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A Profile of Successful Pell Grant Recipients

Time to Bachelor's Degree and Early Graduate School Enrollment

Statistical Analysis Report

NCES 2009-156

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JULY 2009

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Executive Summary

Among students who completed a bachelor's degree in 1999–2000, some 36 percent[1] had received at least one Pell Grant[2] during their undergraduate education. This report describes the characteristics of Pell Grant recipients who graduated from college and compares them with graduates who did not receive Pell Grants.

The time it took to complete a bachelor's degree (time to degree) and early graduate school enrollment (1 year after graduating from college) were the two major outcomes measured in this study. Although Pell Grant recipients had a longer median time to degree than nonrecipients (62 months vs. 52 months) (table 4), receipt of a Pell Grant was actually associated with a *shorter* time to degree in the multivariate regression analysis, which controlled for several related variables simultaneously (e.g., parent's education, undergraduate risk characteristics, and type of institution) (table 15). No measurable differences were found between Pell Grant recipients and nonrecipients in the percentage enrolled in graduate school 1 year after college, in either the bivariate (table 10) or the multivariate (table 16) analyses in this study.

As undergraduates, Pell Grant recipients were generally very low-income students (Wei and Horn 2002). They were at a greater disadvantage than nonrecipients socioeconomically and a larger proportion had characteristics that put them at risk for attrition. Readers should keep in mind these differences when comparing the outcomes of these two populations. Readers who are interested in the postsecondary persistence and attainment rates of Pell Grant recipients may refer to separate studies

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[1] U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

[2] The Pell Grant program is the largest federal need-based grant program available to undergraduate students. In order to qualify for a Pell Grant, students must demonstrate financial need. An expected family contribution (EFC) is first calculated for each financial aid applicant. The EFC is the amount a family can be expected to contribute toward a student's price of attendance and is based upon several factors, the most important of which are the family's income and assets. Other factors are also included in the formula, such as the age of the oldest parent and the total number of children in the family who are in college. To be eligible for federal need-based aid, including a Pell Grant, the student's EFC must be lower than his or her qualified expenses. Qualified expenses include tuition, fees, books, and supplies (and living expenses for those enrolled at least half time). Pell Grant award amounts are determined by subtracting the maximum Pell Grant award from the student's EFC.

addressing this issue (Wei and Horn 2002; U.S. Department of Education 2003, indicator 23).

Data Sources

The data for this report are derived from the 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01). B&B:2000/01 consists of a representative sample of college graduates originally drawn from the 1999–2000 National Postsecondary Student Aid Study (NPSAS), an ongoing national study of undergraduate and graduate students enrolled in postsecondary institutions located in the 50 states and Puerto Rico. Students who received a bachelor's degree and were initially interviewed in 1999–2000 were then interviewed again 1 year later in 2001. This analysis examines their time to degree and rates of graduate school enrollment within the first year after graduation from college.

For the bivariate analysis, all differences were tested using standard statistical *t* tests, with the significance level set at $p < 0.05$ to determine the statistical significance of any differences in estimates among the subgroups being studied. An ordinary least squares (OLS) regression analysis was used to describe the relationship between specific student characteristics and time to degree, and a logistic regression was used in the analysis of graduate school enrollment.

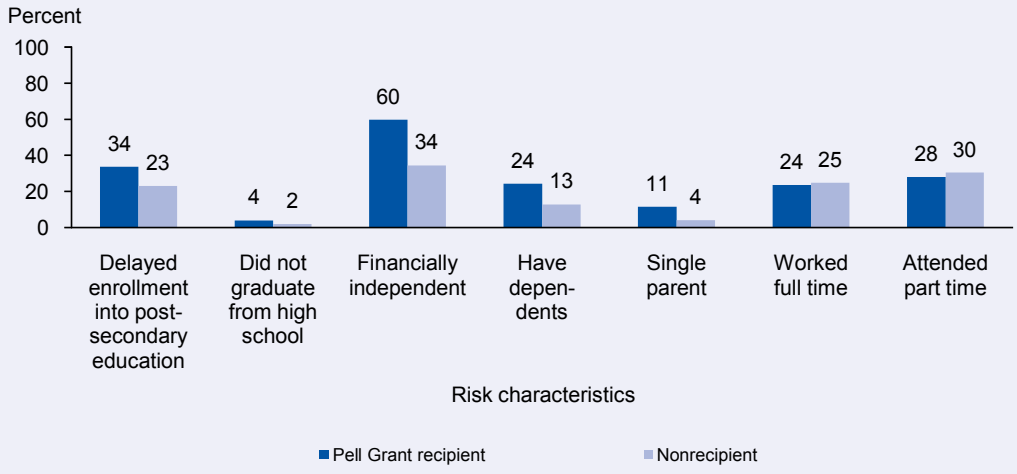
Background

Previous studies on Pell Grant recipients (Wei and Horn 2002; U.S. Department of Education 2003, indicator 23) examined a population of students who began their postsecondary education in 1995–96 and included those who persisted as well as those who left without completing an undergraduate degree.[3] The focus of this study is on *successful* Pell Grant recipients, defined as those who have attained a bachelor's degree.

An analysis of 1999–2000 bachelor's degree recipients (B&B:2000/01) revealed that proportionately more Pell Grant recipients had one of several undergraduate risk characteristics than nonrecipients (figure A). One-third (34 percent) had delayed

[3] The data used in those reports (Wei and Horn 2001 and U.S. Department of Education 2003) are from the Beginning Postsecondary Students Longitudinal Studies (BPS:96/98 and BPS:96/01, respectively). The two follow-up interviews that took place both 3 and 6 years after the initial interview extracted information on whether students had completed a degree, were still enrolled, or had not completed and left postsecondary education altogether.

Figure A. Among 1999–2000 college graduates, percentage with undergraduate risk characteristics by Pell Grant status: 2001



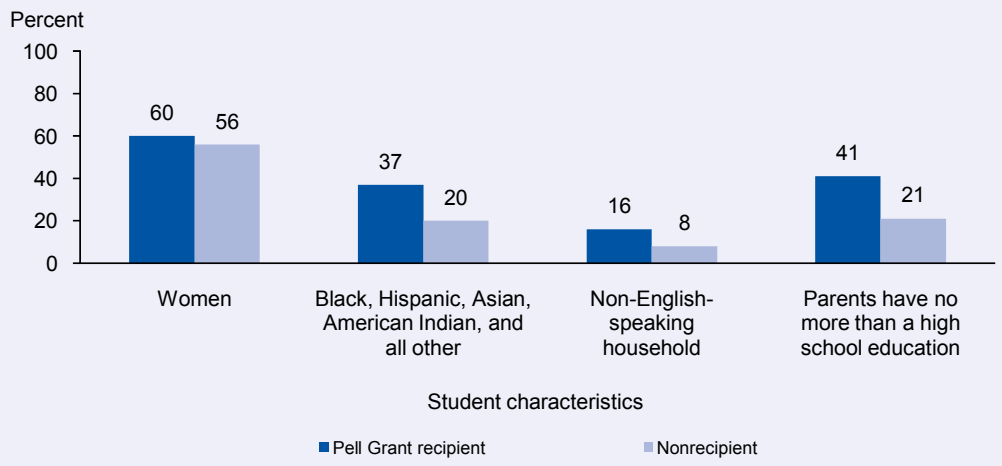
NOTE: "Did not graduate from high school" is defined as those who did not graduate from a high school in the United States, but may have passed a General Educational Development (GED) exam, attained another high school equivalency credential, were home schooled, attended a foreign high school, or did not have any high school credentials.
Standard error tables are available at http://nces.ed.gov/das/library/reports.asp.
SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

their enrollment in postsecondary education, compared with one-fourth (23 percent) of nonrecipients, and 4 percent did not have a regular high school diploma, compared with 2 percent of nonrecipients. Upon graduation, 60 percent of Pell Grant recipients were financially independent, compared with about one-third (34 percent) of nonrecipients; one-fourth (24 percent) had dependents of their own, compared with 13 percent of nonrecipients; and 11 percent were single parents, compared with 4 percent of nonrecipients. However, no measurable differences were observed in the percentages of Pell Grant recipients and nonrecipients who were employed full time, or had attended part time while they were enrolled, two characteristics that also reduce a student's eligibility for the Pell Grant.[4]

Pell Grant recipient graduates also differed from nonrecipient graduates in terms of other background demographic characteristics. In particular, a larger percentage had parents with only a high school education or less (41 vs. 21 percent) (figure B). Pell Grant recipients whose parents did not attend college took longer to complete their

[4] Eligibility for the Pell Grant can be affected by a student's enrollment status as well as income earned through employment. Undergraduates who work while they are enrolled are more likely to have incomes that decrease their eligibility for federal need-based aid. Those who are enrolled less than half time cannot claim room and board as a qualified expense, and also may have lower tuition expenses due to their part-time status. Some low-income students are not eligible for Pell Grants because they are enrolled part time at very low cost institutions or they work while they are enrolled, or do both.

Figure B. Among 1999–2000 college graduates, percentage with selected student characteristics by Pell Grant status: 2001



NOTE: American Indian includes Alaska Native, Black includes African American, and Hispanic includes Latino. "All other" includes Pacific Islander, Native Hawaiian, and those who identified themselves as belonging to other or more than one race. Race categories exclude Hispanic origin unless specified. Standard error tables are available at http://nces.ed.gov/das/library/reports.asp.
SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

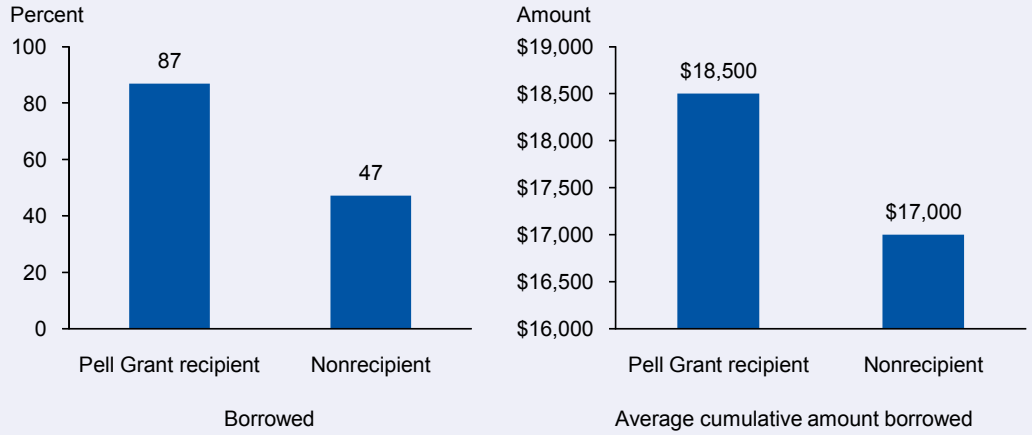
bachelor's degrees (table 6) and enrolled in graduate school at lower rates (table 11) than Pell Grant recipients whose parents had at least a bachelor's degree. Of all the student characteristics that were analyzed, parent's education was the only factor consistently related to both outcomes, in both the bivariate and multivariate analyses.

In addition, a larger percentage of Pell Grant recipients than nonrecipients came from non-English-speaking households (16 vs. 8 percent), and a larger proportion were Black, Hispanic, Asian, American Indian, or from other racial/ethnic backgrounds other than White (37 vs. 20 percent). Also, a larger proportion of Pell Grant recipients than nonrecipients were women (60 vs. 56 percent).

The institutions from which Pell Grant recipients received a bachelor's degree and their fields of study as undergraduates also differed from nonrecipients to some extent. For example, in 1999–2000, lower percentages of Pell Grant recipients earned a bachelor's degree from doctorate-granting institutions (which are primarily research universities) than did nonrecipients (44 vs. 47 percent from public doctoral institutions, and 12 vs. 15 percent from private not-for-profit doctoral institutions) (table 3). Pell Grant recipients majored more often in education (11 vs. 7 percent) and in the social and behavioral sciences (20 vs. 18 percent) and less often in business (17 vs. 24 percent) than nonrecipients.

Reflecting their relative economic disadvantage, nearly 9 in 10 Pell Grant recipient college graduates (87 percent) had borrowed to finance their educational expenses, compared with roughly one-half (47 percent) of nonrecipients (figure C). Among borrowers, the average cumulative loan amount among Pell Grant recipients was also higher than the average amount for nonrecipients ($18,500 vs. $17,000).

