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Increasing Minority Students' Access to Graduate Schools

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Abstract

Although higher education in the United States spans nearly four centuries, minority students continue to struggle to gain access to institutions of higher education, particularly at the graduate and professional levels. Based on survey data we collected in 2002 and 2003, we examined the financial considerations that Summer Research Opportunities Program participants took into account when deciding whether or not to pursue graduate degrees. We found that the participants from higher income brackets were more likely to tolerate a less favorable graduate school financial aid package than students from low- to middle-income brackets, which suggests that lower-income students are less likely to pursue graduate study if they are not offered competitive financial aid packages.

Keywords: higher education, financial aid, minority students

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Introduction

Minority students' access to institutions of higher education in the United States has been a key policy issue for several decades.¹ Some experts in the field have defined access in terms of admission, while others have incorporated other dimensions that impact access to institutions of higher education such as educational background and financial aid (Advisory Committee on Student Financial Assistance, 2001, 2002; Astin, 1982; Crossland, 1971; Kerr, 1967; Perna, 1998a). As Perna (1998a) asserts, "Originally, access was interpreted to encompass opportunity for academically qualified, but financially needy, students to enter postsecondary education" (p. 19). As such, state and federal governments, as well as some institutions of higher education, have traditionally focused on access from a financial aid perspective and have distributed monetary aid to students (Advisory Committee on Student Financial Assistance, 2001, 2002). Additionally, policymakers and the media have kept tabs on access, paying close attention to changes in college affordability for students who come from low- to middle-income homes (Advisory Committee on Student Financial Assistance, 2001, 2002).

Despite the significant attention given to issues of access, most policymakers and scholars have focused on access to undergraduate training. Research in this area has focused on college-related decision processes for students, including how different financial aid packages impact college choice, how financial aid impacts persistence, and how financial aid increases minority student enrollment (Heller, 2002; Leslie & Fife, 1974; Perna, 1998a, 1998b; Tierney, 1980). Although research on access and financial aid is extensive, a gap remains in our understanding of minority students' access to graduate study and related financial aid issues. This article addresses this gap by highlighting the key financial considerations that a select group of high performing undergraduate minority students, as measured by their grade point averages, take into account as they think about pursuing graduate degrees. The primary question this article addresses is: Do different financial aid packages impact minority students' perceived likelihood of pursuing graduate or professional study? Understanding how financial decisions interact with minority students' perceptions of the transition between undergraduate and graduate study is crucial to further inform the lingering problem of minority underrepresentation in graduate school.

Background

Over the last century, the number of minorities attaining undergraduate degrees from institutions of higher education greatly increased (Anderson, 2002;

Harvey, 2001). Although these gains were promising, especially in the last half of the twentieth century, colleges and universities have struggled to admit, enroll, and graduate significant numbers of minority students at both the undergraduate and graduate levels (Frierson, 1998; Hagedorn & Tierney, 2002; Green, 1989; Olivas, 1986; Wilson, 1982b). To be sure, issues related to who goes to college—including how a student pays for college once he or she is admitted and the steps students need to take to successfully complete a college degree—are complex. Traditionally, low-income students (who are overwhelmingly minorities) have not applied to or attended college at the same rates as their white counterparts, have lower rates of college completion, and attend the least selective colleges (Center for Higher Education Policy Analysis, 2004; Heller, 2002; McDonough, 1997; Olivas, 1986). One reason why minority students have not accessed higher education is that they lack the economic resources to pay for college and therefore have to rely on financial aid to determine whether or not they attend (Heller, 2002; Perna, 1998a, 1998b; St. John, 2003). Thus, financial aid plays a crucial role for minority students considering a college degree.

Additionally, financial aid packages have been found to directly affect undergraduate students' persistence. For instance, Astin (1975) showed that students who received grants had higher rates of persistence when compared to students who did not receive them. Since financial aid has traditionally been allocated to students based on need, minority students have benefited greatly from this aid as they are more likely to come from low-income families. However, some researchers have stated that recent changes in financial aid policies which have decreased grant aid and increased the reliance on student loans will depress the number of minority students pursuing college degrees because minority parents and students are less likely to take additional loans to pay for a college education (Hu & St. John, 2001; St. John, 2003). Researchers assert that minority students consider all the costs associated with attaining college and are less willing to take on loans to pay for these costs (St. John 1991; St. John & Noell, 1989). Thus, it is clear that lower-income students seriously consider financial aid when deciding whether or not they will attend college. Surprisingly, although noteworthy attention has been given to the role of financial aid in college choice, little research exists that addresses how financial aid issues are associated with graduate study decisions, especially for minority students.

