

Factors determining attendance in graduate programs: differences in admitted and enrolled students

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ABSTRACT

Using a dataset that matched applicants to graduate programs at a regional university who were admitted but chose not to attend to a section of students who did choose to attend, this research investigates the factors involved in students selecting a graduate program. The distance to a university was not a factor in the student's decision, even controlling for the selection of an online program. The cost of attendance and the quality of the program were important factors in the selection of a graduate program.

Analysis of the survey data revealed that applicants experienced much indecision during the application process. Potential students are uncertain about which program is best for them, whether they can afford graduate school, and if a graduate degree program can fit into their current lifestyle.

The results of this study may inform the graduate admissions and recruiting process to help find suitable matches between students and programs.

Keywords: distance education, graduate recruiting, graduate admissions, regional university

INTRODUCTION

Becker (1964) formalized the notion of education as human capital. Students forgo labor market earnings today and expend financial resources in exchange for higher future earnings. In this context, most economists model higher education as an investment. However, not all investments are the same. In a higher education context, the quality of the investment will depend on the quality of the match between the student, program, and university. It is vital to a student's success to find a quality match for his or her skills and interests. The benefit of helping create good matches makes the study of how students select universities a fruitful endeavor. If a university could better understand how students choose their programs, then that university could tailor its recruiting efforts to help students find a good match and better design its processes to attract those students.

This study investigates factors that might play a role in student decisions to pursue a master's degree. Specifically, it will examine if distance, cost, and university quality factor into the choice of an applicant to attend or not.

The sample was drawn from applicants and students at a master's comprehensive regional university in Texas with an enrollment of approximately 2,600 graduate students. The university has 39 master's programs and one Ph.D. program. There are 317 full-time faculty members. The sample university has a total enrollment of approximately 10,000 and is located in a community of 14,000.

This paper successfully compares a sample of graduate students who were accepted to the university but chose to matriculate to another university to a sample of students who attended the university. The unique approach of comparing admitted students who did not attend with a matched sample of those who did attend allowed a direct comparison of students who attended and who did not but could have. The survey asked former applicants three simple questions to learn where the admitted applicants enrolled, which program the admitted applicants pursued, and an open-ended invitation to comment on the admissions process.

Many of the results fulfilled expectations regarding previous literature, but some of the results of this study did not reaffirm the existing literature. Several admitted students went to universities that were higher ranked than the university or were less expensive than the university. Perceived quality and cost were significant factors. The result that may not have been anticipated by the literature was that, in the sample of applicants, the distance from "home" and the eventual school was irrelevant, even controlling for those applicants who were entering programs offered by the university online.

The survey data revealed some other interesting facts. Applicants to graduate school were often open to the field of study they ultimately pursued. Many applicants who were admitted to the university and attended elsewhere sought programs that the university did not offer. The fact that students were considering such a variety of programs indicated that either many students were unsure what they wanted to study or that students were making decisions based on factors other than the desire to study in a particular program. Finally, the survey revealed that several students ended up attending the university at a later date or ended up not attending graduate school at all.

Students are uncertain about both the program and the timing of their graduate studies when they apply. These results are relevant to faculty and administrators who oversee graduate programs at regional universities.

LITERATURE REVIEW

There is a large corpus of articles on how potential students chose a university. The literature on undergraduate admissions is more generous than the literature on graduate admissions.

The literature on how potential undergraduates select colleges is vast. Hoxby (2004) documented the substantial evidence that financial aid packages, peer relationships, and even the ease of the application process had on college choice. Alter and Rebackt (2013) investigated the role that reputation and school quality had on applications and enrollments. Jacob, McCall, and Stange (2013) examined how college students chose schools based on what amenities (academic and nonacademic) were offered to the campus community.

The results of these studies were not surprising and indeed confirmed conventional wisdom. High-quality schools with many services attracted students. Students also chose schools based on geographical location and the cost of attendance.

The bulk of the literature on undergraduate college selection used data collected in one of two ways. It was common (Jacob et al., (2013) used this approach) for researchers to use existing longitudinal datasets to track individuals through time to investigate their choices. The other method, used by Alter and Rebackt (2013) was to look at aggregate data on applications and enrollment to reach conclusions on how matching students and schools occurred.

The literature which investigates factors concerning the decision to pursue a graduate program at a particular university reached most of the same conclusions that the literature on the undergraduate selection process. Graduate students gravitate to great programs with renowned faculty at a cost and location that is feasible. A notable difference for graduate students seemed to be the increased need to consider how pursuing a graduate degree would have on a spouse or job (Kallio, 1995).

There is a multitude of studies in the early stage of this literature (Baird, 1976; Goldberg and Koenigsknecht, 1985; Malaney and Isaac, 1988; Malaney, 1987; Ethington and Smart, 1986; Kallio, 1995). These studies provided a foundation to study the choice of graduate programs as complex, multistage process (English and Umbach, 2016).