Figure C. Among 1999–2000 college graduates, percentage who borrowed for their undergraduate education and the average cumulative amount borrowed, by Pell Grant status: 2001

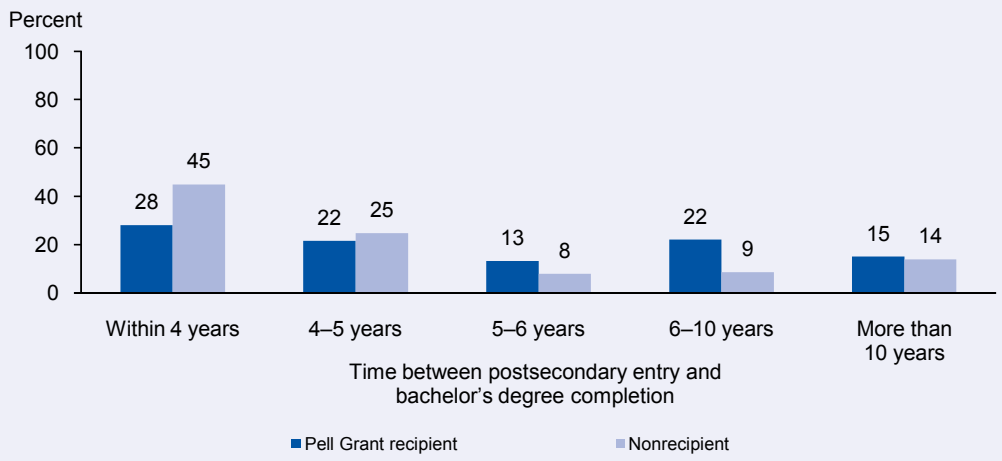


NOTE: Standard error tables are available at http://nces.ed.gov/das/library/reports.asp.
SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

Time to Bachelor's Degree

Although the bivariate analysis in this report showed that Pell Grant recipients who graduated in 1999–2000 took longer to complete a bachelor's degree than their counterparts who did not receive Pell Grants (figure D), the multivariate regression analysis in this study revealed that after controlling for transfer and stopout rates and several other related variables, receiving a Pell Grant was actually associated with a *shorter* time to degree.

Figure D. Among 1999–2000 college graduates, percentage distribution by time between postsecondary entry and bachelor's degree completion and Pell Grant status: 2001



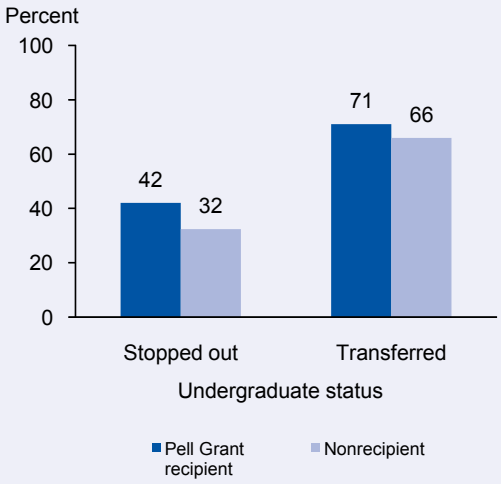
NOTE: Detail may not sum to totals because of rounding. Standard error tables are available at http://nces.ed.gov/das/library/reports.asp.
SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

The results of the bivariate analysis are related to the higher transfer and stopout rates among Pell Grant recipients when compared with nonrecipients (figure E). Stopping out for 4 or more months[5] or transferring from one postsecondary institution to another are both strongly related to a longer time to degree. About 9 in 10 (89 percent) Pell Grant recipients who took longer than 6 years to graduate had transferred from one institution to another and about 8 in 10 (81 percent) had stopped out (table 7).

Many such characteristics as transferring, stopping out, having parents who did not graduate from college, and having undergraduate risk factors were found in greater proportions among Pell Grant recipients than nonrecipients, and these same characteristics are also associated with a longer time to degree. After controlling for some of these factors in the bivariate analysis of this study, the association between Pell Grant status and a longer time to degree disappeared. For example, among 1999–2000 college graduates who had stopped out at one point during their undergraduate education, the median time to degree was 92 months for both Pell Grant recipients and nonrecipients (table 4). In addition, after controlling for parent's education and racial/ethnic background, no measurable differences were

[5] "Stopping out" is defined in this study as those who left postsecondary education for 4 or more months during their undergraduate years, and then returned to complete their degrees at either the same or a different institution.

Figure E. Among 1999–2000 college graduates, percentage who had stopped out and percentage who had transferred to another postsecondary institution during their undergraduate years, by Pell Grant status: 2001



NOTE: "Stopped out" is defined as having left postsecondary education for 4 or more months and then returning to complete a degree at either the same or a different institution. Standard error tables are available at http://nces.ed.gov/das/library/reports.asp.
SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

observed in the median time to degree between Pell Grant recipients and nonrecipients if they were Black or Hispanic, or had parents who did not graduate from college (table 5).

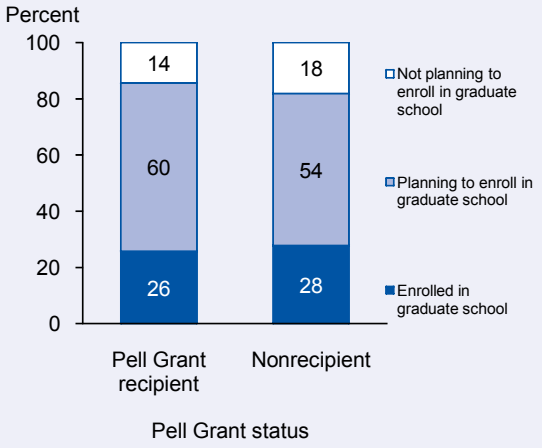
Early Graduate School Enrollment

About one-fourth (26 percent) of Pell Grant recipients who graduated with a bachelor's degree in 1999–2000 had enrolled in graduate school 1 year later—a percentage that was not measurably different from nonrecipients (28 percent) (figure F). This finding also held after the multivariate analysis was applied. Moreover, a higher percentage of Pell Grant recipients than nonrecipients were not enrolled but planned to pursue a graduate education sometime in the future (60 vs. 54 percent).[6] These findings are noteworthy given that Pell Grant recipients tended to have lower GPAs (table 3) and a higher percentage of them had parents who did not graduate from college (table 1)—two characteristics that are also associated with a lower rate of graduate school enrollment (table 16).

For Pell Grant recipients, early graduate school enrollment differed by age, racial/ethnic background, and marital status among women. Those who were 22 years old or younger had higher rates of graduate school enrollment than those who were between 23 and 29 years old (table 11). About one-third (32 percent) of Blacks, compared with one-fourth (24 percent) of Whites, were enrolled in graduate school 1 year after graduating from college. Married women had a lower rate of enrollment in graduate school than unmarried women, regardless of whether they had children (table 14). However, neither marital status nor having children appeared to be

[6] "Planning to enroll in graduate school" includes one or more of the following activities: having been accepted to graduate school but not yet enrolled, having applied to graduate school, and having plans to attend graduate school in the future.

Figure F. Among 1999–2000 college graduates, percentage distribution by graduate school enrollment status and Pell Grant status: 2001



NOTE: "Planning to enroll in graduate school" includes having been accepted but not yet enrolled, having applied, or having plans to attend in the future. Detail may not sum to totals because of rounding. Standard error tables are available at http://nces.ed.gov/das/library/reports.asp.
SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

associated with early graduate school enrollment among men who were Pell Grant recipients.

The amount of undergraduate debt that Pell Grant recipient graduates accumulated did not appear to be associated with early enrollment in graduate school or with their future plans for enrollment (table 12). Undergraduate risk characteristics also were not related to a lower likelihood of early graduate enrollment (table 13).

Foreword

The estimates and statistics reported in the tables and figures of this report are based on data from the 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01), a cohort of college graduates who received a bachelor's degree in 1999–2000. The data were gathered from interviews of bachelor's degree recipients who were first identified in the base year study, as part of the 1999–2000 National Postsecondary Student Aid Study (NPSAS:2000), and then interviewed again 1 year later in spring 2001. NPSAS has been conducted by the U.S. Department of Education's National Center for Education Statistics every 3 to 4 years since 1986–87. NPSAS is based on a nationally representative sample of all undergraduate, graduate, and first-professional students in postsecondary education institutions. For NPSAS:2000, information was obtained from more than 900 postsecondary institutions on approximately 50,000 undergraduate, 9,000 graduate, and 3,000 first-professional students. They represented nearly 17 million undergraduate students, 2.4 million graduate students, and 300,000 first-professional students who were enrolled at some time between July 1, 1999, and June 30, 2000.

For B&B:2000/01, members of the NPSAS:2000 sample who completed a bachelor's degree between July 1, 1999, and June 30, 2000, were identified and contacted for a follow-up interview. The B&B:2000/01 cohort includes bachelor's degree recipients who were enrolled sporadically over time as well as those who completed without any interruptions. Data on enrollment, attendance, and student demographic characteristics are available, as well as information on the immediate transitions of college graduates into work, graduate school, or other endeavors.

All of the data in this report were produced using the B&B:2000/01 Data Analysis System (DAS), an online computer application available to the public. Researchers can use the DAS to generate tables from B&B and several other surveys. Tables provided by the DAS include estimates and design-adjusted standard errors to use when testing for statistical significance. More detail about the DAS and the statistical tests used in this report are presented in appendix B of this report. If you are interested in using or learning more about the DAS, information is also available on the NCES website at http://nces.ed.gov/das.

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Introduction

For more than three decades, the federal Pell Grant program has been the nation's largest need-based grant program available to low-income undergraduates.[1] In 2006–07, the federal government awarded over $13 billion in Pell Grants to more than 5 million undergraduate students (U.S. Department of Education 2007). The goal of the Pell Grant program is to help students with financial need enroll in and graduate from college by providing them with a basic foundation of financial aid, to which they may add other grants, loans, or work-study awards from both federal and nonfederal sources.

Among students who completed a bachelor's degree in 1999–2000 some 36 percent had received at least one Pell Grant during their undergraduate education.[2] Undergraduate students qualify for a Pell Grant based upon their financial need, enrollment intensity, and educational expenses. In order to receive a Pell Grant, students must first demonstrate financial need. An expected family contribution (EFC) is calculated for each financial aid applicant. The EFC is the amount a family can be expected to contribute toward a student's price of attendance and is based upon several factors, the most important of which are the family's income and assets. Other factors are also included in the formula, such as the age of the oldest parent and the total number of children in the family who are in college. To be eligible for federal need-based aid, including a Pell Grant, the student's EFC must be lower than his or her qualified expenses. Qualified expenses include tuition, fees, books, and supplies (and living expenses for those enrolled at least half time). Pell Grant award amounts are determined by subtracting the maximum Pell Grant award from the student's EFC.

Because the program is designed to assist the neediest students, recipients are generally from very low-income families. For example, among full-time beginning postsecondary students who applied for aid in 1995–96, three-quarters (77 percent)

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[1] Pell Grants were first authorized by the 1972 amendments to the Higher Education Act of 1965. Although the program is structured as an entitlement, its funding has been dependent on the amount that Congress appropriates each year. In the past, actual appropriations have generally resulted in a lesser amount than the maximum authorized by statute. In 2004, Congress was authorized to make awards of up to $4,500; however, in 2006–07, the maximum Pell Grant award was $4,050.

[2] U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01). Approximately 3,900 survey respondents were Pell Grant recipients. Data not shown in tables.

of dependent students whose families had an annual income in the lowest 25th percentile (under $25,000) received a Pell Grant, while only 2 percent of those with incomes at or above the median income level ($45,000 or more) received one (Wei and Horn 2002).

Previous research has shown that Pell Grant recipients begin college with socioeconomic characteristics and educational experiences that are associated with increased chances of not finishing college (Wei and Horn 2002).[3] Proportionately fewer Pell Grant recipients are "traditional students"—those who enroll in college right after graduating from high school and are financially supported by their parents. For example, compared with low- or middle-income nonrecipients,[4] Pell Grant recipients have higher rates of being financially independent,[5] delaying their postsecondary enrollment, not having a regular high school diploma,[6] having children or other dependents, or being single parents.

One would expect to find lower rates of persistence among Pell Grant recipients due to their disadvantaged backgrounds. Nevertheless, Wei and Horn (2002) found no measurable difference in the rates at which Pell Grant recipients persist in or complete a degree program after 3 years, compared with low- and middle-income nonrecipients who had similar SAT/ACT scores and had taken similarly rigorous courses in high school.

