The Impact of Collegiate Athletic Performance on Admissions Outcomes: Does a Winning Football Season Attract More Applicants?

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The Impact of Collegiate Athletic Performance on Admissions Outcomes: Does a Winning Football Season Attract More Applicants?

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ABSTRACT

The Impact of Collegiate Athletic Performance on Admissions Outcomes: Does a Winning Football Season Attract More Applicants?

by

Benjamin Avin Priday

Few empirical studies have explored the effect of athletic performance at the college level on the application and admissions decisions of prospective students. In this paper, we create a model of college application and enrollment levels to determine whether successful football programs attract more first-year students in subsequent years. We exploit variation in athletic success across time by constructing a panel dataset that contains all schools with a Division I, II, or III football program during the 1998-2013 year range. We use several measures of athletic success, including win percentage, conference performance, and placement in the Associated Press College Poll. Using a school fixed effects model and accounting for general admissions trends across time, we estimate separate models for each division. Our results suggest that increases in a football team's win percentage cause significant increases in applications for Division I-A schools. We find additional evidence suggesting that higher win percentages cause higher enrollment levels at the Division II and III level, but not for Division I schools.

I. Introduction

Since the first intercollegiate football game between Princeton University and Rutgers University on November 6, 1869, college football's hold on Americans has grown magnificently. In 1903, Harvard revealed the first football-specific concrete stadium; in 1910, the National Collegiate Athletic Association (NCAA) was born as the governing body for the sport; and in years following (to even as recent as the early 1990s), many rules were solidified regarding the forward pass, scoring, field goals, number of games played, and the elimination of the tied game.[1] Today, big name schools, such as University of Texas, Florida, Georgia, and Michigan, earn annual profits between $40 million and $80 million, *after* compensating the coaching staff.[2] In 2010, over 50 million spectators attended collegiate football games, while 200 million watched the regular season at home on television.[3] Bowl game attendance grabbed another 2 million, and 27.3 million people watched the Tostitos BCS National Championship Game on ESPN.[4] The vast amount of resources on funds and investments, media coverage, and construction of facilities, in addition to the massive number of people devoted to intercollegiate football, leads one to question how a given college football program impacts the institution that supports it. One such effect is on the individuals who are applying to and enrolling in the college. We thus investigate the effect of successful NCAA Division I-A, I-AA, II, and III football programs on admissions in postsecondary institutions. Specifically, we examine the

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[1] "College Football History." A Brief History of College Football.
[2] Taylor Branch. "The Shame of College Sports"
[3] Hootens.com "College Football Facts & Figures: Attendance, Viewership Keep Going up."
[4] Hootens.com "College Football Facts & Figures: Attendance, Viewership Keep Going up."

effects of a football program on the quantity of applications received and the amount of admitted students who enroll. We hypothesize that successful athletic performance will have a positive effect on admissions, increasing both applications and first year enrollment. Furthermore, we believe this effect will vary by division.

Few empirical studies have explored this relationship between collegiate athletics and academics of post-secondary institutions. These studies investigate a football effect for Division I-A schools, all finding a significant positive quantity effect of football success on applications, using within-conference win percentage, national championship winners, and Associated Press Top 10 and Top 20 rankings as measures of athletic success. One study, Pope and Pope (2009) also finds a significant positive football effect on enrollment for Division I-A schools, though the effect is smaller than the impact on applications. We expand on previous research by incorporating additional measures of athletic performance, as well as investigating a possible football effect on Division I-AA, II, and II schools.

Our academic variables come from *Peterson's* Undergraduate Licensed Data Set. We include in our model institutional characteristics, such as tuition, total undergraduate enrollment, expenditure per full-time student, faculty-student ratio, and the number of faculty with advanced degrees. We gathered our athletic success data manually, primarily from the NCAA Record Books and College Football Data Warehouse. We include multiple measures of football success in addition to Associated Press Top 10 and Top 20 rankings. We use overall win percentage versus conference win percentage to standardize the effect of the level of competition across conferences within a single division. Additionally, we use national championships,

conference championships, number of All-Americans (held by consensus), number of Heisman Trophy winners, Associated Press Player of the Year, and bowl game appearances.

Our approach is unique in that in addition to looking at the admissions effects of successful Division I-A football programs, we also extend our research to include Division I-AA, Division II, and Division III programs. Each division differs by size, type of school, and scholarship eligibility. Division I-A schools are primarily "flagship" schools—schools that are typically considered to be the most prominent institution in each state, such as University of Texas at Austin or the University of Georgia. They tend to be, on average, much larger than schools in other divisions, and all but seventeen institutions are public. With regard to scholarships, Division I-A football programs are granted a maximum of 85 scholarships per team per year (and these are typically full scholarships). Division I-A games also have minimum attendance requirements of 15,000 spectators. Division I-AA football programs are somewhat similar to those in Division I-A, allotted a maximum of 60 scholarships per team per year; football-only conferences in Division I-AA, such as the Ivy League and the Pioneer Football League offer no scholarships to players. Division II consists of smaller public schools and many private schools, and each team is only able to provide a maximum of 36 scholarships per year. In Division III, no scholarships may be given. Division III institutions are much smaller, on average, than schools in any other division, and are primarily private schools. They also have harsher regulations that limit both practice and competition.

For our empirical estimation, we begin with a basic OLS model. Yet, despite controlling for some school-specific features, we expect there to be an unobserved school quality effect. For this reason, we also run a fixed effects regression, as the panel nature of our data allows us to exploit variation between schools in order to eliminate the unobserved effect. In our regressions, we analyze two potential manifestations of football's impact on college admissions: log total applications received and log first year enrollment. Like Pope and Pope (2009), we believe that a percentage change in applications and enrollment will be more meaningful than looking at numerical increases, as it helps to standardize the effect across schools of different sizes. We run both standard OLS and fixed effects models separately for Division I-A, Division I-AA, Division II, and Division III schools. We extend our models to include interaction variables. We interact overall win percentage with school size, for we believe that the "football effect" will differ for large, mid-sized, and small schools. For example, although both Texas A&M University and Vanderbilt are Division I-A, one would expect a successful season at A&M would have a greater admissions effect than a successful season at Vanderbilt.

