

A Step Toward College Success:
Assessing Attainment among Indiana's Twenty-first Century Scholars

By

Edward P. St. John, University of Michigan,
and Jacob P.K. Gross, Glenda D. Musoba and Anna S. Chung, Indiana University

Prepared for

Lumina Foundation for Education

August 2005

Acknowledgments

Lumina Foundation for Education provided financial support for this research. The Indiana Commission for Higher Education provided access to the Student Information System college enrollment database, the Indiana Career and Postsecondary Advancement Center provided ninth-grade survey data on Indiana students, and the State Student Assistance Commission of Indiana provided information on student financial aid awards. The authors sincerely appreciate this support. The analyses and opinions expressed in the paper are the authors' and do not represent official policies or positions of Lumina Foundation or the other organizations that supported the project.

Table of contents

Foreword	1
Executive summary	4
Introduction	8
Indiana’s Twenty-first Century Scholars program	10
Impact of the Twenty-first Century Scholars program	15
The 1999 cohort	15
Academic preparation	16
College choice	19
Status of academic success: the cohort	19
Status of academic success: low-income students	23
Conclusions	25
Appendices	
1. The 1999 cohort: database design	27
2. Attainment analyses for the entire cohort	30
3. Attainment analyses for low-income students	45
References	58
Endnotes	59
About the authors	61
Publication information	62

Foreword

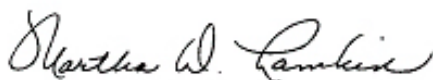
Indiana's Twenty-first Century Scholars program, a national model for combining pre-college access intervention with financial aid, has improved college access for low-income students. The program is part of the state's comprehensive approach to expanding and equalizing opportunities for postsecondary education and has helped Indiana increase its college access rates remarkably in recent years. (In 1986, Indiana ranked 40th among states in the percentage of its high school graduates who went directly on to college. By 2002, the state ranked ninth.). In 2002, Lumina Foundation funded a study of the Scholars program and published a report titled *Meeting the Access Challenge: Indiana's Twenty-first Century Scholars Program*. That report documented the program's progress in enhancing access to higher education for low-income students, but it did not examine whether it affected students' persistence or success in college.

Although the Scholars program was not designed to improve college persistence rates, policy-makers and higher education leaders understand that access without attainment is a hollow promise. Because our mission at Lumina Foundation is to enhance access *and* success in postsecondary education, we are pleased to support this follow-up study on the program. In this report, the principal authors of the original study continue their research with the same cohort of students – those who graduated from Indiana high schools in 1999 – to determine the impact of the Scholars program on college persistence and attainment.

The findings show that the program has improved college persistence somewhat, particularly with regard to students' attainment of two-year degrees. That is encouraging, especially when one considers two important facts:

- First, the Twenty-first Century Scholars program was designed and implemented to encourage low-income students to *enroll* in postsecondary education, not necessarily to help them persist or attain degrees. It's heartening to see any evidence, however slight, that the program may also aid student *persistence*.
- Second, the students this program was designed to assist (low-income students eligible for the Federal Free and Reduced Lunch program) are typically those who face the most – and the most daunting – barriers in their pursuit of postsecondary education. For a variety of reasons, college access and success rates among these students are persistently low, and any effort that works to reverse that trend should be applauded.

Clearly, the Twenty-first Century Scholars program is no panacea for all of the challenges that low-income students face. Much more must be done – in Indiana and throughout our nation – to expand postsecondary access and success. Still, as the title of this report suggests, the Scholars program helps low-income students take an important early step toward college success. For that reason, we feel it is worthy of continued support here in Indiana and increased attention and replication in other states.



Martha D. Lamkin
President and CEO,
Lumina Foundation for Education

Executive summary

The Twenty-first Century Scholars Program is an early-intervention program intended to improve college enrollment among low-income students in Indiana. The Scholars program provides support services – plus a guarantee of grant aid equivalent to public college tuition – to students who pledge in eighth grade to meet five criteria:

- Complete high school.
- Maintain at least a C average.
- Remain drug- and crime-free.
- Apply for college and student financial aid.
- Enroll in an Indiana college within two years of high school.

An earlier study of the Scholars program demonstrated its effectiveness in enhancing access to higher education (St. John, Musoba, Simmons, & Chung, 2002). That study, which focused on students in the 1999 cohort, showed that students who participated in the program were more likely to enroll in college than were their otherwise-average middle school peers. However, that 2002 study did not examine whether the program had any effect on students' persistence or success in postsecondary education. Although the Scholars program was not designed specifically to enhance persistence or degree attainment, some positive effects could logically be expected, and that is the aim of this current study: to identify, isolate and quantify those effects, if any.

This study again focuses on the 1999 cohort, examining the impact that a Scholars award had on students' attainment status four years after enrollment in a public college (i.e., at the end of the 2002-03 academic year). Our analyses of four-year attainment status examined patterns among students in five categories: 1) those who were still

enrolled, 2) those who had attained two-year degrees, 3) those who had attained four-year degrees, 3) those who had attained two- *and* four-year degrees, and 4) those who received no degrees and 5) those no longer enrolled. The analyses controlled for the influence of student background, high school contexts and preparation, the type of public college attended, and college achievement. Students with Scholars awards and other types of aid were compared to students who did not receive aid.

Findings from analyses of the entire cohort

Without statistical control, the analyses appeared to show that Scholars were less likely to persist or attain degrees than were other students. Four years after high school, of the students who took the Scholars pledge as eighth-graders, 50.1 percent had withdrawn from college without earning a degree. The same was true of only 39.2 percent of students who received other types of aid and just 35 percent of students who received no aid. However, a more refined and accurate picture emerges when we control for the influence of other variables. With such statistical control, the analyses showed that:

- Scholars were less likely to still be enrolled in college without a degree than were students who received no aid. (On this measure, there was no significant difference in the success rates of students who received no aid and those who received types of aid other than a Scholars award.)
- Among the three categories of students (Scholars, students with other types of aid, and students with no aid), no significant

difference was found in their receipt of two-year degrees or their receipt of both two- and four-year degrees.

- Students with other types of aid were more likely than students who did not receive aid to have completed *only* a four-year degree, but Scholars did not differ significantly on this measure from students who received no student aid.

However, low-income students were less likely to still be enrolled and were less likely to have attained degrees than students who did not apply for student aid. This difference in attainment rates is no surprise when one considers the fact that low-income students face challenges that their higher-income peers avoid. For this reason – and because the Scholars program was designed specifically to serve low-income students – it is important to compare the success rates of Scholars to those of low-income students who did not participate in the program.

Findings from analyses of low-income students

- After four years, 52.4 percent of eligible non-Scholars (low-income students with other types of financial aid) had either left school or had failed to earn even a two-year degree. This was true of only 47.1 percent of the Scholars.
- Controlling for the influence of other variables, the analyses found that, after four years and compared with their low-income peers who received other types of financial aid:
 - Scholars were more than twice as likely to have received two-year degrees.

- Scholars did not differ significantly in their completion of four-year degrees.
- Scholars did not differ significantly in persistence without a degree.
- These findings indicate that, among low-income students, those who took the Scholars pledge and enrolled in college had equal or better odds of academic success than did their non-Scholar peers.

Conclusions

In combination with the earlier study of enrollment by the 1999 cohort, this study indicates that Indiana's Twenty-first Century Scholars Program improves the odds that low-income students will enroll and succeed in college. Low-income students who take the Scholars pledge as eighth-graders have demonstrably higher odds of enrolling in college than do their peers. Scholars also are more likely to attain two-year degrees – and are no *less* likely to persist and attain four-year degrees – than are other low-income students who do not take the pledge.

Of course, much more needs to be done. Financial inequalities continue to affect educational attainment among the residents of Indiana – and every other state. Despite its documented successes, the Scholars program can't claim to have leveled the playing field entirely. Still, it is a program that has proven worthy of emulation and deserving of continued support.

Introduction

The State of Indiana has made remarkable improvements in college access since the late 1980s. Several factors have contributed to this positive trend, including major reforms in K–12 curricula (St. John, Musoba, & Chung, 2004), substantial investment in student financial aid programs (St. John, Hu, & Weber, 2000, 2001), the development of the Indiana Career and Postsecondary Advancement Center (ICPAC) [Hossler, Schmit, & Vesper, 1999], and the creation of the Twenty-first Century Scholars program (St. John, Musoba, Simmons, & Chung, 2002). In combination, these initiatives represent a comprehensive approach to expanding and equalizing opportunities for college preparation, access to higher education, and college persistence. This approach helped Indiana make substantial gains in college access rates. (In 1986, the state ranked 40th in the percentage of its high school graduates who went directly on to college; by 2002, it ranked ninth.) Also, there is growing evidence that these reforms help equalize opportunity for academic success in college in spite of rising college tuition (St. John, Musoba, & Chung, 2004).

Although the Twenty-first Century Scholars program is not the sole reason for the dramatic pattern of improvement, it is certainly part of the success story – and it has received national attention as a result. The National Governors Association has featured the Scholars program at national meetings on best practices. The federal government has pointed to Indiana’s example as it works to reform federal student financial aid programs (Advisory Committee on Student Financial Assistance, 2003). A recent public television program on college access, *The College Track: America’s Sorting Machine*, featured

Indiana's reform strategies. And the state's comprehensive approach to improving access also was featured in a meeting organized by the Pathways to College Network.

While high school preparation and student financial aid both have been examined for their effects on college persistence in Indiana (St. John, Musoba, & Chung, 2004), the impact of the Twenty-first Century Scholars program on degree attainment had not been examined before this study. After Spring 2003, it was possible to examine that impact for the 1999 cohort of Scholars – students who had previously been studied (St. John, Musoba, Simmons, & Chung, 2002) and who, by Spring 2003, could have earned four-year degrees.

The attainment of two- or four-year degrees within four years of high school graduation is an important indicator of academic success.¹ To assess the impact of the Scholars program, it is important not only to consider how the rates of Scholars' attainment compare with those of other students, but also to measure (controlling for the potential effects of other variables) whether, and to what extent, the support offered by the program can be linked directly to degree attainment. This approach was used to study the impact of the Scholars program on college access (enrollment) [St. John, Musoba, Simmons, & Chung, 2002], and it can now be used to examine college success (degree attainment).

Since other state programs can influence Twenty-first Century Scholars' success, we must consider the state's comprehensive approach to reform, not just the Scholars program. Data limitations can complicate this type of comprehensive assessment,² so it is appropriate to consider the roles of the other Indiana programs and to incorporate information from research on these programs. Since the attainment analyses included in

this report build on the earlier study of the 1999 cohort's enrollment, this report follows that cohort from high schools through degree attainment, summarizing the earlier study and the current one. Statistical analyses on persistence are provided as supplementary information (Appendices 2 and 3).

Indiana's Twenty-first Century Scholars program

Initiated in 1990 by then-Gov. Evan Bayh, Indiana's Twenty-first Century Scholars program was the first state program to meet college tuition costs for middle-school students who qualify for the Federal Free and Reduced Lunch program. To benefit from this guarantee, students in the program pledge in the eighth grade to do all of the following:

- Graduate from an Indiana high school.
- Maintain at least a 2.0 grade point average (GPA).
- Apply for admission to an Indiana college.
- Apply for financial aid.
- Refrain from using illegal drugs and alcohol.
- Refrain from committing a crime.
- Enroll full time at an eligible Indiana college or university within two years after high school.

