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Getting on the Front Page: Organizational Reputation, Status Signals, and the Impact of *U.S. News and World Report* on Student Decisions

Nicholas A. Bowman · Michael N. Bastedo

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Abstract Recent studies have suggested that a causal link exists between college rankings and subsequent admissions indicators. However, it is unclear how these effects vary across institutional type (i.e., national universities vs. liberal arts colleges) or whether these effects persist when controlling for other factors that affect admissions outcomes. Using admissions data for top-tier institutions from fall 1998 to fall 2005, we found that moving onto the front page of the *U.S. News* rankings provides a substantial boost in the following year's admissions indicators for all institutions. In addition, the effect of moving up or down within the top tier has a strong impact on institutions ranked in the top 25, especially among national universities. In contrast, the admissions outcomes of liberal arts colleges—particularly those in the lower half of the top tier—were more strongly influenced by institutional prices.

Keywords Rankings · Reputation · Status · Signaling · Organization theory · College admissions

Introduction

College rankings have a pervasive influence on the higher education landscape. In 1995, over 40% of entering college freshmen reported that national college rankings were either somewhat important or very important in choosing which college to attend (McDonough

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N. A. Bowman (✉)
Center for Social Concerns, University of Notre Dame, P.O. Box 766, Notre Dame, IN 46556-0766, USA
e-mail: nbowman@nd.edu

M. N. Bastedo (✉)
Center for the Study of Higher and Postsecondary Education, University of Michigan, Ann Arbor, USA
e-mail: bastedo@umich.edu

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et al. 1998). But over the past decade, the influence of college rankings has intensified. Since 1995, the proportion of students who describe the ratings as being very important in their college choice process has increased by more than 50% (Higher Education Research Institute 2007). Moreover, the America's Best Colleges section of the *U.S. News and World Report* website now records millions of page views every month (Marklein 2007).

This growing attention has led to both an increasing backlash from many colleges (Thacker 2005) and a number of recent empirical studies on the various effects of undergraduate and graduate school rankings (Griffith and Rask 2007; Martins 2005; Meredith 2004; Pike 2004; Rindova et al. 2005; Sauder and Lancaster 2006; Volkwein and Sweitzer 2006). Recently, some studies have begun to systematically explore the effects of undergraduate college rankings on admissions indicators. Monks and Ehrenberg (1999) analyzed data from 1987 to 1997 for 30 private colleges and universities, almost all of which were ranked in the *U.S. News* top 25 for national universities or liberal arts colleges. Although the sample was small, the results showed a consistent effect of rankings on admissions outcomes. Specifically, they found that a one-unit increase in *U.S. News* ranking corresponded to a 0.4% decrease in acceptance rate, a 0.2% increase in yield, and a 2.8-point increase in average SAT score.

In a subsequent study, Meredith (2004) used a larger sample that included private and public universities (though no liberal arts colleges) from all *U.S. News* tier levels in 1990–1999. Some of the effects were quite consistent with the findings of Monks and Ehrenberg (1999). Among all institutions, appearing in Tiers 2–4 (relative to the bottom half of the more prestigious Tier 1) resulted in higher acceptance rates and lower proportions of students in the top 10% of their high school class. In addition, moving up in the rankings within the top universities (ranked 1st–25th) was positively associated with the proportion of high school students in the top 10%, and moving up within the bottom Tier 1 schools (ranked 26th–50th) was associated with lower acceptance rates.

However, some of the results of the Meredith study were inconsistent with expectations. For example, there were no significant effects of tier level or ranking on average SAT scores. Furthermore, in subgroup analyses, the effects of college ranking on all variables were generally much larger for public schools than for private schools; in fact, for private universities, appearing in less prestigious tiers (particularly Tier 4) was associated with having *higher* average SAT scores. Finally, the variance explained in the subgroup analyses varied drastically across samples and indicators, ranging from 5 to 59%, with no discernible pattern in these results (i.e., the models were not consistently better for particular indicators or types of institutions). The variability in these findings can, in part, be attributed to several changes in the format of the rankings and the information used for calculating the rankings. For instance, over the 10 year period of the study, the number of schools included on the front page of the rankings increased substantially, and SAT math and verbal scores were re-centered; therefore, consistent information was only available for part of the time period investigated.

A recent study of decision making among high-ability students lends further support to the potential impact of college rankings on admissions decisions. Griffith and Rask (2007) examined the likelihood that students would attend a particular institution as a function of its *U.S. News* college ranking and numerous other factors. Overall, 62% of the schools in the sample were national liberal arts colleges, whereas only 32% were national universities. They found that, when controlling for a variety of other factors, students were more likely to attend schools with higher college rankings, and this effect was particularly pronounced among top-ranked institutions.

Given these recent studies, a more comprehensive assessment of the effects of college rankings on student decision making is warranted. In this paper, we examine the impact of recent *U.S. News* college rankings on undergraduate admissions indicators at elite liberal arts colleges and research universities. More specifically, we investigate whether changes in an institution's rankings from year to year are associated with changes in the quality of incoming students and the overall acceptance rate. To control for the effects of enrollment management strategies, we estimate models that include variables reflecting the changing gender, race, and SES of the student body, as well as financial indicators of college quality.

College Rankings and College Choice

Ajzen's theory of planned behavior (1985, 1991) provides a useful model for understanding how college rankings may affect student decision making and thus admissions indicators at elite colleges and universities. In this model, three separate forces influence a person's intention to engage in a particular behavior: attitudes toward that behavior, subjective norms regarding the behavior, and perceived control over the behavior. In other words, one's own internalized attitudes toward a specific action constitute just one factor in the decision-making process. For example, Fred may want to attend a liberal arts college that is 3,000 miles from home. However, if his parents and friends think that this is a bad idea, and Fred believes that he is unlikely to be accepted at this institution, he will probably not apply in the first place, let alone be accepted and ultimately decide to attend. The potential influences of college rankings on each of the three influences on behavioral intentions are discussed below.

