



COMPARING THE ACADEMIC PERFORMANCE OF HIGH SCHOOL ATHLETES AND NON-ATHLETES IN KANSAS IN 2008-2009

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Abstract

The academic performance of students in grades 9-12 who did or did not participate in high school sports in Kansas during the 2008-2009 school year was analyzed. In addition to overall comparisons between athletes and non-athletes on GPAs, graduation rates, number of dropouts, ACT test scores, and state assessments, some gender, ethnicity, and grade comparisons were made. High school athletes earned higher grades, graduated at a higher rate, dropped out of school less frequently, and scored higher on state assessments than did non-athletes; results on the ACT were mixed. Differences between athletes and non-athletes were found for males and females across all academic performance measures, with females contributing more to the differences between athletes and non-athletes on GPAs and not dropping out of school. Whites contributed more to the differences between non-athletes and athletes than did the other racial categories for GPAs, graduation rates, and not dropping out of school.

Keywords: High school, Athletes versus non-athletes, Academic performance.

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Introduction

Over 7.5 million high school students participate in interscholastic athletics each year (National Federation of State High School Associations, n.d.). Proponents of high school sport programs believe these activities contribute to the overall education of students. The mission statement of the National Federation of State High School Associations (NFHS) supports this belief by stating that it serves "...students by providing leadership for the administration of education-based interscholastic activities, which support academic achievement, good citizenship and equitable opportunities" (National Federation of State High School Associations, n.d.). In fact, in "The Case for High School Activities," the National Federation of State High School Associations (2008) emphasizes that students who participate in high school sports make higher grades. Even the National Association of State Boards of Education (2004) claims the purpose of high school sports "...is to enhance the whole school experiences for all students. Academic achievement must always be considered the priority" (p. 5).



To encourage students to achieve on their school work, academic eligibility standards have been enforced in many high schools to stress that extracurricular activities including participation on sport teams is an earned privilege, not a right. Since the primary purpose of schooling is to learn, students must achieve academically as a prerequisite to participating in extracurricular activities and playing on a team. Bukowski (2010) found that 48 state athletic associations recommended some form of academic eligibility requirements for student participation in high school sports, with requirements ranging from being enrolled in a minimum number of courses to a combination of a minimum number of courses, passing all courses, a minimum grade point average, and an attendance policy.

According to Callari (2002), the three most commonly used academic eligibility standards include pass-to-play, a minimum grade point average, and a requirement that allows only a specified number of failing grades. These standards have resulted in some students having higher grades, higher attendance rates, fewer disciplinary problems, and lower dropout rates (Jansen, 1992; National Federation of State High School Associations, 2008). Proponents of “no pass, no play” supported the requirement that students must pass all courses to earn the right to participate in extracurricular activities because these activities were secondary in importance to academic work (Burnett, 2000). If students took their studies seriously, it was believed they would earn better grades. Burnett added that participation in extracurricular activities was the driving force behind some students’ interest in attending school.

Several studies have documented the effect of extracurricular activities on academic performance. For example, Camp (1990) investigated the effects of participation in extracurricular activities on students’ grades, while controlling for gender, family background, and academic ability. He found females participated in more student activities and made better grades than did males, and academic achievement was enhanced by student participation. Camp’s findings raised questions about the rationale behind rules excluding academically marginal students from participation in extracurricular activities.

Kilrea (1998) also argued against denying academically deficient students an opportunity to participate in extracurricular activities. In his study examining relationships between participation and number of seasons in extracurricular activities and academic achievement on ACT composite scores of 186 high school seniors, 103 of whom had participated in at least one extracurricular activity during four years of high school, ACT composite scores were significantly related to two academic, six non-academic, and eight student participation variables. Kilrea concluded that restricting academically deficient students from participating in extracurricular activities could further contribute to a student’s academic difficulties. Also, his results supported the value of extracurricular participation on the academic achievement of students.

In the current economic climate, the debate over whether participation in high school extracurricular activities including sports enhances or detracts from the educational achievement of participants has resurfaced. Proponents of extracurricular activities and sports believe these opportunities enhance academic performance, especially when students must meet specific levels of academic achievement to maintain eligibility. Unfortunately, school districts across the country have encountered major reductions in state and local funding, forcing administrators to identify areas for budget reductions and opening the door for opponents who might target extracurricular activities as easy choices.



In Kansas, a state that has encountered significant reductions in state funding since 2008, over 139,000 students participated in high school sports in 2008-2009, according to the Kansas State High School Activities Association (KSHSAA). Although the KSHSAA emphasizes in its mission statement that participation in high school activities promotes student academic achievement, no empirical evidence supports this claim.

The purpose of this study was to examine the academic performance of Kansas high school athletes in grades 9-12 in 2008-2009 to determine if participation in athletics helps or hinders academic achievement. Self-reported grade point averages (GPAs), graduation rates, number of dropouts, ACT scores, and state assessment scores were examined to identify differences between athletes and non-athletes as a group as well as by gender and ethnicity.

The literature review begins by examining previously found relationships between participation in all extracurricular activities and academic performance. A review of research that specifically compared high school athletes and non-athletes on various academic measures follows. The final section discusses studies that have reported on school dropout rates for athletes and non-athletes.