Despite this limited research, some scholars have begun to document why the United States and its institutions of higher education should be concerned about the low number of minority students in graduate school. These researchers argue that the gross underrepresentation of minority students in graduate school threatens the promising gains that minority students have made towards achieving equitable representation in higher education. Historian James D. Anderson (2002) asserts that the gains minorities have made in higher education have not been

enough to overcome the history of discrimination that they have faced in higher education and in the United States. To be sure, only 40 years have passed since a substantive number of minority students were allowed to participate in higher education in a meaningful manner (Anderson, 2002). Anderson (2002) asserts that “American higher education virtually excluded African American students until after the Civil War. From the founding of Harvard College in 1636 to the 1830s, no American institution of higher education opened its doors to African American students” (p. 4). Despite the fact that some colleges and universities opened their doors to minority students in the early 19th century, it was not until the mid 20th century that a substantive number of minority students enrolled in institutions of higher education. Anderson (2002) further notes that it was not until 1968 that “almost half of the nation’s colleges and universities were making some efforts to recruit and provide financial assistance to students of color” (p. 10). These changes occurred after minority students began protesting and demanding an end to social injustices and access to higher education as part of the Civil Rights Movement. It is appalling that it has taken over two centuries for minorities to gain access to institutions of higher education.

Given the forms of legalized discrimination and the unequal social structure in existence throughout the history of the United States, minority students have not been afforded the opportunity to participate in all aspects of higher education (Anderson, 2002; Trent, Owens-Nicholson, Eatman, Burke, Daugherty, & Norman, 2003). In fact, financial aid for low-income students did not come to full fruition until 1965 when the Higher Education Act authorized financial aid for all academically qualified U.S. citizens (Perna, 1998a). The legacy of slavery and overt discrimination have limited minority students’ opportunities to achieve academically. If the nation’s institutions of higher education want to achieve equity, they must pay close attention to why minority students are still underrepresented at all levels of higher education.

As we progress through the twenty-first century, most higher education officials are aware that an advanced college education is no longer a privilege, but a necessity for individuals to participate meaningfully in today’s global and domestic economies (Hagedorn & Tierney, 2002). To be sure, if a student is able to attain a college degree, then he will inevitably earn more than a student with a high school diploma; if a student earns an advanced degree, she will, on average, make twice as much as someone with a bachelor’s degree (Swail, Redd, & Perna, 2003). Thus, institutions of higher education must continue to make higher education accessible for all students irrespective of socioeconomic status in order to ensure equality of opportunity.

Minority Students in Higher Education

Just as research on minority students in higher education is still evolving, so is our understanding of trends on minority enrollment at all levels of higher education. We do not know how many minority students attended college and graduated prior to 1976 because universities and governmental bodies did not collect detailed data by race and sex until that point (Wilson, 1982a). Additionally, researchers did not examine minority students' participation in higher education prior to the mid-1970s. As soon as institutions began disaggregating enrollment data by race and sex, researchers began to document the number of minority students enrolling and graduating from institutions of higher education. The U.S. Department of Education (2002) reported that in the 1976-77 academic year, white students received 88 percent of all baccalaureate degrees from degree-granting institutions, African American students received 6.4 percent, Hispanic students 2 percent, Asian Pacific Islander students 1.5 percent, American Indian and Alaskan Native students 0.4 percent, and non-resident alien students received 1.7 percent of all bachelor's degrees. The higher education community continued to track minority students' involvement in higher education in the 1980s. Harvey (2003) notes that during the 1980-81 academic year roughly 1.95 million minority students (including African Americans, Hispanics, Asian Americans, American Indians, and non-resident foreign students) enrolled in institutions of higher education. During the 1990-91 academic year, the number rose to roughly 2.7 million minority students, and during the 2000-01 year, 4.32 million minority students enrolled in colleges and universities.

Because tuition and fees vary across institutional types, and because we know that low-income students give college costs serious consideration, it is important to note differences in enrollment trends by institution type. Perna (1998a) showed that low-income students who received financial aid packages that covered all the costs associated with attending college were able to choose between a public and private institutions. Without financial aid, these students more likely would have attended the lower-priced colleges and universities (Perna, 1998a). Because a large proportion of minority students come from low- to middle-income homes, without adequate financial aid, these students are more likely to attend public universities. This important point gets to the heart of the access issue: at a fundamental level, access means that all qualified students should be able to attend the college or university of their choosing, irrespective of the costs associated with attending that institution (Perna, 1998a). If students are not given the financial means necessary to choose between differently priced institutions, they will be limited to those that charge lower tuition and fees. Our point is not that price is always associated with institutional quality. Rather, our

point is that access for low- to middle-income students may be restricted to certain types of institutions if financial aid packages are not adequate.

Indeed, the number of minority students attending public institutions may be evidence that we do not provide these students with adequate financial aid to choose between different types of institutions. As Harvey (2003) documents, roughly 1.6 million minority students enrolled in public institutions in 1980-81; 2.2 million in 1990-91; and approximately 3.5 million in 2000-01. The enrollment numbers look quite different for private institutions. In 1980-81, roughly 354,000 minority students enrolled in private institutions; 505,000 enrolled in 1990-91, and 875,000 enrolled in 2000-01 (Harvey, 2003). Clearly, minority students enroll much more frequently in public institutions.