Specific Attitudes Toward College Choice

College rankings can influence attitudes toward particular institutions in two ways. First, students and parents may view the rankings as "expert opinion" that helps to define institutional quality (McDonough et al. 1998). In their minds, the rankings compile both objective statistics and the perceptions of knowledgeable individuals (i.e., college deans and presidents) to indicate which colleges and universities are, in fact, considered the best. Second, students and parents are likely to internalize the hierarchy presented in the rankings, perhaps even without their conscious awareness (Bastedo and Bowman in press). When making decisions, people can hear persuasive messages and then subsequently forget the source of this information. As a result, sources that are considered highly untrustworthy can contribute to attitude change, since people do not remember where they initially learned this information (e.g., Hovland and Weiss 1951). Thus, even if students and parents do not feel that the *U.S. News* rankings measure anything of importance, they might still adopt these conceptions of which institutions are the most esteemed.

Bastedo and Bowman (in press) have shown that college rankings affect college deans' and presidents' perceptions of institutional quality. In addition, rankings have a strong influence on internal decision making at professional schools, since administrators are sensitive to the strong reaction to various rankings within their own markets (Elsbach and Kramer 1996; Espeland and Sauder 2007; Sauder 2006). Decision theory, however, would suggest that these high-level administrators are much less likely than students and parents to be persuaded, since administrators possess a great deal of information about peer institutions, and many of them believe the rankings are quite flawed (Finder 2007).

Subjective Norms Toward College Choice

When selecting a college, people are influenced not only by their own perceptions and attitudes, but also by what others might think. For instance, a parent may believe that the local regional university provides an excellent undergraduate education, but she may think that it is preferable for her daughter to attend a "big name" university, even if there is no actual difference in educational quality. Subjective norms of what constitutes a "good" college or university play a role in college choice, above and beyond one's own perceptions of quality. Many parents and students place great emphasis on attending top-ranked colleges and universities, because these colleges help students obtain the best jobs, gain acceptance to top graduate schools, and join the professional class of society (Karabel 2005; Stevens 2007). Thus, widely disseminated lists or rankings of elite institutions will have a strong effect on subjective norms, which will then contribute to changes in behavior. Even when controlling for a host of other relevant variables, McDonough et al. (1998) show that students who place a higher importance on rankings in their decision making are more likely to report caring about their college's reputation, having been influenced by family members, and having sought the advice of teachers and college counselors.

Similarly, Rindova et al. (2005) distinguish between two aspects of organizational reputation: the *perceived quality* of specific aspects of an organization and the general *prominence* of an organization in the public eye. That is, perceived quality reflects specific characteristics of an institution (as discussed previously), whereas prominence constitutes a broad subjective norm. In their analyses of 107 graduate business programs, they show that perceived quality and prominence are only loosely related, while rankings from *BusinessWeek* magazine are, in fact, a strong predictor of prominence. Furthermore, in a separate study of 14 research universities, Pike (2004) found that *U.S. News* undergraduate rankings are a poor predictor of the prevalence of educationally effective experiences across institutions. Overall, it seems clear that college rankings are not synonymous with educational effectiveness, yet they are nearly synonymous with organizational reputation.

Perceived Control Over College Acceptance

A third component of forming behavioral intentions is deciding whether the behavior is actually possible or achievable. High school students can send an application to virtually any college, but the likelihood of being accepted varies greatly depending upon the institution. The *U.S. News* college rankings provide some relevant institutional information through admissions statistics: the interquartile range of SAT–ACT scores (i.e., 25th–75th percentiles) of incoming freshmen, the proportion of incoming freshmen who graduated in the top 10% of their high school class, and the percentage of students who were admitted. Using these figures, students gauge how likely they are to be accepted at a particular institution. If a student's SAT score is below the 25th percentile for the college of his choice, he might infer that his acceptance is unlikely and decide not to apply. Conversely, a valedictorian might be highly motivated to apply if she discovers that only 64% of incoming freshmen at her top-choice college graduated in the top 10% of their high school class.

In sum, college rankings can affect students' and parents' decision making in a number of ways. First, rankings can affect perceptions of institutional quality directly. Second, they can create subjective norms of which colleges and universities are considered to be the "best," which may or may not align with an individual's own perception of quality. Third, they can affect students' perceptions of the probability that they will be accepted by the

college of their choice. Overall, rankings seem to exert powerful influences on the college choice process.

Signaling and Organizational Reputation

Competition for organizational reputation is not evenly distributed among members of a field like higher education (Washington and Zajac 2005). As a result, there is a remarkable dynamic between markets and organizational reputation. Competition for status differentiation is most intense at the top of the field and gradually declines as one moves down the reputational hierarchy, however that is defined. Research on corporate firms shows that status dynamics within organizations send important signals about desirability to external stakeholders who provide organizational resources and legitimacy (Podolny 2005).

Signals need to have two characteristics: they must be at least partially manipulable by the actor, and the difficulty of achieving the indicator must be significant and inversely correlated with the actor's quality (Podolny 1993; Spence 1974). So if rankings are an indicator of quality, they are a signal because they can be manipulated by universities either by improving educational effectiveness or by altering their statistics to suit the rankings, and they are inversely correlated because universities with low educational effectiveness will find it more difficult to achieve high rankings, and vice versa. But there may be only a "loose coupling" between quality and status signals (Podolny 1993). There are substantial time lags between shifts in quality and their perception in the environment; shifts in quality are relatively unobservable and will not always be communicated to all members in the market; and many indicators of status are entirely unrelated to shifts in quality, which may make it difficult to distinguish between shifts in quality and shifts in prestige. As a result, we would expect that students will rely upon rankings as a signal when making decisions about quality, but they will also use other indicators, including financial measures (such as tuition and instructional investments) and student demographic profiles (the class, race, and gender characteristics of the student body).

In addition, status attainment is not necessarily linear; that is, attaining membership in a top category tends to accrue benefits far beyond those that accrue from marginal increases in status (Frank and Cook 1996; Rao et al. 2003). As a result, we can say that the *form* of the rankings is likely to matter as much as its content (Bastedo and Bowman in press; Meyer and Rowan 1977; Zuckerman 1999). Like the formal structure of an organization, the formal structure of accountability mechanisms can create differential effects on the legitimacy of organizational participants. In the case of the *U.S. News* rankings, the formal structure of the rankings creates a clear and widely understood stratification of colleges that defines who is elite and who is not. In higher education, academic stratification is a signal of legitimacy to policymakers and the public (Bastedo and Gumport 2003; Gumport and Bastedo 2001).