When these same students were followed up after 6 years, there was no measurable difference in the percentage of Pell Grant recipients and nonrecipients who earned a bachelor's degree if they had first enrolled in a public 2-year institution (9 percent for both groups) (U.S. Department of Education 2003, indicator 23). However, among those who started at a 4-year institution, Pell Grant recipients had lower bachelor's degree attainment rates when compared with nonrecipients. At public 4-year

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[3] Horn and Premo (1995) identified the following seven undergraduate risk characteristics, each of which are associated with an increased rate of attrition: not having a regular high school diploma, delaying enrollment in postsecondary education, having independent status for financial aid purposes, having dependents of one's own, being a single parent, working full time while enrolled, and attending part time.

[4] For comparability, high-income nonrecipients (those with family incomes in the highest 25th percentile) were removed from the analysis in the study conducted by Wei and Horn (2002). Middle- and high-income students generally are not eligible for Pell Grants because their incomes are too high. In some cases, low-income students do not qualify for Pell Grants because their expenses are too low. For example, low-income nonrecipients could be attending only part time, or attending a very low cost institution, or both.

[5] Defined in federal financial need analysis as being age 24 or older or for other reasons not financially dependent on their parents.

[6] Includes those who have a GED or other high school equivalency certificate, or have no high school credentials.

institutions, 46 percent of Pell Grant recipients and 51 percent of nonrecipients had attained a bachelor's degree within 6 years; at private not-for-profit 4-year institutions, 56 percent of Pell Grant recipients and 68 percent of nonrecipients had attained a bachelor's degree within 6 years. While the percentage graduating from a 4-year institution within 6 years may have been lower among Pell Grant recipients than nonrecipients, the percentage that was still enrolled in college was higher (21 vs. 17 percent at public 4-year institutions and 13 vs. 9 percent at private not-for-profit 4-year institutions).[7]

This study expands on the earlier research by analyzing factors related to timely completion of a bachelor's degree (i.e., within 6 years or less) and early enrollment in a graduate program (i.e., enrollment within 1 year of graduating from college) while comparing college graduates who received a Pell Grant with those who did not. Pell Grant recipients have characteristics that are very different from nonrecipients, and many of these characteristics put Pell Grant recipients at a disadvantage when compared with nonrecipients. Readers should keep this in mind when comparing the outcomes of these two populations.

Time to degree among Pell Grant recipients was analyzed after controlling for a number of factors, including stopping out for 4 or more months, transfer history, undergraduate risk characteristics, parent's education, type of institution, undergraduate major, and race/ethnicity. The characteristics used in this study were based on those used in previous reports (McCormick and Horn 1996; Bradburn et al. 2003). Bradburn et al. (2003), for example, found that among those who graduated with a bachelor's degree in 1999–2000, parent's educational attainment was inversely related to time to degree and students who delayed their entry into postsecondary education took longer to complete once enrolled.

To analyze graduate school enrollment among Pell Grant recipients 1 year after receiving a bachelor's degree, several demographic and undergraduate enrollment characteristics were used in this study that were included in previous studies on college graduates and graduate school enrollment. Clune, Nunez, and Choy (2001) showed how enrollment in graduate school 4 years after college was related to family formation activities and how these relationships differed by gender. Results from that

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[7] The data that were used in these prior reports (Wei and Horn 2002; U.S. Department of Education 2003, indicator 23) were drawn from a nationally representative survey of first-time beginners in postsecondary education, the Beginning Postsecondary Students Longitudinal Study (BPS:96/98/01). Because BPS:96/98/01 follows students 3 and 6 years after they first enrolled in college, it does not include persistence rates more than 6 years after first enrollment. The database used in this report (B&B:2000/01) is confined to college graduates only and therefore does not include information on Pell Grant recipients who did not graduate with a bachelor's degree.

study showed that marriage prior to receiving a bachelor's degree was negatively related to graduate school enrollment for women, but not for men. Nevill and Chen (2007) found that among graduates who were interviewed 10 years after graduating from college, several variables played a role in their graduate school enrollment, persistence, or attainment, such as students' racial/ethnic background, age, undergraduate major, grade point average (GPA), gender, and parent's education. For example, Asians and Pacific Islanders, younger students, students who were single, students who majored in the biological sciences, and students with GPAs of 3.5 or higher all had higher rates of graduate school enrollment when compared with those who did not have these characteristics.

Major Research Questions

The study addresses the following major research questions:

- Among college graduates, what student characteristics distinguish Pell Grant recipients from nonrecipients?
- How long did Pell Grant recipients take to attain a bachelor's degree? Did they take longer to attain a bachelor's degree than nonrecipients?
- At what rate did Pell Grant recipients enroll in graduate education within 1 year of receiving a bachelor's degree and what percentage planned to attend graduate school? How do these rates compare with those of nonrecipients?
- Among college graduates who received Pell Grants, what factors are related to timely bachelor's degree attainment and to early graduate school enrollment?
- How is Pell Grant status related to time to degree and early graduate school enrollment, if related factors are held constant? Does receiving a Pell Grant have an independent association with either outcome?

This report does not address the impact of the Pell Grant program on postsecondary access, persistence, or attainment among low-income students.[8] Nor does it discuss whether the amount of assistance provided by the program constitutes an adequate amount of financial aid. Furthermore, the report cannot address how the value of a

[8] Many other studies have a more in-depth discussion and analysis of the experiences of Pell Grant recipients and low-income students in postsecondary education. Readers may refer to some of these more recent publications, among others: Heller (2004), King (2002, 2006), Pascarella et al. (2004), Walpole (2003), and Choy (2000). Two studies that focus specifically on persistence and attainment among Pell Grant recipients include Wei and Horn (2002) and U.S. Department of Education (2003), indicator 23.

Pell Grant award has changed over time relative to college costs. Finally, readers should note that the methods used in this analysis are entirely descriptive in nature and that no causal inferences should be drawn from the results.

Organization of the Report and Data Sources

The data used in this report come from the 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01). The B&B cohort is drawn from the National Postsecondary Student Aid Study (NPSAS:2000) sample. NPSAS is an ongoing national survey conducted by the U.S. Department of Education. Approximately every 4 years, undergraduate and graduate students attending postsecondary institutions located in the 50 states and Puerto Rico are interviewed for NPSAS. The survey includes questions about students' expenses, financial aid, income, background characteristics, educational goals, academic preparedness, and other items.

B&B:2000/01 tracks the experiences of college graduates who received baccalaureate degrees during the 1999–2000 academic year. They were first interviewed as part of NPSAS:2000, with a follow-up interview conducted in spring 2001. Students were asked questions about their undergraduate education, future employment plans, and educational expectations; in the follow-up survey, they were asked about their job search activities, graduate education, and employment. Just over one-third of B&B participants received a Pell Grant at some point during their undergraduate years.[9]

This analysis includes simultaneous comparisons *between* Pell Grant recipients and nonrecipients and *among* groups of Pell Grant recipients only. First, the study examines the amount of time taken to complete a degree among Pell Grant recipients versus nonrecipients and then identifies factors related to time to degree among Pell Grant recipients only. Second, the study looks at rates of enrollment in graduate school among Pell Grant recipients versus nonrecipients and identifies the factors related to such enrollment among Pell Grant recipients only.

For the bivariate analysis, all differences were tested using standard statistical *t* tests, with the significance level set at $p < 0.05$ to determine the statistical significance of any differences in estimates among the subgroups being studied. For the multivariate analysis of time to degree, an ordinary least squares (OLS) regression was used to describe the relationship between student characteristics and time to degree. The

[9] U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01). Data not shown in tables.

multivariate analysis of early graduate school enrollment consisted of a logit analysis because the outcome variable is dichotomous. The Wald F test was used to evaluate the statistical significance of each coefficient whereby the square of the estimate of the regression coefficient is divided by the square of the estimate of its standard error. The test uses the chi-square distribution with 1 degree of freedom and $p < 0.05$.

College Graduates in 2001: Comparing Pell Grant Recipients and Nonrecipients

The characteristics that were analyzed in this study can be divided into three major categories: demographic characteristics, undergraduate enrollment characteristics, and undergraduate risk characteristics. Demographic characteristics include gender, race/ethnicity, parent's level of education, and other characteristics that are generally not determined by individuals. Undergraduate enrollment characteristics include the type of institution from which they graduated and activities such as transferring and stopping out. Undergraduate risk characteristics are factors that have been associated with a higher risk of attrition from undergraduate education. They include not having a regular high school diploma, delaying enrollment in postsecondary education, being financially independent, having dependents of one's own, being a single parent, working full time while enrolled, and attending part time.

When Pell Grant recipient graduates were compared with nonrecipient graduates in terms of their demographic, enrollment, and undergraduate risk characteristics, the differences between the two groups were consistent with the findings from previous studies of beginning postsecondary students (U.S. Department of Education 2003, indicator 23; Wei and Horn 2002).

Student Demographic Characteristics

Among those who graduated with a bachelor's degree in 1999–2000, the percentage of Pell Grant recipients who had at least one parent with a bachelor's degree or higher was much lower than it was for nonrecipients (36 vs. 61 percent) (table 1).

In addition, the gender and racial/ethnic composition of Pell Grant recipients differed from that of nonrecipients: a larger percentage of Pell Grant recipients than nonrecipients were women (60 vs. 56 percent), and compared with nonrecipients, Pell Grant recipients had a smaller percentage of those who were White (63 vs. 80 percent), and larger percentages of those who were Hispanic (13 vs. 6 percent), Black (12 vs. 6 percent), Asian (7 vs. 5 percent), American Indian (1 percent vs. less than 1 percent), and Pacific Islander (1 percent vs. less than 1 percent). Among Pell Grant recipients, a smaller percentage of students indicated that English was their primary language than was the case among nonrecipients (84 vs. 92 percent). Finally, Pell

Table 1. Percentage distribution of 1999–2000 college graduates by Pell Grant status and selected demographic characteristics: 2001

Demographic characteristic	Pell Grant recipients	Nonrecipients
Total	**100.0**	**100.0**
Gender		
Women	60.0	55.9
Men	40.0	44.2
Age at graduation		
22 or younger	23.1	38.7
23–24	31.2	33.9
25–29	26.9	10.1
30 or older	18.8	17.3
Primary language spoken at home		
English	84.0	92.3
Other language	16.0	7.7
Parent's highest level of education		
High school or less	41.1	21.1
Some postsecondary education	22.9	18.0
Bachelor's degree or higher	36.0	61.0
Race/ethnicity[1]		
White	63.3	79.7
Black	11.8	5.8
Hispanic	13.2	5.9
Asian	6.8	5.2
Pacific Islander	1.0	0.5
American Indian	0.9	0.4
Other or more than one race	2.9	2.7

[1] Black includes African American, Hispanic includes Latino, Pacific Islander includes Native Hawaiian, and American Indian includes Alaska Native. Race categories exclude Hispanic origin unless specified. Those who identified themselves as belonging to another race or more than one race are grouped into the category "Other or more than one race."
NOTE: Detail may not sum to totals because of rounding. Standard error tables are available at http://nces.ed.gov/das/library/reports.asp.
SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

Grant recipients tended to be older than nonrecipients when they received a bachelor's degree. About one-fourth (23 percent) of Pell Grant recipients were 22 years old or younger when they received a bachelor's degree, while 39 percent of nonrecipients were in this age group.

Undergraduate Risk Characteristics

Among those who graduated in 1999–2000, a larger percentage of Pell Grant recipients than nonrecipients had characteristics that were associated with being at risk for not completing a bachelor's degree.[10] About one-third (34 percent) of Pell Grant recipients delayed their enrollment in postsecondary education after high school, while about one-fourth (23 percent) of nonrecipients did so (table 2). Compared with nonrecipients, Pell Grant recipients also had higher percentages of graduates who were considered financially independent for financial aid purposes (60 vs. 34 percent), who had dependents of their own (24 vs. 13 percent), who were single parents (11 vs. 4 percent), and who did not have a regular high school diploma (4 vs. 2 percent). In addition, and also consistent with previous studies (Wei and Horn 2002), no statistically measurable differences were observed in the percentages of Pell Grant recipients and nonrecipients who attended part time (28 and 30 percent) or were employed full time (24 and 25 percent), two undergraduate risk characteristics that also decrease a student's eligibility for receipt of a Pell Grant.[11]

Undergraduate Enrollment Characteristics

Pell Grant recipients and nonrecipients also differed by the types of institutions from which they graduated. A higher percentage of Pell Grant recipients graduated from public 4-year non-doctoral institutions than did nonrecipients (23 vs. 17 percent) (table 3), and lower percentages of Pell Grant recipients graduated from both public (44 vs. 47 percent) and private not-for-profit doctoral institutions (12 vs. 15 percent).

