	53.40	18.00	15.00	93.00	0.05	-0.15
AAAA	76	49.00	19.09	6.00	82.00	-0.15	-0.68
AAAAA	71	41.76	22.85	4.00	87.00	0.06	-1.14
GHSGT Scores							
AAA	65	181.40	8.05	158.00	200.00	-0.38	0.58
AAAA	76	181.96	8.90	160.00	197.00	-0.39	-0.46
AAAAA	71	185.68	8.72	151.00	200.00	-0.99	2.10
Graduation Rate							
AAA	65	81.78	7.82	63.00	98.90	-0.21	-0.35
AAAA	76	81.22	7.92	60.70	96.70	-0.39	-0.33
AAAAA	71	85.69	6.96	64.30	100.00	-0.25	0.15

Note. Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

For classification AAA, the negative binomial regression model was statistically significant at the .001 level during all 3 years (see Table 25). For the schools competing in classification AAA during the 2008-09 school year, the negative binomial model was statistically significant, $\chi^2(5) = 787.18$, $p < .001$. The economically disadvantaged students and combined GHSGT scores variables were significant to the model. The economically disadvantaged students variable ($B = -0.22$, $p = .001$, odds ratio = 0.98, 95% CI = 0.97 to 0.99) was associated with a small decrease in Directors Cup points.

The combined GHSGT scores variable (*B* = 0.37, $p < .001$, odds ratio = 1.04, 95% CI = 1.03 to 1.05) was associated with a small increase in Directors Cup points.

For the schools competing in classification AAA during the 2009-10 school year, the negative binomial model was statistically significant, $\chi^2(5) = 771.50$, $p < .001$. The minority students, economically disadvantaged, and GHSGT scores variables were significant to the model. The percentage of minority students (*B* = -0.21, $p = .025$, odds ratio = 0.98, 95% CI = 0.96 to 1.00) and GHSGT scores variables (*B* = 0.02, $p < .001$, odds ratio = 1.05, 95% CI = 1.04 to 1.06) were associated with a slight increase in Directors Cup points. However, the economically disadvantaged students variable (*B* = -0.23, $p < .001$, odds ratio = 0.98, 95% CI = 0.97 to 0.99) were associated with a decrease in Directors Cup points.

The percentage of economically disadvantaged students and GHSGT scores variables were significant all 3 years. The percentage of minority students was significant to the model in 2009-10 and 2010-11. The graduation rate variable was significant in 2010-11.

Table 25

Comparisons of Negative Binomial Regression Models on Total Directors Cup Points for Schools Competing in Classification AAA Across the School Years 2008-11

	2008-09			2009-10			2010-11		
	B	*p*	*OR*	B	*p*	*OR*	B	*p*	*OR*
Overall Model		.000			.000			.000	
Minority Students	.01	.071	1.01	.01	.001	1.01	.01	.024	1.01
SWD	-.02	.307	0.98	-.03	.056	0.97	-.01	.835	1.00
EconDis Students	-.02	.001	0.98	-.02	.000	0.98	-.01	.049	0.99
GHSGT Scores	.04	.000	1.04	.04	.000	1.05	.03	.000	1.03
Graduation Rate	-.00	.691	1.00	-.02	.067	0.98	.02	.040	1.02

Note: Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the % of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

For Directors Cup points earned in football, boys basketball, baseball, and boys track in AAA schools, the negative binomial regression model was statistically significant for baseball and track during all 3 years. In 2008-09, the negative binomial regression model was significant for baseball, $\chi^2(5) = 21.21$, $p = .001$. The percentage of economically disadvantaged students variable ($B = -.03$, $p = .045$, odds ratio = 0.97, 95% CI = .936 to .999) was significant to the model and was associated with a slight decrease in Directors Cup points earned in baseball. The negative binomial regression model was significant for track, $\chi^2(5) = 18.83$, $p = .002$, as well in 2008-09. The percentage of minority students variable ($B = .03$, $p < .001$, odds ratio = 1.04, 95% CI = 1.02 to 1.05) was significant to the model and was associated with a small increase in Directors Cup points for track. The percentage of economically disadvantaged students ($B = -.04$, $p = .003$, odds ratio = 0.96, 95% CI = 0.93 to 0.99) was also significant to the model, but was associated with a decrease in Directors Cup points for track.

During 2009-10, the model was significant baseball, $\chi^2(5) = 26.12$, $p < .001$. The percentage of students with disabilities (B = -.18, p = .001, odds ratio = 0.84, 95% CI = 0.76 to 0.93) and percentage of economically disadvantaged students (B = -.03, p = .018, odds ratio = 0.97, 95% CI = .949 to .995) were significant to the model and were associated with a decrease in Directors Cup points earned in baseball. The GHSGT scores variable (B = .04, p = .003, odds ratio = 1.04, 95% CI = 1.01 to 1.06) was also significant to the model and was associated with a small increase in baseball Directors Cup points. Again in 2010-11, the model was significant, $\chi^2(5) = 20.30$, $p = .001$, and the percentage of minority students (B = -0.02, p = .035, odds ratio = .985, 95% CI = .97 to .99) and percentage of students with disabilities (B = 0.09, p = .034, odds ratio = .91, 95% CI = .84 to .99) were statistically significant to the model. Both variables were associated with a small decrease in Directors Cup points in baseball.

A Poisson regression model was significant for basketball, $\chi^2(5) = 15.36$, p = .009, during the 2009-10 school year. This was the only year the model was significant for basketball. The negative binomial regression model was not significant for football during the 3 years encapsulated in this study.

Table 26

Comparisons of Negative Binomial and Poisson Regression Estimates on Directors Cup Points Earned in Selected Boys Sports for Schools Competing in Classification AAA During the School Years 2008-11

	2008-09			2009-10			2010-11		
	B	*p*	*OR*	B	*p*	*OR*	B	*p*	*OR*
Football									
Overall Model		.503[a]			.754[a]			.585[a]	
Minority Students	.02	.100	1.02	.01	.104	1.01	.00	.607	1.00
SWD	.04	.509	1.04	-.02	.792	0.98	-.06	.261	0.94
EconDis Students	-.03	.054	0.97	-.02	.212	0.98	-.00	.833	1.00
GHSGT Scores	.02	.115	1.02	.02	.324	1.02	.00	.968	1.00
Graduation Rate	-.05	.088	0.95	-.04	.333	0.97	.01	.827	1.01
Basketball									
Overall Model		.264[a]			.183[a]			.000[b]	
Minority Students	.02	.034	1.02	.02	.055	1.02	.01	.212	1.01
SWD	-.06	.363	0.94	-.07	.244	0.93	.02	.455	1.02
EconDis Students	-.02	.267	0.98	-.01	.597	0.99	-.00	.774	1.00
GHSGT Scores	.02	.168	1.02	-.01	.683	0.99	.00	.541	1.00
Graduation Rate	-.03	.146	0.97	.01	.663	1.01	-.00	.689	1.00
Baseball									
Overall Model		.001[a]			.000[a]			.001[a]	
Minority Students	-.00	.854	1.00	-.00	.805	1.00	-.02	.035	0.99
SWD	-.10	.051	0.90	-.18	.001	0.84	-.09	.034	0.91
EconDis Students	-.03	.045	0.97	-.03	.018	0.97	-.02	.125	0.98
GHSGT Scores	.01	.281	1.01	.04	.003	1.04	.01	.176	1.01
Graduation Rate	-.00	.861	1.00	-.05	.057	0.95	.00	.933	1.00
Track									
Overall Model		.002[a]			.000[a]			.002[a]	
Minority Students	.03	.000	1.04	.00	.839	1.00	.02	.018	1.02
SWD	-.08	.228	0.93	-.08	.083	0.93	-.01	.912	0.99
EconDis Students	-.04	.003	0.96	.01	.201	1.01	-.03	.024	0.97
GHSGT Scores	.03	.077	1.03	-.01	.548	0.99	-.01	.304	0.99
Graduation Rate	-.05	.123	0.95	.03	.252	1.03	.04	.074	1.04

Note: [a] = Negative binomial regression; [b] = Poisson regression; Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

For Directors Cup points earned in the girls basketball, girls track, softball, and girls soccer in AAA schools, the negative binomial regression model was statistically significant for track, softball, and softball during all 3 years (see Table 27). For track, the percentage of minority students was significant during each year and was associated with a slight increase in Directors Cup points earned in track. In 2008-09, the negative binomial model was significant for track, $\chi^2(5) = 19.15$, $p = .002$. The percentage of minority students variable ($B = .03$, $p < .001$, odds ratio = 1.03, 95% CI = 1.02 to 1.05) was significant to the model and was associated with a small increase in Directors Cup points earned in track. The percentage of economically disadvantaged students variable ($B = -.04$, $p = .007$, odds ratio = 0.96, 95% CI = 0.94 to 0.99) was also significant to the model for track, however the variable was associated with a decrease in Directors Cup points earned in track. In 2009-10, the negative binomial regression model was significant for track, $\chi^2(5) = 11.32$, $p = .045$. The percentage of minority students variable ($B = .03$, $p = .008$, odds ratio = 1.03, 95% CI = 1.01 to 1.05) was significant to the model and was associated with a slight increase in Directors Cup points earned in track.