These lines of research lead to two hypotheses not yet considered in research on university rankings. First, a ranking in the top group will have a disproportionate influence on admissions indicators, even when controlling for individual ranking. Second, we would expect that changes in ranking outside of the top group will have less influence on admissions indicators, because refinements in organizational reputation of non-elite institutions matter less to the public.

Research Questions

The current study will examine the impact of recent *U.S. News* college rankings on admissions indicators of top-tier institutions. In doing so, it expands upon—and intends to

reconcile—previous research in several important ways. First, it uses the most current data available, thereby providing an up-to-date portrayal of these phenomena. Second, it includes both national universities and liberal arts colleges, while exploring whether the impact of college rankings differs across institutional type. Third, the sample covers a period of time in which there were no major changes to the format of the rankings and no changes to any of the admissions indicators. Fourth, the models control for other factors that may serve as additional markers of prestige that influence admissions outcomes. Therefore, we explore the following five research questions:

- Do changes in college rankings result in concomitant changes in admissions indicators in the following year?
- Does the impact of college rankings on admissions indicators differ for national universities and for liberal arts colleges?
- Is the impact of college rankings more pronounced for the most elite institutions (ranked in the top 25) than for those that are ranked lower (ranked 26th–50th)?
- How do changes in alternative markers of perceived quality (i.e., tuition and instructional expenditures) affect subsequent admissions indicators?
- Do indicators of demographics, including the class, race, and gender composition of the student body, affect subsequent student enrollment choices?

Method

Data and Sample

Data on college rankings were taken from the print editions of the *U.S. News and World Report*. Rankings were collected for all institutions that appeared on the front page of the national university and liberal arts college rankings at any time from 1997 to 2004. Some institutions moved onto or off of the front page during this eight-year period; this movement was particularly relevant to our research questions. Before 1997, only the top 25 institutions were listed on the front page; as a result, we chose to start with 1997 so as to include only the years with a more comprehensive list of elite institutions. For all years in the sample, the top 50 national universities were listed. For liberal arts rankings from 1997 to 1999, 40 colleges appeared on the front page; starting in 2000, 50 liberal arts colleges were listed. When there was a tie at the bottom of the front page, all institutions were included (e.g., if three colleges tied for being ranked 50th, all three colleges were listed, yielding a total of 52 colleges on the front page).

Admissions indicators were gathered from several sources, since no single resource contained information for all admissions indicators over all years. These sources included *U.S. News* magazine issues, the *U.S. News Ultimate College Guide*, *Barron's Profiles of American Colleges*, and data from the Integrated Postsecondary Education Dataset (IPEDS). Data from only one source was used for each indicator for each year. College rankings were used to predict admissions indicators in the following year. For example, the college rankings released in August 2004 were used to predict admissions indicators for the incoming freshman class of Fall 2005. Thus, the admissions data represented the applicants for the incoming freshman classes from Fall 1998 to Fall 2005. This sampling resulted in a total of 56 national universities and 56 liberal arts colleges. (It is worth noting the remarkable stability among the top-tier schools over time, since only 56 institutions appeared in the top 50 for each set of rankings.) Finally, information for all control

variables was obtained through IPEDS, which is managed by the National Center for Education Statistics.

Dependent Variables

Five admissions indicators were included as dependent variables. These were (1) the 25th percentile of SAT/ACT scores for incoming freshmen, (2) the percentage of incoming freshmen in the top 10% of their high school class, (3) the percent of applicants who were accepted, (4) the number of applications received, and (5) yield rates for the percentage of admitted students who enrolled. The vast majority of institutions presented standardized test scores in terms of SAT scores; however, when appropriate, ACT scores were converted to SAT scores through a table provided by the College Board (2002). The 25th percentile of SAT scores for incoming freshmen was used instead of the median or mode, because our intuition was that potential applicants who read the rankings and see that they fall below this marker may be discouraged from applying. In addition, the log of number of applications was used, because the distribution for the number of applications was strongly skewed. To provide larger values for unstandardized regression coefficients, the log transformation was then multiplied by 100. Interpreting unstandardized coefficients for log-transformed dependent variables in real-world terms can be difficult; therefore, concrete examples for significant effects are provided in the results/discussion section.

Independent Variables

College ranking was included as one of the independent variables of interest. To make the results easier to interpret, the rankings were reverse-coded so that higher values reflected better rankings. These values ranged from 49 (for the top-ranked school) to 0 (for the 50th-ranked school). In addition, since some institutions moved in and out of the top 50 over time, a dummy-coded variable indicated whether a given institution was included in the top 50 (1 = top 50, 0 = outside of top 50). This cutoff is particularly important in the *U.S. News* format, since it constitutes the difference between appearing on the front page versus a secondary page in smaller font with less prestigious institutions. For years in which a college or university did not appear in the top 50, it received an overall ranking of 0, and a dummy-coded "top 50" value of 0.

Importantly, several control variables were included in the model. These variables included tuition and fees, total instructional expenditures, total Pell grant funding, proportion of students of color, and proportion of female students. To simplify the interpretation of unstandardized regression coefficients, the total costs of tuition and fees were divided by 1,000. In addition, since the distributions for instructional costs and Pell grants were strongly skewed, log transformations for these two variables were computed and used in the analyses. Furthermore, the proportion of students of color at each institution was calculated by adding the number of students who identified as Black non-Hispanic, Hispanic, Asian or Pacific Islander, and American Indian/Alaska Native and then dividing this sum by the total number of students who reported their race or ethnicity. We chose this formula so as not to include domestic students who did not report their race/ethnicity or international students, which could have yielded misleading results. Finally, as explained below, dummy variables for each institution and each year also served as independent variables. Descriptions of specific variable codings are provided in Appendix A, and descriptive statistics are provided in Appendix B.

Analyses

Like previous authors (Meredith 2004; Monks and Ehrenberg 1999), we conducted fixed effects regression analyses to determine the impact of college rankings on admissions indicators. This technique requires that dummy-coded variables be included for each institution and for each year; in doing so, the model controls for all possible observed and unobserved differences across institutions and years, such as institutional type and institutional control (Allison 2005). Therefore, the results should be interpreted as the effect of change in college rankings on change in admissions outcomes *within the same school*. Because these models account for between-institution differences, using measures of overall instructional expenditures and total Pell grants (which we have included) provide virtually identical results to using per capita or per student indicators. Moreover, including dummy-coded variables for year accounts for the fact that admissions indicators improved, on average, at elite institutions during this time period. The fixed effects method constitutes the most conservative estimate of the impact of college rankings, since it only examines within-institution effects of rankings from year to year. It is quite plausible that the institutions that receive consistently high rankings may also accrue benefits from their long-term standing.