Pell Grant recipients had a higher rate of transferring upward (such as transferring from a 2-year to a 4-year institution) during their undergraduate years (24 vs. 18 percent). Pell Grant recipients also had a higher rate of stopping out for 4 or more months during their undergraduate studies (42 vs. 32 percent). As will be discussed later, these two activities are strongly related to a longer time to degree.

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[10] Horn and Premo (1995) identified the following as risk characteristics among undergraduate students: did not receive a regular high school diploma, delayed postsecondary enrollment, is financially independent, has dependents of one's own, is a single parent, attended part time, and is employed full time.

[11] Eligibility for the Pell Grant can be affected by a student's enrollment status as well as income earned through employment. Undergraduates who work full time or attend only part time may not be eligible for a Pell Grant if their income is too high or their expenses are too low to qualify for need-based financial aid.

Table 2. Percentage distribution of 1999–2000 college graduates by Pell Grant status and undergraduate risk characteristics: 2001

Undergraduate risk characteristic	Pell Grant recipients	Nonrecipients
Total	**100.0**	**100.0**
High school diploma		
Did not receive a regular high school diploma	4.0	1.9
Received a regular high school diploma	96.0	98.1
Delayed enrollment into postsecondary education		
Delayed enrollment	33.7	23.0
Did not delay enrollment	66.3	77.0
Attendance intensity		
Enrolled part time	28.0	30.4
Enrolled full time	72.0	69.6
Worked while enrolled		
Worked full time	23.6	24.8
Worked part time	58.3	54.0
Did not work	18.2	21.2
Dependency status		
Independent	59.8	34.4
Dependent	40.2	65.6
Has dependents of one's own		
Has dependents	24.3	12.8
Does not have dependents	75.7	87.2
Single parent status		
Single parent	11.4	4.0
Not a single parent	88.6	96.0

NOTE: The following have been identified as characteristics that place undergraduate students at risk for attrition: not having received a regular high school diploma, delaying postsecondary enrollment, being financially independent, having dependents of one's own, being a single parent, attending part time, and being employed full time (Horn and Premo 1995). Those who did not receive a "regular high school diploma" include those who received a GED or other high school equivalency certificate and those who do not have any high school credential. Detail may not sum to totals because of rounding. Standard error tables are available at http://nces.ed.gov/das/library/reports.asp.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

Table 3. Percentage distribution of 1999–2000 college graduates by Pell Grant status and undergraduate enrollment characteristics: 2001

Undergraduate enrollment characteristic	Pell Grant recipients	Nonrecipients
Total	**100.0**	**100.0**
Bachelor's institution type		
Public non-doctorate-granting	23.1	17.2
Public doctorate-granting	43.5	47.2
Private not-for-profit non-doctorate-granting	19.4	19.4
Private not-for-profit doctorate-granting	12.1	14.8
Private for-profit	1.9	1.5
Undergraduate major GPA		
2.5 or lower	9.4	7.5
2.6–3.0	24.6	22.4
3.1–3.4	19.8	19.6
3.5 or higher	46.2	50.6
Undergraduate major		
Humanities	17.3	16.0
Social/behavioral sciences	19.6	17.6
Life sciences	5.7	6.1
Mathematics and physical sciences	2.6	2.7
Engineering	5.7	5.9
Education	11.4	7.4
Business/management	16.8	23.5
Health	7.7	8.1
Other technical/professional	13.3	12.7
Transfer status		
Never transferred	29.5	34.2
Downward transfer	14.1	14.6
Upward transfer	24.2	18.5
Lateral transfer	32.3	32.7
Stopout status		
Did not stop out	57.9	67.7
Stopped out[1]	42.1	32.3
Borrowing status		
Did not borrow	13.2	52.9
Borrowed	86.8	47.1
Average cumulative amount borrowed	$18,500	$17,000

[1]"Stopped out" is defined as having left postsecondary education for 4 or more months and then returning to complete a degree at either the same or a different institution.

NOTE: Detail may not sum to totals because of rounding. Standard error tables are available at http://nces.ed.gov/das/library/reports.asp.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

Pell Grant recipients' academic achievement as measured by their grade point averages (GPAs) was not as high as that of nonrecipients. A lower percentage of Pell Grant recipients (46 percent) than nonrecipients (51 percent) had a GPA in their undergraduate major that was higher than 3.5, and the percentage with GPAs of 2.5 or lower was 9 percent among Pell Grant recipients and 7 percent among nonrecipients.

Some differences were found between Pell Grant recipients and nonrecipients in the types of fields they studied. Compared with nonrecipients, a higher percentage of Pell Grant recipients majored in education (11 vs. 7 percent), and a slightly higher percentage majored in the social and behavioral sciences (20 vs. 18 percent). A lower percentage of Pell Grant recipients than nonrecipients majored in business (17 vs. 24 percent).

The percentage of Pell Grant recipients who borrowed to pay for their undergraduate education was higher than the percentage of nonrecipients who took out student loans (87 vs. 47 percent), and among those who did borrow, Pell Grant recipients had a higher average cumulative loan amount ($18,500 vs. $17,000).

Time to Degree

Among those who completed a bachelor's degree in 1999–2000, it took an average of 7 years for Pell Grant recipients to graduate, while nonrecipients did so in about 6 and a half years (i.e., 85 months vs. 79 months). Averages, however, can be affected by the magnitude of only a few cases at the high or low ends. In this instance, the average time to degree is longer than the median time to degree due to a small number of students taking a very long period of time to graduate. The median, therefore, is a more precise estimate of the spread within a population as to the length of time it takes most people to graduate. The median time to degree among Pell Grant recipients was 62 months (slightly over 5 years), while it was 52 months (about 4 years and 4 months) among nonrecipients.

However, many characteristics such as transferring, stopping out, and having parents who did not graduate from college, were found in greater proportions among Pell Grant recipients than nonrecipients—and these were also shown to be associated with a longer time to degree (discussed below). After controlling for some of these factors in the bivariate analysis—as well as in the multivariate analysis as will be discussed later—the association between Pell Grant status and a longer time to degree disappeared. For example, the median length of time it took to complete a bachelor's degree did not differ between Pell Grant recipients who stopped out and nonrecipients who stopped out. Both Pell Grant recipients and nonrecipients who stopped out during their undergraduate years had a median time to degree of 92 months (7 years and 8 months) (table 4). Furthermore, the average number of months to bachelor's degree completion was even shorter among Pell Grant recipients than nonrecipients (119 months vs. 133 months) when comparing only graduates who had stopped out.

There also were no measurable differences in median time to degree between Pell Grant recipients and nonrecipients whose parents did not graduate from college, or who identified their race/ethnicity as Black or Hispanic (table 5).[12] Later in this

[12] Eligibility for the Pell Grant can be affected by a student's enrollment status as well as income earned through employment. Undergraduates who work full time or attend only part time may not be eligible for a Pell Grant if their income is too high or their expenses are too low to qualify for need-based financial aid.

Table 4. Among 1999–2000 college graduates, percentage who graduated within 6 years, and average and median number of months to bachelor's degree, by Pell Grant status and undergraduate enrollment characteristics: 2001

Undergraduate enrollment characteristic	Percent in 6 years or less		Average number of months		Median number of months	
	Pell Grant recipients	Non-recipients	Pell Grant recipients	Non-recipients	Pell Grant recipients	Non-recipients
Total	**62.8**	**77.5**	**84.7**	**79.2**	**62**	**52**
Bachelor's institution type						
Public non-doctorate-granting	57.9	70.6	91.6	88.8	65	57
Public doctorate-granting	64.0	81.2	80.0	72.5	62	52
Private not-for-profit non-doctorate-granting	63.3	71.2	91.9	90.1	56	45
Private not-for-profit doctorate-granting	71.6	85.5	72.4	66.9	53	45
Private for-profit	33.1	35.4	117.8	173.7	95	160
Transfer status						
Did not transfer	85.6	94.6	59.0	54.6	52	45
Transferred	53.3	68.6	95.4	91.8	69	56
Stopout status						
Did not stop out	87.8	94.9	57.5	53.7	52	45
Stopped out[1]	31.1	41.3	119.3	132.8	92	92
Undergraduate major						
Humanities	60.6	78.8	87.9	76.1	63	50
Social/behavioral sciences	64.7	82.9	82.9	69.5	57	46
Life sciences	66.3	86.7	75.6	61.7	57	46
Mathematics and physical sciences	79.0	85.4	71.9	61.3	56	45
Engineering	61.6	83.0	78.6	70.8	64	56
Education	60.9	84.2	85.9	73.5	64	52
Business/management	59.9	68.0	94.3	93.8	64	56
Health	59.3	69.1	90.4	97.7	64	56
Other technical/professional	65.9	77.7	76.1	79.0	58	52
Undergraduate major GPA						
2.5 or lower	67.1	80.4	72.7	71.6	61	53
2.6–3.0	55.5	77.4	90.5	77.1	67	55
3.1–3.4	62.8	79.6	84.3	74.8	63	51
3.5 or higher	61.4	72.3	92.9	91.7	63	52

[1] "Stopped out" is defined as having left postsecondary education for 4 or more months and then returning to complete a degree at either the same or a different institution.

NOTE: Standard error tables are available at http://nces.ed.gov/das/library/reports.asp.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

Table 5. Among 1999–2000 college graduates, percentage who graduated within 6 years, and average and median number of months to bachelor's degree, by Pell Grant status and demographic characteristics: 2001

Demographic characteristic	Percent in 6 years or less		Average number of months		Median number of months	
	Pell Grant recipients	Non-recipients	Pell Grant recipients	Non-recipients	Pell Grant recipients	Non-recipients
Total	**62.8**	**77.5**	**84.7**	**79.2**	**62**	**52**
Gender						
Women	61.6	77.5	87.9	80.7	60	51
Men	64.6	77.5	80.0	77.3	63	52
Primary language spoken at home						
English	60.0	76.8	90.8	82.7	64	52
Other language	64.5	62.1	79.7	89.4	63	58
Parent's highest level of education						
High school or less	57.5	53.6	93.2	125.1	65	68
Some postsecondary education	67.9	73.6	80.5	84.3	57	55
Bachelor's degree or higher	67.4	88.4	77.1	62.1	57	46
Race/ethnicity[1]						
White	62.6	79.3	85.7	77.1	60	51
Black	63.8	61.7	90.7	110.3	62	59
Hispanic	63.6	63.6	78.7	90.2	63	57
Asian	69.1	82.9	65.6	64.9	57	48
Pacific Islander	‡	‡	‡	‡	‡	‡
American Indian	44.3	‡	119.4	‡	76	‡
Other or more than one race	60.2	76.9	90.1	76.5	61	48

‡ Reporting standards not met (too few cases for a reliable estimate).

[1] Black includes African American, Hispanic includes Latino, Pacific Islander includes Native Hawaiian, and American Indian includes Alaska Native. Race categories exclude Hispanic origin unless specified. Those who identified themselves as belonging to another race or more than one race are grouped into the category "Other or more than one race."

NOTE: Standard error tables are available at http://nces.ed.gov/das/library/reports.asp.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

report (in the section titled "Multivariate Analysis of Time to Degree and Graduate Enrollment") these and other variables are used in a multivariate analysis of time to degree.[13]

[13] Multivariate analyses are used to determine whether an independent relationship exists between one of several related characteristics and a specific outcome (in this case, time to degree) by controlling for multiple factors simultaneously.

Pell Grant Recipients: Factors Related to Timely Completion

The major characteristics that were related to time to degree among Pell Grant recipients include parent's education, stopping out or transferring, the type of institution from which they graduated, and having undergraduate risk characteristics. The measure of time to degree used in tables 6 through 9 is the percentage of Pell Grant recipients graduating within a specific time frame. Those who took longer than 6 years to complete a bachelor's degree were compared with those who graduated in 6 years or less.