We find that there is a positive football effect on applications for Division I-A, with larger effects for the following year versus the current year. These effects are not statistically different in magnitude for schools of different sizes. Our basic model does not find any effects on applications for Division I-AA, II, and III schools, but when we allow for heterogeneity in school size we see a small positive application effect for mid-sized schools in Divisions II and III. Regarding first year enrollment, we find no win percentage effects for Division I-A and I-AA schools, although the

number of All Americans is predicted to have a positive impact for Division I-A. For Divisions II and III, however, our model estimates a positive football effect on first year enrollment.

II. Previous Literature

Few empirical studies have explored this relationship between collegiate athletics and academics of post-secondary institutions. McCormick and Tinsley (1987) were the first to investigate this relationship, finding a positive correlation between within-conference win percentages and quantity of applicants. Murphy and Trandel (1994) expand this research in search of a causal relationship between athletics and academics, utilizing panel data to control for unobservable school-specific heterogeneity. Their results show that a .25 percent increase in within-conference win percentages leads to a predicted 1.37% increase in the number of applications, ceteris paribus. They suggest better win percentages serve as positive advertising for the school, thereby boosting their applicant totals. Toma and Cross (1998) combat fundamental institutional differences by comparing schools that have won national championships versus the schools that have not. These "peer" schools are similar in size, student makeup, academic quality, and athletics as the championship schools; likewise, the peer schools are located in the same geographic region as the championship school. Their findings reveal that 14 out of 16 schools that won/shared championships in college football saw an increase in the number of applications received for the first incoming freshman class after the championship. Despite most schools seeing increases in applications following a successful season,

only some championship schools saw increases relative to their peer schools who did not win a football championship. To account for this result, Toma and Cross (1998) note that not all championship seasons are identical, explaining that a good story surrounding a championship will have a much different impact on perception of and attractiveness to that school than if the championship resulted from a weak conference or a scandal.

Pope and Pope (2009) simultaneously try to reproduce the "quantity" effect of football success on admissions (the increase in applications) that previous literature had found and test for a "quality" effect (academic selectivity). Like Murphy and Trandel (1994), they utilize panel data, estimating the football success indicators jointly in a fixed effects model. On the left-hand side, Pope and Pope (2009) include either log applications, log enrollment, or log real tuition of the school. Their approach in logging applications is unique, for previous research has only investigated the effect on total number of applications. On the right-hand side, Pope and Pope's (2009) model includes football success dummy variables (Associated Press rankings and National Champions, and their lags and leads); additionally, they have school quality variables (log cost of attendance, log average professor salary lagged one year, log average real income of the school's state, and number of high school diplomas awarded). Unlike previous research, Pope and Pope (2009) run their regressions separately for public and private schools. Their results reveal that ending a football season ranked in the top 20 leads to a 2.5% increase in applications; a top 10 finish yields a 3% increase; and a 7-8% increase follows a national championship. The largest effect on log applications was on the current year football success

dummy. A variation in the application effect in public versus private schools was not conclusive. Pope and Pope (2009) also investigate the potential reactions of schools to increased applications: increasing enrollment or increasing tuition. Following football success, they found a 3.4% increase in enrollment for football teams finishing in the top 20; 4.4% increase with a top 10 finish; and a 10.1% increase for a national champion, with all effects being significant at the 1% level. They do not find an effect on tuition.

III. Data

We obtained *Peterson's* Undergraduate Licensed Data Set to supply us with academic data. *Peterson's* includes information on institutional characteristics, campus qualities, entrance exams, cost of attendance, admissions, faculty, athletic programs, major programs, facilities, graduation requirements, and applicant and student body demographics from 1998-2013. *Peterson's* defines year in terms of the spring; in other words, variables associated with the year 2012 represent data from the academic year 2011-2012, not 2012-2013.

We collected athletic data manually. College Football Data Warehouse provided a comprehensive list of universities with NCAA Division 1 (Football Bowl Subdivision/I-A and Football Championship Subdivision/I-AA), II, or III football programs in 2013. For those universities, we obtained football program and division information from 1994-2013. *Peterson's* provided the football program and/or division data that was unavailable from CFB Data Warehouse; this was primarily for Division II and Division III programs. We also obtained conference information for

Division I. Our total sample size is 658 institutions with 123 belonging to I-A, 146 belonging to I-AA, 185 belonging to Division II, and 247 belonging to Division III. We broke this down further by type of school: in Division I-A, 106 institutions are public, while only 17 are private; in I-AA, 88 are public and 58 are private; in Division II, 112 are public and 73 are private; and in Division III, 40 are public, while 206 institutions are private. For Division I-A and I-AA programs, we collected data on national championships, conference championships, AP Top 10 and AP Top 20, number of All-Americans, number of Heisman Trophy winners, AP player of the year, bowl game appearances, and overall season win percentages. For Divisions II and III we collected national championship and conference championship information, as well as overall win percentages. We acquired both Consensus All-Americans and Heisman Trophy Winners from Sports Reference and AP Top 10, AP Top 20, and AP Player of the Year from the Associated Press. Bowl game appearances were provided by TexasFan7. We procured national championship, conference championship, and win percentage data from the NCAA, primarily from their annual record books. For most Division I schools we have data since 1994, but for the rest of Division I and all of Divisions II and III we have data since 1998, as our academic dataset only has information from 1998 onward. Furthermore, though our study does not specifically examine NAIA schools, we have included a variable to denote it since some universities who belong to NCAA football programs in 2013 were once members of the NAIA.

See table 1 and table 2 for a summary of the most important athletic and academic variables.

IV. Model

We employ multiple measures of athletic success for Division I-A, but the variables of choice for all divisions are overall win percentage and national championships. For Division I-A we also include consensus All Americans and Heisman Trophy winners. While others are seemingly impactful, such as conference champion, AP Top 10 and AP Top 20, and AP player of the year, they are likely very collinear with win percentage, and so we eliminate them from the model. Each of these measures has a value for school *i* in year *t*. Overall win percentages have decimal values between 0 and 1; they are rounded to either the hundredth or thousandth place. The other athletic success variables are dummies equal to 1 if they satisfy and equal to 0 if they do not, with the exception of consensus All-American which takes on the total number of All-Americans for school *i* in year *t*. We denote if a school has a football program in year *i* with the program variable. We also have a dummy variable to capture the effects of changing divisions. For Division I-A, we include a plethora of conference dummy variables, with the Southeastern Conference (SEC) as our benchmark. Because of the nature of the data, years drop out of the model, and as a consequence, we lose data on the Big West and Ohio Valley Conferences; we thus omit these conferences from the model.