For softball, no predictor was significant in each year, though the percentage of economically disadvantaged students was significant in 2008-09 and 2009-10. The negative binomial regression model was significant, $\chi^2(5) = 25.86$, $p < .001$, during 2008-09. The percentage of economically disadvantaged students was significant to the model ($B = -.05$, $p = .002$, odds ratio = 0.95, 95% CI = 0.92 to 0.98) and was associated with a decrease in Directors Cup points earned in softball. The GHSGT scores variable ($B = .03$, $p = .039$, odds ratio = 1.03, 95% CI = 1.00 to 1.05) was also significant, but was associated with a small increase in Directors Cup points for softball. In 2009-10, the softball model was significant, $\chi^2(5) = 17.64$, $p = .003$. The percentage of economically disadvantaged students variable ($B = -.03$, $p = .013$, odds ratio = 0.97, 95% CI = 0.95 to

0.99) was significant to the model and was associated with a small decrease in Directors Cup points. By comparison, in 2010-11 the model for softball was significant at the .001 level while the percentage of minority students was significant to the model.

The negative binomial regression model was also statistically significant at the .001 level for soccer during the 3 years included in this study. The percentage of economically disadvantaged students variable was significant to the model in all 3 years and was associated with a small decrease in Directors Cup points earned in soccer. For 2008-09, the negative binomial regression model was significant, $\chi^2(5) = 28.61$, $p < .001$. The percentage of minority students ($B = 0.02$, $p = .026$, odds ratio = 1.02, 95% CI = 1.00 to 1.03) and the percentage of economically disadvantaged students ($B = -0.07$, $p < .001$, odds ratio = 0.93, 95% CI = 0.91 to 0.96) were significant to the model. The percentage of minority students was associated with a slight increase in Directors Cup soccer points, while the percentage of economically disadvantaged students was associated with small decrease in Directors Cup points earned in soccer. In 2009-10, the negative binomial regression model was significant, $\chi^2(5) = 51.44$, $p < .001$. The percentage of economically disadvantaged students ($B = -0.06$, $p < .001$, odds ratio = 0.94, 95% CI = 0.92 to 0.97) and the GHSGT scores variable ($B = 0.03$, $p = .015$, odds ratio = 1.03, 95% CI = 1.01 to 1.06) were each significant to the model. The GHSGT scores variable was associated with a small increase in Directors Cup points earned in soccer, while the percentage of economically disadvantaged students was associated with a slight decrease in soccer Directors Cup points.

Table 27

Comparisons of Negative Binomial Regression Estimates for Directors Cup Points Earned in Selected Girls Sports for Schools Competing in Classification AAA During the School Years 2008-11

	2008-09			2009-10			2010-11		
	B	*p*	*OR*	B	*p*	*OR*	B	*p*	*OR*
Basketball									
Overall Model		.530			.505			.356	
Minority Students	.01	.170	1.01	.01	.117	1.01	.01	.280	1.01
SWD	.00	.974	1.00	-.03	.651	0.98	-.09	.154	0.92
EconDis Students	-.02	.231	0.98	-.01	.506	0.99	-.00	.898	1.00
GHSGT Scores	.02	.046	1.02	.01	.415	1.01	-.00	.871	1.00
Graduation Rate	-.05	.024	0.96	-.03	.356	0.97	.01	.787	1.01
Track									
Overall Model		.002			.045			.002	
Minority Students	.03	.000	1.03	.03	.008	1.03	.03	.000	1.03
SWD	.01	.860	1.01	.01	.900	1.01	.02	.696	1.02
EconDis Students	-.04	.007	0.96	-.03	.188	0.97	-.02	.080	0.98
GHSGT Scores	.01	.603	1.01	.01	.497	1.01	-.01	.428	0.99
Graduation Rate	-.01	.796	0.99	-.02	.484	0.98	.02	.327	1.02
Softball									
Overall Model		.000			.003			.000	
Minority Students	-.01	.278	0.99	-.01	.112	0.99	-.03	.000	0.97
SWD	-.01	.899	0.99	-.05	.347	0.95	-.04	.405	0.96
EconDis Students	-.05	.002	0.95	-.03	.013	0.97	-.02	.239	0.98
GHSGT Scores	.03	.039	1.03	.03	.057	1.03	.01	.339	1.01
Graduation Rate	-.03	.179	0.97	-.04	.246	0.96	.01	.702	1.01
Soccer									
Overall Model		.000			.000			.000	
Minority Students	.02	.026	1.02	.02	.071	1.02	.00	.729	1.00
SWD	.01	.823	1.01	-.06	.229	0.94	-.04	.461	0.96
EconDis Students	-.07	.000	0.93	-.06	.000	0.94	-.04	.001	0.97
GHSGT Scores	.02	.074	1.02	.03	.015	1.03	.00	.697	1.00
Graduation Rate	-.03	.244	0.97	-.04	.142	0.96	.02	.427	1.02

Note: Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

For classification AAAA, the negative binomial regression was statistically significant at the .001 level across all 3 years (see Table 28). For the schools competing in classification AAAA during the 2008-09 school year, the negative binomial model was statistically significant, $\chi^2(5) = 881.61$, $p < .001$. The GHSGT scores variable was significant to the model and was associated with an increase in Directors Cup points (B = 0.03, $p < .001$, odds ratio = 1.03, 95% CI = 1.01 to 1.05).

For the schools competing in classification AAAA during the 2009-10 school year, the negative binomial model was statistically significant, $\chi^2(5) = 896.05$, $p < .001$. The GHSGT scores variable was significant to the model and was associated with an increase in Directors Cup points (B = 0.03, $p < .001$, odds ratio = 1.03, 95% CI = 1.02 to 1.04).

The GHSGT scores variable was significant each year covered by this study. The percentage of minority students and the percentage of economically disadvantaged students variables were significant in 2010-11. No other predictors were significant.

Table 28

Comparisons of Negative Binomial Regression Estimates on Total Directors Cup Points for Schools Competing in Classification AAAA during the School Years 2008-11

	2008-09			2009-10			2010-11		
	B	*p*	*OR*	B	*p*	*OR*	B	*p*	*OR*
Overall Model		.000			.000			.000	
Minority Students	-.00	.485	1.00	-.01	.134	0.99	.01	.031	1.01
SWD	-.01	.781	0.99	-.05	.153	0.96	.03	.522	1.03
EconDis Students	-.01	.146	0.99	.00	.963	1.00	-.02	.011	0.98
GHSGT Scores	.03	.000	1.03	.03	.000	1.03	.03	.000	1.03
Graduation Rate	.01	.466	1.01	.02	.131	1.02	.01	.336	1.01

Note: Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

For Directors Cup points earned in the selected boys sports in classification AAAA, the negative binomial regression model was statistically significant at the .001 level for baseball during all 3 years included in the study. The negative binomial regression model was significant for basketball and track as well during the 2009-10 and 2010-11 school years (see Table 29).

For baseball, the negative binomial model was significant during 2008-09 [$\chi^2(5) = 38.08$, $p < .001$], 2009-10 [$\chi^2(5) = 23.03$, $p < .001$], and 2010-11 [$\chi^2(5) = 21.20$, $p = .001$]. Though the percentage of minority students variable was approaching significance each year ($p < .08$), none of the predictors were significant to the model at the .05 level during any of the 3 years reported. Similarly, the negative binomial regression model was significant for track during 2009-10 [$\chi^2(5) = 15.86$, $p = .007$] and 2010-11 [$\chi^2(5) = 17.62$, $p = .003$]. However, again none of the predictors were significant to the model.

The negative binomial regression model for basketball was significant during the 2009-10 [$\chi^2(5) = 13.26$, $p = .021$] and 2010-11 school years [$\chi^2(5) = 12.93$, $p = .024$]. The percentage of minority students was significant to the model both years and was associated with a slight increase in Directors Cup points earned in boys basketball.