A series of fixed effects regression analyses were conducted. First, for all institutions, each of the five admissions indicators was used as a dependent variable; the independent variables included college ranking, appearing in the top 50 ranked institutions, tuition and fees, total instructional expenditures, total Pell grants, proportion of students of color, and proportion of female students. In addition, a series of dummy variables were added for each institution (with one institution as a referent group) and each year (with 1997 as the referent group). Next, these same analyses were repeated separately for national universities and liberal arts colleges. In addition, analyses were conducted separately for the top 25 institutions and the second 25 (i.e., ranked 26th–50th). Finally, separate analyses were conducted by institutional type and ranking level (e.g., for national universities ranked in the top 25).

Limitations

There are several limitations with this study that should be mentioned. First, this study only examines the effects of within-institution changes in college rankings. Fixed effects regression allows us to make fairly strong claims about the short-term impact of rankings, but we cannot gauge the long-term effects of institutions' being consistently ranked highly (or less highly) over a number of years. Second, our sample only includes recent college rankings, so we cannot directly compare whether these effects are stronger or weaker than those from the earlier years of these rankings. Third, only nine national universities moved onto or off of the front page, which makes it difficult to draw firm conclusions from these analyses. In contrast, 15 liberal arts colleges shifted to or from the front page, so the analyses for these institutions and for all institutions together should be more reliable. Fourth, this sample contains only institutions that were ranked in the top tier of national universities or liberal arts colleges. Therefore, we cannot generalize our results to those institutions that *U.S. News* defines as "regional" or those that did not appear in the top tier during this time. In fact, the instability of what *U.S. News* defines as a regional institution makes such analyses nearly impossible.

Results and Discussion

College Rankings and the "Front Page Effect"

All Institutions

Among all institutions, appearing on the front page provides a substantial boost in admissions indicators. For example, moving into the top 50 results in a 3.6% decrease in acceptance rate, $\beta = -.07, p < .001$ (see Table 1). That is, if an institution previously had a 33% acceptance rate, then this percentage drops, on average, to just over 29% in the year after it moved into the top 50, even when controlling for other factors that influence admissions outcomes. In addition, this same jump onto the front page provides a 2.3% increase in the proportion of incoming freshmen who graduated in the top 10% of their high school class, $\beta = .04, p = .01$, and a 3.9% increase in the overall number of applications to the institution, $\beta = .01, p < .08$. That is, if an institution received 20,000 applications in 1 year, then it would receive an additional 780 applications the year after it moves onto the front page. However, the front page effect is not significant for average SAT scores or yield. Moreover, when all colleges and universities are analyzed simultaneously, changes in overall ranking within the top 50 are not significantly related to changes in any of the admissions indicators. This pattern suggests that changes in ranking are primarily influential when they result in an institution's being "promoted" into (or "demoted" from) the top echelon. Subgroup analyses, however, show that changes in college rankings within the front page do have an effect for particular groups of institutions.

National Universities vs. Liberal Arts Colleges

Among national universities, controlling for other factors, there is a positive effect of change in overall ranking on SAT scores, $\beta = .19, p < .01$ (see Table 2). That is, moving up one spot in the rankings yields a 1.2-point increase in average SAT scores. Moving up in the rankings is also associated with increases in the number of applications, $\beta = .18$, $p < .01$. In other words, a university that received 20,000 applications would receive an additional 148 applications for each place that it moved up in the rankings. Furthermore, as is the case for all institutions, moving onto the front page of the national university rankings has a strong positive effect on the proportion of students in the top 10% of high school class, $\beta = .07, p = .01$, such that moving from the second page to the front page yields an impressive 3.9% increase. For example, a university that previously had 60% of its incoming freshman class graduate in the top tenth of their high school would see an increase in this statistic, on average, to 64% in the following year. Unexpectedly, moving into the top 50 yields a small but statistically significant decrease in average SAT scores, $\beta = -.04, p < .03$. This may be the result of chance, since there were only a few universities that moved in or out of the top 50 over this time. Consistent with this interpretation, visual inspection of the data suggests that this relationship is primarily attributable to one university that had particularly high SAT scores in the two years before it entered the top 50. No other significant effects are apparent for overall ranking or moving into the top 50 among national universities.

The findings for liberal arts colleges were somewhat weaker (see Table 3). Moving up or down within the top 50 has no significant effect on any of the admissions outcomes. However, appearing on the front page has a considerable impact on acceptance rates, $\beta = -.13$, $p < .001$, and on the number of applications, $\beta = .07$, $p = .001$. That is,

Table 1 Unstandardized and standardized coefficients for fixed effects regression analyses of all institutions

Independent variable	SAT scores		Frosh top 10% of HS		Acceptance rate		# of applications		Yield	
	B (SE)	β	B (SE)	β	B (SE)	β	B (SE)	β	B (SE)	β
College ranking	.40 (.31)	.07	−.01 (.07)	−.01	−.002 (.07)	−.002	.11 (.07)	.04	.01 (.04)	.01
Ranked in top 50	−4.70 (4.01)	−.02	2.32 (.94)	.04**	−3.64 (.87)	−.07***	1.66 (.92)	.01*	−.32 (.58)	−.01
Tuition and fees	1.52 (1.01)	.15	−.29 (.24)	−.15	−.21 (.22)	−.10	−.18 (.23)	−.04	.04 (.15)	.03
Instructional expenditures	9.13 (16.44)	.06	4.75 (3.86)	.15	2.35 (3.57)	.07	.24 (3.72)	.00	6.06 (2.34)	.28**
Pell grants	−19.97 (10.28)	−.12*	−.26 (2.42)	−.01	1.32 (2.24)	.04	−.36 (2.52)	−.01	−3.89 (1.61)	−.17**
Proportion of students of color	−103.8 (46.00)	−.15**	−30.46 (11.52)	−.22***	31.42 (10.00)	.22***	32.97 (10.60)	−.10***	2.17 (6.73)	.02
Proportion of female students	−300.5 (84.51)	−.51***	−27.63 (19.93)	−.24	53.99 (18.37)	.45***	−32.45 (18.70)	−.12*	14.51 (11.76)	.19
Adjusted R^2	.94		.92		.94		.99		.94	
N (institution × year)	835		828		835		807		801	

