

Four-Year Effects on Degree Receipt and Employment Outcomes from a Performance-Based Scholarship Program in Ohio

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April 2015



Acknowledgments

The long-term follow-up study of the Performance-Based Scholarship Demonstration (PBS Demonstration) in Ohio presented in this paper was supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R305A110204 to MDRC; the Bill & Melinda Gates Foundation; and The Joyce Foundation. The opinions expressed are those of the authors and do not represent the views of the institute or the U.S. Department of Education. The authors at MDRC are very appreciative of the funders' generous support. Other funding for the PBS Demonstration was provided by: College Futures Foundation; Open Society Foundations; Helios Education Foundation; The Kresge Foundation; NYC Center for Economic Opportunity; The Ohio Department of Job and Family Services through the Ohio Board of Regents; and Robin Hood Foundation. We are grateful for their generous backing and ongoing commitment.

It is impossible to name everyone who supported this project at the participating colleges, but we would like to single out a few key individuals for recognition. The following people managed several rounds of recruiting and enrolling students, updated financial aid packages, tracked progress, awarded the performance-based scholarships, and shared data with MDRC. They performed those duties with energy, enthusiasm, and a willingness to make short-term sacrifices for our shared long-range vision: Stephanie Sutton, Saundra Daniels, and Dave Strittmather at Lorain County Community College; William Ivoska, Susanne Schwarck, Karen Shultz, Amy Giordano, Nicholas Savich, and Greg Brown at Owens Community College; Carlyn Bozeman, Sandra Meadows, Nancy Jones, and Cathie Smith at Sinclair Community College.

Our partners at the Ohio Board of Regents were the administrators of the state scholarship funds, and also wonderful resources and problem solvers for MDRC and the participating colleges. We thank Rich Petrick, Chad Foust, Darrell Glenn, Bill Wagner, Penelope Parmer, and Stephanie McCann for their dedication to this project. Likewise, at the Ohio Department of Job and Family Services, we thank Staci Wise, Vickie Maddux, and Mary Lou Owens.

We also appreciate the contributions of many colleagues at MDRC who contributed to this project. We thank Lashawn Richburg-Hayes and Rob Ivry for their leadership and guidance; Colleen Sommo for guidance and technical advising; Frieda Molina, Melissa Wavelet, and Mike Bangser for senior operations support; Paulette Cha for site leadership; Amanda Grossman for resource management; Monica Cuevas for research assistance; Mary Clair Turner for contributing to data processing and analysis; Nicholas Commins for data processing; and Katherine Blessing for research assistance and fact-checking this report. Random assignment and baseline data collection would not have been possible without the hard work of Joel Gordon, Galina Farberova, and Shirley James and her staff in the data room. We also thank Margaret Bald, Gordon Berlin, John Diamond, and Cynthia Miller, for helpful comments on previous drafts. Christopher Boland edited the manuscript, and

Carolyn Thomas prepared it for publication. Finally, we thank the hundreds of students who participated in this study in Ohio.

Dissemination of MDRC publications is supported by the following funders that help finance MDRC's public policy outreach and expanding efforts to communicate the results and implications of its work to policymakers, practitioners, and others: The Annie E. Casey Foundation, The Harry and Jeanette Weinberg Foundation, Inc., The Kresge Foundation, Laura and John Arnold Foundation, Sandler Foundation, and The Starr Foundation.

In addition, earnings from the MDRC Endowment help sustain our dissemination efforts. Contributors to the MDRC Endowment include Alcoa Foundation, The Ambrose Monell Foundation, Anheuser-Busch Foundation, Bristol-Myers Squibb Foundation, Charles Stewart Mott Foundation, Ford Foundation, The George Gund Foundation, The Grable Foundation, The Lizabeth and Frank Newman Charitable Foundation, The New York Times Company Foundation, Jan Nicholson, Paul H. O'Neill Charitable Foundation, John S. Reed, Sandler Foundation, and The Stupski Family Fund, as well as other individual contributors.

The findings and conclusions in this report do not necessarily represent the official positions or policies of the funders.

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Abstract

A college degree is often viewed as a key step toward better employment and higher earnings. Many community college students, however, never graduate and cannot reap the financial benefits associated with a college degree. Although existing research suggests that financial aid interventions can modestly improve students' short-term academic outcomes, there is little rigorous evidence on the critical question of whether such interventions improve graduation rates or employment outcomes. This study helps to fill that gap by using a randomized controlled trial involving over 2,000 community college students. It focuses on low-income parents, most of whom are low-income mothers. The study includes four years of post-random assignment data to examine the long-term impact of a performance-based scholarship program — financial aid that is contingent on academic performance — on degree receipt, employment, and earnings. The findings provide evidence that the program decreased the time it took students to earn a degree, but the findings do not provide evidence that the program increased employment or earnings by the end of the study period.

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Introduction

A college degree is often viewed as a key step toward better employment and higher earnings. Many students who invest their time and money in community colleges, however, never graduate and consequently cannot reap the financial benefits associated with a college degree. Among first-time students who entered community college during the 2003-2004 academic year, for example, roughly two-thirds did not earn a degree or certificate within six years (U.S. Department of Education, 2011). Low-income students may find it particularly difficult to complete their education and earn a degree, as going to college can require a substantial financial commitment relative to their total earnings. For some students, nearly 60 percent of household income is needed to cover the total cost of a two-year community college.¹ Many students use financial aid to help pay for college, but even so, financial need can still be a barrier to finishing school. Low-income students often work because of financial pressures, but students who reduce course enrollment in order to work more are less likely to graduate (Adelman, 2006).