A higher percentage of those taking longer than 6 years to graduate had parents who did not go to college than did those who took less time. Nearly one-half (47 percent) of those who took more than 6 years to graduate had parents with only a high school education, compared with 37 percent of those who graduated in 6 years or less (table 6).

Table 6. Among 1999–2000 college graduates who received a Pell Grant, percentage distribution by parent's education and time to bachelor's degree: 2001

	Parent's highest level of education		
Time to degree	High school or less	Some post-secondary education	Bachelor's degree or higher
Total	**41.1**	**22.9**	**36.0**
Completed bachelor's in 6 years or less	36.8	24.6	38.6
Completed bachelor's in more than 6 years	47.3	20.2	32.5

NOTE: Detail may not sum to totals because of rounding. Standard error tables are available at http://nces.ed.gov/das/library/reports.asp.
SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

Stopping out for 4 or more months or transferring from one institution to another were both strongly associated with a longer time to degree among Pell Grant recipients. Compared with those who had graduated in less time, a higher percentage of Pell Grant recipients who took more than 6 years to graduate had transferred from one institution to another (89 vs. 60 percent) or had stopped out (81 vs. 22 percent) at some point during their undergraduate years (table 7).

Table 7. Among 1999–2000 college graduates who received a Pell Grant, percentage distribution by transfer and stopout status, and time to bachelor's degree: 2001

	Transfer status		Stopout status	
Time to degree	Transferred	Did not transfer	Stopped out	Did not stopout
Total	**70.6**	**29.4**	**42.1**	**57.9**
Completed bachelor's in 6 years or less	59.8	40.2	21.5	78.5
Completed bachelor's in more than 6 years	88.5	11.5	81.3	18.7

NOTE: "Stopped out" is defined as having left postsecondary education for 4 or more months and then returning to complete a degree at either the same or a different institution. Detail may not sum to totals because of rounding. Standard error tables are available at http://nces.ed.gov/das/library/reports.asp.
SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

Time to degree varied to some extent by the types of institutions from which Pell Grant recipients graduated (table 8). Those who took longer than 6 years to graduate had higher rates of enrollment in public non-doctoral institutions (27 vs. 22 percent) and private for-profit institutions (3 vs. 1 percent), but lower rates of enrollment in private not-for-profit doctoral institutions (9 vs. 14 percent).

Table 8. Among 1999–2000 college graduates who received a Pell Grant, percentage distribution by degree-granting institution and time to bachelor's degree: 2001

Time to degree	Public non-doctorate-granting	Public doctorate-granting	Private not-for-profit non-doctorate-granting	Private not-for-profit doctorate-granting	Private for-profit
Total	**23.1**	**43.5**	**19.4**	**12.1**	**1.9**
Completed bachelor's in 6 years or less	21.7	44.7	18.9	13.7	0.9
Completed bachelor's in more than 6 years	26.6	42.5	18.5	9.2	3.2

NOTE: Detail may not sum to totals because of rounding. Standard error tables are available at http://nces.ed.gov/das/library/reports.asp.
SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

This study also found that among Pell Grant recipients, time to degree was strongly related to each of the undergraduate risk characteristics. A higher percentage of those who took longer than 6 years to attain their bachelor's degree had initially delayed their enrollment in postsecondary education after high school (47 vs. 25 percent), did not receive a regular high school diploma (7 vs. 2 percent), attended part time

(38 vs. 22 percent), worked full time (34 vs. 17 percent), had dependents (45 vs. 12 percent), and were single parents (20 vs. 6 percent) (table 9).

Independent status for financial aid purposes is another undergraduate risk characteristic but was not included in the analysis of time to degree among Pell Grant recipients. Independent status is strongly associated with a longer time to degree because it is largely based on the age of the student. All undergraduates who are 24 years or older are automatically considered to be financially independent. Hence, those with a longer time to degree (defined in this study as those who took more than 6 years to complete a bachelor's degree) would nearly all be considered financially independent, thereby confounding the analysis.

Table 9. Among 1999–2000 college graduates who received a Pell Grant, percentage with undergraduate risk characteristics, by time to bachelor's degree: 2001

Time to degree	Delayed enrollment into post-secondary education	No high school diploma	Enrolled part time	Worked full time	Had dependents	Single parent
Total	**33.7**	**4.0**	**28.0**	**23.6**	**24.3**	**11.4**
Completed bachelor's in 6 years or less	24.8	2.0	21.9	16.6	11.9	6.0
Completed bachelor's in more than 6 years	47.2	7.1	38.2	33.8	44.9	19.6

NOTE: Independent status for financial aid purposes is another undergraduate risk characteristic but was not included in the bivariate analysis of time to degree among Pell Grant recipients. Independent status is strongly associated with a longer time to degree because it is largely based on the age of the student. All undergraduates who are 24 years or older are automatically considered to be financially independent. Hence, those who took more than 6 years to complete a bachelor's degree would nearly all be considered financially independent, thereby confounding the analysis. Standard error tables are available at http://nces.ed.gov/das/library/reports.asp.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

Graduate School Enrollment

While one might assume that the financial and academic challenges that Pell Grant recipients face would result in lower rates of early enrollment in graduate school than nonrecipients, this was not the case. Among both Pell Grant recipients and nonrecipients who graduated in 1999–2000, no measurable difference was observed in the percentage of each group who were enrolled in graduate school in 2001 (between 26 and 28 percent) (table 10). Moreover, 60 percent of Pell Grant recipients indicated that they planned to enroll in graduate school sometime in the future.[14] This was higher than the percentage of nonrecipients (54 percent) who said they planned to enroll.

Table 10. Percentage distribution of 1999–2000 college graduates by early graduate school enrollment and receipt of Pell Grant: 2001

		Not enrolled in graduate school	
Pell Grant status	Enrolled in graduate school	Planning to enroll	Not planning to enroll
Total	**27.1**	**56.2**	**16.7**
Pell Grant recipients	25.8	59.9	14.3
Nonrecipients	27.8	54.1	18.0

NOTE: "Early graduate school enrollment" is defined as enrolling in graduate studies within 1 year of receiving a bachelor's degree. "Planning to enroll in graduate school" includes one or more of the following activities: having been accepted to graduate school but not yet enrolled, having applied to graduate school, and having plans to attend graduate school in the future. Detail may not sum to totals because of rounding. Standard error tables are available at http://nces.ed.gov/das/library/reports.asp.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

Pell Grant Recipients: Factors Related to Early Graduate Enrollment

The rate of early graduate enrollment was lower among Pell Grant recipients whose parents only had a high school education or less when compared with those whose parents had a bachelor's degree or higher (24 vs. 30 percent) (table 11).

[14] "Planning to enroll in graduate school" includes one or more of the following activities: having been accepted to graduate school but not yet enrolled, having applied to graduate school, and having plans to attend graduate school in the future.

Table 11. Among 1999–2000 college graduates who received a Pell Grant, percentage distribution by graduate enrollment status and selected demographic characteristics: 2001

Demographic characteristic	Enrolled in graduate school	Not enrolled in graduate school: Planning to enroll	Not enrolled in graduate school: Not planning to enroll
Total	**25.8**	**59.9**	**14.3**
Gender			
Men	25.6	58.7	15.7
Women	25.9	60.7	13.4
Age at graduation			
22 or younger	30.6	57.6	11.9
23–24	23.1	61.1	15.8
25–29	22.9	62.4	14.7
30 or older	28.6	56.9	14.5
Primary language spoken at home			
English	27.4	57.4	15.2
Other language	27.4	64.1	8.5
Parent's highest level of education			
High school or less	24.1	61.5	14.4
Some postsecondary education	25.9	60.2	13.9
Bachelor's degree or higher	30.2	55.3	14.5
Race/ethnicity[1]			
White	24.0	58.5	17.5
Black	31.6	63.5	4.9
Hispanic	28.7	60.5	10.8
Asian	23.7	63.2	13.1
Pacific Islander	‡	‡	‡
American Indian	35.8	59.7	4.4
Other or more than one race	30.7	60.6	8.7

‡ Reporting standards not met (too few cases for a reliable estimate).

[1] Black includes African American, Hispanic includes Latino, Pacific Islander includes Native Hawaiian, and American Indian includes Alaska Native. Race categories exclude Hispanic origin unless specified. Those who identified themselves as belonging to another race or more than one race are grouped into the category "Other or more than one race."

NOTE: "Early graduate school enrollment" is defined as enrolling in graduate studies within 1 year of receiving a bachelor's degree. "Planning to enroll in graduate school" includes one or more of the following activities: having been accepted to graduate school but not yet enrolled, having applied to graduate school, and having plans to attend graduate school in the future. Detail may not sum to totals because of rounding. Standard error tables are available at http://nces.ed.gov/das/library/reports.asp.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

However, early enrollment in graduate school among Pell Grant recipients did not differ by gender or by primary language spoken at home, although a higher percentage of those who came from non-English-speaking households than English-speaking households had plans to enroll in graduate studies in the future (64 vs. 57 percent). The youngest Pell Grant recipients (22 years and younger) had the highest percentage of early graduate enrollees when compared with those between the ages of 23 and 29.[15] Nearly one-third (32 percent) of Blacks had enrolled in graduate school compared with about one-fourth (24 percent) of Whites during their first year out of college.[16] No other differences in early graduate school enrollment were found to vary by race/ethnicity, due in part to sample size constraints.[17]

Several undergraduate enrollment characteristics were related to early graduate school enrollment. A higher percentage of Pell Grant recipients with grade point averages (GPAs) of 3.5 or higher in their undergraduate major had enrolled in graduate school (31 percent), compared with those who had GPAs that were 3.0 or lower (24 percent of recipients with GPAs between 2.6 and 3.0, and 23 percent of recipients with GPAs of 2.5 or lower) (table 12).[18] Pell Grant recipients who graduated from private not-for-profit doctoral institutions (31 percent) had a higher rate of early graduate school enrollment, when compared with public doctoral (25 percent) and private not-for-profit non-doctoral (23 percent) institutions. In addition, Pell Grant recipients who had majored in the social/behavioral sciences (32 percent) and the life sciences (39 percent) when they were undergraduates had a higher rate of early enrollment in graduate school than the overall average (26 percent).[19]

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[15] No statistically measurable differences were found between those age 30 or older and those in each of the other age groups due to the small sample size of those graduating from college at age 30 or older.

[16] It is not clear whether the relationship between graduate enrollment and race/ethnicity continues over time. Nevill and Chen (2007) conducted a study of all bachelor's degree recipients 10 years out of college. In the bivariate analysis, which was not limited to Pell Grant recipients, a higher percentage of Blacks were enrolled in graduate school when compared with Whites (45 vs. 39 percent). However, the subsequent multivariate analysis in that study did not reveal a measurable difference in graduate enrollment by race/ethnicity. The independent variables included in the regression analysis in that study were gender, race/ethnicity, age, parental education, undergraduate major, undergraduate GPA, marital status, number of dependents, and degree expectation. The data analyzed were from the 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:1993/03).

[17] Native Americans also had what appeared to be a higher rate of enrollment in graduate school (36 percent) than other racial/ethnic groups; however, due to small sample size these differences were not statistically significant.

[18] No statistically measurable difference was found between those with GPAs that were between 3.1 and 3.4 and 3.5 or higher.

[19] Those majoring in the physical sciences (including mathematics) appeared to have a higher rate of early graduate school enrollment as well (40 percent); however, the sample size may have contributed to the failure to find a significant difference between these two estimates.