We use a standard OLS model with these variables. We expect the OLS estimates to be biased, so to mitigate some of the bias and improve the OLS estimates, we include variables with no variation that are otherwise eliminated by our

fixed effects model: geographic variables (with the northeast being our benchmark) and Greek life variables for fraternities and sororities.

The OLS model is structured as such:

$$Y_i = \alpha_0 + A_i\lambda + S_i\beta + I_i\gamma + \varepsilon_i, \quad (1)$$

where Y_i is either log applications received by an institution of the incoming class or log first year enrollment of school i. We have vectors of variables associated with athletic performance (A_i), academics (S_i), and the institutional characteristics without variation added intended to decrease slightly the bias of the OLS estimates (I_i).

Since we expect there to be an unobserved school effect associated with institutions, our primary model uses fixed effects regressions. Traditions, legacies, and overall cultural capital differ between institutions, and we assume that this varies between schools but not over time. We acknowledge that these intangibles can vary over time, but for the sake of our model we assume they only vary between schools. The panel nature of our data allows us to eliminate this unobserved school effect by exploiting variation within a school across time, thus enabling us to see more clearly the effect of athletic success. To further control for exogenous effects, we include institutional characteristics that are not captured in the unobserved effect because they vary over time within schools: total cost of attendance, total undergraduate enrollment, expenses per full-time student, faculty-student ratio, and the number of faculty with advanced degrees. In our regressions, we analyze two potential manifestations of changes in college admissions: log total applications received and log first year enrollment.

Our primary model utilizes the panel nature of our data with fixed effects regressions. The model is structured as such:

$$Y_{it} = \alpha_0 + \mathrm{A}_{it}\lambda + S_{it}\delta + X_t\theta + a_i + \varepsilon_{it},^{5} \quad (2)$$

where Y_{it} is either the log number of applications received by an institution for the incoming class or the log number of first year students who enroll in school *i* in year *t*. As with the OLS model, we include vectors of variables associated with athletic performance (A_{it}) and academics (S_{it}), then a vector of year variables (X_t) standard in fixed effects models.

As we describe the variables included in our models, it is important to note the timing in postsecondary applications and admissions. The college football season can last through the end of December in a given year. Most regular application due dates for the following academic year occur after the football season has ended. Many institutions, however, have multiple application deadlines, such as early decision or early action deadlines that occur during the middle of the football season. Therefore, we hypothesize that the athletic success effect will not fully manifest itself on admissions in the academic year immediately following. For example, we expect a successful football program in the fall of 2012 to have a larger impact on students entering college in the fall of 2014 versus students who enter college in the fall of 2013, as they may have submitted applications prior to the end of the fall 2012 football season.

[5] This model is similar in format and identical in notation to the basic fixed effects model from Temple (2015).

It is also necessary to explain how the athletic and academic variables are associated with each year in the dataset. Athletic variables occurring in year *t* are linked with year *t*: for example, if a school wins a national championship in the fall of 2011, then the variable national championship is equal to one for the year 2011. In other words, the athletic variables are defined by the fall. *Peterson's*, on the other hand, defines the academic variables by the spring. A student applying to enter college in the fall of 2012 (an applicant during 2011-2012) is defined as 2012. So, a national champion in 2011 (defined as national champion 2011) will impact applicants during the 2011-2012 school year (defined as applicants 2012), as well as applicants during the 2012-2013 school year (defined as applicants 2013). Thus, to test the effects of athletic success in a given year *t* on log applications, we lead applications one and two times (year *t+1* and year *t+2*, respectively). We also test for a football effect on first year enrollment. A national champion in 2011 will affect the incoming freshman class in the fall of 2012 (defined as first year enrollment 2013). Therefore, in order to test the impact of football success in a given year *t* on log first year enrollment, we lead first year enrollment two times. The cost of leading variables is, of course, lost observations and degrees of freedom. For this reason, we choose not to lead first year enrollment a third time.

V. Results

Applications

We run a basic OLS model, though we acknowledge that these estimates will likely be biased because of the unobserved school level heterogeneity. Results of this

model are presented in table 3A (Divisions I-A and I-AA) and table 3B (Divisions II and III). The basic OLS model predicts a significant football effect on applications for all divisions, via win percentage or winning a national championship. For Division I-A schools, winning a national championship increases predicted applications by 12.9% in the current year and 14.3% in the following year. Being a national championship winner also significantly impacts applications to Division II and Division III institutions. The model estimates that for national championship winners in Division II, applications will increase by 41.9% in the current year and 36.9% in the following year. For Division III, there is only a significant positive national champion effect for the current year (9.58%). A 0.1 rise in win percentage positively affects applications or Division I-AA schools by 1.79% in the current year and Division III schools by 1.47% and 1.52% in the current and following years, respectively. The magnitudes of these coefficients follow our expectations in that there is—except in the case of Division II—a larger effect on the following year's applications than the current year's applications. Our model reveals a football effect from other variables for Division I-A as well. Each additional All American increases the applicant pool by approximately 4% in the current and following years. Furthermore, changing conferences has a significant negative impact on applications. Our conference change variable is equal to 1 if a school changes conferences during a given year; we do not know whether the conference change is for the better or for the worse, but the negative coefficient leads us to think that, on average, changing conferences in Division I-A is perceived unfavorably. For example, in 2012, Texas A&M University left the Big 12 Conference to join the Southeastern Conference—

leaving behind (at the despair of many fans) its long-term rivalry with the University of Texas.

It is interesting to point out some other significant institutional variables in our OLS model. Our results find that compared to private schools, public Division I-A and Division II schools receive less applications, while Division III public schools receive more applications, ceteris paribus. We find no effect for Division I-AA schools. Regarding geographic location of the institution, we find more of a significant impact on applications for Division II and III schools. Postsecondary institutions in the midwest and southwest, compared to the northeast, receive less applications for both Division II and III. Southeast schools in Division II also receive fewer applications than northeast schools. Our model does not show a significant effect of geographic location on applications for Division I-A schools. For Division I-AA, however, schools in the west are expected to receive fewer applications than schools in the northeast.