In return for this pledge, the State of Indiana makes a commitment to:

- Pay in full each Scholar's tuition and fees (after other financial aid awards) at any public college in Indiana or contribute a like portion of tuition at an independent college.

- Provide support services for Scholars, including tutoring, mentoring, college visits and activities for parents.
- Disseminate additional information on higher education and encourage Scholars to pursue a college-preparatory curriculum.

The dual nature of the pledge process is designed to encourage low-income students to take advantage of opportunities to prepare for college, as well as to enroll in college. The Scholars program supplements the state grants Scholars receive as a consequence of their aid eligibility, providing a small additional grant for full-need students and larger supplemental awards for students with less need. Most students who received Scholars awards also had full need, so their normal state grants were high, and the additional award amounts were relatively modest. This pattern constrains the cost of the program for the state and provides an added incentive to fund other state grant programs.

Figure 1 illustrates the role of the Twenty-first Century Scholars program within the state's framework for improving college access. There are six ways that Indiana's reforms can have a positive impact – six links between these reforms and enhanced educational opportunity:

- The Twenty-first Century Scholars program guarantees adequate grant aid to low-income eighth-graders who take a pledge to prepare for college (Link 1). The report *Meeting the Access Challenge: Indiana's Twenty-first Century Scholars Program* (St. John, Musoba, Simmons, & Chung, 2002) fully assesses the impact of the Scholars program (research summarized in this report).

- In addition to Indiana’s requirement that all high schools provide access to the Core 40 curriculum (the college-preparatory curriculum in Indiana) and honors diplomas, the state funds incentives to high schools to graduate students with these diplomas (Link 2). *Academic Preparation and College Success* (St. John, Musoba, & Chung, 2004) examines the impact of high school diplomas on college choice and persistence. Scholars benefit from this support, as do all students.³
- The Indiana Career and Postsecondary Advancement Center (ICPAC, renamed Learn More Resource Center) provided encouragement for students to plan for postsecondary education, take preparatory curricula, take college entrance exams, and apply for student aid and college admission (Link 3). Before 1994, ICPAC also administered the services for the Twenty-first Century Scholars program. The program is now administered by the State Student Assistance Commission of Indiana (SSACI).
- The state need-based grant programs provide financial incentives for students to complete a Core 40 or honors diploma (Link 4). The State of Indiana recently took steps to make Core 40 the default diploma.
- State grant programs provide support for enrollment and persistence directly to students with financial need (Link 5). *Meeting the Access Challenge*, summarized in this report, assesses the impact of the Scholars program on college enrollment, including enrollment in four-year colleges.

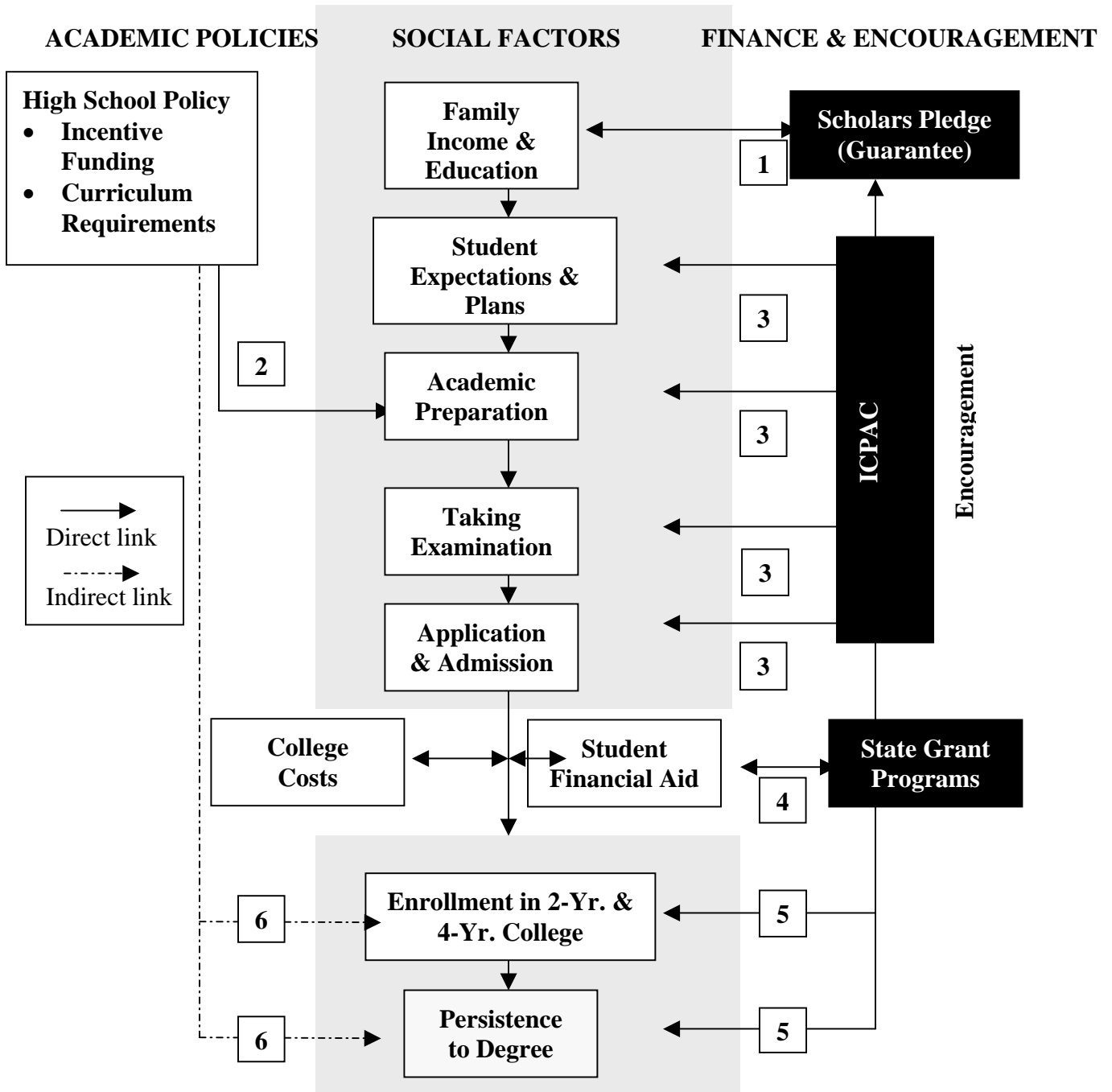
The new analyses (Appendices 2 & 3) in this report provide the first assessment of the impact of the Scholars program on college attainment.

- State policy can affect the curricula that students actually complete, which, in turn, can influence their college success. This means that state education policies have a potential sustained, but indirect, effect on college enrollment and persistence (Link 6). The indirect effects of state curriculum reforms on college enrollment were considered in *Academic Preparation and College Success*. To the extent that students gain access to preparatory curricula, they can benefit from these reforms.⁵

The Twenty-first Century Scholars program is an integral part of Indiana's comprehensive approach for improving college access, especially for low-income students. The information services provided by ICPAC were developed in tandem with the Twenty-first Century Scholars program specifically to assist high-need students. However, these services assist all students, and all students benefit from the comprehensive approach that evolved in the state.

FIGURE 1. THE INDIANA MODEL

A Balanced Approach to College Access and Success



Source: Adapted Balanced Access Model, St. John, 2003

Impact of the Twenty-first Century Scholars program

Tracking one cohort of students is one way to better understand the role that the Twenty-first Century Scholars program plays in promoting academic success. The analyses summarized below focus on the pipeline from ninth grade to college.

The 1999 cohort

Students in the 1999 cohort of Indiana high school students had the opportunity to respond to a survey as high school freshmen. Most students responded to the ninth-grade survey, as it was handed out and collected in their classrooms.⁶ The prior year, low-income students (those eligible for the Federal Free and Reduced Price Lunch program) had been given the opportunity to sign up for the Twenty-first Century Scholars program. To build a database for the 1999 cohort, we combined results from the ninth-grade grade survey with records of students who had signed up as Scholars as eighth-graders. We also added the following data:

- Information for all students who applied for student financial aid as high school seniors. (These data indicated that students had completed the preparation process and had applied to private and/or out-of-state colleges).
- Information on curriculum at the high schools they attended (which indicated the types of preparatory courses available to each student).
- College enrollment information for 1999-2000 (to establish who had enrolled in public colleges).

- College enrollment information for 2000-01, 2001-02, and 2002-03 (to indicate fourth-year enrollment and degree attainment).

Using this combination of data sources, it was possible to trace the educational progress of students in the class. For example, we knew where students had enrolled in college after high school and whether, after four years, students who had enrolled in state two-year and four-year colleges were still enrolled or had attained a degree. Below, we examine evidence of preparation, college enrollment and choice, and status of academic success after four years of college. In addition, we examine patterns of academic success for low-income students who received aid, comparing Scholars' performance with that of other students who received aid.

Academic preparation

Although the state of Indiana is taking steps to ensure that a college-preparatory curriculum is the standard education offered all high school students, for the class of 1999 there was some variability in students' access to advanced curricula . Since the attainment analyses are limited to students who enrolled initially in public colleges, we considered the high school context for all students in the 1999 cohort (see Table 1), broken down by whether students were Scholars, whether they received forms of aid other than the Twenty-first Century Scholars program scholarship, and whether they did not receive aid. These comparisons reveal the following:

- A higher percentage of Scholars than non-Scholars attended urban high schools.

- Scholars graduated from high schools that had lower percentages of students with honors diplomas, indicating lower levels of access to advanced curricula.
- A higher percentage of Scholars than non-Scholars attended high schools with high percentages of students in the Federal Free and Reduced Price Lunch program.
- A higher percentage of Scholars than non-Scholars attended high schools with high percentages of minority students.

Table 1. Comparison of Indicators of Preparation for High Schools Attended by All Students, Scholars, Students Who Received Other Types of Student Aid and Students Who Did Not Receive Student Aid (Based on the 1999 Cohort Who Enrolled In Public Colleges)

Percentages of students from ...	All Students	Twenty-first Century Scholars	Students with other student aid	Students who did not receive aid
Urban high schools	14.2%	27.7%	15.4%	12.2%
Rural high schools	18.1%	15.1%	20.3%	16.3%
High schools with a high percentage (>26%) of honors degrees	27.7%	18.5%	26.1%	29.7%
High schools with a high percentage (>17.7%) of Free and Reduced Lunch recipients	19.4%	42.6%	21.9%	15.7%
High schools with a high percentage (>13.7%) of minority students	22.3%	37.9%	21.5%	22.1%

Although Indiana’s Twenty-first Century Scholars program does not yet reach all eligible students, it does reach students who are attending schools that put them at risk of not preparing for and enrolling in college. Many of the students in the 1999 cohort who signed up as Scholars might have had lower odds of going to college had they not been

guaranteed student aid and, perhaps more important, had they not been provided additional encouragement and academic support.

