The Impact of GMS on Financial Access: Analyses of the 2000 Freshman Cohort

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Executive Summary

Initiated in the 2000-01 academic year, the Gates Millennium Scholars (GMS) program was created with the explicit intent of improving financial access for low-income minority students who were prepared for college. GMS provides "last-dollar" grants to high-achieving applicants, eliminating the need for excessive borrowing and work.

This study used a national survey of 1,829 freshman applicants for the 2000 GMS awards, the first year of implementation. Students who met the non-cognitive selection criteria were included in both the recipient and non-recipient groups in the first years, creating a quasi-random award distribution. Analyses of the impact of GMS awards to the 2000 freshman cohort, therefore, provide evidence of the effect of adequate financial aid on financial access for low-income, college-qualified minority students.

Logistic regression analyses were used to assess the impact of GMS awards on financial access. Specifically, the analyses consider the impact of GMS awards on: a) college destinations (i.e., enrollment in four-year colleges), b) the opportunity to maintain continuous enrollment, and c) the opportunity to change colleges. Key findings include:

- *GMS awards were associated with enrollment in four-year colleges*. Compared with non-recipients, GMS recipients were only .36 times as likely to enroll in public two-year colleges as in public four-year colleges, controlling for other variables that influence college choice.
- *GMS awards were associated with enrollment in private colleges*. GMS recipients were 1.37 times more likely to enroll in private colleges than in public four-year colleges.
- *Receiving a GMS award improved the odds of continuous enrollment.* GMS recipients were 2.74 times more likely to maintain continuous enrollment than were non-recipients.
- *Receiving a GMS award was not associated with change of colleges*. GMS recipients had the same probability of changing colleges as students who did not receive awards, indicating that the additional financial support did not induce students to change colleges after their initial enrollment.

These findings indicate that the GMS program improved financial access (i.e., ability to maintain continuous enrollment in their college of choice) for low-income, college-qualified minority students. This supports the argument that providing adequate financial aid can expand postsecondary opportunity for students who take the steps to prepare for college. However, further research is needed to determine whether the impact of GMS is attributable to the selection process, the financial resources, or other features of the program.

Introduction

The Gates Millennium Scholars (GMS) program, implemented in the fall of 2000, was created to improve educational opportunity for low-income minorities who are qualified for college. Begun following two decades of erosion in the purchasing power of federal need-based grants (Advisory Committee on Student Financial Assistance, 2001, 2002; St. John, 2002, 2003), GMS represents a distinctive national experiment in providing adequate need-based grant aid. Research on the effect of GMS awards on financial access can inform policy makers on the potential impact of reinvesting in need-based grants.

Unfortunately, most federally funded analysts have consistently overlooked the impact of the decline in federal aid on the gaps in college access between majority and minority students that opened after 1980. Instead, these analysts and many others focus almost exclusively on the influence of high school courses and parents' education (e.g., Choy, 2002; King, 1999; NCES, 1997a, 1997b). Fortunately, analyses of the impact of GMS awards on college destinations and continuous enrollment provide an opportunity to build a better understanding of the relationship between the decline in federal grant aid and the new inequality in access to higher education.

Because policy analysts disagree about the role of financial aid in promoting college access, it is important to situate the GMS program within a national policy context. The competing explanations for the disparity in college enrollment rates for low-income high school students compared with middle- and high-income high school students were considered in the design of this study. This report situates GMS in the policy debate about alternative explanations for disparities in college access. Next, the research approach and findings are presented. The report concludes by discussing the implications of the findings for changes in federal and state finance policies that could better promote college access.

Situating the GMS Program

Historically, need-based federal student financial aid programs were created to ensure equal opportunity for low-income students (Gladieux & Wolanin, 1976). By 1975, there was a consensus that financial aid was central to providing equal opportunity for college enrollment. The Pell Grant program[1] had been fully implemented and enrollment rates for Hispanic Americans and African Americans who had graduated from high school were essentially equal to the enrollment rates for Whites (St. John, 2003). At the time, the policy debates were about how best to provide funding for middle-income families: whether through grants or tax subsidies. The *Middle Income Student Assistance Act of 1978* (MISAA) expanded eligibility for Pell Grants and other federal grants to include middle-income students, but these more liberal provisions were never fully funded.

However, the administrations of Ronald Reagan and George H. W. Bush shifted the emphasis in federal aid from grants to loans. Loans provided student aid to middle-income students at a lower cost to taxpayers than would have been possible if grants had been used consistent with MISAA. The Clinton administration created savings programs and tax credits that further increased financing opportunities for middle-income students. By 2000, when the GMS program was implemented, the net cost of attending a public four-year college had increased dramatically for low-income students due to the decline in the value of federal need-based grants and increases in tuition changes.

By 2000, even market-oriented economists recognized that a new imbalance in public financing of higher education had become problematic (e.g., Fogel, 2000). Economists and higher education scholars also had argued that the decline in the value of federal grants had reduced opportunity for low-income students (Heller, 1997; McPherson & Schapiro, 1991, 1997; St. John,

1994; St. John, Paulsen, & Starkey, 1996). Yet, the preponderance of official[2] policy literature after 1980 simply overlooked the role of need-based aid in promoting access (Adelman, 1995, 1999; Gladieux & Swail, 1999; King, 1999; NCES, 1996, 1997a, 1997b, 1998).

When the Bill & Melinda Gates Foundation announced in 1999 that it would dedicate one billion dollars to grants to low-income minority students, it did so in a contested policy context. Federal officials consistently argued that the failure of the public schools explained the lagging college enrollment rates for minority students. At the same time, they advocated for loans, tax credits, and savings programs—strategies that favored middle-income students. Yet, some advocates of minority access continued to point to financial barriers (St. John, 1991, 1997).

The GMS Program

Initiated in the fall of 2000, the GMS program has given scholarships to college students and aspiring college students. Low-income African Americans, Hispanic Americans, Asian Pacific Islander Americans, and American Indians and Alaska Natives are eligible for the awards. Pell Grant award eligibility is used as an indicator of financial need, while non-cognitive measures are used in selection.[3] During the first year, awards were given to entering college students, continuing students, and graduate students in selected high-demand fields. Undergraduate students chosen as Gates Minority Scholars would continue to receive awards throughout their undergraduate education and could receive fellowships for graduate education if they went on in the fields of mathematics, science (including computer science), engineering, education, and library science.

Ambiguities in the award process during the 2000 academic year had the effect of creating a "quasi-random" distribution of first-year awards. Students were required to have a 3.3 grade point average (GPA) in high school. A set of non-cognitive criteria (Sedlacek, in press) was used to

determine student eligibility: selection considered information related to self-concept and long-range plans, among other things. All of the students included in the 2000 surveys—both the GMS recipients and the non-recipients who comprise the comparison group—met both the cognitive and non-cognitive selection criteria.