Additional sources of financial aid for low-income students may be one solution to increase graduation rates, and nonexperimental research (studies that use observational data) suggests that additional financial aid positively affects enrollment (Bettinger, 2010; Castleman and Long, 2013; Cornwell, Mustard and Sridhar, 2006; Dynarski, 2003; Jackson, 2010; Kane, 2003), persistence (Bettinger, 2004), credit accumulation (Castleman and Long, 2013; Scott-Clayton, 2010), and ultimately degree receipt (Dynarski, 2005; Castleman and Long, 2013; Scott-Clayton, 2010). These nonexperimental studies are encouraging but they leave open the possibility that other factors, such as preexisting differences in academic skills or motivation, may have caused the differences in student outcomes, and that additional financial aid may not have led to higher graduation rates.

In a randomized controlled trial, researchers randomly assign students to either a program group that is given the opportunity to receive additional financial aid, or a control group not given the opportunity. Such a trial is the strongest design to establish causality, because random assignment ensures that no systematic factors determine whether students are offered the opportunity to receive additional financial aid.

Researchers have also used randomized controlled trials to test some financial aid interventions. Compared with nonexperimental studies, they generally find more modest effects on average academic outcomes (Angrist, Lang, and Oreopoulos, 2009; Leuven, Oosterbeek, and van der Klaauw, 2010). A number of the more rigorous evaluations of financial aid interventions

¹This estimate is for students with families in the lowest quintile of income who are enrolled in two-year colleges in Ohio. National Center for Higher Education Management Systems (2013).

are part of a large-scale demonstration project to evaluate performance-based scholarships — additional financial aid that is contingent on academic performance — called the Performance-Based Scholarship Demonstration (PBS Demonstration) (Richburg-Hayes et al., 2009; Cha and Patel, 2010; Miller, Binder, Harris, and Krause, 2011; Patel and Rudd, 2012; Patel, Richburg-Hayes, De la Campa, and Rudd, 2013; Patel and Valenzuela, 2013; Sommo et al., 2014). To date, however, there is little rigorous evidence that answers the critical questions of whether any form of financial aid for higher education can improve degree receipt, employment, and earnings.

The study described in this article provides insight into precisely those questions. It uses a randomized controlled trial involving over 2,000 community college students and it includes four years of post-random assignment data on academic and employment outcomes to examine the long-term impact of a performance-based scholarship program on degree receipt, employment, and earnings. Additionally, this study targeted low-income parents — predominantly low-income mothers — a population that may be especially vulnerable to academic challenges related to financial constraints (Richburg-Hayes et al., 2009).

The Ohio Performance-Based Scholarship Program

Performance-based scholarships were first tested in a randomized controlled trial in Louisiana (Richburg-Hayes et al., 2009), and later at other sites across the country through the PBS Demonstration (Cha and Patel, 2010; Miller, Binder, Harris, and Krause, 2011; Patel and Rudd, 2012; Patel, Richburg-Hayes, De la Campa, and Rudd, 2013; Patel and Valenzuela, 2013; Sommo et al., 2014). In Louisiana, low-income parents at two New Orleans community colleges enrolled in a program that allowed them to earn up to \$1,000 per semester for two semesters, provided that they maintained at least half-time enrollment and a “C” average or better. The evaluation found that the scholarships had positive effects on several outcomes, including students’ credit accumulation and semester-to-semester retention. Evidence of these effects persisted into the third and fourth semesters, when most students were no longer eligible for the scholarship. Just after the program ended, Hurricane Katrina struck the Gulf Coast region, causing severe destruction and temporarily shutting down the two colleges. Many students in the study moved away, and the devastation inflicted made it virtually impossible to determine whether the program had long-term effects on graduation and employment outcomes (Richburg-Hayes et al., 2009).

In Ohio, however, the state legislature was impressed by the short-term outcomes of the Louisiana study and developed a similar statewide program for low-income students, using

surplus funds from the Temporary Aid to Needy Families (TANF) program.² The TANF Educational Awards Program (TEAP) was implemented statewide in the 2006-2007 school year, as a one-year program that ended when the surplus funds had been spent. In the 2008-2009 academic year, the program was reintroduced at three colleges within the context of a randomized controlled trial in the PBS Demonstration to provide rigorous evidence about the program's impact. The Ohio Department of Jobs and Family Services (ODJFS) funded the scholarship using flexible TANF dollars, and the Ohio Board of Regents (OBR) administered the program through its division of State Grants and Scholarships.

State administrators believed that low-income parents were likely to stay in Ohio after graduating from college, so the use of TANF funds fit naturally with the state's strategic plan of producing more college graduates who would remain in the state (Fingerhut, 2008). The study population in Ohio was made up mostly of low-income students who were also mothers, with a large majority receiving government benefits such as TANF and food stamps.³ This population was also generally older and half of the students were also employed. Like many low-income students, the students in this study had additional responsibilities such as work obligations. As parents, however, they were often juggling child care responsibilities as well.

The Ohio program was implemented at Lorain County Community College, Owens Community College, and Sinclair Community College, covering three of Ohio's four geographic corners. Located in northeast Ohio's small city of Elyria, Lorain enrolled over 11,000 students in fall 2008, when the PBS Ohio program started.⁴ Owens was almost twice the size of Lorain, with 21,000 students in fall 2008, and is located in northwest Ohio, serving students in Toledo and neighboring Michigan. Sinclair, located in south Ohio near Dayton, served over 19,000 students in fall 2008. Across these three colleges, 2,285 students participated in the study. About 60 percent were randomly assigned to the program group and about 40 percent were randomly assigned to the control group.⁵

The Ohio scholarship program aligned with the general characteristics of programs in the PBS Demonstration. These programs are structured with two main goals: first, to make college more affordable for low-income students; and second, to structure the scholarship

²The information in this section is adapted from Cha and Patel (2010).

³In addition to noted criteria, participants were at least 18 years of age, U.S. citizens, residents of Ohio, and had not been incarcerated. The main criteria for the program were that students needed to be parents (not necessarily custodial), and have an Expected Financial Contribution (EFC) of zero. An EFC of zero was approved by the State of Ohio as a proxy for TANF eligibility in this program. EFC was determined using institutional data on the Free Application for Federal Student Aid (FAFSA) at the time of random assignment, but may have changed at a later date.