Review of the Literature

Participation in Extracurricular Activities and Academic Performance

In the 1978 Phi Delta Kappa/Gallup Poll of attitudes toward public schools, 45% of respondents reported that extracurricular activities play a very important role in schools. In subsequent years, this percentage dropped to 31% in 1984, then increased to 39% in 1985, before spiking at 63% in 1997 (Rose, Gallup, & Elam, 1997). This dramatic increase in public perception might be associated with several studies conducted in the 1990s that found that participation in extracurricular activities enhanced academic performance and the overall educational experiences of students. For example, data from public high school seniors in the National Education Longitudinal Study of 1992 Second Follow-up indicated that participation in extracurricular activities increased students' engagement with and attachment to their schools and contributed to a more well-rounded education (O'Brien & Rollefson, 1992). Additionally, these authors reported that 50.4% of participants had no unexcused absences, 50.7% never skipped a class, 30.6% had a GPA of 3.0 or above, and 29.8% achieved in the highest quartile on a composite math and reading assessment. Percentages for non-participants on these same measures were 36.2%, 42.3%, 10.8%, and 14.2% respectively.

Marsh (1992) found a small but statistically significant, positive relationship associated with extracurricular activity participation during the last two years in high school and academic achievement. Neish (1993) that found positive correlations between high, medium, or low levels of involvement in extracurricular activities and students' GPAs and involved students attained higher GPAs than did students who were not involved. Klesse (1994) found a positive direct effect of participation in extracurricular activities on academic achievement, suggesting that the lack of participation in extracurricular activities negatively affected students' success in school.

Several larger-scale studies have reported academic benefits associated with participating in extracurricular activities. McCarthy (2000) compared GPAs and school attendance of participants and non-participants in school-sponsored activities in 16 high schools in Colorado's largest school district in 1997. Participants had significantly higher GPAs and



significantly lower absenteeism than did non-participants. Overall, female students had higher GPAs than did male students; both female and male participants had higher GPAs than did non-participant comparison groups. Similarly, in a study of 1100 students in a large metropolitan high school in 2001-2002, Branch (2003) found significant differences between the academic achievement of students who did and did not participate in school-sponsored extracurricular activities. Students who participated in extracurricular activities had the highest GPAs, followed by athletes as a sub-group. After controlling for cognitive ability, gender, and socio-economic status, VanDuyne (2004) found a positive correlation between participation in extracurricular activities and academic achievement on the Indiana Student Test of Educational Progress.

Other researchers have reached similar conclusions. Zaff, Moore, Papillo, and Williams (2003) used longitudinal data for students in grades 8-12 and found that over time students' participation was linked with higher levels of academic achievement. In a sample of 492 graduating high school seniors in a large Midwestern high school, Streb (2009) reported that participants in extracurricular activities had significantly higher GPAs and ACT scores than did non-participants. Corbett (2007) found uniformly positive benefits associated with participation in school-sponsored extracurricular activity participation (EAP) and encouraged educational leaders to get students engaged in extracurricular activities, "The results of this study, and the vast majority of the EAP research, regarding standardized test scores clearly demonstrates the value added by extracurricular participation" (p. 92). Feldman and Matjasko (2005) agreed with Corbett, concluding that structured activity participation was linked to many positive academic, behavioral, psychological, and young adult outcomes.

In summary, findings from several studies have linked participation in extracurricular activities to many positive academic performance indicators. The next section examines the academic performance of students who participated in one particular type of extracurricular activity—high school sports.

Participation in High School Sports and Academic Performance

In some early studies, participation in high school sports was not associated with higher grades. For example, Lueptow and Kayser (1973) investigated the relationship between athletics and academic achievement among 3461 seniors in 20 public high schools in 1964 and found no differences in grades between athletes and non-athletes during the high school years. A few years later, Hauser and Lueptow (1978) reported that athletes had higher GPAs at the end of their high school years than they did at the start, but their academic gains were not as high as for non-athletes over the years. Students who chose to participate in high school sports were better students initially and experienced a relative decline in academic achievement, leading them to conclude, "The results of this study and of the Lueptow and Kayser study do not support a causal interpretation of the relationship between athletics involvement and academic achievement" (p. 308).

Later studies also failed to find specific differences between athletes and non-athletes' academic performance. Marsh (1993) suggested that participation in high school sports had no negative effects, Jefferson (1999) found no differences between the GPAs of athletes and non-athletes in two rural high schools in Mississippi, and Stencel (2005) found no statistically significant relationship between participation in athletics and academic achievement. Crosnoe (2002) analyzed students in 9 California and Wisconsin schools in 1987 and 1990 and concluded that even though athletes were high achievers and athletic



participation promoted academic achievement, the academic achievement of athletes neither increased nor decreased over time. Instead, it maintained a successful academic trajectory.

Several other studies, however, have supported the connection between participation in high school sports and higher grades and other indicators of academic achievement (Broh, 2002; Fejgin, 1994; Feldman & Matjasko, 2005; JacAngelo, 2003; Kaufmann, 2002; Overton, 2001; Stegman & Stephens, 2000; Whitley, 1995). For example, Fejgin (1994) examined longitudinal data from a nationally representative sample of 10th graders (i.e., National Educational Longitudinal Study of 1988 First Follow-Up) and found that students who were more involved in high school sports had small but statistically significant higher grades and fewer discipline problems in school. She suggested that participating in high school sports may reflect a deeper commitment by students to comply with school rules and adhere to basic values. That is, increased disciplined behavior may lead to greater effort and higher grades.