The final stage of selection considered financial need. The financial criterion (i.e., Pell eligibility) was applied in the third stage of the selection process. Due to delays in the award process, some students were notified of their awards after the start of the fall term. However, the majority were notified before they made their final college choice. Students with high scores on the non-cognitive criteria were notified first of their eligibility. These students had to have substantial financial need (i.e., be Pell-eligible) to receive GMS awards. In making its final selections, the GMS program also sought to maintain racial balance in award distribution. Thus, some students with high scores on the non-cognitive criteria did not receive awards.

Since the selection process sorted first on the non-cognitive criteria, the two groups are relatively similar with respect to the selection criteria. Thus, respondents include students who met the non-cognitive criteria in both the GMS recipient group and the comparison group. Further, Pell-eligible students were included in both the GMS recipient and non-recipient groups, although Pell eligibility is more strongly represented in the recipient group. This means that there was substantial variation in both groups. Different levels of financial need and different scores on the non-cognitive criteria were represented in both the GMS recipient and non-recipient groups in the 2000 cohort. However, all of the students surveyed in the 2000 cohort met the non-cognitive eligibility criteria. GMS recipients were eligible to receive financial awards throughout their undergraduate education and, if they went to graduate school in one of the selected fields, through their graduate education as well.

The financial criteria for awards were more clearly communicated during the second year of the program, which means that awardees had consistently higher scores on the award criteria than did the non-recipients. Therefore, for the 2000 freshman cohort there was a quasi-random distribution of awards. Research on this cohort is crucial to building an understanding of the impact of supplemental need-based grant aid on financial access for college-prepared low-income students.

The GMS awards cover the amount of financial need remaining after other grant aid—federal, state, and institutional—is awarded. These "last-dollar" grants are intended to eliminate the need for loans. The actual amounts of GMS awards vary substantially, depending on the tuition charges at the colleges and universities students attend and the amount of aid they receive. Students enrolled in private colleges receive much larger awards, on average, than do students who attend public colleges. Thus, GMS functions as a need-based grant program, filling the need remaining after other grant aid.

In addition to financial support, the GMS program also provides leadership opportunities for students receiving awards. This includes attending national meetings and receiving other support services offered by the foundation. These elements of the GMS program were designed to promote persistence, success in college, and professional experience after college.

Evolving Arguments about Access

Arguments by economists about financial need had a substantial influence on federal student financial aid programs through the 1970s (Breneman, Finn, & Nelson, 1978; Finn, 1978; Gladieux & Wolanin, 1976). However, after 1980, new rationales were used to refocus the policy debates on academic preparation for college. Most recently, efforts have been made to build balanced

approaches for research and policy on college access. The assumptions used in these three stages of research merit review as a means of further situating this study.

Early Analyses of Financial Access: Economists began to study the impact of tuition on college enrollment in the 1960s (Becker, 1964; Hansen & Weisbrod, 1969). Early studies used both time-series data and samples of high school students to examine the impact of prices on enrollment. Reviews of these early studies found that tuition charges reduced enrollment rates, a finding that often was used to argue that student aid was the most efficient possible means of promoting college access. Later, substantial progress was made in analyzing the impact of student financial aid on college enrollment using national longitudinal databases. Jackson (1978) and Manski and Wise (1983) found that student aid expanded access for students in the high school class of 1972. Manski and Wise concluded that implementation of Pell Grants had expanded access to two-year colleges more than to four-year colleges because of constraints on academic preparation. Subsequent analyses found that student grants were positively associated with enrollment by low-income students in the early 1980s, as they had been a decade earlier (Jackson, 1988; St. John, 1990, 1991; St. John & Noell, 1989). Recent analyses that consider trends in federal need-based and non-need grants, trends in state grants, and trends in school reform find a correspondence between changes in grant funding and college enrollment rates by high school graduates[4] in the 1970s, 1980s, and 1990s (Perna & Titus, 2002; St. John, 2003).

Recent Analyses of Academic Preparation: During the past two decades, many policy analysts have considered the role of academic preparation for college in efforts to build a better understanding of college access. The focus on the role of academic preparation grew out of efforts by the Reagan administration to respond to concerns about gaps in enrollment rates for White students and African American students after 1978. The official report prepared in response to this

concern examined the relationship between courses taken in high school and college enrollment (Pelavin & Kane, 1988, 1990). While previous studies had controlled for the impact of taking a college preparatory curriculum (e.g., Jackson, 1978; St. John, 1991; St. John & Noell, 1989[5]), they did not examine the impact of specific high school courses, such as algebra. The Pelavin and Kane study focused on specific math courses, but did not consider the direct effects of student financial aid on enrollment, even though analyses of the effects of student aid were available to the authors.[6]

In the late 1990s, the National Center for Education Statistics' analyses of longitudinal databases consistently focused on the association between high school courses and college enrollment (Adelman, 1995, 1999; NCES, 1996, 1997a, 1997b, 1998). These reports sometimes acknowledged that financial aid played a role in college access, but they consistently avoided analyzing the direct effects of financial aid on college enrollment. The reports essentially claimed that preparation for college explained differentials in college enrollment rates for low-income and high-income students, as illustrated in the following passage:

> Although there are differences by income and race-ethnicity in four-year college enrollment rates of college-qualified high school graduates, the difference between college-qualified low-income and middle-income students, as well as the differences among college-qualified black, Hispanic, Asian, and white students, are eliminated among those students who have taken the college entrance examinations and completed an application for admission, the two steps necessary to attend a four-year college (NCES, 1997a, p. iii)

It also is possible that inadequacy of grant aid has a negative influence on college preparation and high school graduation. Thus, not only did these national reports fail to consider the direct effects of student aid on college enrollment, they also failed to consider that student aid could influence the academic preparation process.

More recently, the American Council on Education asked one of the researchers who conducted studies of the longitudinal databases for NCES to write a report on this large body of research (Choy, 2002). The primary conclusions about access in this report were:

- A young person's likelihood of attending a four-year college increases with the level of his or her parents' education. This is true even for the most highly qualified high school seniors.
- Taking challenging mathematics courses can mitigate the effects of parents' education on college enrollment. The association between taking a rigorous high school math curriculum and going to college is strong for all students, but especially for those whose parents did not go beyond high school.
- More at-risk students apply to college if their friends plan to go. College outreach programs, as well as parental and school support with the application process, also have proven worthwhile.
- The price of attending is still a significant obstacle for students from low- and middle-income families, but financial aid is an equalizer, to some degree. Low-income students enroll at the same rate as middle-income students if they take the steps toward enrollment (Choy, 2002, p. 5).

The reports published by NCES and ACE clearly perpetuate the notion that the major access challenge is academic—not financial—and that family background has a large influence on preparation. These reports failed to examine the direct linkage between income and college enrollment (Heller, 2003).