⁴All enrollment numbers are from the U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (2008).

⁵For more information on the implementation of the PBS program in Ohio, see Cha and Patel (2010).

payments to provide incentives for behaviors associated with good academic progress. The key components of the scholarship are:

1. **Performance-based scholarships:** Awards are paid if students meet basic conditions regarding enrollment and grades in college courses. They thus act as incentives, rewarding behavior associated with academic success.
2. **Current semester focus:** Scholarships are based on academic performance in the current semester, regardless of performance in previous semesters or high school performance. This feature is unlike merit-based aid in which students have to first qualify based on high school performance (for example, high school grade point average (GPA)) or grades from a previous college term.
3. **Paid directly to students:** Often scholarships are paid directly to institutions. In contrast, students in the performance-based scholarship program receive the money directly and can use it to cover any expenses, including those that could derail continued attendance and success (for example, child care or transportation).
4. **Designed to supplement other financial aid:** Performance-based scholarships are meant to supplement Pell Grants and state aid to help meet the needs of low-income students. The intervention gives students more money to cover academic and living expenses, and can potentially reduce their dependency on loans.

The performance-based scholarship program in Ohio offered a scholarship for two consecutive semesters at Lorain and Owens, and three consecutive quarters at Sinclair.⁶ Students were given a full-time award of \$900 per semester or \$600 per quarter for achieving a “C” or better in 12 or more credits; or a part-time award of \$450 per semester or \$300 per quarter for achieving a “C” or better in 6 to 11 credits. At each institution, regardless of the semester or quarter system, students were eligible for a maximum award of \$1,800 over the entire program duration. The differential award depending on attendance level was designed to be more flexible for this population, and to allow students to attend part time and still earn part of the scholarship.

Students who participated in the program could earn any combination of part-time award, full-time award, or no award for the duration of the program. Students were paid only once and at the end of each semester or quarter to avoid interference with their eligibility for public benefits, since almost 70 percent of the sample was receiving some sort of public

⁶Quarter institutions have three quarters per academic year, while semester institutions have two semesters. To adjust for inflation due to the additional term at quarter institutions, credits attempted and earned at quarter institutions are multiplied by two-thirds.

benefits. As a result, students received regular reminders about the scholarship throughout the semester or quarter by e-mail and postcard. These reminders were designed to be positive, informative, and regular, and to keep the scholarship at the forefront of students' minds.

The Theory of Change

The program in Ohio was intended to determine whether a scholarship-only program (that is, a program without any added services such as advising or tutoring) could lead to positive outcomes for students.⁷ The scholarship opportunity and the reminders about the scholarship were designed to influence behaviors that might lead to improvements in student outcomes, including:

- **Motivation:** The scholarships were designed to provide incentives for academic progress and to motivate students. Making payments contingent on key academic benchmarks was intended to encourage students to progress academically and motivate them to perform at higher levels.
- **Change in effort or reallocation of priorities:** In order to meet the scholarship benchmark, students might study more (or better), work less, or pay for child care so that they could focus more on their studies.
- **Enroll in more classes:** Having additional funds from a scholarship earned in the first semester or quarter might allow students to enroll in more classes in following semesters or quarters.
- **Reduce financial stress:** Additional funds might also relieve some of the financial stresses facing low-income parents.
- **Increased confidence:** Positive messages and occasional interaction with the scholarship coordinator might boost students' confidence or simply remind them of the requirements to get the award.

Research Design and Data

This study uses a randomized controlled trial to estimate the impact of the intervention. The estimates are intent-to-treat estimates — the estimated effect of being offered the opportunity to participate in the scholarship program — calculated by comparing the average outcomes of all

⁷The programs in Louisiana and at some other colleges in the PBS Demonstration included an advising, tutoring, or another student service component.

students randomly assigned to the program group with the average outcomes of all students randomly assigned to the control group. The study is designed to estimate the impact of the program as a whole, rather than to disentangle the effects of the scholarship from the effects of the reminders or scholarship coordinators at the colleges.⁸

Data

Student data were collected from several sources. Students provided demographic data through a Baseline Information Form (BIF), administered prior to random assignment. Financial information was collected from Free Application for Federal Student Aid (FAFSA) data provided by the Ohio Board of Regents (OBR) and financial aid records provided by each of the partner institutions. FAFSA and BIF data are used to assess recruitment, describe the sample, and compare students in the program and control groups on observable characteristics. The financial aid records are used to assess whether students in the program group received more financial aid through the scholarship program, compared with students in the control group.

Students in both the program and control groups were also surveyed during either the second or third semester or quarter of the program for each cohort.⁹ The survey covered a range of factors hypothesized to mediate the impact of the program on student outcomes, including attendance, study habits, employment, and motivation. Students assigned to the program group were also asked about their experiences in the program.

OBR provided student transcript data that were used for the analysis of academic outcomes such as persistence, credits attempted, and credit accumulation for all public Ohio colleges. OBR also provided data on degrees earned by students for all public Ohio colleges. In addition, National Student Clearinghouse (NSC) data were obtained to provide additional information on institutions not covered by the OBR.¹⁰ Finally, employment data were obtained from the Ohio Department of Job and Family Services (ODJFS) and are used to measure labor market outcomes.

Students in the Sample

Using internal financial aid databases, the colleges identified eligible first-time and continuing students, and invited them by e-mail or letter to on-campus information sessions. At

⁸The principles of this design are discussed in Bloom (1984).

⁹Sinclair students in the fall 2008 and winter 2009 cohorts had the survey administered during the third program quarter, the spring 2009 and fall 2009 quarters, respectively.