Table 12. Among 1999–2000 college graduates who received a Pell Grant, percentage distribution by graduate enrollment status and selected undergraduate enrollment characteristics: 2001

Undergraduate enrollment characteristic	Enrolled in graduate school	Not enrolled in graduate school	
		Planning to enroll	Not planning to enroll
Total	**25.8**	**59.9**	**14.3**
Bachelor's institution type			
Public non-doctorate-granting	27.1	59.6	13.3
Public doctorate-granting	24.6	61.5	14.0
Private not-for-profit non-doctorate-granting	23.0	59.4	17.5
Private not-for-profit doctorate-granting	31.2	56.4	12.4
Private for-profit	31.3	55.1	13.6
Undergraduate major			
Humanities	26.5	60.8	12.6
Social/behavioral sciences	32.1	59.2	8.7
Life sciences	39.1	51.9	9.0
Mathematics and physical sciences	39.6	48.5	11.8
Engineering	23.9	57.9	18.2
Education	21.1	68.9	10.1
Business/management	21.6	59.4	19.0
Health	23.3	59.9	16.8
Other technical/professional	18.3	59.1	22.6
Undergraduate major GPA			
2.5 or lower	22.6	53.4	24.0
2.6–3.0	23.6	61.6	14.8
3.1–3.4	26.3	59.4	14.3
3.5 or higher	31.1	57.2	11.8
Cumulative undergraduate debt			
$0–5,500	26.3	59.4	14.4
$5,501–15,300	24.5	61.3	14.3
$15,301–22,800	25.9	59.0	15.1
$22,801 or higher	26.5	60.0	13.5

NOTE: "Early graduate school enrollment" is defined as enrolling in graduate studies within 1 year of receiving a bachelor's degree. "Planning to enroll in graduate school" includes one or more of the following activities: having been accepted to graduate school but not yet enrolled, having applied to graduate school, and having plans to attend graduate school in the future. Detail may not sum to totals because of rounding. Standard error tables are available at http://nces.ed.gov/das/library/reports.asp.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

The amount of undergraduate debt that Pell Grant recipients accumulated did not appear to be associated with their rates of enrollment in graduate school or with their future plans for enrollment. About one-fourth (between 24 and 26 percent across cumulative debt categories) of all Pell Grant recipients were enrolled in graduate

school within 1 year regardless of the level of debt they had incurred during their undergraduate years.

Although undergraduate risk characteristics are associated with an increased rate of attrition from college as well as a longer time to degree, it appears that once Pell Grant recipients have attained a bachelor's degree, these factors do not show any relationship with graduate-level education (table 13). Those who did not have a regular high school diploma appeared to enroll in graduate school at a lower rate than those who had a regular high school diploma, but there was not enough statistical evidence to support this finding. No other undergraduate risk characteristics were related to lower rates of early enrollment in graduate school among Pell Grant recipients.

Marital status, however, appeared to be strongly associated with early graduate enrollment for women. This finding is consistent with results from a previous study by Clune, Nunez, and Choy (2001). Among those under age 30 when they received a bachelor's degree, 27 percent of unmarried women were enrolled in graduate school, compared with 21 percent of married women (table 14). Furthermore, about one-fifth (21 percent) of married women did not have any plans to enroll, compared with 10 percent of unmarried women. The lower rate of graduate enrollment among married women under the age of 30 did not differ by whether they had children. Among men, there were no measurable differences in graduate school enrollment even after controlling for marital status and having children.

Table 13. Among 1999–2000 college graduates who received a Pell Grant, percentage distribution by graduate enrollment status and undergraduate risk characteristics: 2001

Undergraduate risk characteristic	Enrolled in graduate school	Not enrolled in graduate school	
		Planning to enroll	Not planning to enroll
Total	**25.8**	**59.9**	**14.3**
High school diploma			
Received a regular high school diploma	26.1	59.5	14.4
No regular high school diploma	16.5	69.3	14.2
Delayed enrollment into postsecondary education			
Did not delay	26.5	60.1	13.4
Delayed one year or longer	24.4	59.5	16.1
Attendance intensity			
Enrolled full time	26.7	59.9	13.4
Enrolled part time	23.5	59.8	16.8
Worked while enrolled			
Did not work	25.8	61.1	13.1
Worked part time	26.5	58.3	15.2
Worked full time	30.4	58.1	11.5
Dependency status			
Dependent	26.7	60.8	12.4
Independent	25.1	59.2	15.6
Has dependents of one's own			
No dependents	25.1	60.3	14.6
Has one or more dependents	27.9	58.7	13.4
Single parent status			
Not a single parent	25.3	59.7	14.9
Single parent	29.1	61.3	9.6

NOTE: The following have been identified as characteristics that place undergraduate students at risk for attrition: not having received a regular high school diploma, delaying postsecondary enrollment, being financially independent, having dependents of one's own, being a single parent, attending part time, and being employed full time (Horn and Premo 1995). Those who did not receive a "regular high school diploma" include those who received a GED or other high school equivalency certificate and those who do not have any high school credential. "Early graduate school enrollment" is defined as enrolling in graduate studies within 1 year of receiving a bachelor's degree. "Planning to enroll in graduate school" includes one or more of the following activities: having been accepted to graduate school but not yet enrolled, having applied to graduate school, and having plans to attend graduate school in the future. Detail may not sum to totals because of rounding. Standard error tables are available at http://nces.ed.gov/das/library/reports.asp.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

Table 14. Among 1999–2000 college graduates who received a Pell Grant and were under age 30 when they graduated, percentage distribution by graduate enrollment status, family formation activities, and gender: 2001

Characteristic	Enrolled in graduate school	Not enrolled in graduate school	
		Planning to enroll	Not planning to enroll
Total under age 30			
Total	**25.1**	**60.6**	**14.3**
Not married	26.4	61.8	11.8
Not married, no children	26.5	61.6	11.9
Not married, with children	27.0	61.8	11.3
Married	22.3	57.5	20.1
Married, no children	21.7	57.5	20.8
Married, with children	23.1	58.3	18.6
Women under age 30			
Total	25.2	61.4	13.4
Not married	27.4	62.6	10.1
Not married, no children	27.4	62.2	10.5
Not married, with children	27.5	64.6	7.9
Married	20.5	58.8	20.7
Married, no children	21.3	57.3	21.4
Married, with children	19.1	61.5	19.5
Men under age 30			
Total	25.1	59.3	15.6
Not married	25.1	60.7	14.2
Not married, no children	25.3	60.8	13.8
Not married, with children	26.0	55.9	18.1
Married	25.3	55.4	19.3
Married, no children	22.3	58.1	19.6
Married, with children	29.1	53.7	17.2

NOTE: "Early graduate school enrollment" is defined as enrolling in graduate studies within 1 year of receiving a bachelor's degree. "Planning to enroll in graduate school" includes one or more of the following activities: having been accepted to graduate school but not yet enrolled, having applied to graduate school, and having plans to attend graduate school in the future. Detail may not sum to totals because of rounding. Standard error tables are available at http://nces.ed.gov/das/library/reports.asp.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

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Multivariate Analysis of Time to Degree and Graduate Enrollment

The previous discussion demonstrated a number of bivariate relationships that were observed between the outcomes analyzed in this study (i.e., time to degree and early graduate school enrollment) and a number of student characteristics. A bivariate analysis allows for comparisons to be made between groups. For example, in the bivariate analysis, Pell Grant recipients took longer than nonrecipients to graduate. The comparison was between Pell Grant recipients and nonrecipients, and the question was whether they differed by the amount of time it took to complete a bachelor's degree.

A multivariate analysis allows us to test relationships among several variables simultaneously and enables researchers to ask questions such as "How is Pell Grant status related to time to degree, if other factors, such as parents' education, undergraduate risk characteristics and type of institution are held constant?" In other words, does having received a Pell Grant, in and of itself, have an independent association with time to degree? To answer these and other similar questions, a multivariate analysis was conducted in this study for both time to degree and early graduate school enrollment.

Several bivariate findings discussed in the previous chapters of this report persisted when using multivariate analysis. However, while the bivariate analysis showed that Pell Grant recipients took longer than nonrecipients to graduate, the multivariate analysis revealed that Pell Grant status was actually negatively associated with time to degree when all of the independent variables in the regression were taken into account simultaneously (table 15).

Other factors related to a longer time to degree in the bivariate analysis continued to be associated with a longer time to degree after controlling for other independent variables in the multivariate regression analysis. These include having parents who did not attend college, stopping out for 4 or more months, transferring, attending part time, working full time, and having one or more dependents.

Age and independent status for financial aid purposes were excluded from both the bivariate and multivariate analysis of time to degree because they are confounding variables (i.e., individuals will naturally become older as they take longer to graduate,

Table 15. Among 1999–2000 college graduates, weighted least squares coefficients for number of months between entry into postsecondary education and bachelor's degree completion, after adjusting for covariation among independent variables: 2001

Characteristic	Weighted Least Squares Coefficient	Wald *F*-statistic[1]
Intercept	37.387 *	
Pell Grant status		42.931 (1, 64, <0.001)
Received one or more Pell Grants	-11.998 *	
Did not receive any Pell Grants	†	
Parent's highest level of education		39.362 (2, 63, <0.001)
High school or less	17.244 *	
Some postsecondary education	4.906 *	
Bachelor's degree or higher	†	
Bachelor's institution type		4.278 (4, 61, <0.010)
Public non-doctorate-granting	4.285	
Private not-for-profit non-doctorate-granting	5.763 *	
Private not-for-profit doctorate-granting	-1.849	
Private for-profit	23.000 *	
Public doctorate-granting	†	
Stopout status		657.606 (1, 64, <0.001)
Stopped out	49.224 *	
Did not stop out	†	
Transfer status		20.266 (3, 62, <0.001)
Upward transfer	10.266 *	
Lateral transfer	7.127 *	
Downward transfer	13.592 *	
Did not transfer	†	
High school diploma		0.094 (1, 64, 0.760)
Did not receive a regular high school diploma	1.774	
Received a regular high school diploma	†	
Delayed enrollment into postsecondary education		1.640 (1, 64, 0.205)
Delayed enrollment	-3.160	
Did not delay enrollment	†	
Attendance intensity		16.884 (1, 64, <0.05)
Enrolled part time	7.258 *	
Enrolled full time	†	
Worked while enrolled		57.514 (1, 64, <0.001)
Worked full time	19.417 *	
Did not work full time	†	
Number of dependents		210.453 (1, 64, <0.001)
Has dependents	58.550 *	
Does not have dependents	†	

† Not applicable for the reference group.

* $p < 0.05$

[1] The Wald *F* for the intercept (a test of the overall model) is 115.246 (16, 49, <0.001); the Wald *F* for each independent variable is displayed in the table, and the numbers in parentheses are the numerator and denominator degrees of freedom and associated *p*-value.

NOTE: The italicized text within each variable represents the comparison group used.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

and all students age 24 and older are automatically considered to be financially independent for federal financial aid purposes).

Although not receiving a regular high school diploma and delaying enrollment in postsecondary education for 1 or more years were both related to a longer time to degree in the bivariate analysis, this was not the case in the multivariate analysis. Neither variable was related to time to degree when controlling for such factors as full-time employment, part-time attendance, and parent's level of education.

Institution type also was included in the multivariate regression analysis to control for differences among Pell Grant recipients in this respect. Once other related variables were taken into account, graduates of private not-for-profit non-doctoral institutions and private for-profit institutions took longer to complete their degrees than did graduates of public doctoral institutions. Time to degree did not appear to differ among those graduating from private not-for-profit doctoral institutions, public non-doctoral, and public doctoral institutions.

The multivariate analysis of early graduate school enrollment was performed as a logistic regression and presented as odds ratios in table 16. Odds ratios represent the odds of one group having a specific outcome in relation to the comparison group, whose odds are set at 1. Odds ratios that are less than 1 indicate lower odds of an outcome for the analytical group while odds ratios that are greater than 1 indicate higher odds. An odds ratio that is equal to or not statistically different from 1 indicates that the odds of having an outcome are the same for the two groups under comparison.

Results from both the bivariate and multivariate analyses showed that Pell Grant recipients and nonrecipients enrolled in graduate school (within 1 year of receiving a bachelor's degree) at rates that were not measurably different. Several factors were related to a higher rate of early graduate enrollment in both the bivariate and the multivariate analytical models of this study. These include having parents who had attended college, having a GPA of 3.5 or higher in one's undergraduate major, graduating from college at age 22 or younger, and having majored in one of the sciences as an undergraduate.[20] Marital status also continued to have a negative relationship with graduate enrollment after the logistic regression was applied. In the

[20] In the bivariate analysis, this includes the social/behavioral sciences and the life sciences. Those majoring in the physical sciences (including mathematics) appeared to have a higher rate of early graduate school enrollment as well (40 percent); however, the sample size may have contributed to the failure to find a significant difference between these two estimates.