Seeking More Balance in Access Research: Recently, a group of researchers has begun to reexamine the NCES study with the intent of using a more balanced approach to assessing the impact of policy on access to higher education.

First, reanalysis of statistics reported by NCES (1997a) revealed that there are large numbers of low-income, college-qualified students who did not enroll in college (Advisory Committee on Student Financial Assistance, 2002; St. John, 2002). These analyses used a balanced access model that considered whether students' perceptions of financial need could influence academic preparation, as well as the direct effects of finances on college enrollment. Based on this reanalysis, the Advisory Committee on Student Financial Assistance (2002) estimated that four million college-qualified low- and middle-income students would be left behind in the 2000s because of inadequate grant aid.

Second, at the request of the Advisory Committee, Don Heller (2003) recently reexamined the logical models and statistical methods used by NCES. He concluded that these studies did not adequately consider the relationship between income and parents' education when assessing the impact of family finances on access. His review points to fundamental problems with the basic conception of access used in the NCES and ACE studies. A follow-up study by William Becker (2003), also commissioned by the Advisory Committee, examined the consequences of these oversights from a statistical and econometric perspective. It is clear from these reviews that the NCES reports underestimated the impact of family income on college access (Becker, 2003; Heller, 2003).

This study of the impact of GMS grants on financial access adds to this newest wave of research that considers the impact of student financial aid on access for low-income, college-qualified students. Most GMS applicants were high-achieving students in high school. Because

selection was based on non-cognitive variables, the level of achievement (i.e., test scores, grades) did not influence the selection process.

The New Inequality: There has been a widening gap in college enrollment opportunity for minorities compared with Whites. As is documented in Table 1, the gap in college enrollment rates for African American and Hispanic American high school graduates compared with White high school graduates grew after 1975. In 1999, the year before GMS was implemented, the differential between Whites and African Americans was 6.1 percentage points; in 1975, the gap had been only 0.8 percentage points. For Hispanic American high school graduates, the change was even more dramatic. In 1975, Hispanic American high school graduates attended college at a rate 3.2 percentage points higher than Whites; by 1999, they had fallen behind Whites by 13.7 percentage points. Thus, the GMS program was implemented at a critical time.

Table 1. Trends in Enrollment as a Percent of 18- to 24-Year-Old High School Graduates by Race/Ethnicity (With Opportunity Gaps)

	1970	1975	1980	1985	1990	1995	1999
White	33.2	32.3	32.1	34.9	40.4	44.0	45.3
African American	26.0	31.5	27.6	26.0	32.7	35.4	39.2
(GAP)	(7.2)	(0.8)	(4.5)	(8.9)	(7.7)	(8.6)	(6.1)
Hispanic		35.5	29.9	26.8	28.7	35.2	31.6
(GAP)		+3.2	(2.2)	(8.1)	(11.7)	(8.8)	(13.7)
TOTAL	32.6	32.5	31.8	33.7	39.1	42.3	43.7

Source: St. John, 2003, using data from NCES, *Digest of Education Statistics* 2000a. NCES 2001-034, Table 187, p. 216.

Trend analyses also point to a similar opportunity gap for low-income students compared with upper-income students during the 1980s and 1990s (Table 2). About 29% of low-income high school seniors in 1980 and 1987 attended four-year colleges in the fall after high school graduation. Similarly, in 1992, 28% of this group attended public four-year colleges. However, the percentage of high-income students attending four-year colleges increased from 55% in 1980/82 to 66% in 1992. The gap between low-income and high-income students grew from a 26 percentage point

differential for the 1980 and 1982 cohorts to 37 percentage points for the 1992 cohort. The trend indicates that the new inequality in opportunity was related to income.

A decline in the purchasing power of Pell Grants and other federal need-based grants also paralleled the emergence of the new inequality (Table 3). In 1975-76, the cost of attending a public four-year college (tuition, room & board, and other expenses) was only $2,348 higher than the maximum Pell award (in constant 1997-98 dollars). In contrast, in 1999-2000, the gap after maximum Pell was $4,738. These changes suggest that the new inequality in college opportunity could be related to trends in college costs and federal grants. In addition, the cost of attending college increased faster than Pell Grants in the first two years of the twenty-first century (College Board, 2002a, 2002b).

Table 2: Proportion of Students from Families in Each Income Quartile Who Enroll in Postsecondary Schools Within 20 Months of High School Graduation

Parental Income Quartile	**Any Postsecondary Schooling:** Total	Vocational, Technical	2-Year College	4-Year College	
Bottom	0.57	0.12	0.16	0.29	Class of 1980/82
3rd	0.63	0.11	0.19	0.33	
2nd	0.71	0.10	0.22	0.39	
Top	0.80	0.06	0.19	0.55	
Total:	**0.68**	**0.10**	**0.19**	**0.39**	
Bottom	0.60	0.10	0.22	0.28	Class of 1992
3rd	0.70	0.07	0.25	0.38	
2nd	0.79	0.06	0.25	0.48	
Top	0.90	0.05	0.19	0.66	
Total:	**0.75**	**0.07**	**0.23**	**0.45**	

Note: Table from Kane (2001), based on figures reported in Ellwood and Kane (2000).

Table 3: Purchasing Power of Pell Grant Maximum Awards at Four-Year Public Institutions

Year	Pell Grant Maximum Award		Average Cost of Attendance (Tuition plus other costs in 1997-98 Constant Dollars)	Pell Maximum as % of Average Cost of Attendance* (1997-98 Constant Dollars)	Average Cost of Attendance at Public Colleges Minus Pell Grant Maximum (1997-98 Constant Dollars)
	Current Dollars	1997-98 Constant Dollars			
1975-76	**1400**	**4,048**	**4,769**	**85%**	**.5 x 4,769 = 2,348 ****
1980-81	**1750**	**3,240**	**4,674**	**69%**	**.5 x 4,674 = 2,337****
1985-86	**2100**	**3,095**	**5,419**	**57%**	**.5 x 5,419 = 2,710****
1990-91	**2300**	**2,755**	**5,891**	**47%**	**5,891 - 2,755 = 3,136*****
1995-96	**2340**	**2,427**	**7,011**	**35%**	**7,011 – 2,427 = 4,584**
1999-2000	**3,125**	**2,985**	**7,723**	**39%**	**7,723 – 2,985 = 4,738**

Constant dollar figures assume 1997-98 academic year as base year. College costs and CPI estimated for 1997-98.

*Note: Until 1986, the Higher Education Act limited the Pell Grant award to no more than 50% of a student's *actual* cost of attendance. But, for the lowest-income students at most four-year institutions, Pell awards did exceed 50% of the *average* public four-year cost of attendance. The 50% limit on awards was increased to 60% from 1986 to 1992 and likewise did not reduce the maximum award received by the lowest-income students at most four-year institutions. After 1992, the cost limitation was removed altogether.