Our basic fixed effects model estimates a significant football effect for Division I-A in both the current year and the next year, with larger effects in magnitude for the following year as we expected. Results for this model are presented in table 4A (Divisions I-A and I-AA) and table 4B (Divisions II and III). For every 0.1 increase in win percentage, the model for Division I-A schools predicts a 0.8% increase in applications in the current year and a 1% increase in applications for the next year, all else equal. The football effect manifests itself in consensus All American as well. Although we only see a significant effect on applications for the next year, both coefficients follow our expectations: they are both positive and the

impact on the following year is larger in magnitude than the impact on the current year. Applications are also significantly affected by changing divisions for Division I-A, Division I-AA, and Division II schools. The significance is negative and lies in the current year for Divisions I-AA and II, while for Division I-A, the impact is positive and seen for the next year. The division change variable carries a value of 0 or 1, indicating whether the school changed divisions during a given year; it does not tell us any specifics of the change. It makes sense to see differing effects in sign, as changing divisions could be seen as an "upgrade," resulting in an application boost, or as a "downgrade," driving applicants away. Though the effect of division change on applications is insignificant for Division III, the effects are similar in magnitude to Division II, suggesting that the variables may not be estimated precisely due to having standard errors too large to be significant. Likewise, the effect of changing divisions on applications is similar in magnitude for Division I-A and I-AA schools.

We alter our basic model to test one possible consequences of our subject: that, theoretically, it is likely that the effect of football success varies for schools of differing sizes. We expect the "football effect" to impact large schools more than small schools, where there is a stronger football atmosphere. By grouping all schools together, we are potentially diluting some effect on larger, more athletically successful schools. For example, we expect a winning season at Texas A&M University, a very large school (47,567 undergraduates in the fall of 2014)[6], to have a greater admissions impact than a winning season at Vanderbilt, a smaller school (6,851 undergraduates in the fall of 2014)[7], despite the fact that both belong to

[6] Office of Admissions | Texas A&M University - Home
[7] Vanderbilt University Undergraduate Admissions

Division I-A. To test this, we create an extension on our basic model by clustering by school size. The school size is clustered into three groups (small, midsize, large) and is defined within each division. To get the concentration effect, we interact school size with overall win percentage. This variable alone is concentrated because it is one of the only athletic variables that consistently exists outside of Division I-A, and because we saw significant effects in our basic model. Our heterogeneity results are presented in table 5A (Divisions I-A and I-AA) and table 5B (Division II and III).

Again, most of the significance is found for Division I-A schools. The effect of win percentage on quantity of applications is positive and statistically significant for large schools and mid-sized schools in both the current year and following year, and for small schools in the following year. These effects, however, are not statistically different from each other. This reiterates that with an increase in win percentage, a given school is predicted to see increases in the quantity of applications it receives; the effect of win percentage on applications, however, does not vary by school size. The effect of win percentage on applications is significant for mid-sized schools in the current year for Division I-AA, in the next year for Division II, and in both years for Division III. Because we did not see a significant effect of win percentage when all the schools were grouped together, this result could support the idea that grouping every school together diluted its effect on applications for these divisions. Additionally, consensus All American remains significant and of similar magnitude for Division I-A. Furthermore, the magnitude and significance of the coefficients on the division change variable do not differ between the basic model and this model.

First Year Enrollment

Our basic OLS enrollment model results are presented in table 6. The OLS model predicts a significant positive football effect for Divisions I-A, I-AA, and III. In Division I-A the effect lies on the national championship variable: winning a national championship is predicted to increase first year enrollment by 10.1%. Seemingly contradictory, we find that having a Heisman Trophy winner decrease applications by 6.78% in Division I-A; the net effect, however, remains positive. Winning a national championship also favorably impacts first year enrollment at Division I-AA schools (by 7.84%) and at Division III schools (by 19.7%). Win percentage also has a significant effect on first year enrollment in Division III, predicting a rise in enrollment by 1.92% for every 0.1 increase in win percentage. Our model also finds that public Division I-A and Division III schools have larger first year enrollments than private ones, all else equal. Compared to the northeast, Division I-A schools in the midwest and southeast are predicted to have bigger first year enrollments; for Division II, midwest and southwest schools have smaller first year enrollments than northeast schools; and in Division III, schools in the west have smaller enrollment numbers for first years than do schools in the northeast.

Our basic fixed effects model, presented in table 7, suggests a significant impact of win percentage on first year enrollment for Division II and Division III schools. Results predict that a 0.1 increase in win percentage increases first year enrollment by 0.5% and 0.4% for Divisions II and III, respectively. The positive effect of win percentage on first year enrollment for Division II schools, however, may be countered by a significant negative impact of being a national champion—a

puzzling finding that leaves a zero net effect of athletic performance on log first year enrollment for Division II institutions. Win percentage does not significantly impact first year enrollment for Division I-A; rather, we see a positive significant effect of the quantity consensus All Americans: an additional All American is predicted to increase first year enrollment by 2.45%, ceteris paribus. Consistent with our test on applications, we see no significant effects for Division I-AA schools.

When we run our extended model with the interaction between win percentage and school size, we only find that higher win percentages significantly increase first-year enrollment for mid-sized schools and small schools in Division II; these effects are not statistically different from one another. Results with interaction effects are presented in table 8. Once again, we see a significant negative effect of winning a national championship on first year enrollment for Division II, but the net effect of athletic performance on enrollment remains positive. For Division I-A, the magnitude and significance of consensus All Americans on first year enrollment is stagnant. The interacted model does not find any significant effects for Division I-AA and Division III.

VI. Conclusion

In support of previous studies on the subject, we also find a football effect on the quantity of applications for Division I-A institutions. Driving the effect is the overall win percentage of a program: we find that for every 0.1 increase in win percentage, the model predicts a 0.8% increase in applications in the current year and a 1% increase in applications for the next year, all else equal. This effect is not statistically different in magnitude for schools of different sizes. The quantity of

consensus All Americans (an honor in Division I-A football) in a football program also impacts applications in the current year by 2.40% for each additional All American. This effect remains similar in significance and magnitude in both models. Without clustering by school size, we find no application effect for Division II and Division III institutions. After clustering schools into three percentile groups (large, mid-sized, and small) we see similar increases in applications for mid-sized schools. A 0.1 increase in win percentage increases predicted applications by 0.8% in the following year for mid-sized schools in Division II. For Division III, a 0.1 rise in win percentage results in a predicted 1.03% rise in the current year and a 1.26% rise in the following year for mid-sized schools. We do not find any significant football effect on applications for Division I-AA schools.