Earlier analyses of the 1999 cohort have examined the probability of applying for student financial aid (see Table 2). Students who took the Scholars pledge were consistently more likely to have applied for aid, indicating that the program has a positive influence on pre-college awareness. Specifically, the otherwise-average Scholars (controlling for other factors) were about 1.4 times more likely to apply for aid, with a slightly larger odds ratio in the highest-poverty schools (St. John, Musoba, Simmons, Chung, Schmit, & Peng, 2004). In addition, African-Americans who had taken the pledge had higher odds of applying for aid (1.54 odds ratio) than did the otherwise average African-American student. Further, white students in the program also had higher odds of applying.

Table 2. Probabilities of Applying for Student Financial Aid, for Scholars Compared to Others, for Students in the 1999 Cohort and Subgroups, Controlling for Family Background, School Characteristics, and Student Achievement

Population	Odds ratio	Significance
Entire cohort	1.40	***
Highest-poverty Schools	1.43	***
Whites	1.28	***
African-Americans	1.54	***

*** p<.001, ** p<.01, * p<.05

Sources: St. John, Musoba, Simmons, Chung, Schmit, & Peng (2004); and Musoba (2004).

In combination, these findings indicate that the Scholars program helped students overcome the risks associated with being in poverty and attending schools with large proportions of at-risk students. These findings illustrate a general pattern of positive program effects.

College choice

Earlier analyses of the impact of the Twenty-first Century Scholars program on college choice by students in the 1999 cohort indicated that Scholars who took the steps to prepare were more likely to enroll in colleges of all types (St. John, Musoba, Simmons, & Chung, 2002). That research demonstrated, controlling for other variables in each case, that:

- Scholars were 4.43 times more likely to enroll in public four-year colleges in 1999-2000 than non-Scholars.
- Scholars were 6.37 times more likely to enroll in public two-year colleges than were non-Scholars.
- Scholars were 6.37 times more likely to enroll in Indiana's private colleges than were non-Scholars.
- Scholars were 2.55 times more likely to be probable enrollees⁷ in out-of-state colleges.

These analyses provided evidence of a relationship between being a Scholar and enrolling in college. In addition, supplemental analyses indicated more substantial enrollment effects for African-American students than for white students (Musoba, 2004).

Status of academic success: the cohort

The new analyses in this section examine the impact of the Scholars program scholarships on the postsecondary persistence and attainment of students in the 1999 cohort. The analyses were limited to students who enrolled initially in public colleges

because state-level data on private college students were not available. Approximately 10 percent (346) of Scholars enrolled in in-state private colleges, and 3 percent (118) of Scholars expressed intentions to enroll in out-of-state institutions. Though these numbers are small when compared with the whole Scholars sample, this lack of information might have introduced a sample selection problem.⁸ Persistence and attainment by the entire cohort (Appendix 2) are summarized below, followed by analyses for low-income students.

The first step was to examine the persistence rate for students in the 1999 cohort (see Table 3). Persistence was defined as having attained a college degree or being enrolled in college at the end of the fourth year. After four years, 62.6 percent of the students in the 1999 cohort who entered public colleges could be considered persisters by this definition. This overall rate was higher than the rate for students with other forms of aid (60.8 percent), higher than the rate for Scholars (49.9 percent), but lower than that for students who did not receive aid (65.0 percent).

Table 3. Persistence Status in 2002-03 by Students in the 1999 Cohort Who Enrolled Initially in Public Colleges

Persistence status	All	Scholars	Other aid	No aid
Nonpersisters	37.4%	50.1%	39.2%	35.0%
Persisters	62.6%	49.9%	60.8%	65.0%

Logistic regression analyses were used to examine the impact of the Twenty-first Century Scholars program on persistence, controlling for other variables. These analyses indicated that Scholars were less likely to be persisters after four years than were students who did not receive aid, controlling for other variables (Table 2.2 in Appendix 2). Students who received other forms of aid did not differ significantly in persistence from students who did not receive student aid.

It is possible, however, that this model was not able to capture various unobservable (and, we believe, income-related) characteristics that influence students' persistence – characteristics such as cultural capital, family support and availability of information. To explore this issue further, we undertook two additional analyses: First, we looked at our outcome differently by considering withdrawal against continuous enrollment and degree attainment separately, rather than combined in a multinomial logistic regression. Second, we performed the multinomial analysis on a fixed-income student group: low-income students.

Before performing a multinomial logistic regression, we examined the association between being a Scholar and educational attainment after four years (Table 4). Descriptive statistics indicated that a modest percentage of Scholars (9.7 percent) had obtained four-year degrees, very few (0.4 percent) had earned both two- and four-year degrees, 4.2 percent had received two-year degrees, 35.7 percent had no degree yet still persisted, and 50.1 percent of Scholars did not persist.

Table 4. Attainment Status in 2002-03 by Students in the 1999 Cohort

Attainment status	All	Scholars*	Other Aid	No Aid
Nonpersister, no degree	37.4%	50.1%	39.2%	35.0%
Persister, no degree	42.0%	35.7%	40.6%	43.7%
Two-year degree	4.2%	4.2%	3.9%	4.5%
Both two- and four-year degrees	0.7%	0.4%	0.5%	0.9%
Four-year degree	15.7%	9.7%	15.8%	15.9%

*Total exceeds 100% due to rounding

We conducted a multinomial logistic regression to examine the impact of the Twenty-first Century Scholars program on attainment status (Table 2.4 in Appendix 2). Consistent with the analysis of persistence, Scholars had lower odds of current enrollment, but this was only a modest statistical association; students with other forms of aid did not differ significantly from students who did not receive student aid. However,

Scholars did not differ significantly in their rate of degree attainment from students who did not receive aid. Considering the unmeasured challenges that Scholars face – challenges that higher-income students typically avoid —the fact that there is no significant difference between Scholars and non-aid recipients in four-year degree attainment is an important finding. Yet, Scholars had slightly lower odds of still being enrolled after four years if they had not received a degree.⁹ This led us to the third analyses – one in which we restricted the sample to low-income students (Table 5). We did this because we knew income and Scholar status were related.

Table 5. Summary of Multinomial Logistic Regression for Attainment Status in 2002-03 by Students in the 1999 Cohort: Odds Ratios for Aid Categories Compared to No Aid, Controlling for Other Variables

Attainment status	Scholars		Other aid	
	Odds ratio	Sig.	Odds ratio	Sig.
Persister, no degree	0.771	**	0.933	NS
Two-year degree	1.096	NS	0.952	NS
Both two- and four-year degrees	1.133	NS	0.991	NS
Four-year degree	1.014	NS	1.141	*

****p<0.001, ***p<0.01, **p<0.05, *p<0.10

Source: See Table 2.4 A to D in Appendix 2.

Indeed, students from low-income and lower-middle-income families were less likely to be currently enrolled, or to have received a degree of any type, than were students who did not apply for aid. This illustrates that, by the early 2000s, there were income-related disparities among traditional-age students in persistence and degree attainment, at least in Indiana. It is possible that the substantial investment in need-based aid, including the Twenty-first Century Scholars program, was not sufficient to overcome the disparities attributable to income. Therefore it is appropriate to examine the persistence and attainment of low-income students specifically.

Status of academic success: low-income students

Those students whose families earned less than \$30,621 and who received financial aid – Twenty-first Century Scholar program aid or otherwise – were examined next. Low-income financial aid recipients who were Scholars persisted at higher rates over the four years (52.9 percent) than did low-income students who received aid but were not Scholars (47.6 percent) [(Table 6). Scholars in the lowest-income category persisted at higher rates (52.9 percent) than the average rate of persistence for all Scholars (49.9 percent) (Table 3).

Table 6. Persistence Status in 2002-03 by Students in the 1999 Cohort Who Enrolled Initially in Public Colleges and Were Low-income and Received Financial Aid

Persistence Status	Scholars	Other Aid
Nonpersisters	47.10%	52.40%
Persisters	52.90%	47.60%

An examination of educational attainment status shows that Scholars attained four-year degrees, earned two-year degrees, and generally persisted at higher rates than did non-Scholar aid recipients (Table 7). Low-income students who received aid but were not Scholars obtained both two- and four-year degrees at a somewhat higher rate than Scholars.

Table 7. Attainment Status in 2002-03 by Low-income Students in the 1999 Cohort Who Received Financial Aid

Attainment Status	Scholars*	Other Aid**
Nonpersister, no degree	47.10%	52.40%
Persister, no degree	37.90%	35.50%
Two-year degree	5.70%	3.70%
Both two- and four-year degrees	0.20%	0.40%
Four-year degree	9.00%	8.10%

*Due to rounding equals 99.9%

**Due to rounding equals 100.1%

A multinomial logistic regression for the lowest-income aid recipients was conducted to explore educational attainment for Scholars and non-Scholars (Appendix 3).¹⁰ Results indicate that, controlling for other variables, Scholars do not differ significantly from non-Scholar, lowest-income aid recipients in their likelihood to persist and attain a four-year degree, including those with both two- and four-year degrees. Perhaps most significant and consistent with the preceding descriptive analysis of persistence, Scholars are more than twice as likely as non-Scholar aid recipients to attain a two-year degree (Table 8).

Table 8. Summary of Multinomial Logistic Regression for Attainment Status in 2002-03 by Students in the 1999 Cohort: Odds Ratios for Twenty-first Century Scholars Compared to Aid Recipients Who Were Not Scholars, Controlling for Other Variables

Attainment Status	Scholars	
	Odds ratio	Sig.
Persister, no degree	0.946	NS
Two-year degree	2.026	**
Four-year degree and both two- and four-year degrees	0.998	NS

****p<0.001, ***p<0.01, **p<0.05, *p<0.10

Source: See Table 3.4 Parts A to C in Appendix 3.

Conclusions

The Twenty-first Century Scholars program is a comprehensive, early-intervention program intended to improve college enrollment among low-income students in Indiana. An earlier study demonstrated that the program is effective in enhancing access to higher education (St. John, Musoba, Simmons, & Chung, 2002). That study, of students in the 1999 cohort, showed that students who took the Scholars pledge were more likely to enroll in college than were other students. However, that earlier study did not examine whether the program had any effect on students' persistence or success in postsecondary education. Even though the Scholars program was not designed specifically to enhance persistence or degree attainment, some positive effects could logically be expected. This current study is an attempt to identify, isolate and quantify such effects.

In this new study, we followed the 1999 cohort through the first four years of college to assess the impact of the Twenty-first Century Scholars program on educational attainment. The study had two major findings:

1. When the entire 1999 cohort was examined, it was evident that students in the Twenty-first Century Scholars program persisted at a lower rate than did students who received no student aid and students who received other types of student aid. In addition, when the influence of other variables was controlled for in multinomial logistic regression analyses, Scholars were less likely to be currently enrolled than were students who received no aid. In contrast, students who had received other forms of student aid were more likely than non-Scholar aid recipients to have attained four-year

degrees within four years. Lower-middle-income students also were less likely to have attained four-year degrees, and low-income students were less likely to persist in general. Because Scholars were mostly from low-income families, it was important to consider persistence and degree attainment specifically among low-income students.

2. When persistence by the population of low-income students was examined, a different pattern was evident. Scholars had higher persistence rates than did other low-income students who received financial aid. In addition, controlling for the influence of other variables, Scholars had higher odds of having attained two-year degrees than did low-income students with other forms of aid (though they did not differ significantly in their likelihood to be enrolled or to have attained four-year degrees). Therefore, among low-income students, the very group that the Scholars program was created to support, Scholars awards did have a modest statistical association with academic success.