Using 8th grade student data (N = 24,599) from the 1998 National Longitudinal Study with follow-ups in the 10th and 12th grades, Broh (2002) found that high school sports participation was positively and significantly associated with improved math and English grades, including after controlling for the selection of higher-performing students into sports. He concluded that participation in high school sports had a greater influence on student achievement than did other extracurricular activities.

Stegman and Stephens (2000) investigated the relationship between participation in high school sports and academic achievement at one high school in Omaha, Nebraska. The high participation group achieved higher academic achievement in three measures: class rank, overall GPA, and math GPA. Females in the high participation group significantly outperformed females in the low participation group. Kaufmann (2002) used final GPAs, attendance, highest level of mathematics achieved, and ACT composite scores to examine relationships between athletic participation and academic performance with high school athletes in two suburban high schools in a major metropolitan area and found a positive, significant relationship between athletic participation and academic success. JacAngelo (2003) collected data from 1081 female and male athletes and 1000 non-athletes in 10 public high schools in the Miami-Dade school district in Florida in 2002-2003 and found statistically significant differences with athletes earning higher cumulative GPAs and achieving higher test scores on the 10th grade Florida Comprehensive Assessment Test in reading and mathematics than did non-athletes.

In a large study in North Carolina (N = over 125,000), Overton (2001) found that high school athletes outperformed non-athletes on mean GPAs and mean scores on end-of-course testing in algebra and English from 1993-1996. Additionally, athletes had a significantly lower average number of absences, a lower percentage of disciplinary referrals, and were more likely to graduate than were non-athletes. Overton's findings confirmed Whitley's (1995) earlier findings in a study comparing high school athletes with non-athletes in North Carolina.

In summary, results from more recent studies suggested that participation in high school sports was positively related with higher grades, higher graduation rates, and higher scores on ACT tests and state assessments for athletes when compared to non-athletes. The relationship between participation in high school sports and dropping out of high school is examined in the next section.



Participation in High School Sports and Dropping Out of School

Participation in extracurricular activities, in general, appears to minimize the risk of dropping out of school (Davalos, Chavez, & Guardiola, 1999; Jansen, 1992; Zaff et al., 2003) and participating in high school sports may be particularly effective in keeping students in school (National Federation of State High School Associations, 2008). In North Carolina, Whitley (1995) found lower dropout rates for athletes than for non-athletes, and Overton (2001) reported that 0.6% of high school athletes dropped out of school, compared to 10.32% of non-athletes.

Some researchers have suggested that involvement in extracurricular activity may enhance the feeling of belonging and therefore reduce school dropout. Mahoney (2000) and Mahoney and Cairns (1997) suggested that the development of social networks and increased engagement within schools deterred students from dropping out. This social integration with peers on a team might significantly reduce athletes' likelihood of dropping out of school (McNeal, 1995).

These studies provide some evidence that high school athletes dropped out of school at lower rates than did non-athletes. Becoming engaged with teammates and coaches may help athletes feel more connected with their schools and minimize the risk of dropping out. However, more empirical evidence is needed to support the claims that participation in high school sports contributes to staying in school.

Methods

This study used athletic data from the KSHSAA master roster of students who participated in high school sports during the 2008-2009 school year and academic data from the Kansas State Department of Education (KSDE). Students on this KSHSAA master athletic participation roster were matched with academic-related data available in the new KSDE data warehouse by a KSDE staff member. In addition, results from seniors who took the ACT college entrance examination were provided to KSDE along with results from the ACT optional questionnaire that included self-reported GPAs. (GPAs were not available through the KSDE data warehouse.) Matched data for all Kansas high school students in grades 9-12 were analyzed to identify differences in academic performance between athletes and non-athletes. Because only self-reported GPA ranges from the ACT were available, simple comparative analyses were made between non-athletes and athletes. Similar analyses were completed for graduation and dropout rates.

To examine differences between performance of non-athletes and athletes on the five ACT measures, several one-way multivariate analysis of variance (MANOVA) tests were conducted. On all follow-up analysis of variance (ANOVA) procedures, the Bonferroni approach was used to control for Type I errors with each ANOVA tested at the $p = .01$ significance level ($.05/5$). Differences in performance between non-athletes and athletes on the Kansas State Assessments were examined using one-way analysis of variance (ANOVA) procedures tested at the .05 significance level. Human subjects approval was obtained for this study, although only composite data were reported with no identifiable connection with any student.

Results

Based on matched data from KSDE and KSHSAA, there were 139,349 students enrolled in grades 9-12 in Kansas high schools during the 2008-2009 school year. Of these, 62,297



(44.7%) were athletes, 67,651 (48.5%) were females, and 103,493 (74.3%) were White. The numbers and percentages of non-athletes and athletes by gender, ethnicity, and grade are provided in Table 1.

Table 1

Non-Athletes and Athletes in Grades 9-12 in Kansas High Schools in 2008-2009

	Non-Athletes	%	Athletes	%	Total	%
Gender						
Male	37,129	51.8%	34,569	48.2%	71,698	51.5%
Female	39,923	59%	27,728	41%	67,651	48.5%
Ethnicity						
White	53,073	51.3%	50,420	48.7%	103,493	74.3%
Hispanic/Latino	10,853	71.9%	4,242	28.1%	15,095	10.8%
Black/African American	7,330	63.2%	4,265	36.8%	11,595	8.3%
Asian	2,186	70.8%	900	29.2%	3,086	2.2%
American Indian	1,160	60%	773	40%	1,933	1.4%
Multi-racial	1,710	58.6%	1,210	41.4%	2,920	2.1%
Unknown	740	60.3%	487	39.7%	1,227	0.9%
Grade in 2008-2009						
9 th grade	18,703	50.2%	18,518	49.8%	37,221	26.7%
10 th grade	19,030	53.5%	16,518	46.5%	35,548	25.5%
11 th grade	19,070	56.5%	14,676	43.5%	33,746	24.2%
12 th grade	20,249	61.7%	12,585	38.3%	32,834	23.6%

Note. Multi-racial includes all students who marked more than one ethnicity.