Table 16. Among 1999–2000 college graduates 1 year after receiving a bachelor's degree, results of logit analysis of early enrollment in graduate school after adjusting for covariation among independent variables: 2001

Characteristic	Odds ratio[1]	Wald *F*-statistic[2]
Intercept	0.507 *	
Pell Grant status		0.016 (1, 64, 0.900)
Received one or more Pell Grants	0.991	
Did not receive any Pell Grants	†	
Gender		0.088 (1, 64, 0.768)
Women	1.019	
Men	†	
Race/ethnicity[3]		3.249 (6, 59, <0.05)
Black	1.458 *	
Hispanic	1.480 *	
Asian	1.279	
Pacific Islander	0.852	
American Indian	0.998	
Other or more than one race	1.165	
White	†	
Age at graduation		11.395 (2, 63, <0.001)
23 to 29 years old	0.775 *	
30 or older	1.054	
22 or younger	†	
Parent's highest level of education		11.23 (2, 63, <0.001)
High school or less	0.668 *	
Some college	0.857	
Bachelor's degree or higher	†	
Bachelor's institution type		2.907 (4, 61, <0.05)
Public non-doctorate-granting	0.828 *	
Private not-for-profit non-doctorate-granting	0.796 *	
Private not-for-profit doctorate-granting	1.021	
Private for-profit	0.846	
Public doctorate-granting	†	
Undergraduate major		15.788 (8, 57, <0.001)
Humanities	1.247	
Social/behavioral sciences	1.766 *	
Life sciences	2.625 *	
Mathematics and physical sciences	2.811 *	
Engineering	0.868	
Education	1.364	
Health	0.964 *	
Other technical/professional	1.641	
Business/management	†	

See notes at end of table.

Table 16. Among 1999–2000 college graduates 1 year after receiving a bachelor's degree, results of logit analysis of early enrollment in graduate school after adjusting for covariation among independent variables: 2001—Continued

Characteristic	Odds ratio[1]	Wald *F*-statistic[2]
GPA in undergraduate major		20.646 (3, 62, <0.001)
2.5 or lower	0.526 *	
2.6–3.0	0.542 *	
3.1–3.4	0.732 *	
3.5 or higher	†	
Marital status in 2001		4.427 (1, 64, <0.05)
Married	0.847 *	
Not married	†	

† Not applicable for the comparison group, which has an odds ratio of 1.000.

* $p < 0.05$

[1] The three psuedo *R*-squared statistics for the logistic regression model are the negative log likelihood, .045; the Cox-Snell likelihood ratio, 0.052 (maximum = 0.698); and the Estrella likelihood ratio, 0.053.

[2] The Wald *F* for the intercept (a test of the overall model) is 10.144 (28,37, <0.001); the Wald *F* for each independent variable is displayed in the table, and the numbers in parentheses are the numerator and denominator degrees of freedom and associated *p*-value.

[3] Black includes African American, Hispanic includes Latino, Pacific Islander includes Native Hawaiian, and American Indian includes Alaska Native. Race categories exclude Hispanic origin unless specified. Those who identified themselves as belonging to another race or more than one race are grouped into the category "Other or more than one race."

NOTE: An odds ratio is the ratio of the odds of an event or condition occurring in one group to the odds of it occurring in another group after adjusting for covariation of other independent variables in the regression model. Significant odds ratios greater than 1 mean that those in the analysis group are more likely to have that outcome or condition than those in the comparison group. Significant odds ratios less than 1 mean that those in the analysis group are less likely to have that outcome than those in the comparison group. The italicized text within each variable represents the comparison group used.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

bivariate analysis this was found to be the case only among women, and not among men who were Pell Grant recipients.

Also in both the bivariate and multivariate analyses, Blacks had higher rates of early enrollment in graduate school than Whites. Hispanics also had higher rates of early graduate school enrollment when compared with Whites after the multivariate analysis was applied (although there was no measurable difference between Whites and Hispanics in the bivariate analysis).[21]

[21] It is not clear whether the relationship between graduate enrollment and race/ethnicity continues over time. Nevill and Chen (2007) conducted a study of all bachelor's degree recipients 10 years out of college. In their bivariate analysis, which was not limited to Pell Grant recipients, a higher percentage of Blacks were enrolled in graduate school when compared with Whites (45 vs. 39 percent). However, the multivariate analysis in that study did not reveal a measurable difference in graduate enrollment by race/ethnicity. The independent variables included in the regression analysis of that study were gender, race/ethnicity, age, parental education, undergraduate major, undergraduate

Although graduates of private not-for-profit doctoral institutions had a higher rate of early graduate school enrollment in the bivariate analysis, results from the multivariate analysis showed no difference in the likelihood of early graduate enrollment when compared with graduates of public doctoral institutions. Graduates of non-doctoral institutions, however, were less likely to immediately enroll in graduate school once other independent variables were taken into account in the multivariate analysis.

GPA, marital status, number of dependents, and degree expectation. The data analyzed in that study were from the 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:1993/03).

Conclusions

About 36 percent of bachelor's degree recipients in 1999–2000 received at least one Pell Grant while they were enrolled in college. As undergraduates, Pell Grant recipients were at a greater disadvantage than nonrecipients socioeconomically and a larger proportion had characteristics that put them at risk for attrition. Although Pell Grant recipients had a longer median time to degree than nonrecipients, the multivariate analysis in this study showed that when variables such as parent's education, undergraduate risk characteristics, and transfer history are controlled simultaneously, receipt of a Pell Grant is actually associated with a *shorter* time to degree. The percentage of Pell Grant recipients who enrolled in graduate school did not differ from nonrecipients, in either the bivariate or multivariate analyses. Furthermore, compared with nonrecipients, Pell Grant recipients tended to have higher aspirations for graduate school enrollment in the future, if they were not already enrolled.

Pell Grant recipients who were first-generation students took longer to complete their bachelor's degree and enrolled in graduate school at lower rates than Pell Grant recipients whose parents had graduated from college. Of all the student characteristics that were analyzed in this study, parent's education was the only variable consistently related to both outcomes, in both the bivariate and multivariate analyses.

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Appendix A—Glossary

This glossary describes the variables used in this report. The items were taken directly from the National Center for Education Statistics' (NCES) 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01) Data Analysis System (DAS), a web-based NCES analysis tool that generates tables from the B&B:2000/01 data. (See appendix B for a description of the DAS.) In the index below, the variables are organized by general topic and, within topic, listed in the order in which they appear in the tables. The glossary items are listed in alphabetical order by the variable name (displayed in capital letters to the right of the variable label).

Glossary Index

B&B VARIABLE

Age received BA from NPSAS institution **AGENBA**
This variable calculates the age at which the respondent received the bachelor's degree from the NPSAS institution. In many cases it will be identical to the variable AGE, which is age as of 12/31/99, because all respondents received the bachelor's degree from the NPSAS institution during the 1999–2000 academic year.

Respondent has dependents 1999–2000 **ANYDEP**
Indicates whether the student has any dependents (other than a spouse).

Has one or more dependents
Does not have any dependents

Attendance pattern 1999–2000 **ATTNSTAT**
Indicates a student's attendance pattern at all institutions attended during 1999–2000. Students are considered to have enrolled for a full year if they were enrolled 9 or more months during the NPSAS year. Months did not have to be contiguous or at the same institution, and students did not have to be enrolled for a full month in order to be considered enrolled for that month.

Undergraduate major **BMAJORS3**
Major field of study for the bachelor's degree.

Business/management
Education
Engineering
Health
Social/behavioral sciences
Humanities
Life sciences
Mathematics and physical sciences
Other

Degree-granting institution type **BSECTOR9**
Indicates the sector (level and control) of the institution where the student received the 1999–2000 bachelor's degree, including whether the institution was doctorate-granting or not.

Public 4-year non-doctorate-granting
Public 4-year doctorate-granting
Private 4-year not-for-profit non-doctorate-granting
Private 4-year not-for-profit doctorate-granting
Private for-profit

B&B VARIABLE

High school completion type **CBDIPL**
Student's high school completion type includes those who received a regular high school diploma and those who did not receive a regular high school diploma. Students who did not have a regular high school diploma include those with a GED or other high school completion certificate, those who attended a foreign high school, those who were home schooled, and those who do not have any high school credentials.

Received a regular high school diploma
Did not receive a regular high school diploma

Has any dependent children in 2001 **CHILDREN**
Respondents who indicated in B&B that the number of children they supported financially was greater than 0.

Has children
Does not have children

Delayed enrollment into postsecondary education 1999–2000 **DELAYENR**
Number of years between the year of high school graduation (HSGRADYY) and the first year enrolled in postsecondary education (PSECTYR).

Delayed for 1 or more years
Did not delay

Dependency status in 1999–2000 **DEPEND**
Student dependency status for federal financial aid. Students under age 24 are generally considered to be dependent on their parents for financial support. Students were considered to be independent in 1999–2000 if they met any of the following criteria:

1) Age 24 or older as of 12/31/1999
2) A veteran of the U.S. Armed Forces
3) Enrolled in a graduate or professional program beyond a bachelor's degree
4) Married
5) Orphan or ward of the court
6) Have legal dependents other than a spouse

Students under age 24 who do not meet any of these conditions but are receiving no parental support may be classified as independent by campus financial aid officers using their professional judgment.

Work intensity while enrolled 1999–2000 **ENRJOB**
Intensity of work while enrolled. Average number of hours per week worked while enrolled. Full-time work is defined as 35 or more hours per week, and part-time is any amount less than 35 hours.

Worked full time
Worked part time
Did not work

B&B VARIABLE

Gender **GENDER**
Student's gender.

Male
Female

GPA in undergraduate major **GPAMAJ**
Grade point average in undergraduate major on a 4.0 scale.

2.5 or less
2.6 to 3.0
3.1 to 3.4
3.5 or higher

Graduate school path location **GRDPIP**
Indicates what steps the respondent has completed on the path to graduate school after earning the 1999–2000 bachelor's degree as of the B&B interview.

Enrolled in graduate school
Not enrolled, plans to enroll
No plans to attend graduate school

Current marital status **MARRIED**
Respondents whose current marital status in B&B was married.

Married
Not married

Primary language **NBLANG**
Student's response to question: "What language was spoken most often at home as you were growing up?"

English
All other languages

Parents' educational attainment **NPARED**
The highest level of education of either parent.

High school or less
Some postsecondary education
Bachelor's degree or higher

Amount owed on all undergraduate loans in 2000 **OWEAMT1**
Indicates total amount owed on all undergraduate loans as of late 2000, including loans from family and friends. Excludes Parents Loans to Undergraduate students (PLUS). Primarily based on student reported data.

$0 to $5,500
$5,501 to $15,300
$15,301 to $22,800
$22,801 and higher

B&B VARIABLE

Post-bachelor's degree type, detailed **PBDEG1**
The first degree or certificate program the respondent reported after completing the 1999–2000 bachelor's degree, describes the type of degree or certificate.

Master's in Business Administration (MBA)
Master's in Education (M.Ed.)
Other master's degree program
Doctoral program
First professional degree program

Years received Pell Grants through 1999–2000 **PELLYRS**
Number of years that a Pell Grant was received between the 1993–94 and 1999–2000 award years. Based on the National Student Loan Data System (NSLDS) files that began recording annual Pell amounts starting with the 1993–94 award year.

Time between postsecondary entry and degree completion **PSE_BA**
Indicates the time between first entry into postsecondary education and bachelor's degree completion (in months). This variable was calculated only for those respondents who did not have a prior bachelor's degree.

Race/ethnicity **RACE2**
Student's race/ethnicity, including Hispanic/Latino and those indicating more than one race. Respondents were asked two questions. One question asked respondents to identify whether they were of Hispanic or Latino origin or not. The other question asked them to identify their race, with multiple responses permitted and categories of White; Black or African American; Asian; Native Hawaiian or other Pacific Islander; American Indian or Alaska Native; or Other, specify. Thus, race is defined based on respondents' self-reports according to these categories. These questions were combined, with all respondents indicating Hispanic or Latino origin grouped together regardless of race. Then, those who selected more than one category for race were grouped together. Remaining respondents were placed in the race category they selected. The resulting categories are as follows:

White, non-Hispanic
Black/African American, non-Hispanic
Hispanic or Latino
Asian
Native Hawaiian/Pacific Islander
American Indian/Alaska Native
Other or more than one race

Single parent in 1999–2000 **SINGLPAR**
Students were considered to be single parents if they had dependents and were not married. The number of dependents does not always distinguish between dependent children and other dependents such as parents or relatives, so single parent is best interpreted as single caretaker.

Single parent
Not a single parent

B&B VARIABLE

Stopped out **STOPTOT**

Examining start and end dates for all postsecondary enrollment spells prior to bachelor's degree receipt, nonenrolled spells of at least 4 months' duration were identified. The total duration of all such nonenrolled spells of 4 months or more was then calculated.