Clearly, financial inequalities continue to affect educational attainment among Indiana residents. The Twenty-first Century Scholars program, however effective it has been, can't claim to have leveled the playing field entirely. However, low-income students who take the Scholars pledge as eighth-graders do have demonstrably higher odds of enrolling in college than do their peers. Scholars also are more likely to attain two-year degrees – and are no *less* likely to persist and attain four-year degrees – than are other low-income students who do not take the pledge.

Appendix 1

The 1999 cohort: database design

Six data sources contributed information for the merged database for the 1999 cohort used in the analyses on college enrollment in the earlier study, *Meeting the Access Challenge: Indiana's Twenty-first Century program*.

1. The Indiana Career and Postsecondary Advancement Center (ICPAC) conducts an annual survey of all Indiana ninth-graders regarding their career and educational aspirations, family living situation, current grades, etc. The ninth-grade survey contained key predictor variables and students who would fall into all of the possible outcome categories. With about an 80 percent response rate, this provided a good representation of Indiana students as they enter high school. This data set had 65,975 observations.
2. ICPAC also provided accurate records of which Indiana students had applied for and enrolled in the Scholars program in eighth grade. This data set contained 5,035 records of students who applied for the Scholars program.
3. The Indiana Commission for Higher Education collects from public colleges and universities records regarding each student who attends an Indiana public institution. The Student Information System (SIS) records include cumulative grade point average, SAT scores, high school attended, degree plans, other campuses attended, credits earned, campus living situation, family income, demographic information, and financial aid records, including receipt of a Twenty-first Century Scholars program scholarship. The SIS data set had 275,130 observations, including all undergraduates in the 1999-2000 database.

4. The State Student Assistance Commission of Indiana (SSACI), which administers the state grants, provided access to students' Free Application for Federal Student Aid (FAFSA) records, which offered data similar to the SIS records for students who applied for admission to private and out-of-state higher education institutions. For instance, the records indicated whether the student received a state grant (indicating they went to an in-state institution) or whether they applied for aid for an out-of-state school. SSACI data contained records for all students from Indiana who applied for financial aid regardless of attendance. The data set had 106,097 observations, including undergraduates born in 1980-1982 (students who would be in ninth grade in 1995).
5. The Indiana Department of Education's Web-based school data records provided high school information such as the percentage of students receiving Free or Reduced Price Lunches (a rough measure of poverty), the percentage of graduates who earned an honors diploma, and other institutional variables.
6. The Indiana Commission for Higher Education (ICHE) Student Information System (SIS) databases for 2000-01, 2001-02 and 2002-03 were integrated into this database for the current study. The 2002-03 data set contained 362,469 observations and included data on cumulative grade point average, SAT scores, high school attended, degree plans, other campuses attended, credits earned, campus living situation, family income, demographic information, and financial aid records, including receipt of a Twenty-first

Century Scholars program scholarship. The intervening years of data were used in determining degrees earned.

The SIS and FAFSA records were merged using student identification numbers. Because the ninth-grade surveys did not have identification numbers, a concatenation of the student's birth date, high school code, gender, ethnicity and home zip code was used to match records. Progressive combinations of this concatenation from most restrictive (i.e., all of the variables) to least restrictive were applied. In the first matches, variables from the SIS data were matched. When that was exhausted, a concatenation of first and last name, birth date, and gender was used to match remaining survey records with FAFSA records. Following that, ninth-grade survey records were matched with the Scholars data in a similar manner. A total of 21,615 observations were found in both the SIS and FAFSA data files. All observations were retained in the file because students who did not match with the SIS or FAFSA file have no evidence of higher education enrollment and represented the reference group in the prior studies. Finally, high-school-level variables were matched to the observations using the high school code unique to each Indiana high school. This produced a database of 65,975 cases, of which 65,798 have no missing values and were used in the regression on college enrollments. Of this data set, 25,856 students had attended a public two- or four-year college in Indiana in the fall of 1999 and were considered in the persistence analysis. Of those, 24,062 cases had no missing values and were included in the regressions on persistence.

Appendix 2

Attainment analyses for the entire cohort

**Table 2.1 Descriptive Statistics for Variables in the Logistic Regression:
Indiana's Public Colleges 1999-2003**

Variable	Values	Number of cases	Percentage
Gender	Male and unknown	13,511	52.3%
	Female	12,341	47.7%
Ethnicity	Missing or prefer not to answer	3,691	14.3%
	Other minority	1,330	5.1%
	African American	1,448	5.6%
	White	19,383	75.0%
Parental education level	Parent(s) went to college	16,187	62.6%
	No college for parent(s) or unknown parent education	9,665	37.4%
Who the student lived with in ninth grade	Live with one parent	4,088	15.8%
	Do not live with parent	516	2.0%
	Live with two parents or unknown living situation	21,248	82.2%
Main language spoken in the home	Spanish or other language	207	0.8%
	English or unknown	25,645	99.2%
Grade point average in ninth grade	Missing/did not answer	1,285	5.0%
	Mostly As	3,416	13.2%
	Mixed Bs and Cs and Mostly Cs	6,806	26.3%
	Mixed Cs and Ds or lower	1,462	5.7%
	Mixed As and Bs and Mostly Bs	12,883	49.8%
Percentage of graduates in the student's high school who earned an honors diploma	Low percentage of honors graduates	17,571	72.3%
	High percentage of honors graduates	6,716	27.7%
Locale of high school attended	Urban	3,675	14.2%
	Rural	4,678	18.1%
	Urban fringe, town and unknown	17,499	67.7%
Student's aspirations in ninth grade for education completion	Undecided/other/no response	3,579	13.8%
	Aspire to a high school diploma or less	1,069	4.1%
	Aspire to less than a two-year degree	871	3.4%
	Aspire to a two-year degree	1,611	6.2%
	Aspire to a four-year degree or higher	18,722	72.4%
Percentage in the student's high school who are minorities	Relatively low minority concentration	19,443	77.7%
	Relatively High minority concentration	5,593	22.3%
Percentage in the student's school who receive free or reduced-price lunches	Low percentage of students	20,269	80.6%
	High percentage of students	4,883	19.4%

Family income quartiles	Low income (below \$30,621)	3,544	13.7%
	Lower-middle (between \$30,621 and \$52,719)	3,716	14.4%
	Upper-middle (between \$52,719 and \$75,316)	3,774	14.6%
	High income (above \$75,316)	3,798	14.7%
	No reported income (did not apply for fin. aid)	11,020	42.6%
Dependency status	Self-supporting	423	1.6%
	Dependent on parents or indeterminate	25,429	98.4%
College cumulative grade point average	A	3,057	11.8%
	B	10,896	42.1%
	C	4,587	17.7%
	Below C	6,562	25.4%
	Missing	750	2.9%
Living situation while in college	On campus	12,242	47.4%
	Live off campus, with parents or elsewhere	13,610	52.6%
Institutional type	Other four-year college	13,041	50.4%
	Two-year college	4,019	15.5%
	Research university	8,792	34.0%
Aid package	21st Century Scholar with aid	855	3.3%
	Other aid recipient	12,038	46.6%
	No aid or aid missing	12,959	50.1%
Persistence	Nonpersisters	9,680	37.4%
	Persisters	16,172	62.6%

Table 2.2 Logistic Regression Analysis of Persistence of Variables Associated With Persistence: Indiana's Public Colleges 1999-2003

Variables	Coefficient	Std. Err.	Odds ratio	Sig.
Female compared to male and unknown (zsex3)	-0.013	0.03	0.987	
When compared to Whites: (White)				
Missing or prefer not to answer (Eth_Miss)	-0.001	0.048	0.999	
Other minorities (Min_oth)	-0.023	0.076	0.977	
African American (Black)	-0.073	0.068	0.929	
Parents went to college compared to no or unknown parent higher education (zfirst3)	0.181	0.033	1.199	****
When compared to living with two parents or unknown living situation (Live_no)				
Live with one parent (Live_one)	0.034	0.163	1.035	
Do not live with parent (Live_two)	-0.048	0.042	0.953	
Spanish or other language spoken at home compared to English or unknown language spoken at home (zxlangu3)	-0.284	0.106	0.753	**
When compared to Mixed As and Bs and Mostly Bs GPA in the 9th Grade (GPA_ABB)				
Missing/did not answer (GPA_Miss)	0.128	0.086	1.137	
Mostly As (GPA_A)	0.237	0.053	1.268	****
Mixed Bs and Cs and Mostly Cs (GPA_BCC)	-0.272	0.037	0.762	****
Mixed Cs and Ds or lower (GPA_CD)	-0.294	0.07	0.745	****
When compared to families with no reported income (did not apply for financial aid) (Inc_none)				
Low income (below \$30,621) (Inc_lo)	-0.23	0.065	0.794	****
Lower-middle (between \$30,621 and \$52,719) (Inc_lmid)	-0.225	0.059	0.799	****
Upper-middle (between \$52,719 and \$75,316) (Inc_umid)	-0.112	0.056	0.894	**
High income (above \$75,316) (Inc_high)	-0.081	0.054	0.922	
Self-supporting students when compared to students dependent on parents or indeterminate dependency status (depend3)	-0.035	0.124	0.966	
When compared to suburban/town/unknown: (Loc_town)				
Urban school locale (Loc_urb)	0.106	0.049	1.112	**
Rural school locale (Loc_rur)	-0.046	0.04	0.955	
Low percentage of students in the student's school who receive free or reduced-price lunches (when compared to high percentage) (zlunch2)	0.056	0.047	1.058	
Low percentage minority students in high school (compared to high percentage) (zminor2)	-0.041	0.046	0.96	
Low percentage honors diploma grads in high school (when compared to high percentage) (zhonor2)	-0.005	0.035	0.995	

When compared to plans for a four-year degree or higher: (Ed_4yr)				
Undecided/other/no response (Ed_undec)	-0.157	0.051	0.855	**
Aspire to a high school diploma or less (Ed_HS)	-0.233	0.077	0.792	**
Aspire to less than a two-year degree (Ed_lt2yr)	-0.268	0.082	0.765	**
Aspire to a two-year degree (Ed_2yr)	-0.157	0.061	0.855	**
When compared to students with a B cumulative college GPA: (CGPA_B)				
A (CGPA_A)	0.121	0.054	1.128	**
C (CGPA_C)	-0.335	0.041	0.715	****
Below C (CGPA_CLO)	-1.351	0.037	0.259	****
Missing (CGPA_MIS)	-2.001	0.104	0.135	****
Students who lived on campus compared to students who lived off campus, with parents or elsewhere (zhouse2)				
	0.371	0.035	1.449	****
When compared to students who enrolled in a public research university (En_res)				
Other four-year college (En_4yr)	-0.258	0.04	0.773	****
Two-year college (En_2yr)	-1.294	0.053	0.274	****
When compared to students who received no financial aid (Aid_none)				
21st Century Scholar with aid (Aid_21)	-0.188	0.093	0.829	**
Other aid recipient (Aid_othe)	0.007	0.046	1.007	
****p<0.001, ***p<0.01, **p<0.05, *p<0.10				
N of cases= 24,062				
-2 Log likelihood= 26,825.443				
Chi-square= 5062.015**				
Nagelkerke= 0.258				

*1790 cases were excluded from the regression due to missing values.