Among athletes (N = 9,347) who reported their GPAs on the ACT questionnaire, 80.1% reported a GPA of 3.0 or higher, as compared to 70.5% of non-athletes (N = 9,221) who reported a 3.0 GPA or higher. Additionally, 51.8% of athletes reported having a GPA of 3.5 or above, while 39.8% of non-athletes reporting this level of performance. Comparisons for self-reported GPAs of 3.0 or above and 3.5 and above by gender and ethnicity are shown in Table 2.



Table 2

Comparison of Self-Reported GPAs of 3.0 and above and 3.5 and above from Non-Athletes and Athletes

	Non-Athletes			Athletes		
	N	3.0 GPA or above	3.5 GPA or above	N	3.0 GPA or above	3.5 GPA or above
Gender						
Male	3,674	64%	34%	5,017	74%	43%
Female	5,547	75%	44%	4,330	87%	62%
Ethnicity						
White	5,318	45%	26%	6,626	56%	37%
Hispanic/Latino	638	60%	26%	390	66%	32%
Black/African American	615	52%	22%	503	54%	20%
Asian	329	79%	51%	138	91%	60%
American Indian	110	60%	24%	94	76%	45%
Multi-racial	153	64%	34%	136	72%	40%
Unknown	84	68%	46%	58	69%	37%

Note. Based on self-reported GPA ranges from ACT questionnaire.

Of the 17,249 non-athletes for whom data were available, 88.1% graduated with 2,323 failing to graduate. Of the 12,218 athletes, 97.6% graduated and 303 failed to graduate. Table 3 provides graduation data by gender and ethnicity. The number of students who dropped out of Kansas high schools in 2008-2009 was 2,016 across grades 9-12; 94% were non-athletes. The numbers and percentages of non-athletes and athletes by gender, ethnicity, and grade who dropped out are provided in Table 4.

Table 3

Number and Percentage of 12th Grade Non-Athletes and Athletes Who Graduated in 2008-2009

	Non-Athletes	%	Athletes	%
Gender				
Male	7,823	86.4%	7,019	97.5%
Female	9,426	89.4%	5,199	97.7%
Ethnicity				
White	12,849	90%	10,154	98%
Hispanic/Latino	1,854	85%	716	95%
Black/African American	1,375	79%	760	97%
Asian	487	88%	182	91%
American Indian	246	81%	144	98%
Multi-racial	286	84%	178	96%
Unknown	152	89%	84	95%

Note. While 32,834 students were enrolled in 12th grade in 2008-09, only 32,093 of these students had complete graduation data.

Table 4
Number and Percentage Out of the Total Number of Students of Non-Athletes and Athletes Who Dropped Out in 2008-2009

	Non-Athletes	%	Athletes	%
Gender				
Male	37,129	2.9%	34,569	.26%
Female	39,923	2.2%	27,728	.13%
Ethnicity				
White	53,073	2.4%	50,420	.16%
Hispanic/Latino	10,853	2.9%	4,242	.52%
Black/African American	7,330	2.9%	4,265	.30%
Asian	2,186	1.2%	900	.10%
American Indian	1,160	3.2%	773	.26%
Multi-racial	1,710	2.7%	1,210	.25%
Unknown	740	2.4%	487	0%
Grade in 2008-2009				
9 th grade	18,703	1.8%	18,518	.09%
10 th grade	19,030	2.6%	16,518	.17%
11 th grade	19,070	3.0%	14,676	.30%
12 th grade	20,249	2.6%	12,585	.28%

The first MANOVA evaluated differences between all non-athletes and athletes who had taken the ACT. Table 5 shows the mean scores and standard deviations for each of the two groups on the five dependent variables. Small, significant differences were found between the two groups on the dependent measures, according to Wilks's $\Lambda = .98$, $F(5, 19,225) = 88.54$, $p < .01$, $\eta^2 = .02$. ANOVA tests were conducted as follow-up tests to the MANOVA and showed that athletes significantly outperformed non-athletes in mathematics $F(1, 19,229) = 102.55$, $p < .01$, $\eta^2 = .01$ and science $F(1, 19,229) = 53.85$, $p < .01$, $\eta^2 = .003$; non-athletes outperformed athletes in reading $F(1, 19,229) = 28.30$, $p < .01$, $\eta^2 = .001$.

Table 5

Mean Scores and Standard Deviations for Non-Athletes and Athletes on the ACT

ACT Scores	Non-Athletes		Athletes	
	M	SD	M	SD
English	21.33	5.98	21.12	5.58
Mathematics	21.31	4.86	*22.01	4.83
Science	21.53	4.69	*22.01	4.42
Reading	*22.56	5.96	22.12	5.62
Composite	21.81	4.81	21.94	4.55

Note. N = 9,620 non-athletes; N = 9,611 athletes. * $p < .01$.