Table 29

Comparisons of Negative Binomial Regression Estimates for Directors Cup Points Earned in Selected Boys Sports for Schools Competing in Classification AAAA during the School Years 2008-11

	2008-09			2009-10			2010-11		
	B	*p*	*OR*	B	*p*	*OR*	B	*p*	*OR*
Football									
Overall Model		.147			.454			.212	
Minority Students	.02	.024	1.02	.02	.141	1.02	.01	.202	1.01
SWD	.05	.484	1.06	.01	.876	1.01	-.01	.882	0.99
EconDis Students	-.02	.271	0.98	-.01	.606	0.99	-.02	.260	0.98
GHSGT Scores	.00	.835	1.00	-.00	.795	1.00	-.01	.421	0.99
Graduation Rate	-.02	.395	0.98	-.00	.943	1.00	.02	.380	1.02
Basketball									
Overall Model		.215			.021			.024	
Minority Students	.02	.052	1.02	.03	.003	1.03	.03	.033	1.03
SWD	-.01	.919	0.99	.00	.952	1.00	.00	.989	1.00
EconDis Students	-.01	.593	0.99	-.02	.315	0.99	-.02	.421	0.99
GHSGT Scores	.00	.804	1.00	-.01	.211	0.99	-.00	.908	1.00
Graduation Rate	-.02	.471	0.98	.02	.486	1.02	-.01	.616	0.99
Baseball									
Overall Model		.000			.000			.001	
Minority Students	-.02	.065	0.98	-.02	.062	0.98	-.02	.075	0.98
SWD	-.02	.698	0.98	-.07	.431	0.94	.04	.575	1.04
EconDis Students	-.03	.088	0.97	-.01	.474	0.99	-.01	.655	0.99
GHSGT Scores	.01	.643	1.01	.02	.139	1.02	-.01	.258	0.97
Graduation Rate	.01	.721	1.01	-.01	.632	0.99	.04	.190	1.04
Track									
Overall Model		.076			.007			.003	
Minority Students	-.01	.385	0.99	.01	.320	1.01	.00	.522	1.00
SWD	.04	.557	1.04	.02	.720	1.02	.05	.297	1.06
EconDis Students	.01	.571	1.01	-.00	.844	1.00	-.01	.583	1.00
GHSGT Scores	-.01	.466	0.99	.00	.701	1.00	-.01	.198	0.99
Graduation Rate	.02	.396	1.02	-.01	.661	0.99	.02	.153	1.02

Note: Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

For Directors Cup points earned in the selected girls sports in AAAA schools, the regression models were statistically significant for softball and soccer during each of the

3 years covered by this study. For track, the negative binomial regression model was significant in 2009-10 and 2010-11 (see Table 30).

The negative binomial model was significant for track in 2009-10, $\chi^2(5) = 16.10$, $p = .007$. However, none of the predictor variables were significant to the model during that year. As discussed in the results for research question 3 above, the model was significant as well in 2010-11. During that year, the percentage of minority students and percentage of economically disadvantaged students were significant to the model.

For softball, the negative binomial regression model was significant in 2008-09 [$\chi^2(5) = 32.94$, $p < .001$], and the percentage of minority students ($B = -.03$, $p = .018$, odds ratio = .972, 95% CI = .950 to .995) was significant to the model. In 2009-10, the negative binomial regression model was significant [$\chi^2(5) = 40.26$, $p < .001$], and the percentage of minority students ($B = -.04$, $p < .001$, odds ratio = 0.96, 95% CI = 0.94 to 0.98) was significant to the model. The same was the case in 2010-11 as well. During each of those years, the percentage of minority students was associated with a slight decrease in Directors Cup points earned in softball.

For soccer, the count regression models were statistically significant for soccer during all 3 years. During those years, the percentage of economically disadvantaged students was significant to the model and was associated with decreased Directors Cup points earned in soccer. In 2008-09, a negative binomial regression model was significant, $\chi^2(5) = 24.29$, $p < .001$. The percentage of economically disadvantaged students ($B = -0.04$, $p = .034$, odds ratio = .958, 95% CI = .920 to .997) was significant to the model. In 2009-10, a Poisson regression model was significant, $\chi^2(5) = 63.45$, $p <$

.001. The percentage of economically disadvantaged students was significant to the model (*B* = -.03, p = .015, odds ratio = 0.97, 95% CI = 0.94 to 0.99).

Table 30

Comparisons of Negative Binomial and Poisson Regression Estimates for Directors Cup Points Earned in Selected Girls Sports for Schools Competing in Classification AAAA during the School Years 2008-11

	2008-09			2009-10			2010-11		
	B	*p*	*OR*	B	*p*	*OR*	B	*p*	*OR*
Basketball									
Overall Model		.081[a]			.447[a]			.080[a]	
Minority Students	.02	.141	1.02	.01	.415	1.01	.03	.009	1.03
SWD	-.06	.492	0.95	-.10	.214	0.90	.05	.582	1.06
EconDis Students	-.01	.789	0.99	-.00	.962	1.00	-.03	.072	0.97
GHSGT Scores	.01	.568	1.01	.01	.626	1.01	-.00	.859	1.00
Graduation Rate	-.03	.323	0.97	-.01	.703	0.99	-.01	.600	0.99
Track									
Overall Model		.095[a]			.007[a]			.000[a]	
Minority Students	.01	.438	1.01	.00	.721	1.00	.02	.001	1.02
SWD	.01	.897	1.01	-.08	.262	0.93	-.04	.400	0.96
EconDis Students	-.01	.576	0.99	-.00	.789	1.00	-.02	.038	0.98
GHSGT Scores	-.00	.707	1.00	-.01	.357	0.99	-.00	.696	1.00
Graduation Rate	.01	.576	1.01	.04	.116	1.04	.01	.277	1.01
Softball									
Overall Model		.000[a]			.000[a]			.002[a]	
Minority Students	-.03	.018	0.97	-.04	.000	0.96	-.02	.016	0.98
SWD	-.03	.627	0.97	-.00	.966	1.00	.07	.387	1.08
EconDis Students	-.01	.628	0.99	-.01	.682	1.00	-.01	.412	0.99
GHSGT Scores	-.01	.513	0.99	.01	.111	1.01	.00	.936	1.00
Graduation Rate	.04	.202	1.04	-.01	.580	0.99	.00	.921	1.00
Soccer									
Overall Model		.000[a]			.000[b]			.000[a]	
Minority Students	-.00	.867	1.00	-.02	.096	0.99	.01	.350	1.01
SWD	-.01	.802	0.99	-.09	.076	0.91	-.03	.558	0.97
EconDis Students	-.04	.034	0.96	-.03	.015	0.97	-.07	.000	0.94
GHSGT Scores	.02	.255	1.02	.02	.074	1.02	.03	.000	1.03
Graduation Rate	-.02	.547	0.98	-.01	.692	0.99	-.04	.022	0.96

Note: [a] = Negative binomial regression; [b] = Poisson regression; Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

For classification AAAAA, the negative binomial regression was statistically significant at the .001 level during all 3 years included in this study. The graduation rate variable was significant to the model in the 2008-09 and 2010-11 school years. The percentage of students with disabilities was significant to the model in 2008-09. In each case, those variables were associated with increased Directors Cup points. None of the predictor variables were significant to the model during 2009-10 (see Table 31).

For the schools competing in classification AAAAA during the 2008-09 school year, the negative binomial regression model was statistically significant, $\chi^2(5) = 893.92$, $p < .001$. The percentage of students with disabilities ($B = 0.07$, $p = .039$, odds ratio = 1.07, 95% CI = 1.00 to 1.14) was significant to the model and was associated with a small increase in total Directors Cup points. The graduation rate variable was also significant to the model and was associated with a small increase in Directors Cup points ($B = 0.06$, $p < .001$, odds ratio = 1.07, 95% CI = 1.05 to 1.08). For the schools competing in classification AAAAA during the 2009-10 school year, the negative binomial model was statistically significant, $\chi^2(5) = 884.20$, $p < .001$, though none of the predictors were significant to the model.