¹⁰The NSC, a nonprofit organization, collects and distributes enrollment, degree, and certificate data from more than 3,600 colleges that enroll more than 98 percent of the nation's college students. See "About the Clearinghouse" at www.studentclearinghouse.org.

these information sessions, students learned about the program and the potential changes in their financial aid packages if they were to join the study and be assigned to the program group. After the session, interested students gave their written informed consent to participate, filled out a BIF, and supplied their contact information. Finally, the 2,285 students who completed the process were randomly assigned.¹¹

Table 1 shows that the majority of the sample members, who were nearly all parents, were single mothers and that they were generally older students (the average age was about 30), with more than one child. Most students had earned a high school diploma or a General Educational Development (GED) certificate more than five years before entering the study (69 percent). About 55 percent of the students were white, 30 percent were black, and 9 percent were Hispanic. Nearly 70 percent of the students had someone in their household receiving some government benefits. About half of the students were employed at the time of random assignment, with 60 percent of those employed reporting that they worked 20 hours per week or more (not shown in table). On average, students had an adjusted gross income of just over \$10,000 per year.

The fourth column in Table 1 reports differences between the program and control groups on average baseline characteristics and shows that the groups look essentially the same on the measured attributes: Very few differences between the groups are statistically significant, and a likelihood ratio test used to test whether baseline characteristics jointly predicted research group status yields a p-value of 0.98.¹²

Program Implementation

In general, the program was implemented as designed. Monitoring of performance and award disbursement for the scholarships found that each of the colleges demonstrated a strong capacity to implement the program properly. Additionally, the colleges successfully communicated with students about the program in six reminders over the duration of the program.

Impact Estimates

The performance-based scholarship program in Ohio was designed to increase students' financial aid, alter students' attitudes about education, and provide positive incentives to change their academic behavior, with the ultimate goal of improving their academic and employment

¹¹Students had a 60 percent probability of assignment to the program.

¹²For additional details, see Cha and Patel (2010).

Table 1: Selected Characteristics of Sample Members at Baseline

Characteristic	Full Sample	Program Group	Control Group	Difference	Standard Error
Female (%)	86.4	86.6	86.2	0.4	1.45
Unmarried (%)	78.8	78.5	79.3	-0.8	1.78
Parent (%)	99.7	99.7	99.8	-0.1	0.22
More than one child (%)	59.0	58.7	59.4	-0.7	2.09
Single mother (%)	66.6	66.3	67.0	-0.7	2.01
Average age	29.9	29.9	29.9	0.0	0.34
Race/ethnicity ^a (%)					
White	54.6	55.5	53.2	2.3	2.12
Black	31.4	30.3	33.0	-2.7	1.95
Hispanic	8.6	8.1	9.4	-1.3	1.18
Asian or Pacific Islander	0.6	0.6	0.7	0.0	0.34
Other	4.8	5.5	3.7	1.8 *	0.91
Household receiving any government benefits ^b (%)	68.5	67.7	69.7	-2.1	2.01
Currently employed (%)	48.8	47.6	50.6	-3.0	2.14
Date of high school graduation/GED certificate receipt (%)					
During the past 5 years	25.3	25.2	25.3	-0.1	1.85
More than 5 years ago	68.8	68.6	69.1	-0.6	1.96
Missing ^c	6.0	6.2	5.5	0.7	1.00
Average Adjusted Gross Income (\$)	10,317	10,530	9,999	531	383
Sample size	2,285	1,359	926		

SOURCES: MDRC calculations using Baseline Information Form and Free Application for Federal Student Aid data.

NOTES: To analyze whether baseline characteristics jointly predicted research group status, a likelihood ratio test was performed. This test yielded a p-value of 0.98.

Distributions may not add to 100 percent because of rounding.

Missing values are only included in variable distributions for characteristics with more than 5 percent of the sample missing.

^aRespondents who said they are Hispanic and chose a race are included only in the Hispanic category.

Respondents who said they are not Hispanic and chose more than one race are considered multiracial. These respondents, combined with those who said they are American Indian /Alaskan Native or another race/ethnicity, are included in Other.

^bBenefits include unemployment/dislocated worker benefits, Supplemental Security Income or disability, cash assistance or welfare, food stamps, and Section 8 or public housing.

^cMissing includes students who did not graduate high school and students who did not provide a graduation date.

outcomes. The randomized design used for this study provides strong, reliable estimates of the program's impact on each of these categories of outcomes.

Financial Aid

Students were paid money from the scholarships they earned in addition to any financial aid they had already been awarded.¹³ During the first year of the program, the 2008-2009 academic year, Ohio offered relatively generous need-based financial aid to community college students, and the Ohio College Opportunity Grant (OCOG) was the main vehicle for that aid. The maximum Pell Grant — the primary federal source of financial aid — was \$4,731, and the maximum OCOG grant was \$2,496. The actual amounts of the need-based awards that a student received were affected by the student's cost of attendance (COA), Expected Family Contribution (EFC), and enrollment status (full time or part time). A student's COA includes estimates for costs related to, for example, tuition, fees, books, transportation, and living expenses.¹⁴ In the 2009-2010 academic year, however, the amount available in Ohio for need-based financial aid declined precipitously. The OCOG program was restructured and received a smaller allocation after severe budget constraints in 2009, and OCOG eligibility for community college students was terminated. The first cohort of the program was unaffected by this change during the program's duration (but would lose their OCOG after the program ended). Later cohorts saw their OCOG awards eliminated during the program, and the performance-based scholarship represented a larger proportion of their financial aid packages.

Table 2 shows financial aid outcomes for the program year for all students and demonstrates that the program effectively increased financial aid receipt for students in the program group. The first row of the first panel of Table 2 shows that a large majority of students received financial aid during their first academic year in the study — about 95 percent of students in each of the groups. The second row, however, shows that during this same year, 73.8 percent of program group students also received a performance-based scholarship, while students in the control group were not eligible for the scholarship and consequently did not receive it. The remainder of the first panel shows that approximately equal percentages of students in the program group and control groups received loans, Pell Grants, and other grants.

The second panel of Table 2 shows the average aid amounts that students received for each type of aid. The first row of the second panel of Table 2 shows that on average, program group students received an estimated \$7,947 in total financial aid, while students in the control group received an estimated \$7,445: The estimated impact of the program on the average

¹³In some cases, the scholarship allowed students to reduce the loans in their financial aid packages.