A second MANOVA was conducted to determine if there were significant differences in ACT test scores between male non-athletes and athletes. Wilks's $\Lambda = .98$, $F(5, 9,054) =$



31.16, $p < .01$, $\eta^2 = .02$ indicated significant differences between male non-athletes and athletes. ANOVA tests showed that male non-athletes scored significantly higher on ACT tests than did male athletes in English $F(1, 9,058) = 45.50$, $p < .01$, $\eta^2 = .01$; reading $F(1, 9,058) = 62.34$, $p < .01$, $\eta^2 = .01$ and on the composite score $F(1, 9,058) = 22.09$, $p < .01$, $\eta^2 = .002$. Table 6 shows the mean scores and standard deviations for male non-athletes and athletes for each of the ACT scores.



Table 6

Mean Scores and Standard Deviations for Male Non-Athletes and Athletes on the ACT

ACT Scores	Male Non-Athletes		Male Athletes	
	M	SD	M	SD
English	*21.34	5.91	20.52	5.59
Mathematics	22.29	5.09	22.35	5.00
Science	22.44	4.91	22.31	4.61
Reading	*22.95	6.06	21.97	5.76
Composite	*22.39	4.93	21.91	4.70

Note. N = 3,871 male non-athletes; N = 5,189 male athletes. * $p < .01$.

The third MANOVA evaluated differences between female non-athletes and athletes on the ACT. Mean scores and standard deviations for these two groups are shown in Table 7. Significant differences were found between the two groups, according to Wilks's $\Lambda = .98$; $F(5, 10,165) = 45.39$, $p < .01$, $\eta^2 = .02$. Follow-up ANOVAs showed that female athletes scored significantly higher on the ACT than did female non-athletes in English $F(1, 10,169) = 18.49$, $p < .01$, $\eta^2 = .002$, mathematics $F(1, 10,169) = 113.63$, $p < .01$, $\eta^2 = .01$, science $F(1, 10,169) = 73.95$, $p < .01$, $\eta^2 = .01$, and on the composite score $F(1, 10,169) = 36.12$, $p < .01$; $\eta^2 = .004$.

Table 7

Mean Scores and Standard Deviations for Female Non-Athletes and Athletes on the ACT

ACT Scores	Female Non-Athletes		Female Athletes	
	M	SD	M	SD
English	21.33	6.03	*21.82	5.49
Mathematics	20.64	4.58	*21.62	4.60
Science	20.91	4.42	*21.65	4.15
Reading	22.30	5.87	22.30	5.46
Composite	21.44	4.68	*21.97	4.38

Note. N = 5,749 female non-athletes; N = 4,422 female athletes. * $p < .01$.

The next MANOVA evaluated differences in ACT test scores among male and female athletes. Mean scores and standard deviations for male and female athletes are shown in Table 8. This analysis found significant and larger differences between male and female athletes than existed with previous measures, according to Wilks's $\Lambda = .92$, $F(5, 9,605) = 173.95$, $p < .01$, $\eta^2 = .08$. Follow-up ANOVA analyses showed that female athletes scored significantly higher than did male athletes on the ACT in English $F(1, 9,609) = 131.41$, $p < .01$, $\eta^2 = .01$ and reading $F(1, 9,609) = 8.34$, $p < .01$, $\eta^2 = .001$. Male athletes scored significantly higher than female athletes on the ACT in mathematics $F(1, 9,609) = 53.99$, $p < .01$, $\eta^2 = .01$ and science $F(1, 9,609) = 54.88$, $p < .01$, $\eta^2 = .01$.

Table 8

Mean Scores and Standard Deviations for Male and Female Athletes on the ACT

ACT Scores	Male Athletes		Female Athletes	
	M	SD	M	SD
English	20.52	5.59	*21.82	5.49
Mathematics	*22.35	5.00	21.62	4.60
Science	*22.31	4.61	21.65	4.15
Reading	21.97	5.76	*22.30	5.46
Composite	21.91	4.70	21.97	4.38

Note. N = 5,189 male athletes; N = 4,422 female athletes. * $p < .01$.

The final two MANOVAs examined differences between non-athletes' and athletes' performance on the ACT by ethnicity. The first MANOVA compared White non-athletes and athletes on the five ACT scores. Means and standard deviations are shown in Table 9. Wilks's $\Lambda = .97$, $F(5, 15809) = 87.98$, $p < .01$, $\eta^2 = .03$ indicated significant differences between the two groups. ANOVA analysis found that White non-athletes performed significantly better than did White athletes in English $F(1, 15813) = 33.67$, $p < .01$, $\eta^2 = .002$ and reading $F(1, 15813) = 70.42$, $p < .01$, $\eta^2 = .004$; White athletes outperformed White non-athletes in mathematics $F(1, 15813) = 60.80$, $p < .01$, $\eta^2 = .004$ and science $F(1, 15813) = 17.66$, $p < .01$, $\eta^2 = .001$.

Table 9

Mean Scores and Standard Deviations for White Non-Athletes and Athletes on the ACT

ACT Scores	White Non-Athletes		White Athletes	
	M	SD	M	SD
English	*22.12	5.71	21.60	5.44
Mathematics	21.80	4.77	*22.39	4.75
Science	22.07	4.52	*22.36	4.33
Reading	*23.32	5.76	22.57	5.54
Composite	22.46	4.59	22.35	4.44

Note. N = 7,582 white non-athletes; N = 8,233 white athletes. * $p < .01$.