Table 31

Comparisons of Negative Binomial Regression Models on Total Directors Cup Points for Schools Competing in Classification AAAAA during the School Years 2008-11

	2008-09			2009-10			2010-11		
	B	*p*	*OR*	B	*p*	*OR*	B	*p*	*OR*
Overall Model		.000			.000			.000	
Minority Students	-.01	.051	0.99	.00	.980	1.00	-.01	.326	0.99
SWD	.07	.039	1.07	.04	.246	1.04	-.03	.559	0.97
EconDis Students	.00	.658	1.00	-.01	.117	0.99	.00	.683	1.00
GHSGT Scores	.00	.561	1.00	.02	.121	1.02	.02	.000	1.03
Graduation Rate	.06	.000	1.07	.03	.314	1.03	.03	.017	1.03

Note: Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

For Directors Cup points earned in the selected boys sports in classification AAAAA, the negative binomial regression model was statistically significant for track during each of the 3 years included in this study (see Table 32). The negative binomial regression model was significant for baseball during 2008-09 and 2010-11. The model was also significant for basketball, $\chi^2(5) = 14.21$, $p = .014$, during the 2009-10 school year only, but none of the predictor variables were significant.

During the 2008-09 school year, the omnibus test results for baseball were $\chi^2(5) = 23.52$, $p < .001$. The percentage of minority students ($B = -0.03$, $p = .041$, odds ratio = .972, 95% CI = .946 to .999) and percentage of students with disabilities ($B = 0.16$, $p = .005$, odds ratio = 1.17, 95% CI = 1.05 to 1.31) were significant to the model. The percentage of minority students was associated with a slight decrease in Directors Cup points earned in baseball, but the percentage of students with disabilities was associated with a slight increase in baseball Directors Cup points.

For track during 2008-09, the negative binomial regression model was significant, $\chi^2(5) = 29.69$, $p < .001$. The GHSGT scores ($B = -0.01$, $p = .006$, odds ratio = .987, 95% CI = .977 to .996) and graduation rate variables ($B = 0.03$, $p = .010$, odds ratio = 1.03, 95% CI = 1.01 to 1.06) were significant to the model. GHSGT scores were associated with a slight decrease in Directors Cup points, while the graduation rate variable was associated with a small increase in Directors Cup points earned in track. For 2009-10, the model was again significant, $\chi^2(5) = 32.62$, $p < .001$, however none of the predictor variables were significant to the model.

Table 32

Comparisons of Negative Binomial Regression Estimates on Directors Cup Points Earned in Selected Boys Sports for Schools Competing in Classification AAAAA during the School Years 2008-11

	2008-09			2009-10			2010-11		
	B	*p*	*OR*	B	*p*	*OR*	B	*p*	*OR*
Football									
Overall Model		.065			.479			.553	
Minority Students	-.03	.056	0.97	-.01	.572	0.99	-.01	.259	0.99
SWD	.04	.573	1.04	.06	.395	1.06	.13	.115	1.14
EconDis Students	.02	.413	1.02	-.01	.840	1.00	.00	.977	1.00
GHSGT Scores	-.01	.256	0.99	.02	.429	1.02	-.01	.609	0.99
Graduation Rate	.03	.165	1.03	-.04	.403	0.96	.01	.731	1.01
Basketball									
Overall Model		.663			.014			.729	
Minority Students	.01	.401	1.01	.01	.378	1.01	.00	.747	1.00
SWD	-.04	.622	0.96	-.15	.058	0.86	-.11	.270	0.89
EconDis Students	-.01	.635	0.99	.02	.302	1.02	.01	.581	1.01
GHSGT Scores	.02	.210	1.02	.00	.953	1.00	-.01	.497	0.99
Graduation Rate	-.04	.209	0.96	-.01	.905	0.99	.03	.275	1.03
Baseball									
Overall Model		.000			.322			.032	
Minority Students	-.03	.041	0.97	-.01	.716	1.00	-.02	.086	0.98
SWD	.16	.005	1.17	-.02	.793	0.98	.03	.722	1.03
EconDis Students	-.01	.712	0.99	-.01	.619	0.99	.01	.381	1.01
GHSGT Scores	-.00	.667	1.00	.01	.700	1.01	-.02	.176	0.98
Graduation Rate	.00	.816	1.00	-.02	.807	0.99	.05	.084	1.05
Track									
Overall Model		.000			.000			.000	
Minority Students	.02	.091	1.02	.02	.078	1.02	.01	.324	1.01
SWD	.03	.540	1.03	.05	.313	1.05	-.00	.970	1.00
EconDis Students	-.02	.082	0.98	-.02	.162	0.98	-.02	.295	0.98
GHSGT Scores	-.01	.006	0.99	-.03	.095	0.97	.00	.816	1.00
Graduation Rate	.03	.010	1.03	.07	.079	1.07	.01	.733	1.01

Note: Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

For the Directors Cup points earned in the selected girls sports in AAAAA schools, the negative binomial and Poisson regression models were statistically significant for track, softball, and soccer during each of the 3 years included in this study. The omnibus test results for track were $\chi^2(5) = 29.56$, $p < .001$ in 2008-09, and $\chi^2(5) = 25.91$, $p < .001$ in 2009-10. While none of the predictors were significant in 2010-11, the percentage of minority students was significant to the model during 2008-09 ($B = 0.03$, $p = .035$, odds ratio = 1.03, 95% CI = 1.00 to 1.05) and 2009-10 ($B = 0.03$, $p = .048$, odds ratio = 1.03, 95% CI = 1.00 to 1.05). During those two years, the percentage of minority students was associated with a small increase in Directors Cup points. The percentage of economically disadvantaged students ($B = -0.04$, $p = .039$, odds ratio = .964, 95% CI = .932 to .998) was significant to the model in 2008-09 only and was associated with earning fewer Directors Cup points in track.

For softball, the Poisson regression model was significant during 2008-09, $\chi^2(5) = 26.68$, $p < .001$. A negative binomial regression model was statistically significant during 2009-10, $\chi^2(5) = 15.23$, $p = .009$. The GHSGT scores variable was significant to the model in 2008-09 ($B = 0.03$, $p = .046$, odds ratio = 1.03, 95% CI = 1.00 to 1.06) and 2009-10 ($B = -0.05$, $p = .017$, odds ratio = 0.95, 95% CI = 0.91 to 0.99). During 2008-09, GHSGT scores were associated with increased Directors Cup points, while in 2009-10 they was associated with decreased Directors Cup points earned in softball. Similarly, graduation rate was significant during both of those years, yet during 2008-09 graduation rate was associated with lower Directors Cup points ($B = -0.06$, $p = .041$, odds ratio = .945, 95% CI = .896 to .998) and was associated with higher Directors Cup points in 2009-10 ($B = 0.10$, $p = .014$, odds ratio = 1.11, 95% CI = 1.02 to 1.20). As discussed in the results for Research Question 3, the Poisson regression model was also significant in 2010-11. However, the percentages of minority students and students with disabilities were the significant predictors during that year.

The count models for soccer were significant during each of the 3 years covered by this study. The Poisson regression model was significant in 2008-09, $\chi^2(5) = 32.92$, $p < .001$, and 2010-11. The negative binomial regression model was significant in 2009-10, $\chi^2(5) = 22.36$, $p < .001$. However, in each of those 3 years, none of the predictor variables were significant.

Table 33

Comparisons of Negative Binomial and Poisson Regression Estimates on Directors Cup Points Earned in Selected Girls Sports for Schools Competing in Classification AAAAA during the School Years 2008-11

	2008-09			2009-10			2010-11		
	B	*p*	*OR*	B	*p*	*OR*	B	*p*	*OR*
Basketball									
Overall Model		.170[a]			.112[a]			.926[a]	
Minority Students	.00	.742	1.00	.02	.194	1.02	.01	.175	1.01
SWD	-.09	.213	0.92	-.15	.074	0.86	.01	.936	1.01
EconDis Students	.02	.200	1.02	-.00	.855	1.00	-.02	.227	0.98
GHSGT Scores	.00	.893	1.00	.03	.245	1.03	.00	.885	1.00
Graduation Rate	-.01	.768	0.99	-.06	.266	0.94	-.00	.842	1.00
Track									
Overall Model		.000[a]			.000[a]			.000[a]	
Minority Students	.03	.035	1.03	.03	.048	1.03	.02	.076	1.02
SWD	-.01	.829	0.99	-.01	.878	0.99	-.09	.251	0.92
EconDis Students	-.04	.039	0.96	-.03	.109	0.97	-.02	.127	0.98
GHSGT Scores	-.01	.078	0.99	-.02	.415	0.99	.01	.206	1.01
Graduation Rate	.04	.057	1.04	.04	.336	1.04	-.01	.579	0.99
Softball									
Overall Model		.000[b]			.009[a]			.000[b]	
Minority Students	-.01	.510	0.99	-.02	.212	0.98	-.02	.015	0.98
SWD	.07	.313	1.07	.14	.070	1.15	.13	.035	1.14
EconDis Students	-.02	.314	0.98	-.01	.801	1.00	-.00	.836	1.00
GHSGT Scores	.03	.046	1.03	-.05	.017	0.95	-.01	.407	0.99
Graduation Rate	-.06	.041	0.95	.10	.014	1.11	.02	.302	1.02
Soccer									
Overall Model		.000[b]			.000[a]			.000[b]	
Minority Students	-.02	.250	0.98	-.01	.670	0.99	-.01	.328	0.99
SWD	.02	.681	1.02	.03	.636	1.03	-.04	.453	0.96
EconDis Students	-.01	.627	0.99	-.02	.322	0.98	-.03	.059	0.97
GHSGT Scores	-.01	.091	0.99	-.02	.471	0.98	.01	.336	1.01
Graduation Rate	.03	.051	1.03	.06	.385	1.06	-.00	.881	1.00