Much of the later literature concerning graduate students used a different approach. It is common to sample students directly to investigate why they picked a particular school. Kallio (1995) bridged the gap between the existing literature on undergraduate and graduate attendance decisions by students. Potential students go through an elaborate selection process that involves many characteristics of both the applicants and their institutions of choice. This study also highlighted the need to expand on the types of institutions studied since focusing on a single type of institution (a large R1 public institution, for example) does not produce results that apply to other types of institutions.

Curtis (2011) explored possible strategies for graduate schools use of admissions data. Curtis's (2011) report focused on admitted and rejected students of a single large research institution (the University of Kentucky). The primary focus of this investigation was on which type of data graduate admissions administrators should collect and how they should use it. This question is significant given that researchers know that a good match of a graduate program is essential and that the selection of a graduate program remains a complicated multistate process for applicants. More information in the hands of universities can help facilitate more good matches.

English and Umbach (2016) continued many of the themes in Curtis (2011) and Kallio (1995). English and Umbach (2016) followed a model proposed by Perna (2006) to study how undergraduate students decide which university to attend. This study used a nationally representative dataset to explore how individual characteristics and institutional traits influence the choices potential students make when selecting a graduate school.

A limitation of the existing literature is that often the results only apply to a specific type of institution. Kallio (1995) explained that results obtained from a sample of applicants to a particular program or type of institution would only be relevant to those programs and institutions. While many studies used large datasets spanning a broad range of institutions, no study focused solely on applicants of a regional university.

DATA COLLECTION

A common theme in this literature was that more diverse data was needed. The approach of this study followed what was common in the literature, but adds to the literature by using a sample of students from a regional research institution. The authors collected data from successful applicants of a specific school and directly compared the choices that those applicants made regarding eventual attendance. If they did not choose the sample university, what factors correlated with that decision? The data collected for this paper answers that question in a more succinct way than data obtained from aggregate or large-scale, longitudinal sources.

The data collected for this study was specific to master's programs at regional institutions, making the results apply much more directly to policy at regional schools. Previous research focused on undergraduates and graduates from top public research universities and selective private schools, so it is possible that the results of previous studies do not apply to regional, research-orientated graduate schools such as the sample university.

The authors sent a short three-question survey to all applicants who had been admitted to a graduate program at the university but did not attend:

- What university did you select to attend?
- What program/degree did you pursue?
- Was there anything positive or negative about the application process at the university you would like to share?

The authors used *Qualtrics*, a popular survey platform, to send the survey to 867 applicants that were accepted to a graduate program at the university from fall 2013-spring 2017 but did not attend. There were 97 completed surveys returned.

The authors matched the survey data with existing application data obtained from applicants. Universities gather extensive and detailed information during the application process. The application process required applicants to reveal their complete academic history and their home address. The survey respondent revealed what university, if any, he or she attended, it was easy to match that with data collected from the application process.

Of the 97 responses returned, 49 responses were omitted, including international students, students who ended up attending the university, and students who did not attend graduate school at all. Forty-eight surveys remained.

The basis for these questions was to determine if there were any measurable differences between the students who enrolled in a graduate program at the university and those who were admitted but chose to attend a different university.

To make the comparison, the authors created a control group by matching a set of students to the 48 students who finished the survey. This control group was formed by randomly selecting one student who attended the university who applied for the same program in the same semester as each applicant who completed the survey. International students and any student who had previously attended the university were excluded from consideration for the control group. The summary statistics are presented in Table 1 (Appendix).

The “Average Distance to University” was calculated based on the zip code reported on the applicant’s application. The distance between that zip code and the sample university’s zip code were discovered by using Rand McNally’s mileage calculator, available online. The sample group of applicants who were accepted to the sample university but chose to enroll in a graduate program at a different university applied from zip codes that averaged 630.4 miles from the university attended. The applicant who lived furthest away was 1,793 miles. The closest was zero miles.

The control group of students who attended sample university came from very similar distances. The average distance of the control group’s “home” address and sample university was 600.6 miles with a range of 0 to 1,962.

The average distance of the sample group and the university the survey respondents attended was 630.3 which was coincidentally 0.1 miles different than the distance from their “home” address and the sample university.

A university’s overall rank might influence the decision of an applicant to attend a particular university or not. Over the past generation, school rankings by institutions such as U.S. News and World Report have increased in prevalence. Researchers believe that students use these rankings when deciding where to apply and where to attend (Sauder & Lancaster, 2006). The sample university had an overall score of 29 in the 2017 U.S. News and World Report’s rankings. In the sample of 48, 22 students attended a university that had a higher score than the sampled university in the U.S. News and World Report’s college ranking. An overall score might not be the best measure, as individual programs in universities might have a recognized quality that was different from the university’s overall reputation. However, not all programs were ranked so the best consistent measure of quality would be to use a university-wide score by U.S. News and World Report, a recognized leader in ranking colleges.