**Table 2.3 Descriptive Statistics for Variables in the Multinomial Regression:
Indiana's Public Colleges 1999-2003**

Variable	Values	Number of cases	Percentage
Gender	Male and unknown	13,511	52.3%
	Female	12,341	47.7%
Ethnicity	Missing or prefer not to answer	3,691	14.3%
	Other minority	1,330	5.1%
	African American	1,448	5.6%
	White	19,383	75.0%
Parental education level	Parent(s) went to college	16,187	62.6%
	No college for parent(s)/unknown par. ed.	9,665	37.4%
Who the student lived with in ninth grade	Live with one parent	4,088	15.8%
	Do not live with parent	516	2.0%
	Live with 2 parents/unknown living situation	21,248	82.2%
Main language spoken in the home	Spanish or other language	207	0.8%
	English or unknown	25,645	99.2%
Grade point average in ninth grade	Missing/did not answer	1,285	5.0%
	Mostly As	3,416	13.2%
	Mixed Bs and Cs and Mostly Cs	6,806	26.3%
	Mixed Cs and Ds or lower	1,462	5.7%
	Mixed As and Bs and Mostly Bs	12,883	49.8%
Percentage of graduates in student's high school who earned honors diplomas	Low percentage of honors graduates	17,571	72.3%
	High percentage of honors graduates	6,716	27.7%
Locale of high school attended	Urban	3,675	14.2%
	Rural	4,678	18.1%
	Urban fringe, town and unknown	17,499	67.7%
Student's aspirations in ninth grade for education completion	Undecided/other/no response	3,579	13.8%
	Aspire to a high school diploma or less	1,069	4.1%
	Aspire to less than a two-year degree	871	3.4%
	Aspire to a two-year degree	1,611	6.2%
	Aspire to a four-year degree or higher	18,722	72.4%
Percentage in the student's high school who are minorities	Relatively low minority concentration	19,443	77.7%
	Relatively High minority concentration	5,593	22.3%
Percentage in the student's school who receive free or reduced-price lunches	Low percentage of students	20,269	80.6%
	High percentage of students	4,883	19.4%
Family income quartiles	Low income (below \$30,621)	3,544	13.7%
	Lower-middle (between \$30,621 & 52,719)	3,716	14.4%
	Upper-middle (between \$52,719 & 75,316)	3,774	14.6%
	High income (above \$75,316)	3,798	14.7%
	No reported income (did not apply for fin. aid)	11,020	42.6%
Dependency status	Self-supporting	423	1.6%
	Dependent on parents or indeterminate	25,429	98.4%

College cumulative grade point average	A	3,057	11.8%
	B	10,896	42.1%
	C	4,587	17.7%
	Below C	6,562	25.4%
	Missing	750	2.9%
Living situation while in college	On campus	12,242	47.4%
	Live off campus, with parents or elsewhere	13,610	52.6%
Institutional type	Other four-year college	13,041	50.4%
	Two-year college	4,019	15.5%
	Research university	8,792	34.0%
Aid package	21st Century Scholar with aid	855	3.3%
	Other aid recipient	12,038	46.6%
	No aid	12,959	50.1%
Enrollment outcomes	Nonpersister, no degree	8,336	32.2%
	Persister, no degree	10,855	42.0%
	Two-year degree	1,874	7.2%
	Both Two- and Four-year degrees	190	0.7%
	Four-year degree	4,597	17.8%

**Table 2.4, Part A. Multinomial Regression Analysis of Variables
Associated With Completion of Four-year Degree:
Indiana's Public Colleges 1999-2003**

Variables	Coefficient	Std. Err.	Odds ratio	Sig.
Female compared to male and unknown (zsex2)	-0.19	0.047	0.827	****
When compared to whites: (zxsethn2)				
Missing or prefer not to answer	-0.022	0.077	0.978	
Other minorities	-0.201	0.111	0.818	*
African American	0.039	0.128	1.04	
Parents went to college compared to no or unknown parent higher education (zxfirst2)	0.191	0.05	1.211	****
When compared to living with two parents or unknown living situation (zxslive2)				
Live with one parent	-0.158	0.069	0.853	**
Do not live with parent	-0.167	0.179	0.846	
Spanish or other language spoken at home compared to English or unknown language spoken at home (zxlangu2)	-0.507	0.303	0.602	*
When compared to Mixed As and Bs and Mostly Bs GPA in the 9th Grade (zxcgpa2)				
Missing/did not answer	0.431	0.137	1.539	**
Mostly As	0.384	0.067	1.468	****
Mixed Bs and Cs and Mostly Cs	-0.227	0.066	0.797	
Mixed Cs and Ds or lower	0.182	0.115	1.2	
When compared to families with no reported income (did not apply for financial aid) (zincome)				
Low income (below \$30,621)	-0.17	0.111	0.844	
Lower-middle income (between \$30,621 and \$52,719)	-0.205	0.097	0.814	**
Upper-middle income (between \$52,719 and \$75,316)	0.022	0.088	1.022	
High income (above \$75,316)	0.108	0.079	1.114	
Self-supporting students when compared to students dependent on parents or indeterminate dependency status (depend2)	-0.384	0.285	0.681	
When compared to suburban/town/unknown: (zlocale2)				
Urban school locale	0.019	0.076	1.019	
Rural school locale	0.027	0.061	1.027	
Low percentage of students in the student's school who receive free or reduced-price lunches (when compared to high percentage) (zlunch)	0.057	0.075	1.059	
Low percentage minority students in high school (compared to high percentage) (zminor)	0.055	0.07	1.057	
Low percentage honors diploma grads in high school (when compared to high percentage) (zhonor)	-0.087	0.051	0.917	

When compared to plans for a four-year degree or higher: (zedexp2)				
Undecided/other/no response	-0.209	0.085	0.812	**
Aspire to a high school diploma or less	-0.122	0.13	0.885	
Aspire to less than a two-year degree	-0.111	0.14	0.895	
Aspire to a two-year degree	-0.188	0.112	0.829	*
When compared to students with a B cumulative college GPA: (zcumgpa)				
A	0.634	0.065	1.886	****
C	-1.175	0.069	0.309	
Below C	-3.748	0.14	0.024	****
Missing	-20.706	2227	0.000	
Students who lived on campus compared to students who lived off campus, with parents or elsewhere (zhousing)	0.706	0.054	2.025	****
When compared to students who enrolled in a public research university (zenroll)				
Other four-year college	-0.921	0.056	0.398	****
Two-year college	-4.568	0.265	0.01	
When compared to students who received no financial aid (zaid2)				
21st Century Scholar with aid	0.014	0.163	1.014	
Other aid recipient	0.132	0.072	1.141	*
Dependent variable: enrollment outcome by 2003 ****p<0.001, ***p<0.01, **p<0.05, *p<0.10 N of cases= 24,062† -2 Log likelihood= 37,1916.855 Chi-square= 14.955** McFadden= 0.160 Nagelkerke= 0.350				
†1790 cases were excluded from the regression due to missing values.				

**Table 2.4, Part B. Multinomial Regression Analysis of Variables
Associated With Completion of Both Two- and Four-Year Degree:
Indiana's Public Colleges 1999-2003**

Variables	Coefficient	Std. Err.	Odds ratio	Sig.
Female compared to male and unknown (zsex3)	0.607	0.17	1.835	****
When compared to Whites: (zxsethn2)				
Missing or prefer not to answer	0.13	0.26	1.138	
Other minorities	-0.295	0.432	0.744	
African American	0.053	0.5	1.055	
Parents went to college compared to no or unknown parent higher education (zxfirst2)	0.212	0.18	1.236	
When compared to living with two parents or unknown living situation (zxslive2)				
Live with one parent	0.157	0.236	1.17	
Do not live with parent	-1.172	1.017	0.31	
Spanish or other language spoken at home compared to English or unknown language spoken at home (zxlangu2)	-0.358	1.029	0.699	
When compared to Mixed As and Bs and Mostly Bs GPA in the 9th Grade (zxcgpa2)				
Missing/did not answer	-0.01	0.475	0.99	
Mostly As	0.364	0.221	1.439	*
Mixed Bs and Cs and Mostly Cs	-0.185	0.238	0.831	
Mixed Cs and Ds or lower	-0.102	0.392	0.903	
When compared to families with no reported income (did not apply for financial aid) (zincome)				
Low income (below \$30,621)	-0.676	0.426	0.509	
Lower-middle income (between \$30,621 and \$52,719)	-1.11	0.407	0.33	**
Upper-middle income (between \$52,719 and \$75,316)	-0.655	0.34	0.519	*
High income (above \$75,316)	-0.568	0.3	0.567	*
Self-supporting students when compared to students dependent on parents or indeterminate dependency status (depend2)	0.628	0.789	1.873	
When compared to suburban/town/unknown: (zlocale2)				
Urban school locale	0.087	0.282	1.091	
Rural school locale	0.386	0.202	1.471	*
Low percentage of students in the student's school who receive free or reduced-price lunches (when compared to high percentage) (zlunch)	0.463	0.303	1.589	
Low percentage minority students in high school (compared to high percentage) (zminor)	-0.171	0.247	0.843	
Low percentage honors diploma grads in high school (when compared to high percentage) (zhonor)	0.004	0.183	1.004	

When compared to plans for a four-year degree or higher: (zedexp2)				
Undecided/other/no response	0.151	0.279	1.163	
Aspire to a high school diploma or less	0.121	0.439	1.128	
Aspire to less than a two-year degree	0.537	0.406	1.71	
Aspire to a two-year degree	0.097	0.37	1.102	
When compared to students with a B cumulative college GPA: (zcumgpa)				
A	1.036	0.184	2.817	****
C	-1.117	0.284	0.327	****
Below C	-3.563	0.59	0.028	****
Missing	-21.057	0	0.000	
Students who lived on campus compared to students who lived off campus, with parents or elsewhere (zhousing)				
	0.234	0.194	1.263	
When compared to students who enrolled in a public research university (zenroll)				
Other four-year college	-0.792	0.208	0.453	****
Two-year college	-1.662	0.347	0.19	****
When compared to students who received no financial aid (zaid2)				
21st Century Scholar with aid	0.125	0.662	1.133	
Other aid recipient	-0.009	0.267	0.991	
Comparison group for enrollment outcome is nonpersisters ****p<0.001, ***p<0.01, **p<0.05, *p<0.10 N of cases= 24,062† -2 Log likelihood= 37,1916.855 Chi-square= 14.955** McFadden= 0.160 Nagelkerke= 0.350				
†1790 cases were excluded from the regression due to missing values.				