Note: [a] = Negative binomial regression; [b] = Poisson regression; Minority Students = % of students identified as minority; SWD = % of students with disabilities; EconDis Students = % of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT; Graduation Rate = % of students who graduated with their cohort.

Summary of Findings

The purpose of this study was to determine if the selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) similarly predict both academic and athletic success at the school-level. The study also determined if a significant difference exists between academically high-performing and low-performing schools in their athletic departments' achievement. Four research questions guided this study.

For Research Question 1, logistic regression was used to determine how well the selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) predicted a school's academic performance. The regression model was applied to the schools that competed in GHSA classifications AAA, AAAA, and AAAAA during the 2010-11 school year. For the schools in classification AAA, the logistic regression model was significant at the .001 level and explained 67.9% of the variance between high-performing and low-performing schools. The logistic regression model was also significant at the .001 level for the schools in classification AAAA explaining 55% of the variance. For the schools in classification AAAAA, the model was significant at the .001 level and explained 82.7% of the variance.

No single predictor variable was significant to the logistic regression model across all three classifications. However, the percentage of minority students and graduation rate variables were significant in classifications AAA and AAAAA. The

GHSGT scores variable was significant in classifications AAA and AAAA. The percentage of students with disabilities was significant in classification AAAAA.

To answer Research Question 2, a Mann-Whitney U test was used to determine if a significant difference exists between academically high-performing schools and academically low-performing schools in athletics. A significant difference at the .01 level was found on total Directors Cup points between high-performing and low-performing schools in classification AAA. A significant difference at the .001 level was found on total Directors Cup points between high-performing and low-performing schools in classification AAAA. There was not a significant difference between high-performing and low-performing schools in classification AAAAA. In classification AAA, significant differences between high-performing and low-performing schools were found in baseball (p = .02) and girls soccer (p = .001). In classification AAAA, significant differences between high-performing and low-performing schools were found in baseball (p = .04), girls track (p = .001), softball (p = .028), and girls soccer (p = .002). There were no significant differences between high-performing and low-performing schools in any of the selected sports in classification AAAAA.

For Research Question 3, count model regression (negative binomial regression and Poisson regression) was utilized to determine how well the selected school-level variables predict a school's athletic performance. The regression model chosen was based upon how well the model fit the data. The negative binomial regression model was significant at the .001 level for all three GHSA classifications included in the study. The GHSGT scores variable was significant to the model in each classification. The percentage of minority students and the percentage of economically disadvantaged variables were significant to the model for classifications AAA and AAAA. The graduation rate variable was significant for classifications AAA and AAAAA.

In classification AAA, the negative binomial regression was significant for boys basketball, baseball, boys track, girls track, softball, and girls soccer. None of the predictor variables were significant for boys basketball. The percentage of minority students was significant for baseball, boys track, girls track, and softball. The percentage of economically disadvantaged students was significant for boys track and girls soccer. The percentage of students with disabilities was significant for baseball.

In classification AAAA, a negative binomial regression model was significant for boys basketball, baseball, boys track, girls track, softball, and girls soccer. The percentage of minority students was significant for boys basketball, girls track, and softball. The percentage of economically disadvantaged students was significant for girls track and girls soccer. The GHSGT scores and graduation rate were significant for girls soccer. None of the predictor variables were significant for baseball or boys track.

In classification AAAAA, the negative binomial regression model was significant for baseball and boys track, but none of the predictor variables were significant to the model. The Poisson regression model was significant for softball and girls soccer. The percentage of minority students and the percentage of students with disabilities were significant for softball. None of the predictors were significant for girls soccer.

Research Question 4 involved cross-validation of the regression models used to answer Research Question 3 using data from the two previous school years (2008-09 and 2009-10). The negative binomial regression model was significant at the .001 level for total Directors Cup points in each classification during all 3 years included in this study.

For classification AAA, the percentage of economically disadvantaged students and GHSGT scores were significant during all 3 years. The percentage of minority students was significant during the 2009-10 and 2010-11 school years, while graduation rate was significant during 2010-11 only. For classifications AAAA, the GHSGT scores again were significant to the model during all 3 years in the study. The percentages of minority students and economically disadvantaged students were significant in 2010-11 only. For classification AAAAA, graduation rate was significant during the 2008-09 and 2010-11 school years, while the GHSGT scores were only significant to the model during 2010-11.

The negative binomial and Poisson regression models were also significant for softball and girls soccer in all three classifications during each of the 3 years studied. The negative binomial regression model for baseball was significant across all 3 years in classifications AAA and AAAA, and was also significant in classification AAAAA during the 2008-09 and 2010-11 school years. The negative binomial and Poisson regression models for boys and girls track were significant during all 3 years in classifications AAA and AAAAA, and were significant in two of the 3 years in classification AAAA.

Chapter V

SUMMARY AND DISCUSSION

This chapter presents a summary of the study. An overview is presented of the reasoning behind the study and the related literature. The research methods employed, including the participant schools, the predictor variables, and the statistical procedures used are summarized. The study concludes with a discussion of the findings, limitations of the study, and implications for future research.

Overview of the Study

Balfanz, Legters, West, and Weber (2007) influenced the conceptual framework for this study. The authors proposed three sources of influence on a school's academic performance. Two of those sources were federal and state regulations that apply to all schools equally. The authors identified the third source as school-level variables. Those variables are what make each school unique.

The purpose of this study was to determine if selected school-level variables could predict a school's academic and athletic performance. Those school-level variables included the percentage of minority students, percentage of students with disabilities, percentage of economically disadvantaged students, Georgia High School Graduation Test scores, and graduation rates.

This study sought to determine if those variables could predict whether as school was categorized as high-performing or low-performing. The study also sought to determine how well those same variables predict a school's athletic performance. Additionally, the athletic performance of academically high-performing and low-performing schools was compared to determine if significant differences exist.

To fulfill the stated purpose, four research questions were developed to guide the study:

1. Are selected school level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's academic performance for the 2011-12 academic year?
2. Is there a significant difference between high performing and low performing schools on the total number of Directors Cup points earned for the 2011-12 academic year?
    a. Is there a significant difference between high performing and low performing schools on the total number of Directors Cup points earned in boys football, basketball, baseball, and track for the 2011-12 academic year?
    b. Is there a significant difference between high performing and low performing schools on the total number of Directors Cup points earned in girls basketball, track, softball, and soccer for the 2011-12 academic year?
3. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's total Directors Cup points for the 2011-12 academic year?
    a. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically

disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's playoff performance in boys football, basketball, baseball, and track for the 2011-12 academic year?

   b. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's playoff performance in girls basketball, track, softball, and soccer for the 2011-12 academic year?

4. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's total Directors Cup points for the academic years 2008-09 and 2009-10?
   a. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's playoff performance in boys football, basketball, baseball, and track for the academic years 2008-09 and 2009-10?
   b. Are selected school-level variables (percentage of minority students; percentage of students with disabilities; percentage of economically disadvantaged students; math and English/Language Arts GHSGT scores; graduation rate) significant predictors of a school's playoff performance in girls basketball, track, softball, and soccer for the academic years 2008-09 and

2009-10?