Alter and Rebackt (2013) investigated the role that reputation and school quality had on applications and enrollment. Their study revealed that schools that achieved a high ranking (top 20) in US News’ rankings of universities resulted in a surge in applications. Also, if a peer college increased in rank, applications for a university declined. Bowman and Bastedo (2008) found similar results, and their analysis considered the type of institution such as national university and liberal arts college. Their research introduced the notion that applicants looking for different types of schools might make attendance decisions differently. According to their research, potential students to liberal arts colleges were more reactive and deliberative in their college choice. Graduate students are likely to consider their master’s program decision carefully, so results not common in the literature might be expected for a sample that focuses on graduate students.

A university’s cost is undoubtedly influential to an applicant’s decision to attend a school. Stephenson, Heckert, and Yerger (2016) conducted surveys and interviews of the incoming class at a large university in the northeast. Their results confirmed what is well-known in the literature, namely that students were very cost sensitive.

Also reported in Table 1 (Appendix), in the sample used for this research, nine people attended other universities that had a lower undergraduate tuition rate than the university as reported by U.S. News and World Report. Undergraduate tuition rates were used as a proxy for the cost of attending graduate school because determining the actual cost for any particular graduate student was not possible. Universities typically have complicated fee structures, with different students paying different rates depending on scholarships, assistantships, and differential tuition. A comparison of undergraduate tuition of the schools where the university applicants chose to attend rather than the university gave a comprehensive overview of what less expensive options the university's applicants have taken. Indeed about 20% of admitted applicants sought a less expensive option.

The next two rows of Table 1 (Appendix) report the types of programs sought by individuals in the survey. Nine individuals attended programs that are not offered at the university. The literature also showed that the availability of major dramatically influences a decision to attend a university. In their survey of college freshman, Stephenson et al. (2016) reported that availability of major made a university desirable for students. It was not clear from the survey results why a potential student would apply to a university that did not have his/her preferred field of study. Application/attendance decisions are complicated and no doubt there are many trade-offs students consider when making a final decision about where to go and what to study. If a student seeks a program not available at a particular university, the probability of attending that university drops significantly.

Thirty-one of the 48 applicants applied to programs that were available entirely online at the university. If a student were seeking an online program, it would not be surprising that distance would be less important.

Finally, the last rows in Table 1 (Appendix) give details about the sample of students who returned the survey. Programs in Education and Business were the largest programs at the sample university, and students who applied to those programs were most represented.

STATISTICAL ANALYSIS

To further test if distance mattered for an applicant's decision, the following equation was estimated using Probit regression. Probit regression is appropriate when the left-hand side variable is an indicator variable taking the values of 0 or 1. The specification also tested if students who applied for online programs were less sensitive to distance than those who apply for residential programs.

$$\text{Attend The University}_i = \beta_0 + \beta_1 \text{Distance}_i + \beta_2 \text{Online}_i + \beta_3 \text{Distance}_i * \text{Online}_i + \varepsilon_i \quad (1)$$

Where Attend The University equals 1 if a student attended the university, 0 otherwise

Distance was the number of miles between the zip code reported on the application and the university

Online equaled 1 if an applicant applied for a program that was available online at the university, 0 otherwise

Distance*Online was the interaction between Distance and Online

i was 96 observations. 48 of them attended the university; 48 did not.

The results were presented in Table 2 (Appendix). The coefficients on Distance to the University, Applied to Online Program, and the interaction between Distance and Online all had z-scores very close to zero, which indicated that distance is not a factor in the decision to come

to the university in the sample, even for those who wish to attend class on campus as opposed to online.

DISCUSSION

This research that investigated the enrollment habits of those who were accepted to the sample university but chose not to attend yielded significant insight into the graduate school selection process.

Twenty-one students reported that they did not attend graduate school. Of those, four stated that they were not able to afford to start graduate school, two had significant problems with some aspect of the application process, and five stated that a graduate program did not fit with their current life situation. Three of the 21 explicitly wrote that they would consider reapplying in the future and an additional three implied that graduate school might be in their future.

Seven applicants in the sample reported that they attended the university. One started a different program than he/she initially applied. Four students began their programs at least one semester after their application. Two survey respondents were university graduate students before the survey period and had reapplied to different programs.

Of the 48 respondents who enrolled in graduate programs at other universities, nine of them entered a program that the sample university does not offer. The fact that students applied to a variety of programs was a further indication that applicants were either unsure about what programs they wanted or were shopping for graduate programs based on factors other than programs that were offered by a particular school.

There is much uncertainty among graduate school applicants. Prospective students are often uncertain which graduate program will be best for them and unsure about graduate school in general.