* $p < .10$; ** $p < .05$; *** $p < .01$

Table 2 Unstandardized and standardized coefficients for fixed effects regression analyses of national universities

Independent variable	SAT scores		Frosh top 10% of HS		Acceptance rate		# of applications		Yield	
	B (SE)	β	B (SE)	β	B (SE)	β	B (SE)	β	B (SE)	β
College ranking	1.21 (.44)	.19***	−.08 (.13)	−.07	−.10 (.11)	−.08	.32 (.12)	.18***	.11 (.09)	.12
Ranked in top 50	−12.13 (5.23)	−.04**	3.94 (1.51)	.07**	.14 (1.26)	.002	−1.36 (1.46)	−.01	.51 (1.07)	.01
Tuition and fees	2.11 (1.37)	.23	−.80 (.41)	−.50*	−.44 (.33)	−.24	−.30 (.38)	−.12	.58 (.28)	.42**
Instructional expenditures	−13.25 (14.80)	−.04	3.75 (4.28)	.07	3.92 (3.56)	.07	−1.34 (3.97)	−.02	2.57 (2.88)	.06
Pell grants	−11.18 (9.27)	−.05	−1.68 (2.71)	−.05	1.18 (2.23)	.03	−1.87 (2.71)	−.03	−.55 (2.01)	−.02
Proportion of students of color	−198.6 (58.32)	−.25***	−72.85 (20.54)	−.51***	26.26 (14.04)	.17*	−16.32 (16.52)	−.07	2.30 (12.39)	.02
Proportion of female students	−241.6 (114.8)	−.19**	−50.85 (33.97)	−.23	19.00 (27.62)	.08	17.80 (31.05)	.05	47.97 (22.71)	.26**
Adjusted R^2	.97		.92		.96		.97		.95	
N (institution × year)	411		404		411		387		383	

* $p < .10$; ** $p < .05$; *** $p < .01$

Table 3 Unstandardized and standardized coefficients for fixed effects regression analyses of liberal arts colleges

Independent variable	SAT scores		Frosh top 10% of HS		Acceptance rate		# of applications		Yield	
	B (SE)	β	B (SE)	β	B (SE)	β	B (SE)	β	B (SE)	β
College ranking	−.29 (.45)	−.06	−.01 (.09)	−.01	.09 (.09)	.09	−.00 (.08)	−.00	−.01 (.05)	−.02
Ranked in top 50	2.26 (6.12)	.01	1.59 (1.25)	.04	−5.66 (1.22)	−.13***	3.97 (1.20)	.07***	−.06 (.66)	−.00
Tuition and fees	1.43 (1.54)	.08	.31 (.32)	.09	.36 (.31)	.09	−.20 (.30)	−.04	−.13 (.17)	−.08
Instructional expenditures	120.4 (46.46)	.29**	13.92 (9.51)	.18	−15.13 (9.25)	−.17*	17.88 (9.11)	.13	11.68 (5.08)	.32**
Pell grants	−58.00 (29.43)	−.16*	−2.59 (6.03)	−.04	−9.09 (5.86)	−.12	13.84 (5.86)	.13*	−15.73 (3.23)	−.49***
Proportion of students of color	4.59 (74.00)	.01	−5.40 (15.15)	−.04	47.20 (14.74)	.29***	−59.66 (14.49)	−.28***	10.99 (7.98)	.16
Proportion of female students	−227.9 (127.4)	−.54*	−18.13 (26.08)	−.23	43.88 (25.37)	.49*	−41.55 (24.52)	−.35*	5.59 (13.52)	.15
Adjusted R^2	.90		.88		.91		.95		.85	
N (institution × year)	424		424		424		420		418	

* $p < .10$;** $p < .05$; *** $p < .01$

moving into the front page of the *U.S. News* liberal arts rankings results in a 5.7% decrease in acceptance rate and a 9.6% increase in the number of applications in the following year. Both of these effects reflect a greater quantity (though not necessarily quality) of applicants. Clearly, appearing on the front page of the *U.S. News* rankings provides substantial admissions benefits for elite colleges and universities.

Top 25 vs. Second 25

As expected, the impact of college rankings on admissions indicators is stronger for the most elite institutions than for other top-tier institutions. For all colleges and universities in the top 25, moving up one place in the rankings yields a 1.4-point increase in SAT scores, $\beta = .16$, $p < .03$, a 0.25% decrease in acceptance rates, $\beta = -.14$, $p < .03$, and a 0.95% increase in the number of applications, $\beta = .09$, $p = .001$ (see Table 4). Through subgroup analyses, these patterns among the top 25 appear to be driven primarily by the top 25 national universities. For these top universities, a one-unit increase in college rankings leads to an additional 2.0 points on average SAT scores, $\beta = .22$, $p = .001$, a 0.4% decrease in acceptance rates, $\beta = -.24$, $p < .005$, and a 1.5% increase in the number of applications, $\beta = .23$, $p < .001$. In contrast, among the top 25 liberal arts colleges, changes in overall ranking only affect yield statistics; moving up one position in the rankings is associated with a 0.25% increase in yield, holding all else equal. (Although the complete tables for subgroup analyses cannot be included due to space constraints, these tables can be found at http://www-personal.umich.edu/~bastedo/papers.html).

The effects of college rankings were far less pronounced for institutions ranked below the top 25. As shown in Table 5, moving up one spot in the college rankings leads to a 1.3-point increase in average SAT scores, $\beta = .15$, $p < .005$, which is similar to the 1.4-point increase among the top 25 institutions. However, no effects are apparent for the other four admissions outcomes. Furthermore, when conducting analyses separately for national universities and liberal arts colleges, college rankings are not significantly related to any of the admissions indicators for either type of institution.