Related Literature

For decades, a debate over the appropriate role of athletics in the school environment was waged between supporters and critics. Supporters of interscholastic athletics argued the health and discipline benefits of athletics made it beneficial for students to participate in order to develop the whole person (Gullick, 1910; Hawes, 1924; Holmes, 1909; Howe, 1923; Pickell, 1920; Robertson, 1937; Wiley, 1925). Critics argued athletics brought out the worst in students and the community, siphoned much needed resources away from academics, and negatively impacted the non-athlete (Atkinson, 1939; Booth, 1928; Gould, 1920; Hall, 1905; Pangle, 1956; Parlin, 1903; Prettyman, 1905; Tawney, 1904; Wade; 1909; Waldo, 1903).

As interscholastic athletics became more acceptable, the debate turned to the affects of athletics on academic success. Studies began to focus on whether athletic participation positively or negatively affected the academic performance of a student-athlete (Broh, 2002; Coleman, 1961; Eitle & Eitle, 2002; Hanks & Eckland, 1976; Hauser & Lueptow, 1978; Linnenbrink & Pintrich, 2002; Lipscomb, 2006; Maloney & McCormick, 1993; Picou, 1978; Purdy, Eitzen, & Hufnagle, 1982; Spady, 1970; Spreitzer & Pugh 1973). In a majority of studies, athletic participation was found to have at least some level of positive affect on academic performance for student-athletes.

Many studies have profiled the affect of socioeconomic resources on academic performance (Bond; 1981, Chudgar & Luschei, 2009; Duncan & Magnuson, 2005; Epps, 1995; Ream & Palardy, 2008; Sirin; 2005). A majority of studies found socioeconomic status of the student body to be an important predictor of academic performance. This is true at the school level and individual student level. A positive correlation was also found between SES and athletic performance (Brady & Sylwester, 2004; Heeter, 2011; Monaghan, 2012; Rosen, 2011).

Several studies have found the size of a school's enrollment often predicts academic and athletic performance (Fowler & Walberg, 1991; Kershaw and Blank, 1993; Kuziemko, 2006; Robinson-Lewis, 1991; Sander, 1993; Walberg, 1992; Walberg & Walberg, 1994). Academically, the target enrollment size found to produce the best academic achievement was between 600-900 students (Lee & Smtih, 1997). For the purposes of this study however, schools were compared within the GHSA classifications in which they compete athletically. These classifications were based on enrollment, so the affects of enrollment size were mitigated since the schools were of similar size.

The affects of racial demographics on a school's academic performance have been studied primarily in relation to achievement gaps (Harris, 2007; Kim & Sunderman, 2007; Strutchens, Lubienski, McGraw, & Westbrook, 2004). Studies generally find gaps between White and minority students in many facets of academic performance including standardized testing and graduation rates. Athletically, participation gaps exist between White and minority students as well (Comeaux & Harrison, 2004; Eitle & Eitle, 2002; Lapchick & Mathews, 1999; Price, 1997). Schools lacking racial diversity often find it difficult to field competitive teams in all sports.

The number of students with disabilities enrolled at a school was found to affect a school's overall academic performance (Cawthon, 2007; Eckes & Swando, 2009). The requirements of accountability measures place very high standards of achievement on students with disabilities that schools often struggle to meet. However, students with disabilities who are physically capable often participate in interscholastic athletics (Fetter-Harrott & Steketee, 2008; Simeonsson, Carlson, Huntington, McMillen, & Brent, 2001). Indeed, it is not uncommon for students with disabilities to excel in athletics.

Methods

A nonexperimental multivariate ex post facto correlational design and a group comparison design were utilized. This design was necessary as variables could not be manipulated, samples could not be randomized, and data were gathered from completed events. Logistic regression was used to identify the variables most likely to predict academic performance. Differences between high and low performing schools on athletic performance were measured using a Mann-Whitney U test. Negative binomial and Poisson regression models were employed to measure the predictive ability of the selected school-level variables on a school's athletic performance. All statistical procedures were completed using SPSS version 21.

Participants

The population examined in this study included all Georgia public high schools competing in the GHSA classifications AAAAA, AAAA, and AAA during the academic years 2008-2010. The GHSA based the classifications on enrollment numbers. Classifications AA and A were excluded from the study due to the large numbers of private schools in those divisions. Private schools did not fit in the study as they did not have the same accountability measures as public schools. Outlier cases and multi-campus schools were also eliminated from the study.

Variables Studied

The predictor variables were the percentage of minority students, percentage of students with disabilities, percentage of economically disadvantaged students, combined math and English/Language Arts GHSGT scores, and the graduation rate. The graduation rate for 2010-11 school year was calculated using percentage of students who finished their degree requirements in 4 years total. Earlier graduation data was calculated as the percentage of students who graduated from high school in that year, regardless of how many years it took to do so. GHSGT scores were reported as the sum of the percentage of students who met or exceeded standards on the Math and Language Arts tests.

The dependent variables were academic performance, Directors Cup points, and playoff performance. Cases were classified as high-performing schools and low-performing schools for academic performance. The Directors Cup points were the total number of points earned by each school for each academic year in all 17 eligible sports. Eight individual sports were also chosen for analysis in Questions 2, 3, and 4. Those sports were football, baseball, boys and girls basketball, boys and girls track, girls soccer, and softball. Those eight sports were the top four boys and girls sports measured by participation. Playoff performance was measured as a count of the number of playoff games a team appeared in. Track performance was measured as a count of the number of events each school placed at the state finals.

Procedures

After the Institutional Review Board for Valdosta State University granted permission to conduct the research, the data for this study was collected from four sources: (a) the Accountability Report Cards for each school as reported by the Georgia Department of Education, (b) National Center for Education Statistics, (c) the Regions Directors Cup rankings as reported by the Georgia Athletic Directors Association (GADA), and (d) Georgia Prep Country website. Each school's accountability report card contained data relating to each school's GHSGT results by subgroup, graduation rate by subgroup, and GHSGT participation rate.

The Directors Cup points were gathered from the GADA. Specific point totals for individual sports are found on the website for the 2009-10 and 2010-11 academic years. Hardcopies of the individual sport totals for the 2008-09 academic year were obtained from the GADA. Additional athletic data were gathered from the Georgia Prep Country website.

Logistic regression was used to determine how well the selected school-level variables (percentage of minority students, percentage of students with disabilities, percentage of economically disadvantaged students, combined math and English/Language Arts GHSGT scores, and graduation rate) predicted a school's academic performance classified as high-performing and low-performing. A Mann-Whitney U test was used to measure differences between academically high-performing schools and low-performing schools on athletic performance as determined by total Directors Cup points and points earned in eight different sports. Negative binomial and Poisson regression were used to determine how well the selected school-level variables predicted a school's athletic performance as measured by total Directors Cup points and playoff performance in eight different sports. The negative binomial regression model was cross-validated using data from two prior school years.

Summary of the Findings

Research Question 1 sought to determine if the selected school-level variables percentage of minority students, percentage of students with disabilities, percentage of economically disadvantaged students, math and English/Language Arts GHSGT scores, and graduation rate predicted the academic performance of schools that competed in GHSA classifications AAA, AAAA, and AAAAA during the 2010-11 school year. The logistic regression model was significant for each classification. The model correctly predicted more than 82% of cases in each classification. The percentage of minority students was a significant predictor for schools in AAA and AAAAA. The percentage of students with disabilities was significant for schools in AAAAA. GHSGT scores were a significant predictor in AAA and AAAA. Graduation rate was a significant predictor for schools in AAA and AAAAA. Surprisingly, the percentage of economically disadvantaged students was not significant in any classification (see Table 34).

Table 34

Summary of Logistic Regression Analysis for Variables Predicting a School's Academic Performance for Schools Competing in Classifications AAA, AAAA, and AAAAA

					95% Confidence Interval	
Variable	B	*SE*	Sig.	*OR*	*LL*	*UL*
Minority Students						
AAA	0.05	0.02	.008	1.06	1.01	1.10
AAAA	0.01	0.02	.366	1.02	0.98	1.05
AAAAA	0.13	0.06	.023	1.14	1.02	1.27
SWD						
AAA	-0.03	0.15	.840	0.97	0.73	1.29
AAAA	-0.26	0.19	.158	0.77	0.54	1.11
AAAAA	-1.82	0.90	.043	0.16	0.03	0.94
EconDis Students						
AAA	-0.03	0.04	.380	0.97	0.90	1.04
AAAA	-0.01	0.04	.801	0.99	0.91	1.07
AAAAA	-0.05	0.06	.390	0.95	0.84	1.07
GHSGT Scores						
AAA	0.21	0.07	.003	1.24	1.08	1.43
AAAA	0.11	0.06	.047	1.12	1.00	1.25
AAAAA	0.18	0.11	.101	1.20	0.97	1.49
Graduation Rate						
AAA	0.13	0.05	.012	1.14	1.03	1.27
AAAA	0.06	0.05	.195	1.06	0.97	1.17
AAAAA	0.37	0.14	.007	1.44	1.10	1.89

Note. LL = lower limit; *UL* = upper limit; Minority Students = percentage of students identified as minority; SWD = percentage of students with disabilities; EconDis Students = percentage of economically disadvantaged students as identified by eligibility for free/reduced lunch; GHSGT Scores = sum of the percentages of students who met or exceeded state standards on the Math and English/Language Arts portions of the GHSGT.