**Reflects 50% cost limitation.
***Unaffected by 60% cost limitation

Source: St. John, 2003, imported from Washington office of the College Board (1998, 2000), *Trends in Student Aid 2000* from Table 7 (page 13).
College Board (1999), *Trends in College Pricing 1999* from Table 8 (page 15).

Framing the Study

This study examines the impact of GMS awards on financial access by students in the 2000 cohort. It uses a national sample of students who received GMS awards along with applicants who did not receive awards. We start with an understanding that both forms of access—financial and academic—are important policy issues. Consistent with recent analyses (St. John, 2003), we define the two forms of access as follows:

- *Academic access* refers to *whether students are academically prepared for initial and continued enrollment.*
- *Financial access* is defined as *the ability to afford continuous enrollment in the lowest cost two-year and four-year programs available to applicants, given their ability and prior performance*.

Using these definitions, the applicants for GMS awards uniformly met the requirement for academic access. Most of the students in the sample took the steps to become college qualified: they aspired to attend college, took appropriate preparatory courses[7], applied for college, and applied for government aid. In addition, they applied to GMS for supplemental student financial assistance. Therefore, the current study examines whether low-income minority students who met or exceeded the threshold for academic access made gains in financial access as a result of receiving a GMS award. The analysis focuses on the following questions:

- Did receipt of a GMS award improve the chances that low-income, college-qualified minority students would enroll in four-year colleges?
- Were recipients of GMS awards more likely to maintain continuous enrollment than were applicants who did not receive GMS awards?

- Were recipients of GMS awards more likely or less likely than other applicants to change colleges?

It is necessary to address all three questions to build an understanding of the impact of GMS awards on financial access. Since the definition of financial access includes access to four-year colleges for which students qualify, it is important to consider the impact of the program on college destination. Further, the analysis of the impact of GMS awards on continuous enrollment represents the essential test of the effect of these awards on college access. Because some GMS awards were made after the beginning of the academic year, it is important to consider, especially for the 2000 cohort, whether having the additional financial capacity influences some students to change to more expensive colleges.

The analyses of the impact of GMS awards on financial access have implications for the current policy debates about college access. If college-qualified, low-income minority students lack access to four-year colleges and/or if they lack the opportunity to maintain continuous enrollment, then the threshold of financial access has not been met. Conversely, if GMS is positively associated with enrollment in four-year colleges and/or continuous college enrollment, then Pell Grants are no longer adequate to ensure financial access. If Pell Grants were adequate to support enrollment in public four-year colleges, we might expect that the additional support provided by GMS would have had an additional influence on enrollment in private four-year colleges but not on whether students enrolled in public two-year or public four-year colleges. NCES has rested its arguments about access on the notion that low-income students and minority students who prepare for college have access to four-year colleges (NCES, 1997a).

Research Approach

This study used a survey of the 2000 first-year GMS cohort to examine the impact of GMS awards on financial access. The surveys, statistical methods, and limitations are described below.

The GMS Surveys

The base year for the GMS surveys was 2002-03. The National Opinion Research Center (NORC) at the University of Chicago developed the survey instruments and conducted the survey. Students included in these surveys would have been enrolled for four semesters if they had maintained continuous enrollment.

NORC also collected longitudinal studies for NCES and could draw from the questions from these surveys to design the GMS questionnaire. In addition, the GMS research advisory panel[8] collaborated with NORC on the study design and questionnaire development. The intent of the GMS survey was to follow a longitudinal design similar to NCES' longitudinal studies so that the long-term effects of GMS awards could be examined. The long-term effects of the program could be due to the leadership training, as well as to the additional financial resources Scholars received.

The NORC surveys included samples of both GMS award recipients and applicants who did not receive awards. While the response rates for the two first-year cohorts were slightly higher for recipients than for non-recipients, both groups had a sufficient response[9] level:

- A 76.0 % response rate for GMS recipients in the 2000 freshman year cohort.
- A 56.4 % response rate for non-recipients in the 2000 freshman year cohort.

In developing the databases for the researchers, NORC added weights to adjust the sample for the probability of selection.[10] Statistical analyses for the current study were conducted using SASS (Statistical Application for the Social Sciences).

The sample for the 2000 cohort included 1,829 responses. Given that an extremely low number—only 41—in the sample did not enroll in college, it was not possible to examine the effects of GMS awards on whether students enrolled in any type of institution.[11] The analyses of the 2000 cohort used the 1,788 responses by students who enrolled in college.

Statistical Methods and Specifications

College Destination: The analysis uses multinomial logistic regression to examine the impact of GMS on enrollment in public two-year colleges or in private colleges[12] compared with public four-year colleges. The analysis examined the influence of the following independent variables:

- GMS award (compared with students who did not receive an award).[13]
- High achievement (students in the highest quartile on the ACT/SAT were compared with students in the middle two quartiles, as a control for the influence of prior academic achievement[14]).
- Low achievement (students in the lowest quartile on the ACT/SAT were compared with students in the middle two quartiles, as a control for achievement).
- Low costs (students who rated "chose college for low tuition" as a 5 on a 5-point scale were coded as '1,' others were coded as '0'. This variable provides a control for choosing a college for low costs).
- Reputation (students who rated "chose college for academic reputation" as a 5 on a 5-point scale were coded as '1', others as '0'. This variable provides a control for choosing a college for academic reasons).

- Parental contribution (students whose parents are contributing their "expected contribution" were coded as '1' for yes; those who were not were coded as '0' for no. This variable provides a control for the effects of parental support).
- Male (compared with female).
- African American (compared with Asian American[15]).
- Hispanic (compared with Asian American).
- American Indian and Alaska Native (compared with Asian Pacific Islander American).
- Father has a bachelor's degree (compared with students' fathers who did not have this level of attainment. This variable provides a control for parents' education).

The multiple outcomes in this analysis allow us to consider the implications for the federal government and states. Since the early 1980s, federal student financial aid has not been sufficient to ensure financial access to four-year colleges. Examining whether GMS awards influenced students who attended public two-year colleges provides an indicator of whether this minimum threshold was maintained. However, the analysis of whether GMS awards influenced students to enroll in private colleges has implications for all states, since many states provide need-based grant aid for low-income students in both public and private colleges.

Continuous Enrollment: The analysis of continuous enrollment compares students who maintained continuous enrollment (coded as 1) with students who did not (coded as 0) in a logistic regression model. The independent variables in the continuous enrollment model were:

- GMS award (compares students who received the GMS award with the comparison group [students who were not Pell-eligible and were GMS-eligible or who were not GMS-eligible]).