¹⁴The information in this section is adapted from Cha and Patel (2010).

Table 2: Impacts on Financial Assistance During the First Academic Year

Outcome	Program Group	Control Group	Difference	Standard Error
Academic Year 1				
Received any financial assistance (%)	95.5	94.8	0.7	0.90
Received performance-based scholarship ^a	73.8	-0.1	73.9 ***	1.43
Received loans	58.3	57.8	0.5	1.96
Received Pell Grant	90.9	91.2	-0.2	1.18
Received any other grants ^b	73.0	73.2	-0.2	1.81
Average financial assistance received (\$)	7,947	7,445	502 ***	185
Performance-based scholarship ^a	765	-1	766 ***	20
Federal loans	2,853	3,187	-334 ***	120
Pell Grant	3,395	3,336	59	74
Other grants ^b	934	923	11	36
Sample size (total = 2,285)	1,359	926		

SOURCES: MDRC calculations using financial aid data provided by Lorain County Community College, Owens Community College, and Sinclair Community College.

NOTES: A two-tailed t-test was applied to differences between research groups. Statistical significance levels are indicated as: *** = 1 percent; ** = 5 percent; * = 10 percent.

Estimates are adjusted by cohort and campus.

Rounding may cause slight discrepancies in sums and differences.

Federal work study awards are excluded from the figures above due to unavailability of data.

^aThe estimate of -\$1 for students in the control group is due to regression adjustments. Only program group students received performance-based scholarship awards during the program period.

^bThis category includes all grants and scholarships excluding Pell Grant and performance-based scholarship awards.

amount of financial aid package is \$502, statistically significant at the 0.01 level. The second and third rows of the same panel show how the program appears to have caused this difference. The second row shows that students in the program group are estimated to have received an additional \$766 from the scholarship, a substantial increase, but still just about 10 percent of the average financial assistance students received during the program year. The third row shows that students in the program group took out less money in loans, an estimated reduction of \$334. This loan reduction was in part a result of a reduction in unsubsidized loans, which are less advantageous to students. While students are in school, the government pays the interest on subsidized loans, but not unsubsidized loans. Students in the program group reduced their unsubsidized loans by an estimated average of \$147 (not shown). The scholarship was not specifically geared to reduce loans, but the reduction in educational debt may be an added benefit for students in the long run.

Hypothesized Mediators of Academic Success

The opportunity for additional aid was hypothesized to motivate students academically, promote behaviors believed to help students graduate, such as enrolling full time and studying more in order to meet the academic benchmarks, and instill confidence in students' ability to succeed. The award was also intended to reduce students' financial stress and increase the amount of time they could dedicate to schoolwork and studying, by providing financial aid that could reduce the need to work. Table 3 shows results of the survey that was conducted to measure student attitudes and changes in behavior related to these hypotheses. In all, 1,096 students in the program group and 745 students in the control group completed the survey.¹⁵

In general, the survey results suggest that the program did not substantially change students' attitudes and behaviors, but may have done so to a modest degree. The first row of Table 3 shows that students in the program group did not report spending more time studying for their most recent exam or assignment than their control group counterparts: Students in the program group reported an average of 8.2 hours, compared with 8.4 hours in the control group, a difference that is not statistically significant. Table 3, however, also shows that the program may have helped students feel more prepared for exams or assignments and increased their confidence: 26.2 percent of students in the program group felt they prepared extremely well compared with 22.3 percent of students in the control group, a 3.9 percentage point difference — significant at the 10 percent level.

The survey also asked students about their motivation to complete their course load, using several questions that were aggregated into a relative autonomy index (RAI). The RAI is an overall measure of motivation that ranges from -18 to 18, with higher values representing greater autonomous or personally driven motivation. Research suggests that greater autonomous motivation leads to improved outcomes such as achievement (Ratelle, Guay, Vallerand, Larose, and Senecal, 2007). The fourth row of Table 3 shows that students in both groups had similar levels of RAI (an average of 3.9 in each group), suggesting the program did not increase motivation during the program year. It also does not appear to have negatively affected motivation, a potential concern related to performance-based payments (Deci, Koestner, and Ryan, 2001).¹⁶

¹⁵Students in the program group did not differ systematically from students in the control group, as measured by observable baseline characteristics: An omnibus F-test of respondents by treatment group yielded a p-value of 0.9720. An omnibus F-test was also performed to compare survey nonrespondents with survey respondents. The test yielded a p-value of 0.001, suggesting there are some statistically significant differences in baseline characteristics between respondents and nonrespondents, but the respondents constituted a large proportion of the study sample, so nonrespondents were a minority: Across all the colleges and cohorts, the response rate was between 79 percent and 82 percent.

¹⁶The survey cannot assess whether motivation changed in later semesters or quarters.

Table 3: Survey Responses: Educational Experiences

Characteristic	Number of Observations	Program Group	Control Group	Difference	Standard Error
For the most recent exam, final project, or paper:					
Number of hours studied	1,838	8.2	8.4	-0.3	0.48
Did not seek help (%)	1,841	52.3	49.1	3.1	2.37
Prepared adequately (%)					
Did not prepare adequately	1,841	1.8	3.1	-1.3 *	0.72
Prepared a little	1,841	2.8	2.9	-0.2	0.79
Prepared somewhat	1,841	23.0	24.2	-1.3	2.01
Prepared quite a bit	1,841	46.3	47.5	-1.2	2.37
Prepared extremely well	1,841	26.2	22.3	3.9 *	2.05
Motivation to complete coursework (RAI) ^a (average)	1,841	3.9	3.9	-0.1	0.17
Ever asked instructor to reconsider a grade (%)	1,841	29.7	26.1	3.5 *	2.14
Sample size	1,841	1,096	745		

SOURCE: MDRC calculations using the performance-based scholarship survey.