The last MANOVA examined differences in ACT performance between minority non-athletes and athletes. Means and standard deviations are shown in Table 10. Wilks's $\Lambda = .99$, $F(5, 3263) = 6.64$, $p < .01$, $\eta^2 = .01$ suggested differences between the 2 groups among the 5 ACT variables, but no significant differences were found with follow-up ANOVAs using the Bonferroni method to control for errors.



Table 10

Mean Scores and Standard Deviations for Minority Non-Athletes and Athletes on the ACT

ACT Scores	Minority Non-Athletes		Minority Athletes	
	M	SD	M	SD
English	18.30	6.01	18.10	5.50
Mathematics	19.37	4.69	19.65	4.64
Science	19.42	4.68	19.80	4.32
Reading	19.65	5.80	19.34	5.30
Composite	19.32	4.76	19.34	4.38

Note. N = 1,952 minority non-athletes; N = 1,317 minority athletes. * $p < .01$.

A series of one-way ANOVA procedures were conducted to examine differences between the academic performance of non-athletes and athletes on Kansas state assessment measures. Means, standard deviations, degrees of freedom, F values, and η^2 effect sizes for these tests are shown in Table 11. Since ANOVA analysis on the Kansas state assessments indicated significantly higher performance for athletes than for non-athletes across all assessments and grades, MANOVA analyses were conducted to evaluate whether athletes entered high school with distinctive academic advantages over non-athletes. Because of limited longitudinal data, only one analysis was conducted. It examined 2006, 2007, and 2008 math and reading scores for students identified as 9th graders in 2009. These 9th grade students would have been in the 6th grade in 2006. Wilks's $\Lambda = .94$, $F(2, 31,200) = 1,039.62$, $p < .01$, $\eta^2 = .06$ indicated significant differences between the 2 groups. Using the Bonferroni approach to control for Type I errors, each follow up ANOVA was tested at the .025 significance level ($.05/2$). Results indicated that athletes performed significantly higher than non-athletes in mathematics $F(1, 31,201) = 2,048.62$, $p < .01$, $\eta^2 = .06$ and reading $F(1, 31,201) = 1,358.86$, $p < .01$, $\eta^2 = .04$ in the 6th grade.



Table 11

Analysis of Variance Comparisons between Non-Athletes and Athletes on Kansas State Assessment Tests in 2006-2009

Kansas Assessment	Non-Athletes		Athletes		df	ANOVA Results	
	M	SD	M	SD		F	η^2
Mathematics 2006	65.32	18.62	73.39	16.25	1, 90,517	*4,823.91	.05
Mathematics 2007	64.71	18.51	72.74	16.12	1, 61,753	*3,316.24	.05
Mathematics 2008	62.69	18.98	72.05	16.98	1, 37,126	*2,512.50	.06
Math. 2009 Grade 10	69.20	15.28	73.10	13.88	1, 17,760	*317.39	.02
Math. 2009 Grade 11	49.47	15.85	54.15	15.80	1, 10,921	*224.19	.02
Reading 2006	73.13	16.72	78.70	13.64	1, 90,016	*3,001.59	.03
Reading 2007	73.92	16.66	79.89	13.34	1, 62,052	*2,449.66	.04
Reading 2008	75.74	16.21	81.03	13.14	1, 46,871	*1,506.88	.03
Reading 2009 Grade 10	80.87	9.32	82.41	8.23	1, 10,984	*84.23	.01
Reading 2009 Grade 11	75.31	15.26	79.58	12.65	1, 18,767	*422.36	.02
History/Govt. Grade 8	56.11	18.03	62.10	16.46	1, 30,510	*915.54	.03
History/Govt. Grade 11	58.60	16.02	61.47	14.31	1, 27,975	*238.28	.01
Writing 2009 Grade 11	3.42	.79	3.64	.73	1, 17,997	*356.55	.02
Science 2008	55.11	16.41	59.24	15.13	1, 28,730	*470.00	.02
Science 2009 Grade 11	56.38	18.27	61.43	17.15	1, 24,448	*496.76	.02

Note. * $p < .01$.

Discussion

The purpose of this study was to examine the academic performance of high school athletes and non-athletes to determine whether participation enhances or detracts from academic achievement. Although research in this area is abundant, results have been mixed. Some prior researchers have reported that participation in high school sports detracts from academic performance; some have found no positive or negative effects; and some have linked athletic participation to improved academic achievement. Using data from over 139,000 Kansas athletes and non-athletes from grades 9-12 in 2008-2009, this study found clear and striking differences between athletes and non-athletes in GPA, graduation, and dropout rates and statistically significant differences on performance on the ACT and Kansas State Assessments by group, gender, and ethnicity. In most areas, athletes clearly outperformed non-athletes.

Grade Point Average

Athletes in Kansas self-reported higher GPAs than did non-athletes, a finding supported by the results of Broh (2002), JacAngelo (2003), and others. As a group, 80.5% of athletes reported having a 3.0 GPA or higher compared to only 69.5% of non-athletes who reported this same level of academic performance.

Several gender differences were also noted. Female athletes reported GPAs of 3.0 or above at a 12% higher rate than did female non-athletes. These differences were even more striking at the 3.5 and above level as 62% of female athletes reported a GPA of 3.5 or above as



compared to 44% of female non-athletes. Despite that fact that male athletes are often perceived as putting more emphasis on athletics than academics, 74% of male athletes reported GPAs of 3.0 or above; only 64% of male non-athletes reported attaining a 3.0 or above. As with female athletes, this trend was also evident at the 3.5 GPA level as 43% of male athletes reported a 3.5 GPA or above, compared to 34% of male non-athletes.