- Pell only (compares students who received Pell awards and were GMS-eligible and did not receive GMS with the comparison group).
- High achievement (students in highest ACT/SAT quartile compared with students in the middle two quartiles).
- Low achievement (students in the lowest ACT/SAT quartile compared with students in the middle two quartiles).
- Male (compared with female).
- African American (compared with Asian Pacific Islander American).
- Hispanic American (compared with Asian Pacific Islander American).
- Father had bachelor's degree (compared with not having degree).
- Private college (compared with attending a public four-year college).[16]
- Public two-year college (compared with attending a public four-year college).

This analysis allows us to examine the effects of GMS awards on financial access, defined as the ability to maintain continuous enrollment in a public two-year or four-year college to which students can gain financial access. The first step of the analysis assesses the impact of GMS awards on college destination. It provides a basis for judging whether GMS awards influence the ability to enroll in public four-year colleges,[17] as well as whether they furnish additional support for enrolling in private colleges.[18] The second step examines whether students had adequate financial resources to maintain continuous enrollment.

Change of College: This analysis compares students who changed colleges with those who stayed with their initial college choice. Change of college is considered as a function of the following independent variables:

- GMS award (compares students who received the award with students who did not).

- High achievement (students in the highest quartile on the ACT/SAT were compared with students in the middle two quartiles).
- Low achievement (students in the lowest quartile on the ACT/SAT were compared with students in the middle two quartiles).
- Financial difficulty (students who indicated it was "very difficult" to pay for the first year of college were compared with students who answered otherwise to this question).[19]
- Parental contribution (students who reported that their families contributed support required under the federal methodology compared with students who did not have this support).
- Male (compared with female).
- African American (compared with Asian Pacific Islander American).
- American Indian and Alaska Native (compared with Asian Pacific Islander American).
- Hispanic (compared with Asian Pacific Islander American).
- Private college (compared with students who enrolled in public four-year colleges).
- Public two-year college (compared with students enrolled in public four-year colleges).

This third step further supplements and broadens the analysis of financial access to examine whether the financial support Scholars received through GMS provided an additional incentive to transfer. Controlling for difficulty in affording the first year of college as an independent variable means that the variable for GMS awards examines whether the additional resources students received through GMS provided a financial incentive for them to transfer, possibly to a more expensive college.

Limitations

This study used the most appropriate available approach for assessing the effects of GMS and Pell awards on financial access. However, a few constraints on the current study merit consideration by readers.

First, the ratings of the non-cognitive measures used to make GMS awards were not available for the current study. While efforts are under way to make these measures available to the research advisors, this has not yet happened. This information void is somewhat problematic because the selection criteria can have an indirect effect on the outcomes measured here. This problem is mitigated at least partially by the quasi-random nature of the first-year award process.[20] Therefore, subsequent analyses should include variables that control for the effects of the selection process.

Second, the information that can be collected appropriately from student self-reports is limited. Generally, students know about the type of grant aid that they receive, so it was appropriate to ask whether they had received Pell awards. However, we could not depend on the accuracy of responses to questions about the amount of state and federal grants received, so these questions were not asked on the survey.[21] In the future, we plan to use information on state financial indicators in a multi-level analysis.

Third, a number of additional questions about the monetary effects of GMS awards were beyond the scope of this initial study. For example, the continuing student file can be used to examine the impact of accumulated debt[22] on continuous enrollment, since GMS was designed to eliminate debt burden. In addition, it will be important to examine the impact of GMS on persistence by graduate students, a subject that is not studied frequently.

Fourth, while these analyses document whether GMS awards and these outcomes are associated, it is not possible to discern whether documented relationships are causally linked. Specifically, significant relationships could be attributed to the selection process, the finances provided, or other features of the GMS program. Further analyses are needed to discern the reasons for the statistical relationships reported here. However, the analysis is more than a simple comparison, because the logistic regression controlled for many of the other independent variables that influenced these outcomes. Proven logical models guided the selection of the independent variables.

Finally, while the GMS program was not a true experiment with random assignment, the 2000 study has some similarity to experimental studies. The population for this study includes only students who met the non-cognitive selection criteria. The second stage of selection considered need, but there were students who met the need criteria in both groups. Therefore, logistic regression analyses of survey responses that control for the financial selection criterion (i.e., Pell award) are as valid as policy studies that use experimental designs. Further, since these analyses control for other factors that influence the selected outcomes, this approach includes better statistical controls than studies that compare only means for treatment and control groups, a much simpler approach to statistical analysis.

Findings

The analyses of financial access are presented in three steps. The analysis of college destination is followed by the analyses of continuous enrollment and change of college. These analyses present descriptive statistics along with the regression analysis.[23]

College Destinations

The Sample: Most of the students in the sample (Table 4) attended four-year colleges: 42.1% attended private colleges and 55.7% attended public four-year colleges. Only 2.2% of the sample attended public two-year colleges. The highest achievement group (23.5%) and the lowest achievement group (27.5%) each represented about one quarter of the population.

At a *prima facie* level, the basic notion put forward by NCES (1997a)—that students who take the steps to prepare for college have the opportunity to attend four-year colleges—appears to hold. However, such descriptive statistics do not establish that those students who took the steps to prepare for college and who attended two-year colleges were not influenced by their financial circumstances, as some analysts conclude when they do not consider the direct effects of student aid (Choy, 2002; NCES, 1997a).

There was a great deal of racial/ethnic diversity in this sample. Fewer than half the respondents in the 2000 sample were GMS recipients (40.5%). Fewer than half were male (31.5%). African Americans comprised 34.9% of the 2000 sample, compared with 5.6% for American Indians and Alaska Natives, 25.3% for Hispanic Americans, and 34.2% for Asian Pacific Islander Americans. More than one third (36.3%) had fathers who had completed college degrees.[24]

Finances were more central to college choices for students in the sample than were academic reputations. While slightly less than half (44.3%) of the 2000 sample indicated that reputation was a very important reason for choosing their colleges, most (80.2%) indicated that costs were very important.

Federal need analysis estimates the expected parental contribution. Students in the study were asked whether their parents contributed to college finances. The majority responded affirmatively (53.8%), indicating that their parents tried to fulfill their expected contribution.

However, in cases where parents did not or could not fulfill this obligation, their children could have been influenced by this shortfall.

The Impact of GMS Awards: Receipt of a GMS award was one of several variables influencing college destinations (Table 5). Receiving a GMS award increased the odds of attending a private college compared with a public college and reduced the chances of being enrolled in a public two-year college. Students receiving GMS awards were 1.37 times more likely to enroll in private colleges than in public four-year colleges. In contrast, GMS awardees were only .359 times as likely to enroll in two-year colleges. Conversely, GMS recipients were more likely to enroll in public four-year colleges than in two-year colleges.

Since some GMS recipients received awards after enrolling, it is conceivable that the significance of GMS for college choice is an artifact of selection.[25] However, because all students in the study met the selection criteria, it is highly unlikely that this artifact (the delay of some awards) explains the significance of the GMS variables, especially given the other statistical controls in this analysis. Therefore, there is a sound basis for concluding that this significance is related to the GMS program, both to its funding and to other design features. These findings have implications for state and federal policy, as is discussed in the concluding section.