While they may be concentrated in public institutions, minority students have made significant enrollment gains; from 1.8 million in 1980-81 to 3.6 million in 2000-01 (Harvey, 2003). Enrollment gains in graduate school are not as striking. In the 1980-81 school year, roughly 125,000 minority students enrolled in graduate school. In 1990-91, the number rose to 191,000, and in 2000-01 the number climbed to 359,000 (Harvey, 2003). Minority students showed similar gains in professional school enrollment. In 1980-81, 26,000 students enrolled in professional schools. By 1990-91 47,000 students were enrolled, and by 2000-01 and 78,000 minority students were enrolled in professional school. Clearly, fewer minority students enroll in graduate and professional programs than in undergraduate institutions.

Although enrollment trends are useful in gauging admissions rates, we get a better sense of access and academic success when we consider degree attainment. In 1981, minority students received 15.7 percent of all associate degrees. In 1991 they received 17.2 percent, and in 2001 they received 27 percent of all associate degrees (Harvey, 2003). Similarly, in 1981 minorities received 11.2 percent of bachelor's degrees. In 1991 they received 13.7 percent, and in 2001 they received 22.3 percent (Harvey, 2003). Minorities received 10.5 percent of master's degrees in 1981, 11.2 percent in 1991, and 18.5 percent in 2001 (Harvey, 2003). As well, in 1981 minorities received 8.6 percent of all professional degrees. They received 14.1 percent in 1991 and 23.9 percent in 2001 (Harvey, 2003). Finally, in 1981, minority students received 6.8 percent of all doctoral degrees. They received 7.1 percent in 1991 and 10.4 percent in 2001. As these numbers indicate, minority students do not pursue graduate degrees at the same rate as they pursue undergraduate degrees. Consequently, minority are underrepresented in graduate schools.

As a result of the low number of doctoral degrees conferred on minority students, there is a huge disparity between the number of minority and white professors. In 1979-80, 91 percent of professors at all institutions of higher education were white; only 9 percent were minority. In 1989-90, 88.5 percent of

professors were white and 11.5 percent were minority. In the 1999-2000 academic year, 85.6 percent were white and 14.4 percent of professors were minority (Harvey, 2003).

Clearly, minority students have accessed institutions of higher education at higher rates in the latter half of the 20th century, especially in the two decades between 1980-1981 and 2000-2001. However, minority students are not represented in higher education at the same rates in which they appear in the general population. Consequently, minority students are underrepresented in higher education, and that underrepresentation increases in graduate and professional schools. As Syverson and Bagley (1999) report, in 1997 African Americans comprised 9 percent of all enrollments in masters, professional, and doctoral programs. Latinos/as made up 6 percent, and whites accounted for the remaining 80 percent (Center for Higher Education Policy Analysis, 2004). Furthermore, recent research indicates that the numbers of students are decreasing at institutions of higher education as a result of the recent attacks on affirmative action policies (Anderson, 2002). Thus, it is important to continue to analyze trends in minority student enrollment and completion at all levels. As well, it is important to examine the factors that may contribute to the low representation of minority students in graduate and professional schools. This paper addresses an important gap in our understanding of minorities in graduate school by seeking to understand if financial aid affects minority students' perceived likelihood of pursuing graduate or professional school. Although this is only one factor in the graduate-school choice process for these students, it contributes to our understanding of minority students' perceptions and decisions about attending graduate school.

Methods

This article examines survey responses from participants of the Summer Research Opportunities Program (SROP) being implemented at fifteen universities across the Midwest.²

The Summer Research Opportunities Program

The SROP was developed in 1986 by the Committee on Institutional Cooperation (CIC). The CIC was established in 1958 and is the academic consortium of twelve major teaching and research universities in the Midwest. It established the SROP in recognition of the need for inter-university cooperation to increase the number of talented students from underrepresented groups who enroll in graduate programs at research universities in the Midwest. SROP's

major program components include an 8-10 week research project conducted by participating students with guidance from faculty mentors, campus-based educational enrichment activities, and a CIC-wide summer conference. The program's goal is to increase the number of minority students who successfully pursue graduate study and attain academic careers. Although each institution has devised their own selection criteria, students invited to participate in the SROP are academically talented and are, typically, in the top pool of prospective graduate students. Thus, if they are interested, these students are very likely to be admitted to a graduate program. This program is unique in that its students come from a variety of institutions across the nation. By analyzing their thoughts about financial aid, we will gain a better understanding of the role of monetary assistance in the graduate school choice process.

By focusing on financial aid, this study addresses a current problem in higher education: low- and middle-income students' opportunities to attend college and graduate school are decreasing due to significant increases in the cost of higher education (Advisory Committee on Student Financial Assistance, 2001, 2002; St. John, 2003). As tuition increases and financial assistance decreases, access to higher education will continue to be limited for minority students.