NOTES: A two-tailed t-test was applied to differences between research groups. Statistical significance levels are indicated as: *** = 1 percent; ** = 5 percent; * = 10 percent.

Estimates are adjusted by cohort and campus.

Distributions may not add to 100 percent because of rounding.

^aMotivation to complete coursework is defined using the Relative Autonomy Index (RAI), which has a range of - 18 to 18. A higher value represents greater autonomous motivation. The RAI is calculated as a weighted average: $RAI = \text{External}*(-2) + \text{Introjected}*(-1) + \text{Identified}*(1) + \text{Integrated}*(2)$.

Finally, the last row of Table 3 suggests that the scholarship program may have caused students to be attentive to their grades, since earning the scholarships depended on these grades. Table 3 shows that 29.7 percent of students in the program group requested that instructors reconsider a grade, while only 26.1 percent of students in the control group did so, a difference of 3.5 percentage points and significant at the 10 percent level. It is possible that more students in the program group were simply making these requests as an easy way to improve their grades. The survey data, however, show that less than 2 percent of program group students said that they took easier classes to meet the GPA requirements.

Academic Outcomes

A key goal of the program was to improve students' academic achievement. Table 4 provides strong evidence that the program did have an effect on important academic outcomes.

Table 4: Impacts on Academic Outcomes During the First Four Academic Years

Outcome	Program Group	Control Group	Difference	Standard Error
Full-time completion ^a (%)				
Term 1	33.2	26.3	7.0 ***	1.94
Term 2	28.8	18.3	10.5 ***	1.80
Ever registered (%)				
Year 1	96.9	95.9	1.1	0.78
Year 2	68.8	66.6	2.3	1.97
Year 3	48.8	50.2	-1.5	2.12
Year 4	34.7	33.4	1.3	2.00
Credits attempted ^b				
Year 1	21.5	20.6	0.9 **	0.40
Year 2	13.4	12.5	0.9 *	0.50
Year 3	8.8	8.7	0.1	0.47
Year 4	5.6	5.5	0.1	0.40
Cumulative credits attempted after four years	49.3	47.3	2.0	1.35
Credits earned ^b				
Year 1	15.9	14.2	1.7 ***	0.43
Year 2	9.6	8.9	0.7	0.44
Year 3	6.4	6.4	0.1	0.41
Year 4	3.9	4.0	0.0	0.33
Cumulative credits earned after four years	35.8	33.4	2.5 *	1.25
Sample size (total = 2,285)	1,359	926		

SOURCE: MDRC calculations from the Ohio Board of Regents transcript data from all public Ohio institutions.

NOTES: A two-tailed t-test was applied to differences between research groups. Statistical significance levels are indicated as: *** = 1 percent; ** = 5 percent; * = 10 percent.

Estimates are adjusted by cohort and campus.

Rounding may cause slight discrepancies in sums and differences.

^aFull-time completion is defined as earning 12 or more credits at the institution of enrollment. Term refers to fall or spring at semester institutions and fall, winter, or spring at quarter institutions. Third quarter outcomes are not shown for Sinclair students.

^bQuarter institutions have three quarters per academic year, while semester institutions have two semesters. To adjust for inflation due to the additional term at quarter institutions, credits attempted and earned at quarter institutions are multiplied by two-thirds.

The first panel of Table 4 shows that the program had a relatively large, statistically significant effect on the percentage of students who earned a full-time course load of credits (12 credits or more) in both the first and second semesters or quarters of the program, indicators of the likelihood of completion found in previous research (Adelman, 2006).¹⁷ In the first semester or quarter of the program, the estimated impact on the percentage of students who earned full-time credits is 7.0 percentage points, and in the second semester or quarter, the estimated impact grew to 10.5 percentage points. These estimates suggest that students may have responded positively to the differential scholarship structure and the added financial incentive to earn full-time credits, and that scholarship payments may have helped students afford more classes in the second semester or quarter.

The second panel of Table 4 shows registration rates for each group for each year of the study. Consistent with previous research on performance-based scholarships, the program does not appear to have had an impact on registration in the first year or on persistence in subsequent years. In the first year, more than 95 percent of students in both groups registered for classes, with no statistically significant differences between the groups. During all follow-up years, both program and control group students enrolled at essentially equal rates. By the fourth year, only 34.7 percent of program group students and 33.4 percent of control group students were still registering for classes.

In contrast, the third panel of Table 4 shows that despite enrolling at nearly equal rates, students in the program group took more classes than students in the control group. In the first year, students in the program group attempted an average of 21.5 credits, compared with an average of 20.6 credits in the control group — a difference of 0.9 credits that is statistically significant at the 5 percent level. In the second year, program group students attempted 0.9 credits more than their control group counterparts, a difference significant at the 10 percent level. In the third and fourth years, however, students in the program group only attempted an average of 0.1 credits more than the control group, a difference that is not statistically significant. These results suggest that the program was successful in motivating students to attempt more credits during program semesters and that students modified their behavior in the short term. Results from the survey support this finding. In the program group, 72.9 percent of respondents indicated that the scholarship encouraged them to take more or continue taking classes.

The fourth panel of Table 4 shows that the positive estimate for credits attempted is associated with a positive estimate for credits earned. On average, students in the program group earned more credits compared with students in the control group. In the first year, students in

¹⁷Adelman (2006) argues that earning less than 20 credits in the first year is a “serious drag” on completion.

the program group earned an average of 15.9 credits, compared with an average of 14.2 credits in the control group — an estimated impact of 1.7 credits, or a nearly 12 percent increase, statistically significant at the 1 percent level. Furthermore, the estimated impact on credits earned is larger than that on credits attempted in the first year, suggesting that students in the program group may have also been doing better in classes and not just taking more classes. In the second year of the study, after the scholarship ended, program group students earned an average of 0.7 credits more than control group students, but the difference is not statistically significant. In the third and fourth years, both groups earned the same number of credits on average. Differences in credits earned each year after the first year are not statistically significant. The last row of Table 4 shows that after four years of follow-up the estimated impact of the program increased to 2.5 credits — a cumulative difference that is statistically significant at the 10 percent level. The estimates during the first year, the program year when students could earn the scholarship, account for two-thirds of the cumulative impact estimate.