Student achievement also was associated with college destination. Students with high scores were more likely to attend private colleges than public four-year colleges and less likely to attend two-year colleges. In contrast, students with low scores were less likely to enroll in private colleges. This finding is consistent with a long history of research on college choice (Hossler, Schmit, & Vesper, 1999; Paulsen, 2001a, 2001b).

Choosing a college because of low expenses was negatively associated with enrollment in private colleges but was not significantly associated with enrollment in public two-year colleges.

Minority students who chose public four-year colleges differed from students who chose private colleges on this variable, but did not differ from students who attended two-year colleges. Therefore, these findings indicate that costs were central in the choice of college destination for students enrolling in public colleges, both two-year and four-year.

Gender and ethnicity were associated with enrollment in private colleges. Males were less likely to enroll in private colleges, but gender was not associated with enrollment in two-year colleges compared with public four-year colleges. African Americans were 1.47 times more likely to enroll in private colleges than were Asian Pacific Islander Americans. Hispanic Americans were significantly more likely to enroll in private colleges, while American Indians and Alaska Natives were significantly less likely to enroll in private colleges.

Hispanics were more likely to enroll in public two-year colleges than were Asian Pacific Islander Americans, but the other ethnicity variables were not significant for the 2000 cohort. This confirms other research indicating that college choices are more constrained for Hispanic Americans than for other ethnic groups (Paulsen, St. John, & Carter, 2002).

Parents' education was not associated with enrollment in private colleges, but did influence enrollment in two-year colleges for the 2000 cohort. Compared with their peers whose parents had not received a degree, students whose fathers had bachelor's degrees were less likely to enroll in public two-year colleges than in public four-year colleges. Thus, while parents' education does influence the college choice process for these minority students, it does not appear to be the most important determinant, as some have proposed (Choy, 2002).

Continuous Enrollment

Sample Characteristics: Most of the sample (96.6%) enrolled continuously, indicating a high degree of financial access. Table 6 summarizes the descriptive data, which, of course, is similar to Table 4. This table provides a further breakdown of recipient categories. Only a small percentage of the sample was Pell-eligible and GMS-eligible but did not receive GMS awards (2.8%). Comparing these students and GMS recipients with others in the sample refines our ability to understand the impact of GMS. The comparison group included students who were eligible for GMS but not Pell and students who did not meet the GMS eligibility criteria. No Pell information was available on students who did not meet the GMS criteria.[26]

The Impact of GMS: Controlling for other variables, receiving a GMS award was positively associated with continuous enrollment (Table 7). GMS recipients were 2.7 times more likely than were non-recipients to maintain continuous enrollment. However, non-GMS recipients who received a Pell award and were eligible for GMS did not differ statistically from the comparison group. This indicates that the added financial resource provided by the GMS award, rather than meeting the non-cognitive selection criteria, was the reason why GMS students persisted better.

The finding that GMS improved continuous enrollment is important, given the substantial statistical controls in this study. Both the recipient and comparison groups met the selection criteria. Controlling for other factors influencing enrollment, GMS recipients were substantially more likely to persist. These findings confirm that providing adequate financial assistance along with other support services improves the odds that low-income, high-achieving students will maintain continuous enrollment.

In contrast, achievement, as measured by the design variables for test scores, was not related statistically to continuous enrollment. Typically, a high correlation is found between college grades

and scores on ACT and SAT tests (St. John, Hu, Simmons, & Musoba, 2001). However, most colleges do not have policies that preclude lower division students from continuing if they have low grades for up to two terms. Thus, the finding that achievement was not related to continuous enrollment indicates that the students in this sample did not have substantial academic problems.

African American respondents were less likely to enroll continuously than were Asian Pacific Islander Americans who met the non-cognitive selection criteria, a finding that merits further analysis. However, other ethnic groups did not differ significantly. Neither gender nor fathers' education was associated with continuous enrollment.

The type of college attended did influence persistence, however. Compared with students in public four-year colleges, those attending private colleges were more likely to persist, while students attending public two-year colleges were less likely to persist. Thus, students starting out in two-year colleges had less opportunity to maintain continuous enrollment and their financial access was further constrained.

Change of College

Sample Characteristics: A relatively small share (10%) of the sample population (Table 8) changed colleges. Finances were very difficult for only 18% of the sample. Therefore, a substantial portion of GMS recipients and non-recipients did not report excessive financial difficulties. Most families made the expected contributions.

Impact of GMS: In contrast to the analyses above, GMS was not significantly associated with change of college, controlling for other variables in the model (Table 9). This means that the financial resources provided by GMS did not create an additional incentive to change colleges.

Having high achievement scores was negatively associated with change of college. This indicates that students with greater academic ability were less likely to change colleges. It is conceivable that low achievement explains some of the transfer observed, but GMS awards were not statistically associated with change of college.[27] Perhaps having funds makes it easier for students receiving awards to pay the costs of attending a better college, but there is no evidence that the GMS award per se caused students to change schools.

However, family finances were associated with persistence. Having financial difficulty during the first year of college also was positively associated with change of college. Students whose parents contributed financially to their education were less likely to change colleges. These variables could have confounding relationships with GMS awards, since GMS recipients are less likely to have difficulty financing their college education and less likely to need family contributions.

Finally, students attending public two-year colleges were more likely to change colleges than were students in public four-year colleges. However, there were no significant differences in college change for students in private colleges compared with students in public four-year colleges.

Findings and Implications

These analyses strongly suggest that GMS awards improved financial access. GMS recipients were better able to afford to attend a four-year college. Further, starting in a two-year college was negatively associated with continuous enrollment and change of college. Thus, receiving a GMS award improved the odds that college-qualified, low-income minority students would enroll in a four-year college and maintain continuous enrollment.[28] In addition to meeting a minimum threshold set by our definition of financial access, the GMS recipients had an increased

ability to enroll and persist in private colleges. Thus, college choices were expanded for GMS recipients.[29]

These findings also add to a general understanding of the access challenge facing educational policy makers in the United States. In the 1970s, the rates of college enrollment by Hispanic Americans, African Americans, and Whites who had graduated from high school were essentially equal, but a substantial gap opened after 1980 (St. John, 2002, 2003). Growth in the enrollment gap corresponded with the decline in the purchasing power of Pell Grants. However, since NCES failed to use its massive databases to examine the impact of student aid on access, little information was publicly available on the relationship between the gap in enrollment opportunity and the decline in federal need-based grants. Thus, the extra support provided by GMS awards created additional financial access for college-qualified, low-income minority students.