Data

In 2001, the U.S. Department of Education's Institute of Education Sciences awarded Dr. William T. Trent from the Department of Educational Policy Studies at the University of Illinois at Urbana-Champaign a three year research grant to examine academic career attainment among participants in the Summer Research Opportunities Program. The research project, titled "Underrepresented Minorities in the Academy: Understanding the Career Attainment Process," sought data to inform the question: "What are the individual attributes of students of color and women, along with key educational experiences and institutional characteristics, that contribute to their success in securing graduate education that leads to the Ph.D. and faculty positions?"

As part of this research project, we administered a questionnaire to all SROP participants during the summers of 2002 and 2003. The questionnaire explored participants' SROP experiences, financial aid considerations, mentoring relationships, undergraduate experiences, self-conceptions, graduate aspirations, pre-undergraduate experiences, and asked for background information about the student. Of the 529 students who participated in SROP in 2003 and the 504 who participated in 2002, 490 and 431 valid responses were obtained, resulting in 93 percent and 86 percent response rates, respectively.

In order to understand how financial aid influences minority students' decision to pursue graduate or professional school, we included in the

questionnaire an item that asked respondents to indicate the likeliness that they would attend graduate or professional school in each of eight circumstances. The eight circumstances ranged from students pondering whether to attend graduate school if they were offered full time admission with a fellowship and tuition waiver to being offered part time study with no financial aid. These eight circumstances covered the most frequently encountered situations in financing graduate or professional school, and respondents could choose from not at all likely, somewhat likely, and very likely. After discussing our sample in more detail, we will present our findings. While they are primarily descriptive in nature, we feel that they are an important first step in understanding how financial aid affects minority students' plans to pursue graduate study.

Samples

Tables 1 through 3 depict respondents' race, gender, undergraduate institution, and family income in both 2002 and 2003. Based on our understanding of the program and its participants, we have no reason to suspect that our sample is biased, and thus it is representative of all SROP participants. As Table 1 indicates, the samples consist of primarily African American and Hispanic students and a much smaller proportion of white, Asian, and Native American students, which is consistent with the SROP's mission. Per our focus on minority students, white respondents are excluded from our analyses, although they appear in the tables describing our samples. As Table 2 shows, over 40 percent of the respondents are from CIC Institutions (those hosting the SROP), and another 40 percent hail from Historically Black Colleges and Universities, Hispanic-Serving Institutions, and Tribal Institutions. As well, as Table 3 depicts, roughly one third of SROP participants are from families whose combined annual income is less than \$30,000. Less than one in six are from families with incomes greater than \$100,000.

Table 1: Gender and Ethnic Composition of Samples

Cohort	Gender	Black	Hispanic	White	Asian	Native American	Other	Total
		N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
2002	Male	67 (14.0)	43 (9.0)	9 (1.9)	12 (2.5)	2 (0.4)	3 (0.6)	136 (28.4)
	Female	194 (40.5)	96 (20.0)	12 (2.5)	18 (3.8)	7 (1.5)	16 (3.3)	343 (71.6)
	Total	261 (54.5)	139 (29.0)	21 (4.4)	30 (6.3)	9 (1.9)	19 (3.9)	479* (100.0)
2003	Male	63 (14.8)	32 (7.5)	8 (1.9)	10 (2.3)	2 (0.5)	10 (2.3)	125 (29.3)
	Female	180 (42.2)	70 (16.4)	19 (4.4)	11 (2.6)	3 (0.7)	19 (4.4)	302 (70.7)
	Total	243 (57)	102 (23.9)	27 (6.3)	21 (4.9)	5 (1.2)	29 (6.7)	427** (100.0)

* Of the total 490 cases in 2002, 11 were missing on either gender or ethnicity or both.

** Of the total 431 cases in 2003, 4 were missing on either gender or ethnicity or both.

Table 2: Respondents' Home Institution

Type of Institution	2002		2003	
	N	%	N	%
CIC Institutions	195	43.5	171	43.7
HBCUs	111	24.8	93	23.8
Hispanic-Serving Institutions	66	14.7	49	12.5
Tribal Institutions	2	0.5	3	0.7
Other	74	16.5	75	19.2
Total	448*	100.0	391**	99.9***

* 12 respondents did not indicate home institution.

** 13 cases respondents did not indicate home institution.

*** Total does not add up to 100% due to rounding.

Table 3: Reported Parents' Combined Annual Income

Income Level	2002		2003	
	N	%	N	%
Less than \$1,000	9	2.0	6	1.7
\$1,000 - 9,999	24	5.4	22	6.2
\$10,000 – 19,999	52	11.7	36	10.1
\$20,000 – 29,999	58	13.1	51	14.3
\$30,000 – 49,999	102	23.0	88	24.7
\$50,000 – 74,999	92	20.8	69	19.4
\$75,000 – 99,999	51	11.5	29	8.2
\$100,000 – 149,999	32	7.2	41	11.5
\$150,000 – 199,999	14	3.2	9	2.5
\$200,000 or more	9	2.0	5	1.4
Total	443	99.9*	356	100.0

* Total does not add up to 100% due to rounding.