Our model finds small, significant positive impacts of win percentage on first year enrollment for Division II (0.561%) and Division III institutions (0.445%). Furthermore, winning a national championship has a significant negative effect on first year enrollment in Division II schools, suggesting that winning a national championship decreases predicted enrollment by 0.568%. Although this effect is puzzling, combined with the positive effect of win percentage, our results suggest that the net effect of football success on first year enrollment for Division II schools is zero. When Division II is broken down by school size, however, the effect of national champion on enrollment becomes insignificant while the significance of win percentage remains for mid-sized and small schools. These effects are larger in magnitude, with 1.01% increases in enrollment for mid-sized schools and 0.865% increases for small schools, although these effects are not statistically different from

one another. When clustering by school size in Division III, the significance of win percentage disappears. This is not a surprising result, seeing as how the effect of win percentage on enrollment in the basic model was less than one-half percent. We see no significant effect of win percentage on first year enrollment for Division I-A and I-AA institutions. For Division I-A, however, there is a positive enrollment effect for consensus All Americans: an additional All American increases predicted first year enrollment by 2.45%—an effect similar in magnitude to the application effect. In our interacted model, consensus All American remains significant and increases very slightly in magnitude to approximately 2.47%.

Appendix

Table 1: Athletic Summary Statistics by Division (2013)

	Obs	Mean	Standard Dev	Min	Max
Panel A: Division I-A					
win percentage	125	0.5182	0.2374	0	1
national champ	125	0.0080	0.0894	0	1
consensus All-American	125	0.2000	0.5820	0	3
Heisman	125	0.0080	0.0894	0	1
Panel B: Division I-AA					
win percentage	126	0.4790	0.2207	0	0.933
national champ	131	0.0076	0.0874	0	1
Panel C: Division II					
win percentage	156	0.4996	0.2430	0	0.93
national champ	160	0.0063	0.0791	0	1
Panel D: Division III					
win percentage	234	0.4834	0.2628	0	1
national champ	238	0.0042	0.0648	0	1

Note: The data in this table was collected and analyzed collaboratively with Chelsea Temple (Rhodes College). As such, this table is identical to the academic summary statistics presented in table 1 of Temple (2015).

Table 2: Academic Summary Statistics by Division (2013)

	Obs	Mean	Standard Dev	Min	Max
Panel A: Division I-A					
applications	123	19630.8	11665.25	2641	72697
total enrollment	122	20978.2	9769.657	3160	59382
freshman enrollment	122	3755.07	1752.003	0	8393
total cost of enrollment (in thousands)	118	23.6218	8.480668	4.71	43.722
student-faculty ratio	122	17.8525	4.758068	5	32
faculty with advanced degrees (in hundreds)	107	11.9596	6.455833	0	34.43
expenses for full-time students (in thousands)	76	12.4395	11.88051	0	73.894
Panel B: Division I-AA					
applications	117	10655	8715.599	1598	36941
total enrollment	121	8390.88	5369.374	1569	25868
freshman enrollment	120	1564.6	847.0673	389	4118
total cost of enrollment (in thousands)	119	23.6235	10.59515	5.8425	45.132
student-faculty ratio	119	15.479	4.331299	5	26
faculty with advanced degrees (in hundreds)	100	5.1005	3.954056	0.89	22.5
expenses for full-time students (in thousands)	85	10.2583	7.882567	2.114	47.865
Panel C: Division II					
applications	152	4083.26	3027.678	316	17880
total enrollment	154	5017.23	4023.153	633	25259
freshman enrollment	149	901.477	640.5161	181	3940
total cost of enrollment (in thousands)	145	16.7219	7.150616	4.587	38.13
student-faculty ratio	149	16.7651	3.335698	10	27
faculty with advanced degrees (in hundreds)	129	1.95372	1.452125	0.2	8.94
expenses for full-time students (in thousands)	104	6.33174	2.350309	0	16
Panel D: Division III					
applications	225	4364.41	3879.583	223	27265
total enrollment	229	2785.49	2372.934	528	14432
freshman enrollment	225	602.804	399.6142	90	2200
total cost of enrollment (in thousands)	220	29.4495	9.919413	7.05	45.358
student-faculty ratio	222	12.8243	3.032366	6	25
faculty with advanced degrees (in hundreds)	194	1.95706	1.888187	0.18	15.28
expenses for full-time students (in thousands)	157	12.0751	8.692022	2.073	64.3

Note: The data in this table was analyzed collaboratively with Chelsea Temple (Rhodes College). As such, this table is identical to the academic summary statistics presented in table 2A of Temple (2015).

Table 3A: Effect of Athletic Success on Applications (OLS)

	Division I-A		Division I-AA	
	current year	next year	current year	next year
win percentage	-0.112	-0.0912	0.179*	0.166
	(0.0966)	(0.0997)	(0.100)	(0.112)
national champ	0.129**	0.143**	0.0552	0.0887
	(0.0610)	(0.0664)	(0.0814)	(0.0928)
Heisman	-0.0620	-0.115		
	(0.0741)	(0.0696)		
consensus All-American	0.0411**	0.0374*		
	(0.0173)	(0.0191)		
ln(enrollment)	0.996***	0.986***	0.673***	0.676***
	(0.141)	(0.143)	(0.111)	(0.109)
conference change	-0.104**	-0.0759*		
	(0.0431)	(0.0447)		
division change	0.153	0.159*	-0.0934	-0.0535
	(0.0953)	(0.0866)	(0.0986)	(0.0907)
tuition	0.0273***	0.0280***	0.0330***	0.0355***
	(0.00928)	(0.00987)	(0.00862)	(0.00929)
student/teacher ratio	0.00960	0.0105	-0.0335**	-0.0336**
	(0.00830)	(0.00840)	(0.0152)	(0.0159)
faculty degree	0.00189	0.00262	0.0252	0.0265
	(0.00761)	(0.00816)	(0.0216)	(0.0223)
student expense	-0.00366	-0.00398	1.37e-05***	1.49e-05***
	(0.00412)	(0.00421)	(4.29e-06)	(4.50e-06)
fraternity	-0.668***	-0.665***	0.178	0.145
	(0.205)	(0.212)	(0.158)	(0.144)
west	-0.198	-0.162	-0.309**	-0.297**
	(0.196)	(0.215)	(0.132)	(0.142)
midwest	-0.232	-0.175	-0.189*	-0.187*
	(0.157)	(0.177)	(0.107)	(0.111)
southeast	-0.229	-0.200	-0.0371	-0.0330
	(0.208)	(0.231)	(0.0982)	(0.0993)
southwest	-0.264	-0.193	0.0878	0.110
	(0.177)	(0.195)	(0.110)	(0.105)
public	-0.824***	-0.798***	0.0259	0.0392
	(0.251)	(0.246)	(0.145)	(0.145)
Observations	768	698	864	799
R-squared	0.797	0.798	0.699	0.696