CONCLUSIONS

The findings of this research made a significant contribution to the literature and will be useful for graduate schools at regional institutions since the sample focused on students considering that type of school. When studying this topic using a sample from students of national universities (the University of Michigan, for example) the results of the published studies were what one would expect. Graduate students select a school for many of the same reasons that undergraduates do. However, spousal and other life cycle considerations play a more substantial role for graduate students. The literature was devoid of studies that use potential students of regional institutions, so the literature might not give administration and faculty at those institutions the full picture of the decision-making process of their potential graduate students.

Those who are involved in graduate school admissions at regional universities can learn from this study. First, distance seems to play little role in student decisions. Among those who have no tie to a university, being close does not factor in a decision to attend a particular graduate school, even for those who seek a residential degree. Second, many students' plans are not firmly in place. Students are not entirely sure what programs they wish to enter and are unsure about finances when they apply. Many are not sure even if, or when, they will be able to

attend as revealed by a large number of potential students who do not enroll at all and who enroll at the university at a later date than their initial application date.

These conclusions have many policy implications for graduate school admissions, particularly graduate admissions at regional schools. Graduate schools in regional universities should realize that they face a national market for students. Recruiting efforts either through graduate fairs or targeting with social media does not have to be “close to home” as students are willing to attend schools, online or not, that were outside their geographical region.

Graduate schools in regional universities should be staffed with personnel who are qualified to make initial advisement of students. Nearly 20% of students who were accepted to the university but chose to attend elsewhere ended up enrolling in a program that the university does not have. The programs that applicants pursued implied that many applicants were not sure what program best suited their interests. Their decisions involved many factors and academically qualified staff in graduate school could help match an applicant with a program. Along the same lines, providing excellent customer service and promoting a smooth process through the application process should be a high priority.

Graduate schools should maintain some level of contact with admitted students that do not enroll. Among the domestic applicants in our sample, nearly 8% ended up attending the university at a later date or in a different program than they initially considered. Almost one-quarter of those students had not enrolled in a graduate school at all at the time of the survey. Graduate schools should maintain contact with admitted students who do not attend. It is possible that a university can recruit a significant portion of these potential students at a future date.

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APPENDIX

Table 1: Summary Statistics		
	Sample	Control
<i>Average Distance to the University</i>	630.4 (520.4) [0-1,793]	600.6 (578.7) [0-1,962]
<i>Average Distance to School Attended</i>	630.3 (683.3) [0-2,925]	600.6 (578.7) [0-1,962]
<i>Average Difference Between Distance to the University and Program Attended</i>	0.1 (687.8) [-1,829-1,601]	0 (0) [0]
<i>Number of Applicants Who Attended a University Ranked Higher Than the University*</i>	22	0
<i>Number of Students Who Attended a School Less</i>	9	0

<i>Expensive Than the University#</i>		
<i>Number of Students Who Entered a Program Not Available at the University</i>	9	0
<i>Number of Students Who Applied for a Program Available Online at the University</i>	31	31
<i>Programs Represented</i>	Master of Business Administration-22 Communication Disorders-4 Educational Leadership-4 Interdisciplinary Studies-4 Nursing-3 Curriculum and Instruction-2 Instructional Design Technology- 2 Social Work-2 Art-1 Education Diagnostician-1 Finance and Economics-1 Music-1 Sports and Exercise Science-1	Master of Business Administration-22 Communication Disorders-4 Educational Leadership-4 Interdisciplinary Studies-4 Nursing-3 Curriculum and Instruction-2 Instructional Design Technology- 2 Social Work-2 Art-1 Education Diagnostician-1 Finance and Economics-1 Music-1 Sports and Exercise Science-1
<i>Years Represented</i>	AY 2012-2013 Spring/Summer 2013 only-2 AY 2013-2014-5 AY 2014-2015-12 AY 2015-2016-12 AY 2016-2017-17	AY 2012-2013 Spring/Summer 2013 only-2 AY 2013-2014-5 AY 2014-2015-12 AY 2015-2016-12 AY 2016-2017-17
Standard deviation is in parenthesis, and the range is in brackets. *A program was considered ranked higher than the university if the overall university score as reported by U.S. News and World Report’s University Guide was higher than the university’s score of 29. #A program was considered less expensive than the university if the US News reported resident undergraduate tuition is less than the reported undergraduate tuition for the university of \$7,936.		

Table 2: Probit Regression Results	
<i>Distance to The University</i>	-0.00027 (-0.06) [0.96]
<i>Student Applied to Online Program</i>	0.055 (0.14) [0.89]
<i>Interaction of Distance and Online</i>	-0.000060 (0.14) [0.92]
<i>Constant</i>	0.010 (0.04) [0.97]
<i>Pseudo R-Squared</i>	0.0007
<i>Number of Observations</i>	96
z-scores in parentheses, p-values in brackets	