Findings

Table 4: Respondents' Graduate School Aspirations

	Highest Degree Expected			Total
	Master's Degree or Above	Below Master's Degree or Not Sure		
2002	N	413	29	442
	%	93.4	6.6	100.0
2003	N	368	29	397
	%	92.7	7.3	100.0

As Table 4 suggests, most of the respondents have high educational aspirations. More than 90 percent expect to receive at least a master's degree and are seriously considering graduate or professional school. With one exception, Chi-Square tests suggest that those who have high aspirations for graduate study

do not differ significantly from those with lower aspirations in terms of their willingness to tolerate various financial aid packages (see Appendix I). The one exception is that a significantly higher percentage of high aspirants than low aspirants indicated that they would be “Very Likely” or “Somewhat Likely” to attend graduate school “Full Time with Assistantship but no Tuition Waiver.” This difference is only evident in the 2002 cohort, and the number of low aspirants is quite small. Therefore, we included both higher and lower aspirants in our analysis. It is important to note, however, that the majority of the respondents are high aspirants, which may skew the data and allow their responses to carry more significance than they would if the sample was balanced between low and high aspirants.

Figure 1: Percentage of Respondents Reporting They Were “Very Likely” to Attend Graduate or Professional School under Different Circumstances

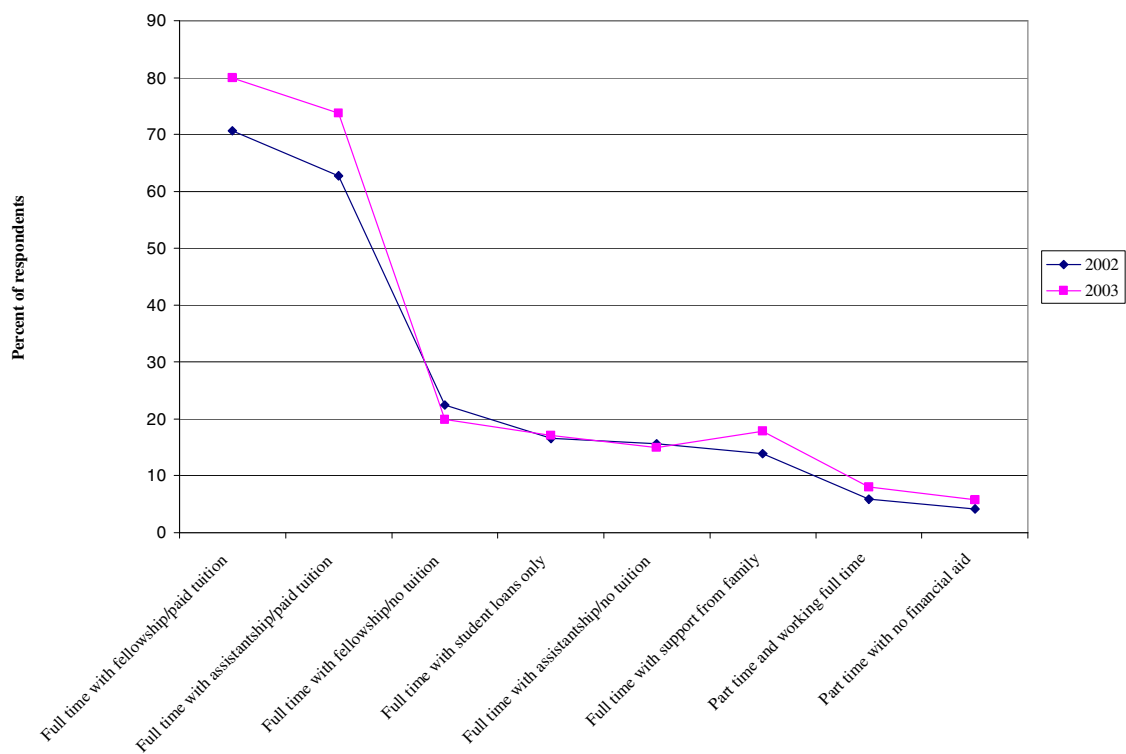


Figure 1 depicts respondents’ reported likelihood of going to graduate or professional studies under different financial circumstances. Clearly, there is a

consistent pattern across cohorts that shows how different financial aid scenarios affect the likeliness that minority students will attend graduate school. Most respondents would attend graduate or professional school if they could enroll full time and receive a fellowship or assistantship and a tuition waiver. However, there is a sharp drop in the percentage of respondents who indicated that they would “Very Likely” attend graduate school under any other circumstances. Clearly, whether or not their tuition is paid is a significant factor in respondents’ decisions about pursuing graduate or professional degrees. Only one in five students picture themselves going to graduate or professional school without a tuition waiver. About one in six would go to graduate or professional school if they were offered only student loans, and attending graduate or professional school part time was the least favorable option for these respondents. Additionally, attending graduate or professional school full time with financial support from family was not an optimal option for more than 80 percent of respondents.