Tuition and Instruction: Alternative Markers of Prestige

It is perhaps surprising that college rankings did not significantly predict admissions indicators among liberal arts colleges. It seems plausible that students who apply to and ultimately attend these institutions use other criteria when determining which colleges are the "best." Generally speaking, people are inclined to believe that a more expensive price tag is associated with better quality goods and services (Olson 1977). Similarly, students and parents might use tuition as a reflection of prestige or quality. In support of this view, nine of the ten colleges with the highest tuition in 2006—George Washington University, University of Richmond, Sarah Lawrence College, Kenyon College, Vassar College, Bucknell University, Columbia University, Wesleyan University, and Trinity College (see Riper 2007)—were consistently ranked in the top 50 during this study. To date, it is unclear whether the high costs contribute to perceptions of prestige or vice versa, but the association certainly exists. Moreover, students and parents might also attempt to gauge institutional quality through their perceptions of instruction and learning opportunities. Although we do not have direct measures for perceived instructional quality, instructional expenditures may serve as a proxy for resources allocated toward this goal.

Indeed, changes in tuition and fees and instructional expenditures predict changes in admissions indicators, particularly among liberal arts colleges and the lower half of top-tier

Table 4 Unstandardized and standardized coefficients for fixed effects regression analyses of institutions ranked in the top 25

Independent variable	SAT scores		Frosh top 10% of HS		Acceptance rate		# of applications		Yield	
	B (SE)	β	B (SE)	β	B (SE)	β	B (SE)	β	B (SE)	β
College ranking	1.44 (.64)	.16**	.01 (.11)	.01	−.25 (.11)	−.14**	.41 (.13)	.09***	.15 (.09)	.09
Tuition and fees	1.63 (1.24)	.17	−.16 (.22)	−.08	−.04 (.22)	−.02	−.14 (.24)	−.03	−.05 (.18)	−.03
Instructional expenditures	37.55 (33.69)	.31	.76 (5.93)	.03	−10.94 (5.84)	−.45*	4.40 (6.60)	.07	13.42 (4.93)	.61***
Pell grants	−49.85 (18.72)	−.33***	−2.77 (3.29)	−.09	.90 (3.25)	.03	−1.32 (3.67)	−.02	−2.53 (2.74)	−.09
Proportion of students of color	18.03 (68.52)	.03	−15.07 (12.05)	−.12	27.26 (11.88)	.22**	−24.90 (13.52)	−.08*	−6.77 (10.11)	−.06
Proportion of female students	−225.0 (120.5)	−.50*	−30.01 (21.20)	−.35	49.94 (20.88)	.57**	−26.55 (23.63)	−.12	17.32 (17.67)	.22
Adjusted R^2	.91		.93		.93		.99		.94	
N (institution × year)	391		391		391		384		383	

* $p < .10$; ** $p < .05$; *** $p < .01$

Table 5 Unstandardized and standardized coefficients for fixed effects regression analyses of institutions ranked 26th–50th

Independent variable	SAT scores		Frosh top 10% of HS		Acceptance rate		# of applications		Yield	
	B (SE)	β	B (SE)	β	B (SE)	β	B (SE)	β	B (SE)	β
College ranking	1.32 (.46)	.15***	.11 (.13)	.05	−.09 (.12)	−.05	.10 (.11)	.02	.07 (.06)	.05
Tuition and fees	3.62 (2.15)	.61*	−.36 (.60)	−.23	−1.20 (.55)	−.86**	−.31 (.51)	−.08	.53 (.26)	.54**
Instructional expenditures	−15.44 (19.77)	−.13	2.19 (5.37)	.07	6.24 (5.01)	.22	−2.54 (4.56)	−.03	2.68 (2.31)	.14
Pell grants	−12.76 (12.96)	−.12	−2.76 (3.54)	−.10	5.06 (3.28)	.21	−5.13 (3.39)	−.07	−.68 (1.79)	−.04
Proportion of students of color	−157.0 (73.01)	−.37**	−30.35 (23.60)	−.27	31.95 (18.49)	.32*	44.72 (17.39)	−.15**	11.37 (8.98)	.16
Proportion of female students	−12.15 (150.7)	−.03	15.62 (41.38)	.14	56.49 (38.17)	.55	−5.55 (34.52)	−.02	−6.85 (17.58)	−.10
Adjusted R^2	.88		.88		.86		.99		.94	
N (institution × year)	340		333		340		320		317	

* $p < .10$; ** $p < .05$; *** $p < .01$

institutions. Specifically, among all liberal arts colleges, increases in instructional expenditures contribute to higher average SAT scores, $\beta = .29$, $p = .01$, lower acceptance rates, $\beta = -.17$, $p < .10$, and more applications, $\beta = .32$, $p < .03$, in the following year. Among institutions ranked 26th–50th, tuition seems to serve as an indicator of prestige, since increases in tuition and fees lead to higher average SAT scores, $\beta = .61$, $p < .10$, lower acceptance rates, $\beta = -.86$, $p < .03$, and higher yield rates, $\beta = .54$, $p < .05$. That is, when controlling for the average tuition increase over time among other factors, an additional $1,000 increase in tuition leads to a 3.6-point gain in SAT scores, a 1.2% reduction in acceptance rates, and 0.5% increase in yield. In contrast, among institutions ranked in the top 25, tuition rates are not related to any admissions indicator, and instructional expenditures predict future acceptance rates, $\beta = -.45$, $p < .07$, and yield, $\beta = .61$, $p < .01$. Furthermore, among national universities, instructional expenses are not related to any admissions indicator, and the relationships between tuition and admissions outcomes are mixed. Specifically, increases in tuition and fees are positively related to yield rates, but they are *negatively* related to the proportion of freshmen in the top 10% of their high school graduating class.

More detailed subgroup analyses show that the effects of these alternative markers of prestige are most pronounced among liberal arts colleges ranked 26th–50th. Specifically, among these institutions, increases in tuition and fees lead to higher SAT scores, $\beta = .94$, $p < .02$, and a higher proportion of freshmen in the top of their high school class, $\beta = 1.24$, $p < .01$. In real-world terms, a $1,000 increase in tuition and fees in these colleges leads to an impressive 12.9-point increase in SAT scores and a 3.6% gain in the proportion of top freshmen. In addition, increases in instructional expenses are associated with increases in average SAT scores, $\beta = .67$, $p < .03$, lower acceptance rates, $\beta = -.65$, $p < .03$, more applications, $\beta = .27$, $p < .07$, and greater yield, $\beta = .56$, $p < .10$.