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. All specifications include year and conference dummy variables.

Table 3B: Effect of Athletic Success on Applications (OLS)

	Division II		Division III	
	current year	next year	current year	next year
win percentage	-0.0878	-0.0922	0.147**	0.152**
	(0.0953)	(0.0999)	(0.0619)	(0.0664)
national champ	0.419***	0.369***	0.0958*	0.0733
	(0.114)	(0.123)	(0.0507)	(0.0592)
ln(enrollment)	0.337***	0.356***	0.485***	0.480***
	(0.0868)	(0.0852)	(0.0840)	(0.0822)
division change	-0.143	-0.0464	-0.178**	-0.127
	(0.0980)	(0.0914)	(0.0839)	(0.0778)
tuition	0.00769	0.00724	0.0582***	0.0615***
	(0.00883)	(0.00945)	(0.00522)	(0.00578)
student/teacher ratio	0.0215*	0.0223*	-0.0116	-0.0101
	(0.0113)	(0.0117)	(0.0127)	(0.0130)
faculty degree	0.180***	0.182***	0.0492	0.0465
	(0.0351)	(0.0361)	(0.0332)	(0.0321)
student expense	-1.68e-05***	-1.61e-05***	-6.08e-06	-3.47e-06
	(3.03e-06)	(3.31e-06)	(7.82e-06)	(7.82e-06)
fraternity	0.0819	0.0802	-0.00998	-0.0121
	(0.102)	(0.103)	(0.0552)	(0.0559)
sorority	0.278***	0.271***	0.117**	0.116**
	(0.0973)	(0.0986)	(0.0515)	(0.0528)
west	-0.0237	0.0178	-0.124	-0.121
	(0.112)	(0.110)	(0.0848)	(0.0813)
midwest	-0.568***	-0.581***	-0.255***	-0.263***
	(0.0911)	(0.0927)	(0.0561)	(0.0569)
southeast	-0.299***	-0.296***	-0.0827	-0.0708
	(0.0982)	(0.101)	(0.0797)	(0.0825)
southwest	-0.637***	-0.648***	-0.187**	-0.152
	(0.138)	(0.137)	(0.0947)	(0.0952)
public	-0.271*	-0.312**	0.716***	0.723***
	(0.141)	(0.146)	(0.129)	(0.128)
Observations	1,127	1,045	1,734	1,591
R-squared	0.655	0.659	0.789	0.784

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. All specifications include year dummy variables.

Table 4A: Effect of Athletic Success on Applications (Fixed Effects)

	Division I-A		Division I-AA	
	current year	next year	current year	next year
win percentage	0.0872***	0.106***	0.0165	0.0104
	(0.0215)	(0.0234)	(0.0281)	(0.0387)
national champ	0.0403	0.00325	0.0382	0.0542
	(0.0424)	(0.0378)	(0.0388)	(0.0401)
Heisman	0.0474	0.00924		
	(0.0325)	(0.0501)		
consensus All-American	0.0238	0.0240*		
	(0.0154)	(0.0135)		
ln(enrollment)	0.468***	0.537***	0.789***	0.701***
	(0.132)	(0.163)	(0.252)	(0.240)
conference change	-0.0150	-0.0175		
	(0.0299)	(0.0206)		
division change	0.0463	0.0877**	-0.0731**	-0.0541
	(0.0557)	(0.0338)	(0.0288)	(0.0456)
tuition	0.00383	0.00386	0.0171***	0.0177**
	(0.00362)	(0.00349)	(0.00634)	(0.00725)
student/teacher ratio	-0.000199	-0.00260	0.000183	0.00815
	(0.00355)	(0.00288)	(0.00848)	(0.00858)
faculty degree	0.000579	-0.00151	0.00932	0.0123
	(0.00352)	(0.00276)	(0.0112)	(0.0114)
student expense	-0.000769	0.00300	4.33e-06***	6.32e-06***
	(0.00271)	(0.00333)	(1.44e-06)	(1.74e-06)
Observations	768	698	864	799
R-squared	0.774	0.782	0.496	0.476
Number of schools	95	92	109	108

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. All specifications include year and conference dummy variables.

Table 4B: Effect of Athletic Success on Applications (Fixed Effects)

	Division II		Division III	
	current year	next year	current year	next year
win percentage	0.0446	0.0226	0.0539	0.0558
	(0.0441)	(0.0370)	(0.0346)	(0.0373)
national champ	0.0475	0.0565	0.0120	-0.00450
	(0.0555)	(0.0996)	(0.0214)	(0.0243)
ln(enrollment)	0.437**	0.466***	0.422**	0.441**
	(0.168)	(0.157)	(0.178)	(0.181)
division change	-0.132**	-0.0232	-0.0131	0.0277
	(0.0570)	(0.0542)	(0.0467)	(0.0513)
tuition	0.00678	0.0102	0.0201***	0.0215***
	(0.00713)	(0.00730)	(0.00562)	(0.00624)
student/teacher ratio	0.00858	0.00473	-0.000577	-0.000539
	(0.00597)	(0.00688)	(0.00657)	(0.00725)
faculty degree	-0.00663	0.0227	-0.0242	-0.0274
	(0.0255)	(0.0341)	(0.0161)	(0.0179)
student expense	-3.50e-06***	-0.00133	-1.71e-06***	4.92e-07
	(1.24e-06)	(0.00775)	(5.31e-07)	(5.41e-07)
Observations	1,134	1,051	1,767	1,624
R-squared	0.373	0.361	0.575	0.529
Number of schools	157	151	205	201

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. All specifications include year dummy variables.