Figure 2: Percentage of 2002 Respondents Reporting They Were “Very Likely” to Attend Graduate or Professional School under Different Circumstances, by Parental Income

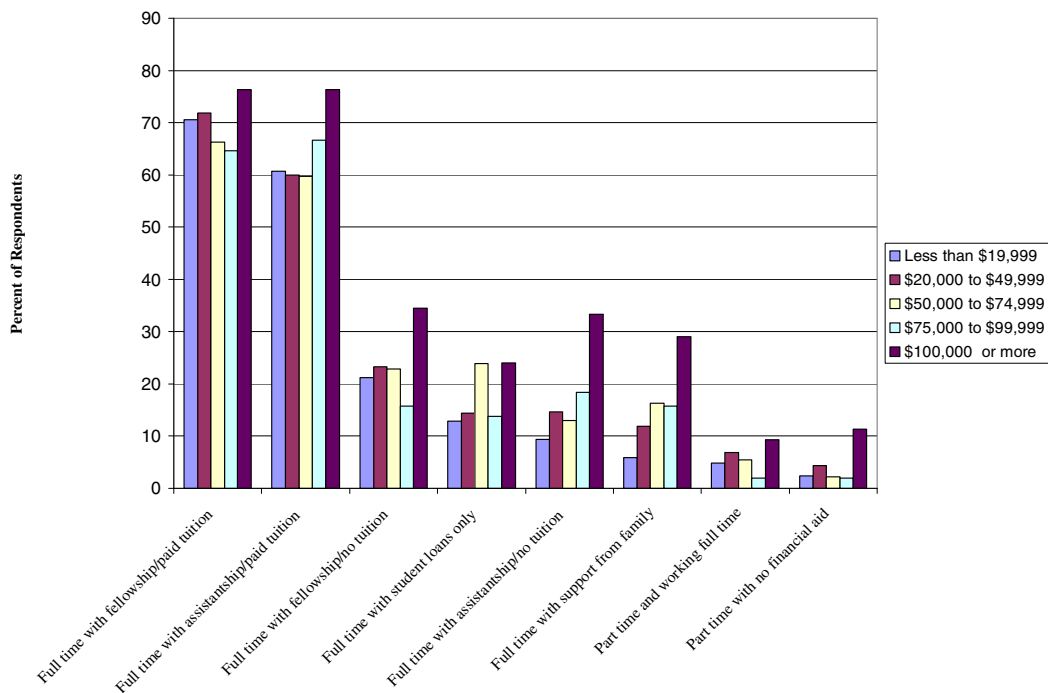
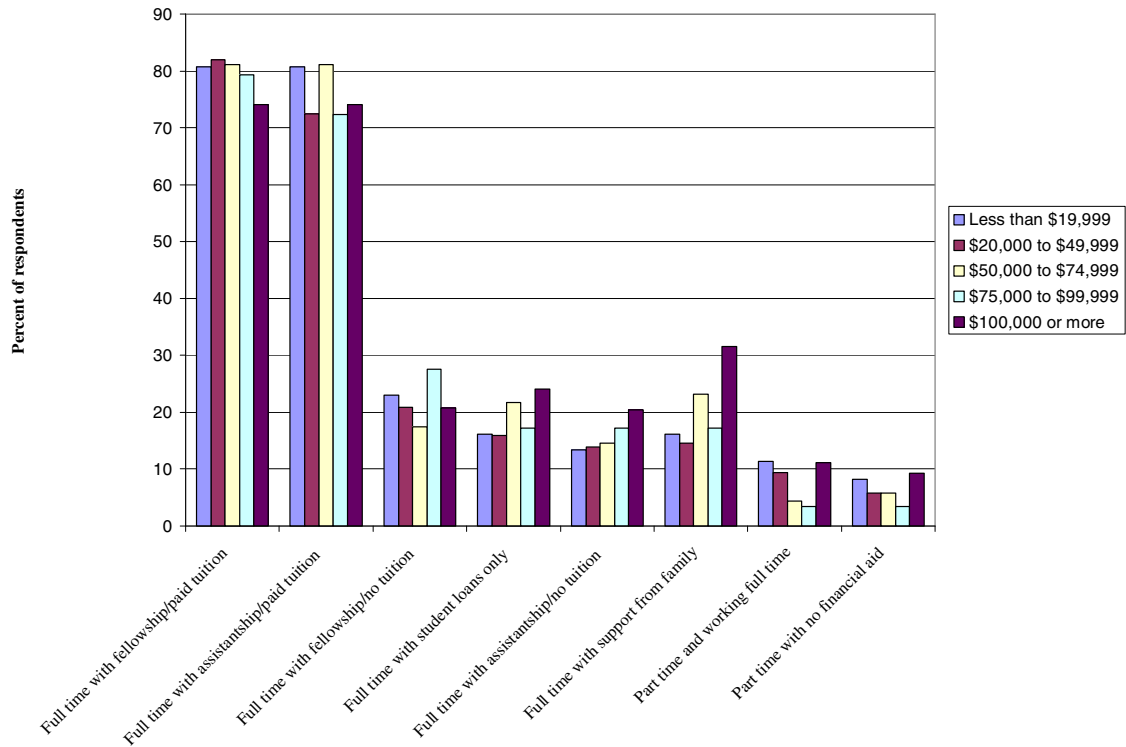