These relationships are much less consistent for other types of institutions. Among national universities ranked 26th–50th, the only significant relationship is that increases in instructional expenditures are associated with *higher* acceptance rates, $\beta = .22$, $p < .05$; in fact, this direction is the opposite of what was expected. Among the top 25 liberal arts colleges, neither tuition and fees nor instructional expenditures are associated with any future admissions indicators. Among the top 25 national universities, tuition and instruction costs are often associated with admissions indicators, but these relationships are weaker and less consistent. Specifically, increases in tuition and fees are associated with lower acceptance rates, $\beta = -.60$, $p < .03$, and higher average SAT scores, $\beta = .43$, $p = .05$. Furthermore, increases in instructional expenditures are related to lower acceptance rates, $\beta = -.57$, $p < .001$, and more applications, $\beta = .22$, $p < .02$. However, these effects are quite small relative to those for liberal arts colleges ranked 26th–50th. For instance, the 26.8% decrease in acceptance rates per one-unit increase in instructional expenditures is about half of the 52.3% among liberal arts colleges ranked 26th–50th. Moreover, the 3.6-point gain in SAT scores per $1,000 increase of tuition and fees for top national universities is less than 1/3 of the 12.9-point increase for the relatively lower-ranked liberal arts colleges. In addition, contrary to predictions, increases in tuition and fees at the top 25 universities are *negatively* related to the proportion of freshmen who graduated at the top of their high school class, $\beta = -.15$, $p < .10$.

In sum, tuition costs and instructional expenditures can serve as alternative markers of prestige that can affect students' decision-making and, as a result, admissions outcomes. However, as with college rankings, these signifiers of prestige influence admissions indicators differently, depending on the type of institution and its status in the prestige hierarchy.

Campus Demographics and Admissions Indicators

Although campus demographics were simply used as control variables in this study, it was somewhat surprising how frequently these variables predicted admissions indicators, even when controlling for numerous other factors. For instance, among all institutions, increases in the proportion of students of color were associated with lower SAT scores, $\beta = -.15$, $p < .03$, a smaller proportion of freshmen in the top 10% of their high school class, $\beta = -.22$, $p < .01$, higher acceptance rates, $\beta = .22$, $p < .005$, and fewer applications, $\beta = -.10$, $p < .005$ (see Table 1). Similar inverse effects were found for changes in the proportion of women on campus and the amount of Pell grant funding received.

These findings might be largely explained from an enrollment management perspective (Desjardins et al. 2006). For instance, a particular institution may decide to increase its representation of students of color over a number of years, and this decision can have a variety of effects. Since Black and Latino high school students, on average, have lower SAT scores and high school grades than their White counterparts (e.g., Adelman 1999; Nettles and Perna 1997), this long-term strategy could decrease some of the admissions indicators used in this study. If institutions are engaging in these enrollment management strategies over a sustained period of time, it is quite possible that one would find the relationships apparent in this study, even given the temporal sequence of our analyses (i.e., campus demographics predicting next year's admissions indicators). Importantly, though, if the enrollment management explanation is correct, one would also expect to find that admissions indicators predict future campus demographics. In support of this interpretation, we performed additional analyses (not reported here) and found that improvements in admissions indicators, in fact, do predict smaller proportions of students of color and women and less money spent on Pell grants in the following year.

The other possibility is that diverse student bodies constitute a negative status signal for elite institutions. That is, prospective students may respond over time to subtle changes in student demographics and are subsequently less likely to enroll at campuses with increasing proportions of students of color. Theoretically, this is a complicated phenomenon to explain. Signaling theory would suggest that prospective students, in the midst of an ambiguous selection decision characterized by high information asymmetries, rationally seek out information that indicates whether a particular campus is their best choice (Spence 1974). Students seeking high-status colleges are likely to be particularly vulnerable to these signaling effects (Podolny 2005). In society, the affirmative action debates have signaled to many that students of color at elite colleges have lower grades and SAT scores than their White counterparts (Bowen and Bok 1998; Jencks and Phillips 1998). Institutionally, for most of the history of college admission, elite colleges have purposely engaged in admissions practices that ensure admission of the "right type" of student, who was historically wealthy, Christian, athletic, and White (Karabel 2005).

It is not unreasonable to hypothesize that students seeking to enroll at top universities and colleges see campuses with the "right type" of students as more elite and more selective than more diverse campuses. This explanation could also account for the bi-directional nature of these effects. That is, on average, high-achieving prospective students may be reluctant to attend elite institutions that are more diverse, which leads to lower admissions indicators, which then leads to fewer White students enrolling, and so on. In addition, there is some emerging research on organizational dynamics demonstrating that diversity can be a negative status signal. For example, a recent controlled experiment found that people give higher ratings to teams with White leaders who had degrees from top universities, and lower ratings to teams with Black leaders with degrees from the same

institutions (Sauer et al. 2008). Inversely, they find Black leaders with degrees from less prestigious institutions more credible than their White counterparts. The authors of this study hypothesize that the affirmative action controversy has made external evaluators suspicious of the credentials of minority students who may have benefited from affirmative action, and thus lead to lowered assessments of their quality and productivity.

However, with the current data, it is impossible to determine whether these effects can be best explained from an enrollment management perspective, through signaling theory, or a combination of the two. Clearly, these results are quite intriguing, and future research should explore the nature and cause(s) of these effects.

Conclusion

The various analyses presented here provide a clear picture of the impact of recent college rankings on admissions indicators. In particular, three conclusions are strongly supported. First, moving onto the front page of the *U.S. News and World Report* rankings results in a substantial improvement in admissions indicators in the following year, and these effects are apparent for both national universities and liberal arts colleges. For highly qualified students, the front page of the rankings may essentially serve as a potential list of schools to consider. As a result, being labeled as a "top-tier" institution carries substantial weight, much more so than moving up a single spot within the top tier. In the current sample, there are a relatively small number of institutions that shifted in and out of the top tier. However, given similar findings from previous studies (Meredith 2004; Monks and Ehrenberg 1999), it seems quite safe to say that a change in tier level has substantial implications for an institution's applicant pool. Furthermore, in this study, these effects are observed when controlling for numerous other variables that affect admissions outcomes.