Table 5A: Heterogeneity in the Effect of Athletic Success on Applications (Fixed Effects)

	Division I-A		Division I-AA	
	current year	next year	current year	next year
win percentage*large	0.0906***	0.0721**	0.0288	0.0112
	(0.0240)	(0.0275)	(0.0381)	(0.0502)
win percentage*middle	0.0923**	0.118***	0.103*	0.00296
	(0.0362)	(0.0336)	(0.0526)	(0.0682)
win percentage*small	0.0632	0.120**	-0.0568	0.0203
	(0.0443)	(0.0568)	(0.0372)	(0.0604)
national champ	0.0401	0.0114	0.0397	0.0539
	(0.0398)	(0.0390)	(0.0379)	(0.0398)
Heisman	0.0471	0.0107		
	(0.0329)	(0.0526)		
consensus All-American	0.0238	0.0252*		
	(0.0150)	(0.0137)		
ln(enrollment)	0.459***	0.554***	0.780***	0.701***
	(0.129)	(0.157)	(0.242)	(0.241)
conference change	-0.0155	-0.0155		
	(0.0296)	(0.0205)		
division change	0.0452	0.0892**	-0.0692***	-0.0547
	(0.0557)	(0.0346)	(0.0264)	(0.0454)
tuition	0.00385	0.00378	0.0157**	0.0179**
	(0.00356)	(0.00350)	(0.00628)	(0.00723)
student/teacher ratio	-0.000352	-0.00276	0.000151	0.00815
	(0.00358)	(0.00289)	(0.00827)	(0.00861)
faculty degree	0.000591	-0.00136	0.00853	0.0124
	(0.00351)	(0.00275)	(0.0111)	(0.0114)
student expense	-0.000742	0.00288	3.61e-06**	6.43e-06***
	(0.00271)	(0.00329)	(1.44e-06)	(1.74e-06)
Observations	768	698	864	799
R-squared	0.774	0.782	0.502	0.476
Number of schools	95	92	109	108

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. All specifications include year and conference dummy variables.

Table 5B: Heterogeneity in the Effect of Athletic Success on Applications (Fixed Effects)

	Division II		Division III	
	current year	next year	current year	next year
win percentage*large	0.0337	-0.00346	0.0532	-0.00153
	(0.0490)	(0.0578)	(0.0465)	(0.0436)
win percentage*middle	0.0886	0.0840*	0.103**	0.126**
	(0.0565)	(0.0459)	(0.0513)	(0.0515)
win percentage*small	0.0183	0.0172	0.0241	0.0540
	(0.0858)	(0.0576)	(0.0622)	(0.0692)
national champ	0.0436	0.0477	0.00967	-0.00165
	(0.0571)	(0.0996)	(0.0217)	(0.0207)
ln(enrollment)	0.439***	0.471***	0.413**	0.449**
	(0.167)	(0.157)	(0.183)	(0.184)
division change	-0.132**	-0.0207	-0.0124	0.0296
	(0.0571)	(0.0542)	(0.0462)	(0.0515)
tuition	0.00621	0.00934	0.0197***	0.0211***
	(0.00705)	(0.00713)	(0.00564)	(0.00622)
student/teacher ratio	0.00811	0.00392	-0.000755	-0.000509
	(0.00596)	(0.00687)	(0.00660)	(0.00726)
faculty degree	-0.00600	0.0237	-0.0238	-0.0244
	(0.0253)	(0.0343)	(0.0161)	(0.0179)
student expense	-2.67e-06	-0.00190	-1.75e-06***	4.55e-07
	(1.64e-06)	(0.00779)	(5.35e-07)	(5.41e-07)
Observations	1,134	1,051	1,767	1,624
R-squared	0.374	0.363	0.576	0.532
Number of schools	157	151	205	201

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. All specifications include year dummy variables.

Table 6: Effect of Athletic Success on Enrollment (OLS)

	Division I-A	Division I-AA	Division II	Division III
win percentage	-0.0257	0.0663	0.0848	0.192***
	(0.0451)	(0.0514)	(0.0614)	(0.0415)
national champ	0.101**	0.0784**	0.0466	0.197***
	(0.0434)	(0.0386)	(0.130)	(0.0421)
Heisman	-0.0678*			
	(0.0402)			
consensus All-American	0.0122			
	(0.0156)			
ln(enrollment)	0.684***	0.729***	0.600***	0.550***
	(0.0656)	(0.0591)	(0.0585)	(0.0614)
conference change	-0.00396			
	(0.0413)			
division change	0.0402	-0.0484	-0.0350	-0.0980
	(0.0804)	(0.0724)	(0.0601)	(0.0606)
tuition	0.0177***	0.0172***	-0.00375	0.0268***
	(0.00538)	(0.00494)	(0.00580)	(0.00336)
student/teacher ratio	0.0128**	0.0166***	0.00782	0.0136*
	(0.00559)	(0.00564)	(0.00703)	(0.00776)
faculty degree	0.00485	0.0109	0.109***	0.0141
	(0.00360)	(0.0104)	(0.0294)	(0.0230)
student expense	-0.00618**	7.84e-06***	-4.25e-06*	-5.11e-06***
	(0.00269)	(2.84e-06)	(2.19e-06)	(1.72e-06)
fraternity	-0.321***	0.0356	0.0846	-0.0166
	(0.0821)	(0.0777)	(0.0773)	(0.0511)
west	-0.0517	-0.0426	0.00711	-0.146**
	(0.0950)	(0.0797)	(0.0942)	(0.0676)
midwest	0.0539	0.111*	-0.240***	-0.0143
	(0.0710)	(0.0576)	(0.0611)	(0.0324)
southeast	-0.0173	0.117**	-0.0969	-0.0273
	(0.0935)	(0.0561)	(0.0625)	(0.0509)
southwest	0.0297	0.0788	-0.245***	0.0901
	(0.0877)	(0.0735)	(0.0931)	(0.0705)
public	0.222**	0.0877	-0.0479	0.452***
	(0.109)	(0.0790)	(0.0767)	(0.0988)
Observations	692	792	1,042	1,574
R-squared	0.880	0.896	0.841	0.835

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. All specifications include year and conference dummy variables.