**Table 2.4, Part C. Multinomial Regression Analysis of Variables
Associated With Completion of Two-Year Degree:
Indiana's Public Colleges 1999-2003**

Variables	Coefficient	Std. Err.	Odds ratio	Sig.
Female compared to male and unknown (zsex3)	-0.063	0.069	0.939	
When compared to Whites: (zxsethn2)				
Missing or prefer not to answer	-0.148	0.114	0.862	
Other minorities	0.147	0.146	1.159	
African American	-0.194	0.203	0.824	
Parents went to college compared to no or unknown parent higher education (zxfirst2)	-0.03	0.077	0.97	
When compared to living with two parents or unknown living situation (zxslive2)				
Live with one parent	-0.031	0.098	0.97	
Do not live with parent	-0.425	0.285	0.654	
Spanish or other language spoken at home compared to English or unknown language spoken at home (zxlangu2)	0.477	0.315	1.612	
When compared to Mixed As and Bs and Mostly Bs GPA in the 9th Grade (zxcgpa2)				
Missing/did not answer	-0.103	0.194	0.903	
Mostly As	0.038	0.118	1.038	
Mixed Bs and Cs and Mostly Cs	-0.489	0.086	0.613	****
Mixed Cs and Ds or lower	-0.998	0.193	0.369	****
When compared to families with no reported income (did not apply for financial aid) (zincome)				
Low income (below \$30,621)	-0.606	0.148	0.545	****
Lower-middle income (between \$30,621 and \$52,719)	-0.597	0.134	0.55	****
Upper-middle income (between \$52,719 and \$75,316)	-0.386	0.124	0.68	**
High income (above \$75,316)	-0.399	0.127	0.671	**
Self-supporting students when compared to students dependent on parents or indeterminate dependency status (depend2)	0.249	0.26	1.283	
When compared to suburban/town/unknown: (zlocale2)				
Urban school locale	0.105	0.111	1.111	
Rural school locale	-0.021	0.086	0.979	
Low percentage of students in the student's school who receive free or reduced-price lunches (when compared to high percentage) (zlunch)	-0.059	0.106	0.942	
Low percentage minority students in high school (compared to high percentage) (zminor)	0.242	0.111	1.274	**
Low percentage honors diploma grads in high school (when compared to high percentage) (zhonor)	0.293	0.083	1.34	****

When compared to plans for a four-year degree or higher: (zedexp2)				
Undecided/other/no response	0.012	0.113	1.012	
Aspire to a high school diploma or less	0.046	0.176	1.047	
Aspire to less than a two-year degree	-0.122	0.194	0.885	
Aspire to a two-year degree	0.219	0.123	1.245	*
When compared to students with a B cumulative college GPA: (zcumgpa)				
A	-0.067	0.109	0.935	
C	-0.507	0.093	0.602	****
Below C	-1.654	0.098	0.191	****
Missing	-2.342	0.298	0.096	****
Students who lived on campus compared to students who lived off campus, with parents or elsewhere (zhousing)				
	-0.222	0.083	0.801	**
When compared to students who enrolled in a public research university (zenroll)				
Other four-year college	-0.039	0.096	0.962	
Two-year college	0.244	0.112	1.276	**
When compared to students who received no financial aid (zaid2)				
21st Century Scholar with aid	0.091	0.215	1.096	
Other aid recipient	-0.05	0.103	0.952	
Comparison group for enrollment outcome is nonpersisters				
****p<0.001, ***p<0.01, **p<0.05, *p<0.10				
N of cases= 24,062†				
-2 Log likelihood= 37,1916.855				
Chi-square= 14.955**				
McFadden= 0.160				
Nagelkerke= 0.350				
†1790 cases were excluded from the regression due to missing values.				

**Table 2.4, Part D. Multinomial Regression Analysis of Variables
Associated With Persisters Who Have Not Completed a Degree:
Indiana's Public Colleges 1999-2003**

Variables	Coefficient	Std. Err.	Odds ratio	Sig.
Female compared to male and unknown (zsex3)	0.033	0.032	1.033	
When compared to Whites: (zxsethn2)				
Missing or prefer not to answer	0.018	0.05	1.018	
Other minorities	-0.079	0.072	0.924	
African American	-0.025	0.079	0.975	
Parents went to college compared to no or unknown parent higher education (zxfirst2)	0.197	0.035	1.218	****
When compared to living with two parents or unknown living situation (zxslive2)				
Live with one parent	-0.031	0.044	0.969	
Do not live with parent	-0.281	0.113	0.755	**
Spanish or other language spoken at home compared to English or unknown language spoken at home (zxlangu2)	0.07	0.169	1.073	
When compared to Mixed As and Bs and Mostly Bs GPA in the 9th Grade (zxgpa2)				
Missing/did not answer	0.083	0.091	1.086	
Mostly As	0.172	0.056	1.188	**
Mixed Bs and Cs and Mostly Cs	-0.269	0.039	0.764	****
Mixed Cs and Ds or lower	-0.339	0.075	0.712	****
When compared to families with no reported income (did not apply for financial aid) (zincome)				
Low income (below \$30,621)	-0.202	0.069	0.817	**
Lower-middle income (between \$30,621 and \$52,719)	-0.182	0.062	0.834	**
Upper-middle income (between \$52,719 and \$75,316)	-0.109	0.059	0.897	*
High income (above \$75,316)	-0.111	0.057	0.895	*
Self-supporting students when compared to students dependent on parents or indeterminate dependency status (depend2)	-0.046	0.132	0.955	
When compared to suburban/town/unknown: (zlocale2)				
Urban school locale	0.13	0.051	1.138	**
Rural school locale	-0.065	0.042	0.937	
Low percentage of students in the student's school who receive free or reduced-price lunches (when compared to high percentage) (zlunch)	0.061	0.049	1.063	
Low percentage minority students in high school (compared to high percentage) (zminor)	-0.079	0.048	0.924	
Low percentage honors diploma grads in high school (when compared to high percentage) (zhonor)	0.001	0.037	1.001	

When compared to plans for a four-year degree or higher: (zedexp2)				
Undecided/other/no response	-0.17	0.053	0.844	**
Aspire to a high school diploma or less	-0.3	0.083	0.741	****
Aspire to less than a two-year degree	-0.333	0.089	0.716	****
Aspire to a two-year degree	-0.218	0.066	0.804	**
When compared to students with a B cumulative college GPA: (zcumgpa)				
A	-0.198	0.06	0.821	**
C	-0.101	0.043	0.904	**
Below C	-1.018	0.039	0.361	****
Missing	-1.689	0.108	0.185	****
Students who lived on campus compared to students who lived off campus, with parents or elsewhere (zhousing)				
	0.358	0.036	1.43	****
When compared to students who enrolled in a public research university (zenroll)				
Other four-year college	-0.058	0.042	0.944	
Two-year college	-1.137	0.057	0.321	****
When compared to students who received no financial aid (zaid2)				
21st Century Scholar with aid	-0.26	0.099	0.771	**
Other aid recipient	-0.007	0.049	0.993	
Comparison group for enrollment outcome is nonpersisters ****p<0.001, ***p<0.01, **p<0.05, *p<0.10 N of cases= 24,062† -2 Log likelihood= 37,1916.855 Chi-square= 14.955** McFadden= 0.160 Nagelkerke= 0.350				
†1790 cases were excluded from the regression due to missing values.				

Appendix 3

Attainment analyses for low-income students

Table 3.1. Descriptive Statistics for Variables in the Logistic Regression for Enrollment Outcomes for *Low-income, Financial Aid Recipients: Indiana's Public Colleges 1999-2003*

Variable	Values	Number of cases	Percentage
Gender	Male and unknown	1,338	42.2%
	Female	1,829	57.8%
Ethnicity	Missing or prefer not to answer	535	16.9%
	Other minority	201	6.3%
	African American	435	13.7%
	White	1,996	63.0%
Parental education level	Parent(s) went to college	2,461	77.7%
	No college for parent(s) or unknown parent education	706	22.3%
Who the student lived with in ninth grade	Live with one parent	988	31.2%
	Do not live with parent	152	4.8%
	Live with two parents or unknown living situation	2,027	64.0%
Main language spoken in the home	Spanish or other language	26	0.8%
	English or unknown	3,141	99.2%
Grade point average in ninth grade	Missing/did not answer	206	6.5%
	Mostly As	263	8.3%
	Mixed Bs and Cs and Mostly Cs	1,081	34.1%
	Mixed Cs and Ds or lower	244	7.7%
	Mixed As and Bs and Mostly Bs	1,373	43.4%
Percentage of graduates in the student's high school who earned an Honors diploma	Low percentage of honors graduates	2,370	79.6%
	High percentage of honors graduates	609	20.4%
Locale of high school attended	Urban	650	20.5%
	Rural	617	19.5%
	Urban fringe, town and unknown	1,900	60.0%
Student's aspirations in ninth grade for education completion	Undecided/other/no response	540	17.1%
	Aspire to a high school diploma or less	177	5.6%
	Aspire to less than a two-year degree	148	4.7%
	Aspire to a two-year degree	271	8.6%
	Aspire to a four-year degree or higher	2,031	64.1%
Percentage of students in the student's high school who are minorities	Relatively low minority concentration	2,115	70.7%
	Relatively High minority concentration	878	29.3%

Percentage of students in the student's school who receive free or reduced-price lunches	Low percentage of students	2,015	66.5%
	High percentage of students	1,015	33.5%
Dependency status	Self-supporting	355	11.2%
	Dependent on parents or indeterminate	2,812	88.8%
College cumulative grade point average	A	225	7.1%
	B	1,113	35.1%
	C	557	17.6%
	Below C	1,111	35.1%
	Missing	161	5.1%
Living situation while in college	On campus	1,212	38.3%
	Live off campus, with parents or elsewhere	1,955	61.7%
Institutional type	Other four-year college	1,631	51.5%
	Two-year college	1,114	35.2%
	Research university	422	13.3%
Aid package	21st Century Scholar with aid	391	12.3%
	Other aid recipient	2,776	87.7%
Persistence	Nonpersisters	1,623	51.2%
	Persisters	1,544	48.8%

**Table 3.2 Logistic Regression Analysis of Variables Associated with Persistence by
Low-income, Financial Aid Recipients Enrolled in
Indiana's Public Colleges 1999-2003**

Variables	Coefficient	Std. Err.	Odds ratio	Sig.
Female compared to male and unknown (zsex3)	-0.063	0.087	0.939	
When compared to Whites: (white)				
Missing or prefer not to answer (Eth_Miss)	0.52	0.135	1.682	****
Other minorities (Min_oth)	0.265	0.16	1.303	*
African American (Black)	-0.002	0.177	0.998	
Parents went to college compared to no or unknown parent higher education (zxfirst3)	0.107	0.104	1.113	
When compared to living with two parents or unknown living situation (Live_no)				
Live with one parent (Live_one)	0.019	0.481	1.019	
Do not live with parent (Live_two)	0.223	0.095	1.25	**
Spanish or other language spoken at home compared to English or unknown language spoken at home (zxlangu3)	-0.241	0.211	0.786	
When compared to Mixed As and Bs and Mostly Bs GPA in the 9th Grade (GPA_ABB)				
Missing/did not answer (GPA_Miss)	-0.585	0.228	0.557	**
Mostly As (GPA_A)	0.232	0.165	1.261	
Mixed Bs and Cs and Mostly Cs (GPA_BCC)	-0.152	0.102	0.859	
Mixed Cs and Ds or lower (GPA_CD)	-0.338	0.186	0.713	*
Self-supporting students when compared to students dependent on parents or indeterminate dependency status (depend3)	-0.009	0.138	0.991	
When compared to suburban/town/unknown: (Loc_town)				
Urban school locale (Loc_urb)	0.451	0.125	1.57	****
Rural school locale (Loc_rur)	-0.1	0.111	0.905	
Low percentage of students in the student's school who receive free or reduced-price lunches (when compared to high percentage) (zlunch2)	0.269	0.119	1.308	**
Low percentage minority students in high school (compared to high percentage) (zminor2)	0.013	0.14	1.013	
Low percentage honors diploma grads in high school (when compared to high percentage) (zhonor2)	-0.321	0.107	0.725	**
When compared to plans for a four-year degree or higher: (Ed_4yr)				
Undecided/other/no response (Ed_undec)	-0.06	0.138	0.942	
Aspire to a high school diploma or less (Ed_HS)	-0.016	0.2	0.984	
Aspire to less than a two-year degree (Ed_lt2yr)	-0.156	0.205	0.856	
Aspire to a two-year degree (Ed_2yr)	0.183	0.154	1.201	