These results suggest that despite the modest effects measured by the survey, the program did change student behavior: More program than control group students met full-time credit benchmarks and program students earned more credits overall.

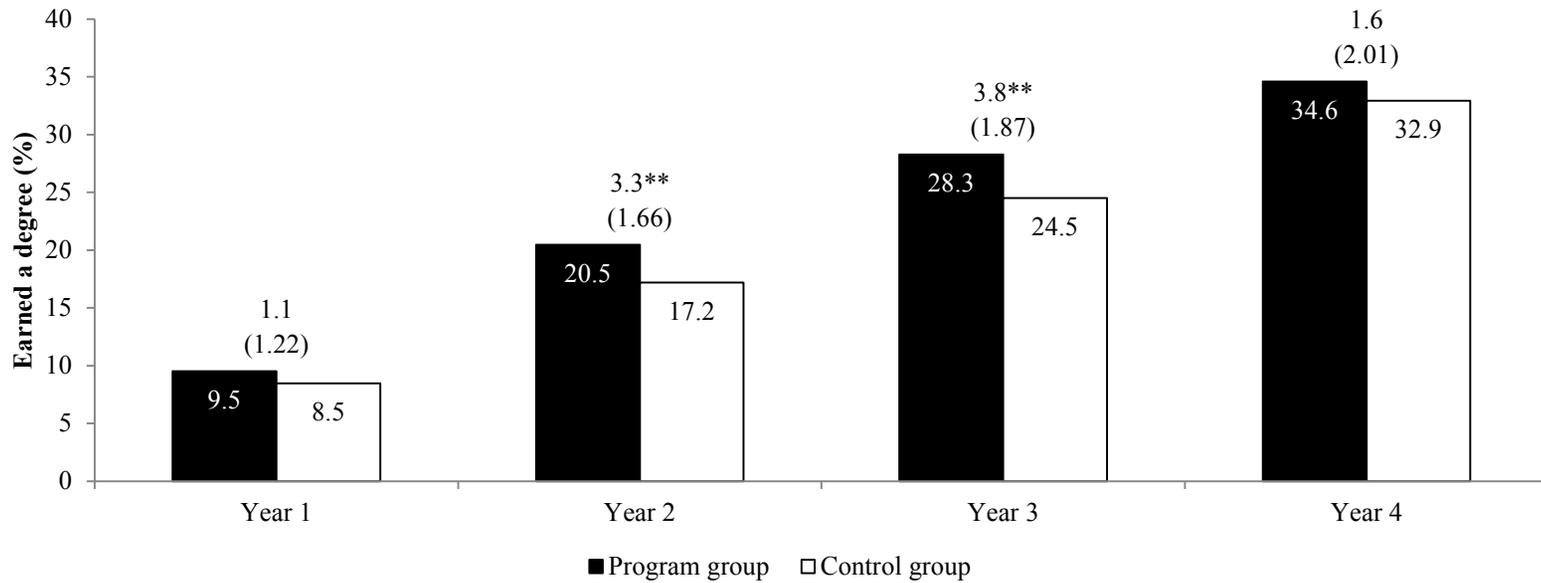
Degrees

The program also appears to have produced short-term impacts on degree completion, and accelerated the time it took students to earn degrees. Figure 1 shows the percentages of students in the program and control groups who had earned degrees at the end of each follow-up year. Less than 10 percent of students in both groups earned a certificate or degree in the first year. In the second year of the study, however, 20.5 percent of students in the program group had done so, compared with 17.2 percent of students in the control group — an estimated impact of 3.3 percentage points, significant at the 5 percent level. By the end of the third year, 28.3 percent of students in the program group had earned a certificate or degree compared with 24.5 percent in the control group — a difference of 3.8 percentage points, also significant at the 5 percent level. But by the end of the fourth year, evidence of an impact disappears; the graduation rate in the control group increased more than the graduation rate in the program group. In the program group, 34.6 percent of students had earned a degree compared with 32.9 percent of students in the control group — a difference of 1.6 percentage points that is not statistically significant.¹⁸

These results suggest that the program may have shortened the time it took students to earn a credential. Although the results do not provide evidence of a long-term impact on degree

¹⁸Rounding may cause slight discrepancies in sums and differences.

Figure 1: Certificate or Degree Attainment After Four Years



SOURCES: MDRC calculations using Ohio Board of Regents and National Student Clearinghouse degree data.

NOTES: A two-tailed t-test was applied to differences between research groups. Statistical significance levels are indicated as: *** = 1 percent; ** = 5 percent; * = 10 percent. Standard errors are shown in parentheses.

Estimates are adjusted by cohort and campus.

Rounding may cause slight discrepancies in sums and differences.

completion, the estimated impacts on credit accumulation after four years show that the program's impacts on students' academic outcomes remained evident even three years after the program ended.

Employment Outcomes

As discussed earlier, the program also aimed to reduce students' need to work in the short term, while in school. In the long term, the program aimed to improve earnings and employment outcomes by helping students earn degrees and enter the workforce earlier and more prepared. Table 5 shows measures of student employment during and after the program.

Table 5 shows that students in the program and control groups were employed at similar rates and earned similar amounts throughout the four years of follow-up. During the first year after random assignment, for example, 62.1 percent of students in the program group were employed, compared with 64.5 percent of students in the control group.¹⁹ The 2.5 percentage point difference is not statistically significant. This result also holds when measured by the percentage of students who were ever employed during the follow-up period and the total number of fiscal quarters during which students were employed in the follow-up period.²⁰ Table 5 also provides little evidence that the program had a long-term impact on earnings: Students in the program and control groups generally earn similar amounts during all the follow-up years.²¹

These results are unsurprising given the lack of detectable impacts on degree receipt after four years. They also align with recent research that suggests detectable impacts on employment outcomes may be too much to expect for programs that last for relatively short durations and do not produce exceptionally large academic impacts (Weiss et al., 2014).