Table 7: Effect of Athletic Success on Enrollment (Fixed Effects)

	Division I-A	Division I-AA	Division II	Division III
win percentage	-0.00195	-0.00870	0.0561*	0.0445**
	(0.0151)	(0.0282)	(0.0306)	(0.0217)
national champ	-0.00374	-0.0135	-0.0568*	-0.0333
	(0.0373)	(0.0103)	(0.0320)	(0.0301)
Heisman	0.0167			
	(0.0514)			
consensus All-American	0.0245**			
	(0.0112)			
ln(enrollment)	0.531***	0.547***	0.388***	0.315**
	(0.121)	(0.102)	(0.100)	(0.129)
conference change	-0.0104			
	(0.0300)			
division change	0.0504	-0.0324	0.0181	0.0167
	(0.0361)	(0.0262)	(0.0427)	(0.0277)
tuition	0.00339	0.00379	0.00136	-0.00202
	(0.00567)	(0.00341)	(0.00487)	(0.00298)
student/teacher ratio	-0.00174	0.0131**	0.000220	0.00292
	(0.00284)	(0.00602)	(0.00485)	(0.00511)
faculty degree	7.30e-05	0.00484	0.00271	-0.0100
	(0.00326)	(0.00825)	(0.0150)	(0.00787)
student expense	0.00652	1.92e-06**	-4.29e-05	-4.43e-06***
	(0.00475)	(8.98e-07)	(0.00405)	(3.59e-07)
Observations	692	792	1,047	1,606
R-squared	0.383	0.304	0.193	0.164
Number of schools	92	106	151	200

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. All specifications include year and conference dummy variables.

Table 8: Heterogeneity in the Effect of Athletic Success on Enrollment (Fixed Effects)

	Division I-A	Division I-AA	Division II	Division III
win percentage*large	0.0123	-0.0414	0.0194	0.0390
	(0.0267)	(0.0464)	(0.0385)	(0.0286)
win percentage*middle	0.0170	0.0199	0.101***	0.0239
	(0.0257)	(0.0474)	(0.0314)	(0.0221)
win percentage*small	-0.0514	0.00677	0.0865*	0.0598
	(0.0374)	(0.0329)	(0.0492)	(0.0365)
national champ	-0.00560	-0.00629	-0.0633*	-0.0314
	(0.0353)	(0.0127)	(0.0361)	(0.0304)
Heisman	0.0154			
	(0.0512)			
consensus All-American	0.0247**			
	(0.0106)			
ln(enrollment)	0.509***	0.549***	0.395***	0.319**
	(0.119)	(0.0969)	(0.103)	(0.127)
conference change	-0.0119			
	(0.0310)			
division change	0.0490	-0.0316	0.0214	0.0164
	(0.0365)	(0.0261)	(0.0430)	(0.0276)
tuition	0.00357	0.00335	0.000608	-0.00183
	(0.00565)	(0.00354)	(0.00469)	(0.00300)
student/teacher ratio	-0.00216	0.0132**	-0.000401	0.00293
	(0.00300)	(0.00593)	(0.00476)	(0.00510)
faculty degree	-4.07e-05	0.00461	0.00444	-0.00996
	(0.00324)	(0.00811)	(0.0150)	(0.00802)
student expense	0.00651	2.08e-06**	-0.000694	-4.41e-06***
	(0.00471)	(9.56e-07)	(0.00403)	(3.62e-07)
Observations	692	792	1,047	1,606
R-squared	0.387	0.307	0.201	0.166
Number of schools	92	106	151	200

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. All specifications include year and conference dummy variables.

References

Branch, Taylor. "The Shame of College Sports." The Atlantic. September 7, 2011. Accessed March 22, 2015.http://www.theatlantic.com/magazine/archive/2011/10/the-shame-of-college-sports/308643/

Chung, Doug J. "The Dynamic Advertising Effect of Collegiate Athletics." *Marketing Science* 32, no. 5 (September-October 2013): 679-698. Accessed 4 September 2014.

"College Football Data Warehouse." College Football Data Warehouse. Accessed November 15, 2014.

"College Football Facts & Figures: Attendance, Viewership Keep Going up." - Hootens.com. Accessed March 22, 2015. http://www.hootens.com/college-football-facts-figures-attendance-viewership-keep-going-up_335_a.aspx.

"College Football History." A Brief History of College Football. Accessed March 22, 2015. http://www.collegefootballpoll.com/history_of_college_football.html.

"College Football - Home | NCAA.com." NCAA.com. Accessed November 15, 2014. http://www.ncaa.com/sports/football.

ESPN. Accessed November 15, 2014. http://espn.go.com/.

McCormick, Robert E. & Maurice Tinsley. "Athletics versus Academics? Evidence from SAT Scores." *The Journal of Political Economy*, Volume 95, Issue 5 (Oct., 1987), 1103-1116. Accessed 26 August 2014.

Murphy, Robert G. & Gregory A. Trandel. "The Relation Between a University's Football Record and the Size of Its Applicant Pool." *Economics of Education Review*, Vol. 13, No. 3, pp. 265-270, 1994. Accessed 15 September 2014.

"NCAA Football History." NCAA Football History. Accessed November 15, 2014. http://www.texasfan7.greatnow.com/Bowls/Bowls.htm.

"Office of Admissions | Texas A&M University - Home." Office of Admissions | Texas A&M University - Home. Accessed May 9, 2015.

Pope, Devin G. and Jaren C. Pope. "The Impact of College Sports Success on the Quantity and Quality of Student Applications." *Southern Economic Journal* 75.3 (2009): 750-780. Southern Economic Association. Accessed 4 September 2014.

"Sports-Reference.com - Sports Statistics and History." Sports-Reference.com - Sports Statistics and History. Accessed November 15, 2014.

Toma, J. Douglas and Michael E. Cross. “Intercollegiate Athletics and Student College Choice: Exploring the Impact of Championship Seasons on Undergraduate Applications.” *Research in Higher Education* 39.6 (1998): 633-661. Springer. Accessed 26 August 2014.

"Vanderbilt University Undergraduate Admissions." Vanderbilt University Undergraduate Admissions. Accessed May 9, 2015.