When compared to students with a B cumulative college GPA: (CGPA_B)				
A (CGPA_A)	0.032	0.169	1.032	
C (CGPA_C)	-0.403	0.118	0.668	**
Below C (CGPA_CLO)	-1.591	0.104	0.204	****
Missing (CGPA_MIS)	-1.557	0.233	0.211	****
Students who lived on campus compared to students who lived off campus, with parents or elsewhere (zhouse2)	0.203	0.094	1.225	**
When compared to students who enrolled in a public research university (En_res)				
Other four-year college (En_4yr)	-0.355	0.137	0.701	**
Two-year college (En_2yr)	-1.394	0.152	0.248	****
When compared to students who received financial aid but were not Scholars: (Aid_othe)				
Aid recipients who also got Twenty-first Century scholarships (Aid_21)	0.015	0.131	1.015	
****p<0.001, ***p<0.01, **p<0.05, *p<0.10				
N of cases= 2,931†				
-2 Log likelihood= 3,372.811				
Chi-square= 687.338**				
Nagelkerke= 0.279				

†236 cases were excluded from the regression due to missing values.

Table 3.3 Descriptive statistics for variables in the Multinomial Regression for Enrollment Outcomes for *Low-income, Financial Aid Recipients:* Indiana's Public Colleges 1999-2003

Variable	Values	Number of cases	Percentage
Gender	Male and unknown	1,338	42.2%
	Female	1,829	57.8%
Ethnicity	Missing or prefer not to answer	535	16.9%
	Other minority	201	6.3%
	African American	435	13.7%
	White	1,996	63.0%
Parental education level	Parent(s) went to college	2,461	77.7%
	No college for parent(s) or unknown parent education	706	22.3%
Who the student lived with in ninth grade	Live with one parent	988	31.2%
	Do not live with parent	152	4.8%
	Live with two parents or unknown living situation	2,027	64.0%
Main language spoken in the home	Spanish or other language	26	0.8%
	English or unknown	3,141	99.2%
Grade point average in ninth grade	Missing/did not answer	206	6.5%
	Mostly As	263	8.3%
	Mixed Bs and Cs and Mostly Cs	1,081	34.1%
	Mixed Cs and Ds or lower	244	7.7%
	Mixed As and Bs and Mostly Bs	1,373	43.4%
Percentage of graduates in the student's high school who earned an honors diploma	Low percentage of honors graduates	2,370	79.6%
	High percentage of honors graduates	609	20.4%
Locale of high school attended	Urban	650	20.5%
	Rural	617	19.5%
	Urban fringe, town and unknown	1,900	60.0%
Student's aspirations in ninth grade for education completion	Undecided/other/no response	540	17.1%
	Aspire to a high school diploma or less	177	5.6%
	Aspire to less than a two-year degree	148	4.7%
	Aspire to a two-year degree	271	8.6%
	Aspire to a four-year degree or higher	2,031	64.1%
Percentage of students in the student's high school who are minorities	Relatively low minority concentration	2,115	70.7%
	Relatively High minority concentration	878	29.3%
Percentage of students in the student's school who receive free or reduced-price lunches	Low percentage of students	2,015	66.5%
	High percentage of students	1,015	33.5%

Dependency status	Self-supporting	355	11.2%
	Dependent on parents or indeterminate	2,812	88.8%
College cumulative grade point average	A	225	7.1%
	B	1,113	35.1%
	C	557	17.6%
	Below C	1,111	35.1%
	Missing	161	5.1%
Living situation while in college	On campus	1,212	38.3%
	Live off campus, with parents or elsewhere	1,955	61.7%
Institutional type	Other four-year college	1,631	51.5%
	Two-year college	1,114	35.2%
	Research university	422	13.3%
Aid package	21st Century Scholar with aid	391	12.3%
	Other aid recipient	2,776	87.7%
Enrollment outcomes	Nonpersister, no degree	1,458	46.0%
	Persister, no degree	1,148	36.2%
	Two-year degree	257	8.1%
	Four-year degree, including those with Both Two- and Four-Year Degrees	304	9.6%

Table 3.4, Part A. Multinomial Regression Analysis of Variables Associated With Completion of Four-year Degree, Including Those with Both Two- and Four-Year Degrees for *Low-income, Financial Aid Recipients:* Indiana's Public Colleges 1999-2003

Variables	Coefficient	Std. Err.	Odds ratio	Sig.
Female compared to male and unknown (zsex3)	-0.175	0.165	0.839	
When compared to Whites: (zxsethn2)				
Missing or prefer not to answer	0.582	0.245	1.789	**
Other minorities	-0.686	0.414	0.504	*
African American	0.33	0.327	1.392	
Parents went to college compared to no or unknown parent higher education (zxfirst2)	-0.005	0.185	0.995	
When compared to living with two parents or unknown living situation (zxslive2)				
Live with one parent	0.022	0.181	1.022	
Do not live with parent	-0.147	0.404	0.863	
Spanish or other language spoken at home compared to English or unknown language spoken at home (zxlangu2)	-0.535	1.112	0.586	
When compared to Mixed As and Bs and Mostly Bs GPA in the 9th Grade (zxcgpa2)				
Missing/did not answer	-0.126	0.433	0.881	
Mostly As	0.546	0.236	1.726	**
Mixed Bs and Cs and Mostly Cs	0.02	0.206	1.02	
Mixed Cs and Ds or lower	0.068	0.408	1.07	
Self-supporting students when compared to students dependent on parents or indeterminate dependency status (depend2)	-0.163	0.303	0.85	
When compared to suburban/town/unknown: (zlocale2)				
Urban school locale	0.42	0.238	1.522	*
Rural school locale	-0.247	0.204	0.781	
Low percentage of students in the student's school who receive free or reduced-price lunches (when compared to high percentage) (zlunch)	0.219	0.223	1.245	
Low percentage minority students in high school (compared to high percentage) (zminor)	0.54	0.273	1.716	**
Low percentage Honors diploma grads in high school (when compared to high percentage) (zhonor)	0.202	0.19	1.224	
When compared to plans for a four-year degree or higher: (zedexp2)				
Undecided/other/no response	-0.25	0.28	0.779	
Aspire to a high school diploma or less	-0.074	0.409	0.929	
Aspire to less than a two-year degree	-0.571	0.486	0.565	
Aspire to a two-year degree	-0.211	0.395	0.81	

When compared to students with a B cumulative college GPA: (zcumgpa)				
A	0.661	0.229	1.937	**
C	-0.829	0.206	0.437	****
Below C	-3.955	0.465	0.019	****
Missing	-21.866	0	3E-10	
Students who lived on campus compared to students who lived off campus, with parents or elsewhere (zhousing)	0.743	0.172	2.102	****
When compared to students who enrolled in a public research university (zenroll)				
Other four-year college	-0.678	0.192	0.508	****
Two-year college	-4.226	0.538	0.015	****
When compared to students who received financial aid but were not Scholars: (zaid4)				
Aid recipients who also got Twenty-first Century scholarship	-0.012	0.238	0.988	
Dependent variable: enrollment outcome by 2003 ****p<0.001, ***p<0.01, **p<0.05, *p<0.10 N of cases= 2,931† -2 Log likelihood=4,996.503 Chi-square=273.823 McFadden=0.181 Nagelkerke=0.360				

†236 cases were excluded from the regression due to missing values.

Table 3.4, Part B. Multinomial Regression Analysis of Variables Associated With Completion of Two-Year Degree for *Low-income, Financial Aid Recipients: Indiana's Public Colleges 1999-2003*

Variables	Coefficient	Std. Err.	Odds ratio	Sig.			
Female compared to male and unknown (zsex3)	-0.24	0.217	0.787				
When compared to Whites: (zxsethn2)							
Missing or prefer not to answer	0.524	0.317	1.689	*			
Other minorities	0.55	0.349	1.732				
African American	0.045	0.425	1.046				
Parents went to college compared to no or unknown parent higher education (zxfirst2)	-0.56	0.306	0.571	*			
When compared to living with two parents or unknown living situation (zxslive2)							
Live with one parent	0.523	0.221	1.688	-0.128	0.552	0.88	
Spanish or other language spoken at home compared to English or unknown language spoken at home (zxlangu2)	-0.045	1.086	0.956				
When compared to Mixed As and Bs and Mostly Bs GPA in the 9th Grade (zxcgpa2)							
Missing/did not answer	-0.751	0.524	0.472				
Mostly As	-0.156	0.465	0.855				
Mixed Bs and Cs and Mostly Cs	-0.31	0.243	0.733				
Mixed Cs and Ds or lower	-0.649	0.459	0.522				
Self-supporting students when compared to students dependent on parents or indeterminate dependency status (depend2)	0.178	0.302	1.195				
When compared to suburban/town/unknown: (zlocale2)							
Urban school locale	0.111	0.317	1.117				
Rural school locale	-0.297	0.268	0.743				
Low percentage of students in the student's school who receive free or reduced-price lunches (when compared to high percentage) (zlunch)	0.315	0.295	1.37				
Low percentage minority students in high school (compared to high percentage) (zminor)	-0.123	0.347	0.884				
Low percentage Honors diploma grads in high school (when compared to high percentage) (zhonor)	0.507	0.285	1.661	*			
When compared to plans for a four-year degree or higher: (zedexp2)							
Undecided/other/no response	0.312	0.311	1.366				
Aspire to a high school diploma or less	0.262	0.455	1.299				
Aspire to less than a two-year degree	-0.268	0.504	0.765				
Aspire to a two-year degree	0.743	0.315	2.103	<p align="center">54</p>			

When compared to students with a B cumulative college GPA: (zcumgpa)				
A	0.22	0.326	1.247	
C	-0.908	0.3	0.403	**
Below C	-2.069	0.284	0.126	****
Missing	-2.635	0.739	0.072	****
Students who lived on campus compared to students who lived off campus, with parents or elsewhere (zhousing)	-0.252	0.247	0.777	
When compared to students who enrolled in a public research university (zenroll)				
Other four-year college	0.486	0.503	1.626	
Two-year college	0.949	0.507	2.582	*
When compared to students who received financial aid but were not Scholars: (zaid4)				
Aid recipients who also got Twenty-first Century scholarship	0.706	0.28	2.026	**
Dependent variable: enrollment outcome by 2003 ****p<0.001, ***p<0.01, **p<0.05, *p<0.10 N of cases= 2,931† -2 Log likelihood=4,996.503 Chi-square=273.823 McFadden=0.181 Nagelkerke=0.360				

†236 cases were excluded from the regression due to missing values.