Overall, females consistently outperformed males on their GPAs. Among athletes, 87% of females reported a 3.0 GPA or above compared to 74% of male non-athletes. Female non-athletes also outperformed male non-athletes as 75% of non-athlete females reported a 3.0 or above GPA compared to 64% of males. These findings confirmed those of Camp (1990), McCarthy (2000), Stencel (2005), and Stegman and Stephens (2000).

Differences in GPA between non-athletes and athletes were evident by racial category as well, as shown in Tables 2 and 3. Across all racial groups, a higher percentage of athletes than non-athletes reported earning a 3.0 GPA or above, with double digit differences among American Indian (16%), Asian (12%), and White (11%) athletes.

Graduation Rates

In addition to outperforming non-athletes on self-reported GPA, Kansas high school athletes graduated at a much higher rate (98%) than did non-athletes (88%), which supports Overton's (2001) and Whitley's (1995) findings for students in North Carolina. Interestingly, female athletes graduated at an over 8% higher rate than did female non-athletes, but male athletes graduated at just over an 11% higher rate than did male non-athletes. These data confirmed that athletes were more likely to graduate than were non-athletes, although being required to maintain academic eligibility in order to participate in sport may have been a contributing factor.

Graduation rates by ethnicity revealed that athletes graduated at higher rates than non-athletes in all racial categories. These differences were especially noteworthy among Black/African Americans (18%), American Indians (17%), and Hispanic/Latinos (10%). Among Black/African Americans, only 79% of non-athletes graduated compared to 97% of athletes. Similarly, 81% of American Indian non-athletes graduated while 98% of athletes completed high school. Finally, 85% of Hispanic/Latino non-athletes graduated, but 95% of athletes earned their high school diplomas. These findings suggest that participating in high school athletics may be especially beneficial in helping students who were ethnic minorities graduate.

Dropout Rates

Several previous studies have reported that athletes drop out of high school less often than do non-athletes (Davalos, Chavez, & Guardiola, 1999; Jansen, 1992; McNeal, 1995; Overton, 2001; Whitley, 1995; Zaff et al., 2003), and this study supports these findings. Non-athletes in Kansas were over 15 times more likely to drop out of school than were athletes as 1555 non-athletes dropped out during 2008-2009 compared to only 126 athletes.

Once again, several gender differences surfaced. Male non-athletes were 12 times more likely to drop out of school than were male athletes. Athletic participation may be even more important for females as non-athletes were 24 times more like to drop out than were female athletes. Only 36 female athletes dropped out of school in 2008-2009 compared to 878 female non-athletes. While the factors involved with any high school student's decision to drop out of school are unknown, these data suggest that participation in high school sports



can have an ameliorating effect on persistence in school, especially for female athletes. The fact that female athletes were less likely to drop out could be related to higher levels of confidence and self-esteem, more positive body image, and higher states of psychological well-being as claimed by the Women's Sports Foundation (n.d.).

Across all ethnic groups, athletes were much less likely to drop out of school than non-athletes, thus supporting the argument that participating in high school sports is a contributing factor in retention. Participating in sports may be particularly beneficial in helping students who were ethnic minorities matriculate. In this study, 213 (2.9%) Black/African American non-athletes dropped out of school compared to only 13 athletes (.30%); 37 (3.2%) American Indian non-athletes dropped out compared to only 2 (.26%) athletes. In other words, Black/African Americans non-athletes are 16 times more likely to drop out of school than athletes and American Indian non-athletes were nearly 19 times more likely to drop out of school.

ACT

In 2009, the national average ACT composite score was 21.1 (ACT, n.d.). This study found that both athletes and non-athletes' mean scores in all areas of the ACT (English, Math, Science, Reading, and Composite) exceeded the national average. More importantly, several statistically significant differences emerged. As a group, Kansas high school athletes scored significantly higher on the ACT mathematics and science tests than did non-athletes. However, as a group, non-athletes performed significantly better than athletes in reading. These findings partially supported the findings of JacAngelo (2003) and Kaufman (2002). There were no significant differences in English or on the composite score.

Unlike the findings with GPA and graduation rates, male athletes failed to outperform male athletes on the ACT. Instead, male non-athletes scored significantly higher on ACT English, reading, and composite scores than did male athletes. Among females, however, the findings were reversed. Female athletes scored significantly higher in English, mathematics, science, and the composite score than did female non-athletes. These findings suggest that as a group, male non-athletes may be more serious students than are male athletes. Conversely, female athletes appear to either be more serious students or have found better methods of balancing their academic and athletic commitments.

Among athletes, males outperformed females significantly on mathematics and science, while females scored significantly higher than males on English and reading on the ACT. These differences on ACT tests seem to reinforce past findings about curricular strengths and interests by gender.

Since only 25% of Kansas high school students are ethnic minorities, ACT scores were evaluated using ethnic minorities as one large group. This evaluation revealed no significant differences between athletes' and non-athletes' ACT performances. However, White athletes and non-athletes differed on all four of the ACT tests with White non-athletes scoring significantly higher than White athletes in English and reading and White athletes scoring higher than White non-athletes in mathematics and science.

Kansas State Assessments

Unlike the ACT where athletes outperformed non-athletes in math and science, but non-athletes performed higher in reading, scores on Kansas state assessments showed that athletes outperformed non-athletes in all areas and in all years for which data were available. As



shown in Table 11, athletes scored significantly higher than did non-athletes in math, reading, history/government, writing, and science each year since 2006.