Figure 3: Percentage of 2003 Respondents Reporting They Were “Very Likely” to Attend Graduate or Professional School under Different Circumstances, by Parental Income



As we expected, family income affects the likelihood that minority students will attend graduate or professional school under different financial aid scenarios, especially for the least favorable circumstances (see Figures 2 and 3). In the 2002 cohort, chi-square tests show that the last four scenarios are significantly associated with income. In the 2003 cohort, the last two scenarios are significantly associated with income. Thus, when students receive the least favorable financial aid packages, family income has a bigger effect on the perceived likelihood that minority students will attend graduate or professional school.

Summer Research Opportunities Program participants who came from higher income brackets in both 2002 and 2003 were more likely to picture themselves attending graduate school with lower financial assistance. On the other hand, students from low- to middle-income brackets were less likely to pursue graduate school if they received a less desirable financial aid package. However, when students are offered a fellowship or assistantship with a tuition waiver (the two most desirable financial aid packages), the effect of family income on the perceived likelihood of going to graduate or professional schools is

not significant. Thus, most minority students, irrespective of income, would go to graduate school if institutions were willing to provide competitive financial aid packages that cover the costs associated with graduate study. As well, given the limited financial support low-income students can receive from their families, it is all the more important to provide these students with financial aid packages that include tuition waivers. Also, the data suggests that for both cohorts, some students are willing to invest in graduate school by acquiring loans or working to meet the financial costs. However, most students prefer financial aid packages that include a tuition waiver.

Conclusion and Implications

Our findings suggest that most minority students who participate in the Summer Research Opportunities Program aspire to attend graduate school. However, students from higher income brackets are more likely to tolerate a less-than-favorable financial aid package than students from the low- to middle-income brackets. This finding is in line with current research that shows that students from the lowest income brackets are less likely to pursue higher education if they do not have access to financial aid. However, more research needs to be done to see if this finding generalizes to other, non-SROP minority students.

This research contributes to the literature on access to higher education by showing that the quality of a financial aid package—in particular whether or not a tuition waiver is included—affects whether or not minority students pursue graduate or professional degrees. For institutions considering how they can increase the number of underrepresented students at the graduate level, our research findings suggest a need to revisit the financial aid packages offered to highly talented minority students. From this study, it is clear that even if institutions admit minority students to their graduate programs, these students may not enroll if they are not offered quality financial support.

Higher education in the United States is highly regarded around the world because its willingness to provide access to students from a wide array of backgrounds. Yet, if American colleges and universities are to retain their stature, they must consider how they package financial aid for prospective minority graduate students. Faculty and institutional leaders at these institutions must make it a priority to secure funding that allows them to offer quality financial aid packages that may include tuition waivers or assistantships. Institutional leaders must advocate for these packages even though federal and state financial support for higher education is declining. If an institution believes strongly that increasing the number of underrepresented students in graduate school is an important goal,

then it needs to secure funding for quality financial aid packages for graduate students. There exists a talented pool of minority undergraduate students, such as those participating in the Summer Research Opportunities Program, who can be trained to become the next generation of researchers, faculty members, and institutional leaders. Yet without a strong commitment to diversity and a value for equality, access to graduate school will continue to be limited for minority students.

Notes

¹ In this paper, the term “minority students” refers to those who have traditionally been underrepresented in four-year colleges and universities. These students include Latino/as, African-Americans students, Asian-Pacific Islanders students, and Native-Americans students. The terms underrepresented, students of color, and minority students will be used interchangeably throughout the paper to refer to these groups.

² The fifteen CIC institutions that participate in the SROP program are the University of Chicago, the University of Illinois at Chicago, the University of Illinois at Urbana-Champaign, Indiana University, Indiana University / Purdue University at Indianapolis, the University of Iowa, the University of Michigan, Michigan State University, the University of Minnesota, Northwestern University, Ohio State University, Pennsylvania State University, Purdue University, the University of Wisconsin-Madison, and the University of Wisconsin-Milwaukee.