Table 3.4, Part C. Multinomial Regression Analysis of Variables Associated with Persisting with No Degree for *Low-income, Financial Aid Recipients: Indiana's Public Colleges 1999-2003*

Variables	Coefficient	Std. Err.	Odds ratio	Sig.
Female compared to male and unknown (zsex3)	-0.013	0.092	0.987	
When compared to Whites: (zxsethn2)				
Missing or prefer not to answer	0.517	0.142	1.676	****
Other minorities	-0.025	0.186	0.976	
African American	0.266	0.165	1.305	
Parents went to college compared to no or unknown parent higher education (zxfirst2)	0.178	0.109	1.195	
When compared to living with two parents or unknown living situation (zxslive2)				
Live with one parent	0.219	0.1	1.245	**
Do not live with parent	-0.249	0.225	0.779	
Spanish or other language spoken at home compared to English or unknown language spoken at home (zxlangu2)	0.08	0.49	1.083	
When compared to Mixed As and Bs and Mostly Bs GPA in the 9th Grade (zxcgpa2)				
Missing/did not answer	-0.641	0.244	0.527	**
Mostly As	0.155	0.176	1.168	
Mixed Bs and Cs and Mostly Cs	-0.161	0.107	0.852	
Mixed Cs and Ds or lower	-0.352	0.197	0.703	*
Self-supporting students when compared to students dependent on parents or indeterminate dependency status (depend2)	-0.025	0.147	0.975	
When compared to suburban/town/unknown: (zlocale2)				
Urban school locale	0.502	0.13	1.653	****
Rural school locale	-0.037	0.118	0.964	
Low percentage of students in the student's school who receive free or reduced-price lunches (when compared to high percentage) (zlunch)	0.283	0.127	1.327	**
Low percentage minority students in high school (compared to high percentage) (zminor)	-0.055	0.146	0.947	
Low percentage honors diploma grads in high school (when compared to high percentage) (zhonor)	0.33	0.115	1.391	**
When compared to plans for a four-year degree or higher: (zedexp2)				
Undecided/other/no response	-0.086	0.146	0.918	
Aspire to a high school diploma or less	-0.039	0.212	0.962	
Aspire to less than a two-year degree	-0.069	0.214	0.933	
Aspire to a two-year degree	0.138	0.164	1.148	

When compared to students with a B cumulative college GPA: (zcumgpa)				
A	-0.3	0.194	0.741	
C	-0.247	0.125	0.781	**
Below C	-1.319	0.109	0.267	****
Missing	-1.27	0.241	0.281	****
Students who lived on campus compared to students who lived off campus, with parents or elsewhere (zhousing)	0.156	0.099	1.168	
When compared to students who enrolled in a public research university (zenroll)				
Other four-year college	-0.265	0.145	0.767	*
Two-year college	-1.344	0.162	0.261	****
When compared to students who received financial aid but were not Scholars: (zaid4)				
Aid recipients who also got Twenty-first Century scholarship	-0.055	0.139	0.946	
Dependent variable: enrollment outcome by 2003 ****p<0.001, ***p<0.01, **p<0.05, *p<0.10 N of cases= 2,931† -2 Log likelihood=4,996.503 Chi-square=273.823 McFadden=0.181 Nagelkerke=0.360				

†236 cases were excluded from the regression due to missing values.

References

- Advisory Committee on Student Financial Assistance (ACSFSA). (2003). *Review of NCES research on financial aid and college participation and omitted variables and Sample selection issues in the NCES research on financial aid and college participation*. Reports prepared for ACSFA by D. Heller & W. E. Becker. Washington, DC: Author.
- Hossler, D., J. Schmit, & Vesper, N. (1999). *Going to college: How social, economic, and educational factors influence the decisions students make*. Baltimore: Johns Hopkins University Press.
- Musoba, G. D. (2004). Postsecondary encouragement for diverse students: A reexamination of the Twenty-first Century Scholars program. In E. P. St. John (Ed.), *Readings on equal education: Vol. 19. Public policy and college access: Investigating the federal and state roles in equalizing postsecondary opportunity* (pp. 153-180). New York: AMS Press.
- St. John, E. P. (2003). *Refinancing the college dream: Access, equal opportunity, and justice for taxpayers*. Baltimore, MD: Johns Hopkins University Press.
- St. John, E. P., Hu, S., & Weber, J. (2000). Keeping public colleges affordable: A study of persistence in Indiana's public colleges and universities. *Journal of Student Financial Aid*, 30(1), 21-32.
- St. John, E. P., Hu, S., & Weber, J. (2001). State policy and the affordability of public higher education: The influence of state grants on persistence in Indiana. *Research in Higher Education*, 42, 401-428.
- St. John, E. P., Musoba, G. D., & Chung, C. G. (2004). Academic access: The impact of state education policies. In E. P. St. John (Ed.), *Readings on equal education: Vol. 19. Public policy and college access: Investigating the federal and state roles in equalizing postsecondary opportunity* (pp. 131-151). New York: AMS Press.
- St. John, E. P., Musoba, G. D., & Chung, C. G. (2004). *Academic preparation and college success: Analyses of Indiana's 2000 high school class*. IPAS Research Report #04-03. Available online at <http://www.indiana.edu/~ipas1/>
- St. John, E. P., Musoba, G. D., & Chung, C. G. (2004, July 21). *Academic preparation and college success: Analyses of Indiana's 2000 high school class*. [Report prepared for the Indiana Commission on Higher Education and the Lumina Foundation for Education.]. Bloomington, IN: Indiana Project on Academic Success.
- St. John, E. P., Musoba, G. D., Simmons, A. B., & Chung, C. G. (2002). *Meeting the access challenge: Indiana's Twenty-first Century Scholars program*. [New Agenda Series, Vol. 4, No. 4]. Indianapolis: Lumina Foundation for Education.
- St. John, E. P., Musoba, G. D., & Simmons, A. B., Chung, C. G., Schmit, J., & Peng, C. J. (2004). Meeting the access challenge: An examination of Indiana's Twenty-first Century Scholars program. *Research in Higher Education*, 45(8).

Endnotes

1. While six-year degree attainment is becoming the minimum standard, four-year degree attainment should still be the goal.
2. The development of longitudinal databases that track students from high school through college requires coordination across data systems. The database developed for the study of the 1999 cohort used information collected from a survey on ninth-graders, along with college records and student aid applications (see Appendix A). We did not have data on high school courses, and we used high school information on curriculum as a statistical control for the high school level.
3. One of the major challenges facing Indiana and most states has been to place college-preparatory curricula in all high schools. Urban and rural schools were slower to fully implement these curriculum options than were other schools, and course selection is still limited in these schools.
4. As of October 2004, the Indiana Career and Postsecondary Advancement Center (ICPAC) is now officially known as the *Learn More Resource Center*, Indiana's Pre-K to College Connection.
5. With the recent decisions to make Core 40 the default diploma in Indiana, a substantially larger percentage of low-income students should have the benefits of this curriculum. There is a risk that raising graduation requirements in areas such as math and language, an artifact of requiring a Core 40 for the standard diploma, could reduce high school graduation rates (St. John, Musoba, Chung, & Simmons, 2004). However, the preparation benefits of this reform may outweigh these potential risks. This is an issue that merits further study and debate.
6. The response rate to this survey was 80 percent. Further details on data sources can be found in Appendix 1.
7. These studies had information on whether students applied for aid, whether they requested to have aid information sent to an out-of-state institution, whether they enrolled in a public college in state, and whether they applied for aid and received aid for a private in-state institution (St. John, Musoba, Simmons, & Chung, 2002). Students who applied for aid out of state and did not enroll in an in-state college were probably out-of-state students.
8. These approximates are from *Meeting the Access Challenge: Indiana's Twenty-first Century Scholars Program* (2002). If a student applied for or received state aid but was not enrolled in a public institution, (s)he was assumed to be enrolled in a private in-state institution. If a student applied for aid with the intent to attend an out-of-state institution, (s)he was assumed to enroll in an out-of-state institution.
9. The standard error for the variable "missing grades" was substantial (see Table 2.4, Parts A & B). This is largely an artifact of the practice of not reporting grades for students who dropped before the term was ended and grades were reported. Our aim in these analyses was to retain all cases and note all missing cases. Given this goal, this standard error term could not be avoided.
10. This model specification resulted in a better fit, compared with the first multinomial logistic regression performed on all students: McFadden R^2 has

improved from 0.16 to 0.18. This improved fit gives more credence to our findings of significance for the coefficient on Scholars.

About the authors

Edward P. St. John is the Aglo D. Henderson Collegiate Professor of Education at the Center for the Study of Higher and Postsecondary Education, University of Michigan. His research focuses on the impact of education and finance policies in K-12 and higher education. He is author of *Refinancing the College Dream: Access, Equal Opportunity, and Justice for Taxpayers* and is series editor of *Readings on Equal Education*.

Jacob P. K. Gross is a doctoral student in educational leadership and policy studies at Indiana University. His research interests include linkages between access policies and economic globalization, critical whiteness, multicultural education, the scholarship of teaching and learning, and persistence of low-income and historically underrepresented students in postsecondary education.

Glenda D. Musoba holds a doctorate in Higher Education and Student Affairs from Indiana University. She is the Associate Director/Policy Analyst for the Indiana Project on Academic Success. Her research interests include state and federal education policy and finance, access, equity and student persistence in higher education, and K-12 school reform.

Anna S. Chung is a doctoral candidate in economics at Indiana University and is a research associate for the Indiana Project on Academic Success. Her dissertation research on students in for-profit postsecondary institutions has been supported by grants from the American Educational Research Association and the National Association of Student Financial Aid Administrators. She was also awarded the Cameron Fincher Fellowship by the Association for Institutional Research for the best dissertation proposal of the year.

Publication information

Lumina Foundation for Education, a private, independent foundation, strives to help people achieve their potential by expanding access and success in education beyond high school. Through research, grants for innovative programs and communication initiatives, Lumina Foundation addresses issues surrounding financial access and educational retention and degree or certificate attainment — particularly among underserved student groups, including adult learners.

Focusing on these areas, the Foundation frames issues and explores new solutions through fact-based research. Because we strive to be a credible and objective source of information on issues affecting higher education, Lumina Foundation encourages original sponsored research. The results of that research, and therefore the content of this and other Lumina Foundation publications, do not necessarily represent the views of the Foundation or its employees.

Believing that published research may have the longest-term impact on higher education, the Foundation publishes and disseminates articles, research reports and books. We prefer topics and approaches that are more practical than theoretical, and which emphasize pragmatic tools that will assist institutions and public policy-makers.

Additional information about the Foundation’s research and grant-making programs may be obtained from:

Leah Meyer Austin
Senior Vice President for Research and Programs
laustin@luminafoundation.org

Additional information about Lumina Foundation programs and communications may be obtained from:

Susan O. Conner
Executive Vice President for Impact Strategy
sconner@luminafoundation.org

Lumina Foundation for Education
P. O. Box 1806
Indianapolis, IN 46206-1806
800-834-5756
www.luminafoundation.org