Discussion

Overall, this study helps fill an important gap in the literature on financial aid programs and their long-term effectiveness. It used a randomized controlled trial with over 2,000 students to evaluate an important financial aid program, and it includes four years of post-random

¹⁹To account for variation in the timing of random assignment, the first year of employment data omits the fiscal quarter of random assignment.

²⁰Self-reported employment responses in the survey also corroborate this result.

²¹Table 5 shows that the average earnings for students in the first-year program group with jobs covered by unemployment insurance were \$6,073, compared with \$6,496 in the control group, a reduction of \$423 that is not statistically significant. When this same estimate is calculated including regression adjustments for earnings and employment from the three years prior to random assignment as covariates (not shown), the estimate increases to a reduction of \$540, significant at the 10 percent level. This result may provide some support for the hypothesis that the program helped students reduce employment.

Table 5: Impacts on Employment and Earnings

Outcome	Program Group	Control Group	Difference	Standard Error
Employed (%)				
Year 1	62.1	64.5	-2.5	2.06
Year 2	65.6	64.9	0.7	2.03
Year 3	69.0	65.9	3.1	1.99
Year 4	70.5	71.0	-0.4	1.94
Ever employed during fiscal quarters 2-20 (%)	87.0	88.3	-1.3	1.41
Quarters employed, fiscal quarters 2-20 (%)	56.2	55.9	0.3	1.55
Earnings from Unemployment Insurance-covered jobs (\$)				
Year 1	6,073	6,496	-423	354
Year 2	7,776	7,751	26	431
Year 3	9,851	9,425	426	513
Year 4	11,710	11,645	65	578
Total earnings, fiscal quarters 2-20 (\$)	45,474	45,557	-82	1,995
Sample size (total = 2,285)	1,359	926		

SOURCE: MDRC calculations using administrative records from the Ohio Department of Job and Family Services.

NOTES: A two-tailed t-test was applied to differences between research groups. Statistical significance levels are indicated as: *** = 1 percent; ** = 5 percent; * = 10 percent.

Estimates are adjusted by cohort and campus.

Rounding may cause slight discrepancies in sums and differences.

Employment and earnings estimates do not include the fiscal quarter during which students were randomly assigned.

assignment longitudinal data on degree receipt, employment, and earnings. It is important to emphasize that the performance-based scholarship program examined here lasted for only one year and provided a relatively modest financial award. The scholarship itself provided about 10 percent of the average total financial aid received by students in the program group during the program year, and a much smaller average percentage over the full duration of students' college careers. Still, the evidence suggests that the program helped students graduate faster and earn more credits in the long term.

The low-income parents in this study also faced the additional challenges of caring for children while pursuing their academic studies and helping to support a family. Their odds of graduating were low to begin with: Only a third of the students in the control group earned a credential within four years, even though some of the students had started college prior to the start of the study. This study also reports important findings that build on the accumulating

knowledge of the short-term impacts of performance-based scholarships. These findings suggest that the scholarships helped more students advance toward their degrees by earning more credits during the program, and the results can inform both future research and the evolution of scholarship programs. The scholarship structure itself was designed to be flexible for the targeted students. Students could earn an award for part-time academic benchmarks, but the program also provided an incentive for full-time credit accumulation. In fact, this study finds a 10 percentage point impact on full-time credit accumulation after two semesters or quarters. Students in the program group also reduced their reliance on loans, including unsubsidized loans for which interest accrues even while students remain in school. At the same time, they received more overall financial aid.

Low graduation rates remain a pressing problem in community colleges, especially for low-income students, and rigorous evidence about the long-term impacts of most community college programs is still relatively rare. This study provides an important example of how a state used existing funds to both help low-income students improve their academic outcomes and rigorously evaluate the program's effectiveness. The program lasted for only one year, and the estimated impacts on credit accumulation occurred primarily during the program year, but the program's impacts on academic outcomes were still evident three years after the program ended. States and other organizations can build on this model to better understand what works for community college students. Future studies can make important contributions by incorporating rigorous research designs, studying performance-based scholarship programs with longer durations, and examining the impacts on students' long-term financial outcomes and graduation rates.

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About MDRC

MDRC is a nonprofit, nonpartisan social and education policy research organization dedicated to learning what works to improve the well-being of low-income people. Through its research and the active communication of its findings, MDRC seeks to enhance the effectiveness of social and education policies and programs.

Founded in 1974 and located in New York City and Oakland, California, MDRC is best known for mounting rigorous, large-scale, real-world tests of new and existing policies and programs. Its projects are a mix of demonstrations (field tests of promising new program approaches) and evaluations of ongoing government and community initiatives. MDRC's staff bring an unusual combination of research and organizational experience to their work, providing expertise on the latest in qualitative and quantitative methods and on program design, development, implementation, and management. MDRC seeks to learn not just whether a program is effective but also how and why the program's effects occur. In addition, it tries to place each project's findings in the broader context of related research — in order to build knowledge about what works across the social and education policy fields. MDRC's findings, lessons, and best practices are proactively shared with a broad audience in the policy and practitioner community as well as with the general public and the media.

Over the years, MDRC has brought its unique approach to an ever-growing range of policy areas and target populations. Once known primarily for evaluations of state welfare-to-work programs, today MDRC is also studying public school reforms, employment programs for ex-offenders and people with disabilities, and programs to help low-income students succeed in college. MDRC's projects are organized into five areas:

- Promoting Family Well-Being and Children's Development
- Improving Public Education
- Raising Academic Achievement and Persistence in College
- Supporting Low-Wage Workers and Communities
- Overcoming Barriers to Employment

Working in almost every state, all of the nation's largest cities, and Canada and the United Kingdom, MDRC conducts its projects in partnership with national, state, and local governments, public school systems, community organizations, and numerous private philanthropies.