Second, once institutions have reached the top tier, moving up in the rankings provides noteworthy benefits for institutions in the top 25 and among national universities, but this impact is weaker or non-existent among liberal arts colleges and the bottom half of the top tier. Consumers of liberal arts colleges may not share the general perceptions of the overall population. One hypothesis is that these families are far more knowledgeable about higher education than are general consumers of higher education and therefore less sensitive to magazine rankings. Liberal arts colleges are largely private and charge relatively high tuitions. Historically, the applicants to liberal arts colleges have been a highly self-selecting group, such that even when the percentages of admitted students were very high, declines in student quality were marginal. These consumers could be expected to be less sensitive to status differentiation than to the fit between the student and the college's academics and institutional culture, an ideology that is strongly promoted within the admissions profession (Steinberg 2002; Stevens 2007; Thacker 2005).

Third, tuition costs and instructional expenditures also serve as markers of institutional quality and prestige that yield improvements in subsequent admissions outcomes. These markers are influential primarily among liberal arts colleges and the lower half of the top tier. Consistent with the notion that potential consumers of liberal arts colleges are savvier in their decision-making, liberal arts colleges are the only type of institution in which admissions indicators are responsive to a proxy for institutional quality: expenditures on student instruction. This sensitivity to instructional quality fits with the conception of liberal arts colleges as placing a more singular emphasis on undergraduate education as its primary mission. Furthermore, instructional resources can serve as an important indicator

of prestige in and of itself (Brewer et al. 2001), and consumers of liberal arts colleges are likely more aware of this less transparent or readily accessible measure of prestige.

Interestingly, increases in tuition also contributed to improved admissions indicators, even though tuition is not necessarily connected with institutional quality. This finding seems counterintuitive in terms of a purely economic perspective, which would suggest that consumers would gravitate toward the institutions that provided the greatest benefit for the lowest cost. Clearly, then, students and/or parents must view high tuition as reflecting some positive aspect of institutions, whether it be prestige, quality, or a combination of the two; moreover, this effect is powerful enough to overcome the financial burden that higher tuition can impose. Perhaps reflecting a cognizance of this dynamic, some colleges have increased tuition substantially in their efforts to become elite institutions. For instance, as a part of its strategic plan, the University of Richmond—listed as 40th in the 2007 *U.S. News* rankings of national liberal arts colleges—raised tuition by a massive 26.9% in 2005–2006 for incoming freshman and transfer students (Rossi 2007; University of Richmond 2005). Moreover, in Fall 2004, Miami University (Ohio) raised its in-state tuition to equal that of its out-of-state tuition, but then provided substantial scholarships to all in-state residents to mitigate this increase (Miami University 2008). According to then-President James Garland, an important intended outcome of the plan was to help Ohio residents better understand the "actual market value" of the institution (2003, p. 1).

In sum, improvements in college rankings can influence admissions outcomes, but these effects occur primarily for universities ranked in the top 25 and for institutions moving onto the front page. For other types of elite institutions, increases in alternative measures of prestige (e.g., tuition costs and instructional expenditures) contribute to substantial improvements in admissions outcomes. Thus, it seems that college rankings play a role in some students' decision-making processes, but other indicators of reputation and prestige also exert considerable influence for some students. College rankings receive a great deal of public attention, and many institutions are quite concerned about their position in these rankings. This may be the aspect of the beauty contest that receives the greatest attention, but other aspects are quite important—especially for certain institutions—in establishing the final outcome.

Unfortunately, the current study suggests that institutions can effectively woo more highly qualified students by using status signals that are unrelated to substantive changes in institutional quality. In one exception to this trend, liberal arts colleges tend to accrue benefits by allocating their resources toward instruction, which will likely result in greater student engagement and learning. However, some colleges receive similar benefits merely by raising tuition, which can result in students' leaving college with substantial debt. Although institutions might try to offset some of these costs by increasing financial aid packages (e.g., University of Richmond 2005), these efforts are unlikely to completely mitigate the additional financial burden. Furthermore, as shown earlier, moving up in the *U.S. News* rankings confers substantial benefits in the quantity of applications and quality of incoming students among top national universities. Oftentimes, though, changes in college rankings stem from institutions' ability to "play the rankings game" rather than from actual improvements in institutional quality (e.g., Machung 1998). Thus, for ranking systems to have a positive impact not only on colleges and universities, but also on the decision-making processes of potential college students, ranking systems must continually strive to find measures that accurately and fairly determine what counts in determining the best colleges and universities.

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Appendix A

See Table 6.

Table 6 Descriptions and codings for variables in fixed effects regression analyses

Average SAT scores	25th percentile of SAT scores in incoming class; when applicable, the 25th percentile of ACT scores was converted to SAT scores
Proportion of top freshmen	Percentage of freshmen in incoming class who graduated in the top 10% of their high school class (0–100)
Acceptance rate	Percentage of applicants who were admitted for the incoming class (0–100)
Number of applications	100 × Log transformation of number of applications
Yield	Percentage of admitted students who enrolled (0–100)
College ranking	Reverse-coded college ranking (50 minus overall ranking in *U.S. News*)
Ranked in top 50	1 = Top 50, 0 = Outside of top 50
Tuition and fees	Undergraduate tuition and fees (in-state, when applicable) divided by 1,000
Instructional expenditures	Log transformation of all instructional expenses
Pell grants	Log transformation of total amount of money received for Pell grants
Proportion of students of color	Sum of Black non-Hispanic, Hispanic, Asian or Pacific Islander, and American Indian/Alaska Native domestic students divided by all domestic students who reported their race or ethnicity
Proportion of female students	Total number of female students divided by all students
Year	Series of dummy-coded variables for each year
Institution	Series of dummy-coded variables for each institution

Appendix B

See Table 7.

Table 7 Descriptive statistics for variables (excluding year and institutional dummy variables)

Variable name	Mean	SD	Minimum	Maximum
Average SAT scores	1,220	87.77	1,000	1,470
Proportion of top freshmen	67.84	17.38	22	100
Acceptance rate	43.95	18.17	9	90
Number of applications	380.5	39.53	274.2	465.3
Yield	37.46	11.83	16.81	80.36
College ranking	22.40	15.76	0	49
Ranked in top 50	.875	.331	0	1
Tuition and fees	23.05	8.92	2.27	44.71
Instructional expenditures	7.92	.550	6.88	9.03
Pell grants	6.12	.530	5.09	7.61
Proportion of students of color	.227	.124	.03	.70
Proportion of female students	.530	.148	.00	1.00

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