This study of the GMS 2000 freshman cohort reduces substantially the information void created by NCES' failure to examine the consequences of the decline in need-based grants. By comparing students who received awards with students who did not, controlling for variables other than educational choices, we assessed the impact of GMS on financial access. For high-achieving minority students, receiving adequate (last-dollar) financial aid improved their odds of attending four-year colleges and their ability to maintain continuous enrollment, two important indicators of financial access for college-prepared students.

Low-income students who received additional need-based financial support had a greater probability of enrolling in four-year colleges and of maintaining continuous enrollment. Only a few states provide sufficient additional need-based financial aid to offer low-income students the opportunity to enroll in college (St. John, Chung, Musoba, Simmons, Wooden, and Mendez, 2002).

This GMS study further confirms that providing additional need-based student aid is an effective strategy and merits serious consideration by states.

These findings will have important policy implications. The primary policy lesson is that greater investment is needed in need-based financial aid. High-achieving, low-income students lack adequate financial resources to enroll in four-year colleges and to persist during the first two years.

Further analyses are necessary to untangle the reasons why GMS improved financial access. Studies should examine the relative contribution of the selection criteria and process, the monetary awards, and the other features of the GMS program. However, these initial analyses strongly indicate that a relationship exists between providing adequate financial aid and enrollment opportunity.

Table 4: Descriptive Statistics for Variables in the Multinomial Logistic Regression for College Choice: 2000 Freshman Cohort

Variable	Value	Frequency	%
Institution Choice in 2000 Fall	Private	701	42.1
	Public 2-year	37	2.2
	Public, 4-year or above	928	55.7
Gates Scholarship	Recipient	674	40.5
	Non-Recipient	992	59.5
SAT-ACT Crosswork Score Group	Lowest quartile	459	27.5
	Highest quartile	392	23.5
	Mid quartiles	816	48.9
Reason select school low expenses	Very important	738	44.3
	Other	928	55.7
Reason select school strong reputation	Very important	1,337	80.2
	Other	329	19.8
Parents contributing college finances	Parents are contributing college finances	897	53.8
	No	770	46.2
Gender	Male	525	31.5
	Female	1,142	68.5
Ethnicity	African Americans	581	34.9
	American Indians/Alaska Natives	94	5.6
	Hispanic Americans	422	25.3
	Asian Pacific Islander Americans	569	34.2
Father's Education Attainment	Bachelor's or Higher	604	36.3
	Other	1,062	63.7
Valid cases		1,666	
Cases with missing values		163	
Total number of cases with relative weight		1,829	

Table 5: Multinomial Logistic Regression for College Destination for the 2000 GMS Freshman Cohort

Variable		Private		Public 2-year	
		Odds Ratio	Sig.	Odds Ratio	Sig.
Gates Scholarship	Recipient	1.3692	***	0.3589	**
	Non-Recipient				
SAT-ACT Crosswork Score Group	Lowest quartile	0.5436	***	1.1885	
	Highest quartile	2.2479	***	0.1644	*
	Mid quartiles				
Reason select school low expenses	Very important	0.4284	***	0.8333	
	Other				
Reason select school strong reputation	Very important	1.3947	**	0.4286	**
	Other				
Parents contributing college finances	Parents are contributing college finances	1.4158	***	1.5972	
	No				
Gender	Male	0.7198	***	1.1471	
	Female				
Ethnicity	African Americans	1.4672	***	0.9301	
	American Indians/Alaska Natives	0.4996	**	2.6547	
	Hispanic Americans	1.4881	***	3.0427	**
	Asian Pacific Islander Americans				
Father's Education Attainment	Bachelor's or Higher	1.0127		0.3149	**
	Other				
Number of cases with relative weight =		1,666			
Model X^2 =		259			
-2 Log Likelihood =		1,186			
Cox & Snell Pseudo R^2 =		0.144			

Note: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 6: Descriptive Statistics for Variables in the Logistic Regression on Continuous Enrollment: 2000 Freshman Cohort

Variable	Value	Frequency	%
Continuous Enrollment	Continuous Enrollment	1,645	96.6
	Stop or Drop-Off	58	3.4
Gates Scholarship and Pell Eligibility	Gates Scholar and Pell Eligible	685	40.2
	Non Gates Scholar and Pell/GMS Eligible	47	2.8
	Non Gates Scholar and Pell Ineligible	972	57.0
SAT-ACT Crosswork Score Group	Lowest quartile	471	27.6
	Highest quartile	398	23.4
	Mid quartiles	835	49.0
Gender	Male	536	31.5
	Female	1,167	68.5
Ethnicity	African Americans	593	34.8
	American Indians/Alaska Natives	97	5.7
	Hispanic Americans	432	25.3
	Asian Pacific Islander Americans	582	34.1
Father's Education Attainment	Bachelor's or Higher	612	36.0
	Other	1,091	64.0
Institution Type in 2000 Fall	Private	710	41.7
	Public 2-year	43	2.5
	Public, 4-year or above	950	55.8
Valid cases		1,703	
Cases with missing values		126	
Total number of cases with relative weight		1,829	

Table 7: Logistic Regression Analysis of Continuous Enrollment by Students in the GMS 2000 Freshman Cohort

Variable		Odds Ratio	Sig.
Gates Scholarship and Pell Eligibility	Gates Scholar and Pell Eligible	2.7380	***
	Non Gates Scholar and Pell Eligible	1.0397	
	Non Gates Scholar and Pell Ineligible		
SAT-ACT Crosswork Score Group	Lowest quartile	0.8787	
	Highest quartile	0.9353	
	Mid quartiles		
Gender	Male	1.4708	
	Female		
Ethnicity	African Americans	0.4956	*
	American Indians/Alaska Natives	0.5563	
	Hispanic Americans	1.2549	
	Asian Pacific Islander Americans		
Father's Education Attainment	Bachelor's or Higher	1.4058	
	Other		
Institution Type in 2000 Fall	Private	2.0932	**
	Public 2-year	0.1607	***
	Public, 4-year or above		
Number of cases with relative weight =		1,703	
Model X^2 =		49.193	
-2 Log Likelihood =		458.753	
Cox & Snell Pseudo R^2 =		0.028	

Note: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 8: Descriptive Statistics for Variables in the Logistic Regression for Change of College for 2000 Freshman Cohort

Variable	Value	Frequency	%
School Change	Change	168	10.0
	No Change	1,502	90.0
Gates Scholarship	Recipient	677	40.5
	Non-Recipient	993	59.5
SAT-ACT Score Group	Lowest quartile	460	27.5
	Highest quartile	394	23.6
	Mid quartiles	816	48.9
Difficulty in paying first year college expense	Very difficult	300	18.0
	Other	1,369	82.0
Parents contributing college finances	Parents are contributing college finances	899	53.8
	No	771	46.2
Gender	Male	526	31.5
	Female	1,143	68.5
Ethnicity	African Americans	583	34.9
	American Indians/Alaska Natives	94	5.6
	Hispanic Americans	423	25.3
	Asian Pacific Islander Americans	570	34.1
Father's Education Attainment	Bachelor's or Higher	606	36.3
	Other	1,064	63.7
Institution Type in 2000 Fall	Private	704	42.2
	Public 2-year	37	2.2
	Public, 4-year or above	929	55.7
Valid cases		1,669	
Cases with missing values		160	
Total number of cases with relative weight		1,829	