Research Question 2 sought to determine if academically high-performing and low-performing schools differ significantly in terms of athletic performance. A Mann-Whitney U test was conducted on overall Directors Cup points and the four most popular boys and girls sports (football, boys and girls basketball, boys and girls track, baseball, softball, and girls soccer) in GHSA classifications AAA, AAAA, and AAAAA. The Mann-Whitney U test revealed that schools in classification AAA and AAAA do differ significantly in overall Directors Cup points, baseball, and girls soccer. High-performing and low-performing schools in AAAA also differ significantly in girls track and softball (see Table 35).

Table 35

Summary of Mann-Whitney U Results for Athletic Performance in High-Performing and Low-Performing Schools Competing in Classifications AAA, AAAA, and AAAAA

	High-Performing Schools		Low-Performing Schools					
	Median	Mean Rank	Median	Mean Rank	*U*	*z*	Sig.	*r*
Directors Cup								
AAA	345.75	47.99	183.00	32.23	1062.00	3.06	.002	.35
AAAA	332.50	57.88	171.50	32.96	1543.00	4.55	.000	.48
AAAAA	501.50	33.88	333.15	26.64	556.00	1.60	.110	.21
Football								
AAA	0.00	40.83	0.00	38.36	804.00	0.56	.577	.06
AAAA	0.00	46.28	0.00	43.80	1044.00	0.53	.594	.06
AAAAA	0.00	27.80	25.00	33.59	361.50	-1.36	.175	-.18
Boys Basketball								
AAA	0.00	38.00	0.00	40.79	702.00	-0.62	. 534	-.07
AAAA	0.00	44.63	0.00	45.35	973.00	-0.15	.878	-.02
AAAAA	25.00	30.69	0.00	29.23	455.50	0.35	.725	.05
Baseball								
AAA	25.00	45.24	0.00	34.58	963.00	2.33	.020	.26
AAAA	0.00	49.93	0.00	40.39	1201.00	2.06	.040	.25
AAAAA	12.50	29.81	12.50	31.29	426.00	-0.35	.725	-.05
Boys Track								
AAA	0.00	43.57	0.00	36.01	903.00	1.75	.080	.20
AAAA	0.00	46.64	0.00	43.47	1059.50	0.68	.496	.07
AAAAA	19.00	32.77	0.00	27.91	520.50	1.13	.257	.15
Girls Basketball								
AAA	0.00	40.99	0.00	38.23	810.00	0.62	.534	.07
AAAA	0.00	45.57	0.00	44.47	1013.50	.237	.812	.03
AAAAA	25.00	30.69	25.00	30.29	454.00	0.10	.924	.10
Girls Track								
AAA	7.00	43.64	0.00	35.95	905.00	1.71	.088	.19
AAAA	0.00	52.72	7.33	37.78	1321.00	3.18	.001	.34
AAAAA	15.00	30.48	11.00	30.52	447.50	-0.01	.994	-.00
Softball								
AAA	0.00	41.58	0.00	37.71	831.00	0.87	.384	.10
AAAA	0.00	50.21	0.00	40.13	1213.00	2.19	.028	.23
AAAAA	25.00	30.06	25.00	31.00	434.00	-0.22	.826	-.03
Girls Soccer								
AAA	25.00	47.83	0.00	32.36	1056.00	3.46	.001	.39
AAAA	0.00	52.42	0.00	38.07	1308.00	3.09	.002	.33
AAAAA	25.00	33.81	0.00	26.71	554.00	1.68	.093	.22

Note: *U* = Mann-Whitney U; *z* = standardized test statistic; Sig. = asymptotic significance; *r* = effect size.

Research Question 3 sought to determine if the selected school-level variables percentage of minority students, percentage of students with disabilities, percentage of economically disadvantaged students, math and English/Language Arts GHSGT scores, and graduation rate predicted the athletic performance of schools that competed in GHSA classifications AAA, AAAA, and AAAAA during the 2010-11 school year. Count model regression analysis (specifically negative binomial and Poisson regression) was conducted on overall Directors Cup points and the four most popular boys and girls sports (football, boys and girls basketball, boys and girls track, baseball, softball, and girls soccer). The regression models were significant for total Directors Cup points, baseball, boys and girls track, softball, and girls soccer in each classification. Boys basketball was significantly predicted in classifications AAA and AAAA. The regression models were not significant for football or girls basketball.

Research Question 4 sought to cross-validate the regression models used for Question 3 by analyzing data from 2008-09 and 2009-10. The models were significant for total Directors Cup points, softball, and girls soccer in all three classifications during each of the 3 years covered by this study. The models were significant for baseball for classifications AAA and AAAA during each year. The models were also significant for baseball during 2 of the 3 years for classification AAAAA. The models were significant for boys and girls track during all 3 years in classifications AAA and AAAAA and for 2 of the 3 years in classification AAAA. The models were significant for boys basketball in a few instances, but the findings were inconsistent. The models were not significant for football or girls basketball in any classification during any year.

Discussion of Findings

The percentage of minority students, percentage of students with disabilities, percentage of economically disadvantaged students, math and English/Language Arts GHSGT scores, and graduation rate were examined in the context of academic and athletic performance at the school-level. The study focused on three points. The study sought to determine the predictive value of the predictor variables in relation to a school's academic performance. It also sought to determine if a significant difference existed between academically high-performing and low-performing schools in terms of athletic performance. The study also determined the predictive value of the variables on athletic performance.

Research Question 1

The results of this study found the predictor variables were able to accurately predict academic performance for over 82% of schools and also explained much of the variance. The percentage of minority students, graduation rate, and GHSGT scores were significant predictors in two out of the three classifications included in this study. These results support the findings of Balfanz, Legters, West, and Weber (2007), Harris (2007), and Kim and Sunderman (2005) on the role of racial demographics on a school's academic performance.

Surprisingly, the percentage of economically disadvantaged students was not a significant predictor. This result supports the findings of Kober, McMurrer, Silva, and Rentner (2011) and Mayer and Jencks (1989) on schools with higher percentages of economically disadvantaged students. A survey of accountability report cards on per pupil spending in Georgia revealed that schools with higher percentages of economically disadvantaged students also spent the most money per student (GaDOE, 2011). The findings support the assertion that made by Kober, McMurrer, Silva, and Rentner (2011) that the additional resources brought in from federal and state agencies help offset the deficiencies inherent in poorer communities in terms of academic performance.

Research Question 2

The results of this study found significant differences between high-performing and low-performing schools in terms of overall athletic performance in GHSA classifications AAA and AAAA. Academically high-performing schools were generally more successful athletically when all sports were taken into account in the smaller classifications. There were no significant differences detected in the most popular boys sports (football and basketball) or in the most popular girls sport (basketball). In the boys sports, a significant difference was only found in baseball (the third most popular boys sport). Soccer (the fourth most popular girls sport) was the only sport where significant differences were found in both classifications.

There were no significant differences between high-performing and low-performing schools in the classification with the largest schools, AAAAA. This finding suggests the enrollment sizes of those schools may weaken the impact of the factors causing the differences.

Research Questions 3 and 4

This study found the negative binomial and Poisson regression models containing the school-level predictor variables were significant for overall athletic performance as measured by total Directors Cup points. For the schools in classification AAA, the percentage of economically disadvantaged students and the combined math and

English/Language Arts GHSGT scores were significant predictors of athletic performance during each year from 2008-2011. For schools in classification AAAA, the combined math and English/Language Arts GHSGT scores were also significant predictors during that time period. For classification AAAAA, graduation rate was a significant predictor of athletic achievement during 2008-09 and 2010-11. These findings suggest that academically-related predictors (combined math and English/Language Arts GHSGT scores and graduation rate) and athletic achievement at the school-level are indeed linked.