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Appendix I: Tests of Association Between Aspirations and Perceived Likelihood of Attending Graduate School

Circumstances for Graduate Study	Graduate Study Aspiration	2002 Cohort				2003 Cohort			
		Perceived Likelihood				Perceived Likelihood			
		Not At All Likely N (%)	Somewhat Likely N (%)	Very Likely N (%)	Total	Not At All Likely N (%)	Somewhat Likely N (%)	Very Likely N (%)	Total
Full Time With Fellowship and Paid Tuition	Master's Degree or Above	16 (3.87)	109 (26.4)	288 (69.7)	413	17 (4.6)	56 (15.3)	294 (80.1)	367
	Below Master's Degree or Not Sure	2 (6.9)	6 (20.7)	21 (72.4)	29	0 (0.0)	6 (21.4)	22 (78.6)	28
	All	18	115	309	442	17	62	316	395
	X ² test	X ² = 0.9744, df = 2, p = 0.614				X ² = 0.0384*, df = 1, p = 0.8446			
Full Time With Assistantship and Paid Tuition	Master's Degree or Above	12 (2.9)	141 (34.1)	260 (63.0)	413	11 (3.0)	82 (22.3)	274 (74.7)	367
	Below Master's Degree or Not Sure	2 (7.1)	12 (42.9)	14 (50.0)	28	0 (0.0)	10 (35.7)	18 (64.3)	28
	All	14	153	274	441	11	92	292	395
	X ² test	X ² = 2.7655, df = 2, p = 0.251				X ² = 3.2149, df = 2, p = 0.2004			
Full Time With Student Loans Only	Master's Degree or Above	190 (46.1)	153 (37.1)	69 (16.8)	412	149 (40.6)	151 (41.1)	67 (18.3)	367
	Below Master's Degree or Not Sure	18 (62.1)	9 (31.0)	2 (6.9)	29	16 (55.2)	12 (41.4)	1 (3.4)	29
	All	208	162	71	441	165	163	68	396
	X ² test	X ² = 3.3694, df = 2, p = 0.186				X ² = 4.802, df = 2, p = 0.0906			
Full Time With Fellowship and No Tuition Waiver	Master's Degree or Above	94 (22.8)	225 (54.6)	93 (22.6)	412	85 (23.2)	206 (56.1)	76 (20.7)	367
	Below Master's Degree or Not Sure	8 (27.6)	17 (58.6)	4 (13.8)	29	6 (21.4)	19 (67.9)	3 (10.7)	28
	All	102	242	97	441	91	225	79	395
	X ² test	X ² = 1.2954, df = 2, p = 0.5232				X ² = 1.9611, df = 2, p = 0.3751			
Full Time With Assistantship and No Tuition Waiver	Master's Degree or Above	129 (31.5)	215 (52.6)	65 (15.9)	409	108 (29.7)	199 (54.7)	57 (15.6)	364
	Below Master's Degree or Not Sure	20 (74.1)	7 (25.9)	0 (0.0)	27	8 (27.6)	19 (65.5)	2 (6.9)	29

	All	149	222	65	436	116	218	59	393
	X ² test	X ² = 21.23, df = 2, p < .0001				X ² = 1.9831, df = 2, p = 0.371			
Part Time With No Financial Aid	Master's Degree or Above	311 (76.0)	82 (20.1)	16 (3.9)	409	284 (77.6)	60 (16.4)	22 (6.0)	366
	Below Master's Degree or Not Sure	25 (86.2)	4 (13.8)	0 (0.0)	29	22 (75.9)	6 (20.7)	1 (3.4)	29
	All	336	86	16	438	306	66	23	395
	X ² test	X ² = 2.0392, df = 2, p = 0.361				X ² = 0.6103, df = 2, p = 0.737			
Part Time and Working Full Time	Master's Degree or Above	279 (67.9)	109 (26.5)	23 (5.6)	411	245 (66.8)	94 (25.6)	28 (7.6)	367
	Below Master's Degree or Not Sure	21 (72.4)	7 (24.1)	1 (3.5)	29	18 (64.3)	7 (25.0)	3 (10.7)	28
	All	300	116	24	440	263	101	31	395
	X ² test	X ² = 0.369, df = 2, p = 0.8315				X ² = 0.3431, df = 2, p = 0.8423			
Full Time With Support From Family	Master's Degree or Above	242 (58.6)	112 (27.1)	59 (14.3)	413	196 (53.4)	103 (28.1)	68 (18.5)	367
	Below Master's Degree or Not Sure	21 (75.0)	6 (21.4)	1 (3.6)	28	17 (58.6)	9 (31.0)	3 (10.4)	29
	All	263	118	60	441	213	112	71	396
	X ² test	X ² = 3.713, df = 2, p = 0.1562				X ² = 1.2236, df = 2, p = 0.5424			

*Due to the high number of cells with expected counts less than 5, the first two columns were combined for the test.

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