Table 9: Logistic Regression for Change of College, 2000 Freshman Cohort

Variable		Odds Ratio	Sig.
Gates Scholarship	Recipient	0.9413	
	Non-Recipient		
SAT-ACT Crosswork Score Group	Lowest quartile	0.9746	
	Highest quartile	0.5520	**
	Mid quartiles		
Difficulty in paying first year college expense	Very difficult	1.6286	**
	Other		
Parents contributing college finances	Parents are contributing college finances	0.6309	**
	No		
Gender	Male	1.0657	
	Female		
Ethnicity	African Americans	1.3469	
	American Indians/Alaska Natives	2.7958	***
	Hispanic Americans	1.0849	
	Asian Pacific Islander Americans		
Father's Education Attainment	Bachelor's or Higher	0.9039	
	Other		
Institution Type in 2000 Fall	Private	0.8951	
	Public 2-year	5.4385	***
	Public, 4-year or above		
Number of cases with relative weight =		1,669	
Model X^2 =		62.080	
-2 Log Likelihood =		1,026.450	
Cox & Snell Pseudo R^2 =		0.037	

Note: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

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End Notes

[1] The Pell program was created as Basic Educational Opportunity Grants (BEOGs) in the Education Amendments of 1972, but was subsequently renamed Pell Grants. This report uses the current name for the program even though it was known as BEOGs before 1980.
[2] By "official" literature, we refer to policy reports written by the U.S. Department of Education and its contractors, along with reports published by national higher education associations.
[3] The United Negro College Fund administered both the program and the award process for African Americans. Other national organizations with commitments to Hispanic Americans, Asian Pacific Islander Americans, and American Indians/Alaska Natives were contracted with to administer the scholarship award process for these groups.
[4] High school graduation represents an appropriate indictor of academic preparation for a two-year or four-year college. Other analysts have examined the role of college preparatory courses in preparing high school students for enrollment in four-year colleges (Adelman, 1999; NCES, 1997; Pelavin & Kane, 1990).
[5] The publications (St. John, 1991; St. John & Noell, 1989) originally were completed as reports for Pelavin Associates, prior to the release of Pelavin and Kane (1988).
[6] Professor St. John was a Senior Associate with Pelavin Associates when the Pelavin and Kane study (1988) was conducted. He completed analyses of the relative effects of academic preparation, aspirations, and student aid on enrollment (St. John, 1991b).
[7] Students in these analyses enrolled in college. So, by definition, they took sufficient or appropriate courses to gain financial access. Since we lacked variables on high school experience, we could not examine high school courses.
[8] The advisory panel included Walter Allen, Sylvia Hurtado, William Sedlacek, Edward St. John, and William Trent.
[9] The advisory panel was concerned that NORC reach at least a 50% response level for each group, a threshold that was met consistently.
[10] The GMS recipients may be more "self-selected." For example, it is conceivable that students who dropped out may not have responded. Nevertheless, we must assume that the use of the weights compensates for this possible bias.
[11] Earlier studies of access using longitudinal databases have examined whether students enrolled in college (Jackson, 1985; Perna, 2002; St. John, 1989). However, since students in this sample had achieved a threshold for financial access, it is not surprising that most actually enrolled in college. Therefore, our analyses focus on continuous enrollment, consistent with our definition of financial access (St. John, 2003).
[12] A very small sample of members enrolled in proprietary schools. These students were included in the group that went to private colleges, because these colleges have private control (albeit for profit) and have higher cost than public two-year colleges. Public two-year colleges were treated as a distinct category because they have lower tuition than other types of colleges.
[13] In the multinomial logistic analysis, it was not possible to maintain a distinct coding for Pell without GMS award. There was no information on Pell awards for students who did not meet GMS award criteria.
[14] We did not have information on high school courses and grades in this file. We were limited to ACT/SAT scores as a measure of prior achievement.
[15] Asian Pacific Islander Americans were used as the comparison group in these analyses because Asian Pacific Islander Americans generally attend college at a rate comparable with Whites and, on average, they have higher parental educational attainment levels than other minority groups (Paulsen, St. John, & Carter, 2002).
[16] These variables—private college and public two-year college—are included to provide a basis for comparing across the two models. The multinomial analysis of college destinations considers financial and academic reasons for college choice. Therefore, it is possible logically to consider the indirect effects of college choice on persistence (in the logic regression) when the choice variables had a significant association with college destinations (in the multinomial logistic regression).
[17] This represents a minimum threshold of access. For students in states with high need-based state grants, the GMS awards usually are of modest size.
[18] Originally, Pell was created to subsidize college choice by low-income students, including the choice to attend private colleges. When MISAA extended Pell eligibility to children of middle-income families, the intent of subsidizing choice for private colleges was liberalized. However, since the mid-1980s, Pell Grants have not reached a threshold that would ensure financial access to public four-year colleges in most states (St. John, 2002).
[19] This variable provides a control for perceptions of financial need. This is an appropriate control given the lack of reported information on Pell eligibility and family income.

[20] The quasi-random nature of the first-year award was discussed as part of the background on GMS above.
[21] This issue was the subject of a great deal of discussion by the research advisors with the NORC team. Ultimately, we agreed to a constrained set of questions about student financial assistance as a means of ensuring that there was adequate room to ask a broader range of questions on other topics of importance for research on minority students.
[22] We are reliant on self-reported information about debt, but these questions were included in the survey of continuing students because they were central to the interest of the Bill & Melinda Gates Foundation.
[23] The tables presented in this report have different numbers of cases. This variation is attributable to differences in response rates for the questions on the survey.
[24] Most students who had a mother with a college degree also had a father with a college degree. This study used father's education as the indicator, but mother's or both would have had similar results.
[25] We do not know the exact number of GMS recipients who were notified after the beginning of the academic year, but verbal communications indicate that a relatively small number of recipients were affected by the delay.
[26] Therefore, it was not fully possible to assess the direct effects of Pell. However, the method of coding provides a basis for assessing the effects of GMS monetary awards.
[27] In conversations about the GMS program, personnel in the Bill & Melinda Gates Foundation have observed that some students in the 2000 cohort changed colleges after they were notified about their awards. Therefore, we want to assess whether these choices were influenced by the additional funding provided by GMS.
[28] The GMS selection criteria and process may have played a role in the findings on college destination, so this finding should be interpreted with caution.
[29] Historically, the goal of federal student financial aid programs was to equalize choice of college (Gladieux & Wolanin, 1976).

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