While the socioeconomic component (percentage of economically disadvantaged students) was a significant predictor of athletic performance for schools in classification AAA, it was not significant for schools in classifications AAAA and AAAAA. This was bourn out in the several of the popular sports as well. The socioeconomic component was usually a significant predictor of success for those sports in classification AAA, but rarely in the upper classifications. Since the lower classifications A and AA were excluded from this study, it does not definitively contradict Brady and Sylwester (2004) or Powell, Slater, Chaloupka, and Harper (2006). It is possible that the effects of the percentage of economically disadvantaged students on athletic achievement were mitigated in some way by the higher enrollment numbers at schools that compete in those higher classifications.

Similarly, the percentage of minority students was only a significant predictor of athletic achievement for the smaller schools competing in classification AAA. Again, it is possible the effects of the percentage of minority students is mitigated by the higher enrollments found at the upper classification levels. The percentage of minority students was also not a consistently significant predictor for the selected sports. The percentage of minority students was significant in some cases but not in others. As such, no clear pattern across years or classifications could be established. However, in instances where the percentage of minority students was significant for baseball and softball, a higher percentage of minority students was associated with lower levels of performance in those sports. In all other instances, the percentage of minority students was associated with higher levels of achievement in those sports. These findings support the findings of Comeaux and Harrison (2004), Lapchick and Mathews (1999), and Price (1997).

Limitations of the Study

This study had several limitations from a practical and theoretical standpoint. The study only included schools that competed in the top three classifications. The reasoning behind this was due to the excessive number of private schools that competed in classifications A and AA. However, removing those classifications from the study eliminated a large number of small, rural schools from the study.

Due to a failure of the data to meet the assumptions for an independent samples *t* test, the nonparametric Mann-Whitney U test was used instead. The use of nonparametric tests to analyze the data limits the ability to generalize the results to other states (Field, 2009).

Academic performance was measured by adequate yearly progress guidelines under NCLB. In 2012, the state of Georgia applied for and received a waiver to opt out of the NCLB mandates for a three-year period. Academic performance data under the new accountability was not collected until 2013, which was a “hold harmless” year. The predictor variables may not have the same predictive value under the accountability framework Georgia adopted in 2012.

This study only took into account the selected quantifiable predictor variables. It did not consider qualitative variables such as leadership styles and principal attitudes toward athletics. Other quantitative variables such as coaching experience, principal experience, teacher experience, and funding for athletics were also not considered.

Recommendations for Future Research

The findings of this study indicate the school-level variables predict a school's overall academic and overall athletic performance. However, of the popular sports included in the study, the predictor variables only consistently predicted performance in baseball, softball, and girls soccer. The study could be replicated with a focus on the other sports including wrestling, volleyball, cross country, lacrosse, cheerleading, riflery, boys soccer, and swimming. While these sports have fewer participants than the eight sports included in this study, the number of Directors Cup points schools can earn in these sports are equal to the those earned in the more popular sports. It is possible the predictive value of the school-level variables is higher in those sports.

Future research could also focus on the effects of principal attitudes towards athletics as it pertains to athletic performance. The attitude of the principal, much like with academic programs, should establish the athletic climate within the school. If the principal has high expectations of the athletic department, does it translate into better performance? Conversely, if the principal has a laissez-faire attitude or is openly hostile toward athletics, does that lead to underperforming sports teams? Do the attitudes of the faculty and students affect the athletic climate of the school?

While several studies (Epps, 1995; Harris, 2007; Siegrest, Weeks, Pate, & Monetti, 2009; Sirin, 2005) suggest that socioeconomic status is a major predictor of academic performance for individual students, this study found the percentage of economically disadvantaged students was not a significant predictor of a school's academic performance. One possible reason for this finding could be mitigating effects of enrollment size. Schools in this study were compared to other schools of similar size based upon GHSA classifications. Another possible mitigating factor is the increase in governmental spending in economically depressed schools. Future research should take those factors into account.

Conclusions

Athletics has been analogized as a school's front porch. While a clean and beautiful front porch does not necessarily guarantee the interior of a house is also clean and beautiful, it leaves that impression on passersby. One also would not want to have a dilapidated porch on the front of a mansion. Similarly, athletic performance is often the most visible aspect of a school. Athletics accounts for a majority of the press coverage a school receives. While having winning sports teams does not necessarily mean the school's academic performance is also high, it gives the impression that the school is a winner. It makes sense from a public relations standpoint not only to be perceived as academically high-performing, but athletically competitive as well.

Academics and athletics are not mutually exclusive. The results of this study show they are intertwined. The results of this study discovered significant differences between high-performing schools and low-performing schools that competed in GHSA classifications AAA and AAAA in the performance of their athletic departments.

Academically high-performing schools generally had more successful athletic departments. Academically low-performing schools tended to struggle to compete athletically. While there was little difference in the most popular sports between high and low-performing schools, the differences were more pronounced in sports with lower participation rates such as baseball, softball, and girls soccer. No significant differences were discovered in the highest classification. It is possible that the larger enrollment sizes of the schools in that classification could be a mitigating factor.

The selected school-level variables were found to predict overall academic and athletic performance. These variables should be thoroughly understood by building-level leaders and athletic directors. When variables that are associated with low-performance in the classroom or on the athletic field are present in a school, leadership must take steps to circumvent the negative effects of that variable in order to improve performance. Understanding those variables and finding ways to minimize their effects is crucial moving forward.

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APPENDIX A: Institutional Review Board (IRB) Exemption Form

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VALDOSTA STATE UNIVERSITY
GRADUATE SCHOOL

Valdosta State University Graduate School

Institutional Review Board Oversight Screening Form for Graduate Student Research

Project Title: High Achieving Schools and Athletics in Georgia High School

Name: John Spurlock

Department: Educational Learning

E-mail: jfspurlock@valdosta.edu

Telephone: 706-315-5156

Faculty Advisor: Gerald Siegrist

Please indicate the academic purpose of the proposed research:
☒ Doctoral Dissertation
☐ Master's Thesis
☐ Other:

1. ☐ YES ☒ NO **Will you utilize *existing identifiable private* information about living individuals?** "Existing" information is data that were previously collected for some other purpose, either by the researcher or, more commonly, by another party. "Identifiable" means that the identities of the individuals can be ascertained by the researcher by name, code number, pattern of answers, or in some other way, regardless of whether or not the researcher needs to know the identities of the individuals for the proposed research project. "Private" information includes information about behavior that occurs in a context in which an individual can reasonably expect that no observation or recording is taking place or information provided for specific purposes that the individual can reasonably expect will not be made public (e.g., a medical record or student record).

   Note: If you are using data that: (1) are publicly available; (2) were collected from individuals anonymously (i.e., no identifying information was included when the data were first collected); (3) will be de-identified before being given to the researcher, (i.e., the owner of the data will strip identifying information so that the researcher cannot ascertain the identities of individuals); or (4) do not include any private information about the individuals, regardless of whether or not the identities of the individuals can be ascertained, your response to Question 1 should be NO.

2. ☐ YES ☒ NO **Will you *interact* with individuals to obtain data?** "Interaction" includes communication or interpersonal contact between the researcher and the research participant, such as testing, surveying, interviewing, or conducting a focus group. It does not include observation of public behavior when the researcher does not participate in the activities being observed.

3. ☐ YES ☒ NO **Will you *intervene* with individuals to obtain data?** "Intervention" includes manipulation of the individual or his/her environment for research purposes, as well as using physical procedures (e.g., measuring body composition, using a medical device, collecting a specimen) to gather data for research purposes.

If you answered YES to ANY of the above questions, your research is subject to Institutional Review Board oversight. Please discard this form and complete and submit an IRB application. Do not begin your research until your application has been reviewed by the IRB and you are informed of the outcome of the review.

* * * * * * * * * * * * *

If you answered NO to ALL of the above questions, your research is not subject to Institutional Review Board oversight. Stop here, sign below, secure your faculty advisor's signature, and submit this form to the Graduate School. Please remember that, even though your project is not subject to IRB oversight, you should still observe ethical principles in the conduct of your research.

STUDENT CERTIFICATION: I certify that my responses to the above questions accurately describe my proposed research.

Student's Signature: John Spurlock Date: 3/26/13

FACULTY ADVISOR CERTIFICATION: I have reviewed the student's proposed research and concur that it is not subject to Institutional Review Board oversight.

Faculty Advisor's Signature: JR Siegrist Date: 10/17/14

Valdosta State University *Rev: 04.08.2010*