Overall, this study found that athletes outperform non-athletes in several academic areas. It is important to note, however, that these findings do not imply that participation in athletics *causes* higher academic achievement. This study did not control for factors like socio-economic status, family background, or years of sport participation which may have contributed to academic differences prior to participation in high school sports. Therefore, no causal relationships were established.

There are numerous reasons why participation in high school sports may positively affect academic achievement. The Kansas eligibility requirement that students must pass five units of credit each semester to retain eligibility to participate in high school sports may motivate some athletes to take their school work more seriously. Additionally, coaches and other educators can be influential in encouraging and helping athletes maintain their eligibility. Through sports participation, high school athletes may have learned greater self-discipline and better time management, enabling them to effectively fulfill their academic responsibilities. Competitiveness in sports may contribute to a similar work effort focused on achieving at least minimal, and possibly higher, academic goals. Finally, athletes may enjoy the prominent status attached to being an athlete because they receive more encouragement and praise for their efforts than do non-athletes. Thus, maintaining athletic eligibility becomes a priority.

A confounding factor could be that athletes may enjoy academic advantages prior to entering high school and participating on sport teams, as suggested by Lueptow and Kayser (1973). It is possible that students who already achieve at higher academic levels choose to participate in sports. Since athletes' scores on math and reading assessments for the 9th grade (the only grade level for which three years of data were available) were significantly higher on these same tests in the 6th grade, it is possible that these better-prepared students chose to participate in high school sports while under-prepared students chose not to participate. Thus, differences in academic performance at the high school level may be due to selection bias. However, Broh (2002) controlled for the selection of higher-performing students into sports and still found higher grades for athletes.

To summarize, this study demonstrates high school athletes in Kansas reported higher grades, had higher graduation rates, much lower numbers of dropouts, some significantly higher ACT scores, and significantly higher state assessment scores on all tests than did non-athletes. While no cause-and-effect relationships could be established, several statistically significant and other double-digit percentage differences support that participation in high school athletes does not detract from their academic performance. Instead, participation appears to enhance academic performance.

Conclusions

Across the nation, high school sports have faced renewed scrutiny as reduced federal, state, and local financial support has forced school administrators to find ways to reduce budget deficits. Some school districts in Kansas, Arizona, and Florida have already eliminated sport programs and coaches (Carlyon, 2011; Hardy, 2001; Whetten, 2011). Other district administrators continue to evaluate eliminating sport programs as they search for ways to reduce expenses and minimize deficits (Iorizzo & McGuire, 2011).



As an alternative to eliminating sport programs, many high schools have either already implemented or are considering implementing pay-to-play fees (Campbell, 2011; Carlyon, 2011; Iorizzo & McGuire, 2011; Whetten, 2011). While this may seem like a reasonable alternative to eliminating sport programs altogether, it discriminates against students who do not have the financial means to pay for membership on a high school sports team. Pay-to-play may be especially harmful to urban students, many of whom may also be ethnic minorities. In this study, athletes from ethnic minorities graduated at much higher rates, dropped out much less frequently, and reported much higher GPAs than did non-athletes.

Holloway (1999/2000) suggested that instead of cutting extracurricular activities during tough budgetary times, school administrators should financially support these activities because they helped students stay in school and succeed academically. This large-scale study supports Holloway's findings. In Kansas, participation in high school sports is definitely not detracting from academic performance. Kansas high school athletes in 2008-2009 earned higher grades, graduated at higher rates, were less likely to drop out of school, and scored higher on state assessments and some areas of the ACT than did non-athletes.

According to the NFHS (n.d), high school sports and other extracurricular activity programs typically account for only 1-3% of a school's overall budget. As coaches, administrators, and supporters of high school athletics battle for funding in a challenging economic climate, they now have recent empirical evidence that can be used to help substantiate and quantify their arguments for the overall cost-benefit of funding high school sports.

Limitations and Recommendations for Future Research

This study was limited by the data currently available in the KSDE data warehouse. As a new state initiative, the KSDE is just beginning to collect and make available extensive academic performance data on Kansas students. As increased data become available, future studies can provide a more extensive perspective of the academic achievement of athletes and non-athletes. For example, longitudinal ACT test scores and state assessment data are needed to more fully examine the academic performance of non-athletes and athletes including by gender and ethnicity. Additionally, within the next few years the KSDE data warehouse will include specific GPAs for all students rather than the self-reported GPA ranges used in this study. As the availability of data increases, researchers can more confidently and conclusively determine whether participation in high school sports leads to higher levels of academic performance across a variety of measures. Despite limited data in some areas, this study provides baseline information for subsequent studies in Kansas and other states.

How much influence participation in high school sports has on the academic achievements of participants versus how much is attributable to other factors is unknown. Additional research is needed to answer this important question. Future researchers are encouraged to control for factors such as academic ability, family background, and socio-economic status that may influence higher-performing students to self-select into sports. Controlling these types of variables would help confirm or refute a causal relationship between participation in high school sports and higher academic achievement. The impact of eligibility requirements on academic performance should also be examined. Are more high school students motivated to achieve at least at the minimal academic level so they can participate in sports, or do more students choose to drop out of school, and thus lose the benefits associated with participation in high school sports, because they are unwilling or unable to meet minimum academic requirements? Examining the positive and negative outcomes associated with meeting

academic eligibility requirements to participate in high school sports would be helpful in establishing eligibility policies.

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