Stopped out
Did not stop out

Undergraduate type of transfer **TXFRTYP**

For respondents for whom the 1999–2000 bachelor's degree was their first bachelor's degree, this variable describes the type of their first transfer, if any, between institutions while an undergraduate (i.e., first change of institution from the time they began postsecondary education to bachelor's degree completion). Simultaneous enrollment in two or more institutions is not counted as transfer. Upward and downward transfers involve transfers between higher and lower level institutions. For example, an upward transfer would be a transfer from a 2-year community college to a 4-year university.

Upward transfer
Lateral transfer
Downward transfer
Did not transfer

Appendix B—Technical Notes and Methodology

The 2000/01 Baccalaureate and Beyond Longitudinal Study

The estimates and statistics reported in the tables and figures of this report are based on data from the 2001 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01), a spring 2001 follow-up of bachelor's degree recipients from the 1999–2000 National Postsecondary Student Aid Study (NPSAS:2000), conducted by the U.S. Department of Education's National Center for Education Statistics. NPSAS:2000 is based on a nationally representative sample of all students in postsecondary education institutions, including undergraduate, graduate, and first-professional students. For NPSAS:2000, information was obtained from more than 900 postsecondary institutions on approximately 50,000 undergraduate, 9,000 graduate, and 3,000 first-professional students. They represented nearly 17 million undergraduates, 2.4 million graduate students, and 300,000 first-professional students who were enrolled at some time between July 1, 1999, and June 30, 2000. For B&B:2000/01, those members of the NPSAS:2000 sample who completed a bachelor's degree between July 1, 1999, and June 30, 2000 were identified and contacted for a follow-up interview. The estimates in this report are based on the results of surveys with approximately 10,000 bachelor's degree recipients, representing about 1.3 million bachelor's degree completers from 1999–2000.[1] About 3,900 received at least one Pell Grant while they were enrolled in college and 6,200 did not receive any Pell Grants, representing approximately 500,000 and 800,000 graduates respectively. The weighted overall response rate for the B&B:2000/01 interview was 74 percent, reflecting an institution response rate of 90 percent and a student response rate of 82 percent. (Because the B&B:2000/01 study includes a subsample of NPSAS:2000 nonrespondents, the overall study response rate is the product of the NPSAS:2000 institution-level response rate and the B&B:2000/01 student-level response rate.)

The B&B:2000/01 data provide a profile of the 1999–2000 cohort of college graduates, including degree recipients who have been enrolled sporadically over time

[1] For more information on the B&B survey, consult U.S. Department of Education, National Center for Education Statistics, *Methodology Report for the 2001 Baccalaureate and Beyond Longitudinal Study* (NCES 2003–156) (Charleston et al. 2003).

as well as those who went to college right after completing high school. The dataset contains comprehensive data on enrollment, attendance, and student demographic characteristics and provides a unique opportunity to understand the immediate transitions of college graduates into work, graduate school, or other endeavors.

Accuracy of Estimates

The statistics in this report are estimates derived from a sample. Two broad categories of error occur in such estimates: sampling and nonsampling errors. Sampling errors occur because observations are made on only samples of students, not entire populations. Nonsampling errors occur not only in sample surveys but also in complete censuses of entire populations. Nonsampling errors can be attributed to a number of sources: inability to obtain complete information about all students in all institutions in the sample (some students or institutions refused to participate, or students participated but answered only certain items); ambiguous definitions; differences in interpreting questions; inability or unwillingness to give correct information; mistakes in recording or coding data; and other errors of collecting, processing, sampling, and imputing missing data.

Item Response Rates and Bias Analysis

Weighted item response rates were calculated for all the variables used in this report by dividing the weighted number of valid responses by the weighted population for which the item was applicable. Overall, most of the items had a high response rate (85 percent or above). Three items, however, had weighted item response rates that were below 85 percent: GPAMAJ (grade point average in undergraduate major), ENRJOB (work intensity while enrolled in 1999–2000), and NBLANG (primary language).

GPAMAJ (grade point average in undergraduate major) from B&B:2000/01 had a response rate of 83 percent. Among Pell Grant recipients, those who had missing data for GPAMAJ enrolled in graduate school at a rate that did not differ statistically from those with a GPA of less than 3.0 (19 percent and 23 percent), both of which were lower than the percentage of respondents with a GPA of 3.0 or higher (30 percent). Therefore, nonrespondents to the item GPAMAJ are likely to have had lower major GPAs. This bias is likely to have depressed any relationships between GPAMAJ and other variables such as early graduate enrollment among Pell Grant recipients; that is, the relationship between GPAMAJ and early graduate enrollment as discussed in this report is likely to be underestimated.

The response rate for ENRJOB (work intensity while enrolled) was 82 percent. The analysis of time to degree in relation to full time employment while enrolled (table 9) showed that those who worked full time had a longer time to degree. A subsequent bias analysis was conducted on ENRJOB in relation to time to degree and revealed that respondents with missing data on ENRJOB were very similar to those who did not work while enrolled. About three-fourths (74–75 percent) of both nonrespondents and those who did not work graduated within 6 years, compared with 83 percent of those who worked part time, and 42 percent of those who worked full time. Including the missing values in the analysis of work intensity and time to bachelor's degree would likely increase the magnitude of the observed difference in time to degree for those employed full time.

NBLANG (primary language spoken at home) had a response rate of 83 percent. NBLANG was one of several variables used to describe the student background characteristics of Pell Grant recipients in comparison with nonrecipients. NBLANG was used in this study to compare the proportions of Pell Grant recipients and nonrecipients who came from families whose primary language was not English. A bias analysis found that no difference was observed in the percentage of Pell Grant recipients among responders and nonresponders to NBLANG (36–38 percent).

Data Analysis System

The estimates presented in this report were produced using the B&B:2000/01 Data Analysis System Online (DAS). The web-based DAS application makes it possible for users to specify and generate their own tables. With the DAS, users can replicate or expand upon the tables presented in this report. In addition to the table estimates, the DAS calculates accurate standard errors[2] and weighted sample sizes for these estimates. For example, table B-1 contains standard errors that correspond to estimates in table 1 of the report. If the number of valid cases is too small (fewer than 30) to produce a reliable estimate, the DAS prints the message "low-n" instead of the estimate. All standard errors for estimates presented in this report can be viewed at http://nces.ed.gov/das/library/reports.asp.

[2] The B&B:2000/01 sample is not a simple random sample, and therefore, simple random sample techniques for estimating sampling error cannot be applied to these data. The DAS takes into account the complexity of the sampling procedures and calculates standard errors appropriate for such samples. The method for computing sampling errors used by the DAS involves approximating the estimator by balanced repeated replication of the sampled population. The procedure is typically referred to as the "balanced repeated replication technique" (BRR).

Table B-1. Standard errors for Table 1: Percentage distribution of 1999–2000 college graduates by Pell Grant status and selected demographic characteristics: 2001

Characteristic	Pell Grant recipients	Nonrecipients
Total	†	†
Gender		
Women	0.80	0.46
Men	0.80	0.46
Age at graduation		
22 or younger	0.89	0.92
23–24	1.04	0.88
25–29	1.02	0.50
30 or older	1.07	0.64
Primary language spoken at home		
English	0.99	0.47
Other language	0.99	0.47
Parent's highest level of education		
High school or less	1.16	0.69
Some postsecondary education	0.98	0.55
Bachelor's degree or higher	1.07	0.78
Race/ethnicity		
White	1.28	0.78
Black	0.95	0.55
Hispanic	1.11	0.52
Asian	0.52	0.33
Pacific Islander	0.24	0.12
American Indian	0.21	0.09
Other or more than one race	0.38	0.31

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2000/01 Baccalaureate and Beyond Longitudinal Study (B&B:2000/01).

In addition to tables, the DAS can also produce a correlation matrix of selected variables to be used for linear regression models. Included in the output with the correlation matrix are the design effects (DEFTs) for each variable in the matrix. The DAS is also capable of performing logistic regression. Since statistical procedures generally compute regression coefficients based on simple random sample assumptions, the standard errors must be adjusted with the design effects to take into account the stratified sampling method used in the survey.

The DAS can be accessed electronically at http://nces.ed.gov/DAS/. For more information about the B&B:2000/01 and other Data Analysis Systems, contact:

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Statistical Procedures

Differences Between Means

The descriptive comparisons were tested in this report using Student's *t* statistic. Differences between estimates were tested against the probability of a Type I error,[3] or significance level. The significance levels were determined by calculating the Student's *t* values for the differences between each pair of means or proportions and comparing these with published tables of significance levels for two-tailed hypothesis testing ($p<.05$).[4]

Student's *t* values may be computed to test the difference between estimates with the following formula:

$$t = \frac{E_1 - E_2}{\sqrt{se_1^2 + se_2^2}} \quad (1)$$

where E_1 and E_2 are the estimates to be compared and se_1 and se_2 are their corresponding standard errors. This formula is valid only for independent estimates. When estimates are not independent, a covariance term must be added to the formula:

$$t = \frac{E_1 - E_2}{\sqrt{se_1^2 + se_2^2 - 2(r)se_1\, se_2}} \quad (2)$$

[3] A Type I error occurs when one concludes that a difference observed in a sample reflects a true difference in the population from which the sample was drawn, when no such difference is present.
[4] In this study, the Student's *t* statistic was also used to test for statistically significant differences between median values as well as means and percentages, although nonparametric tests such as the two-sample Wilcoxon or the Mann-Whitney U may be more appropriate for testing differences between medians. As of this writing, these and other nonparametric testing procedures are not adequate and not yet available for users of the DAS.

where *r* is the correlation between the two estimates.[5] This formula is used when comparing two percentages from a distribution that adds to 100. If the comparison is between the mean of a subgroup and the mean of the total group, the following formula is used:

$$t = \frac{E_{sub} - E_{tot}}{\sqrt{se_{sub}^2 + se_{tot}^2 - 2p\, se_{sub}^2}} \quad (3)$$

where *p* is the proportion of the total group contained in the subgroup.[6] The estimates, standard errors, and correlations can all be obtained from the DAS.

There are hazards in using statistical tests for each comparison. First, comparisons based on large *t* statistics may appear to merit special attention. This can be misleading since the magnitude of the *t* statistic is related not only to the observed differences in means or percentages but also to the number of respondents in the specific categories used for comparison. Hence, a small difference compared across a large number of respondents would produce a large *t* statistic.

A second hazard in using statistical tests is the possibility that one can report a "false positive" or Type I error. In the case of a *t* statistic, this false positive would result when a difference measured with a particular sample showed a statistically significant difference when there is no difference in the underlying population. Statistical tests are designed to control this type of error, denoted by alpha. The alpha level of .05 selected for findings in this report indicates that a difference of a certain magnitude or larger would be produced no more than one time out of 20 when there was no actual difference in the quantities in the underlying population. When hypotheses are tested that show *t* values at the .05 level or smaller, this finding is treated as rejecting the null hypothesis that there is no difference between the two quantities. Failing to reject the null hypothesis (i.e., finding no difference), however, does not necessarily imply the values are the same or equivalent.

A third hazard in reporting statistical tests for each comparison occurs when making multiple comparisons among categories of an independent variable or when finding significant results that are not indicated by any hypothesis. In these cases, Type I errors should not be ignored. For example, when making paired comparisons among different race/ethnicities, the probability of a Type I error for these comparisons taken as a group is larger than the probability for a single comparison. When more

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[5] U.S. Department of Education, National Center for Education Statistics, *A Note from the Chief Statistician,* no. 2, 1993.
[6] Ibid.

than one comparison between groups of related characteristics are tested for statistical significance, one must apply a standard that assures a level of significance for all of those comparisons taken together, that is, the findings are reported only when $p \leq .05/k$ for a particular pairwise comparison, where that comparison is one of k tests within a family. This procedure guarantees both that the individual comparison would have $p \leq .05$ and that for k comparisons within a family of possible comparisons, the significance level for all the comparisons will sum to $p \leq .05$.[7] In this analysis, however, adjustments for multiple comparisons were not made because a subsequent multivariate analysis was conducted, which included all independent variables where significant differences were found (see description below on "Multivariate Analysis"). A difference that was significant by chance alone would not be found significant in the multivariate analysis.

Multivariate Analysis

Many of the variables included in the analyses in this report are interrelated, and to some extent, the patterns of differences found in the bivariate analyses reflect this covariation. To take into account the relationships among variables, multivariate analyses were performed to examine whether Pell Grant status and other demographic and enrollment characteristics were related to time to degree and early graduate enrollment. An ordinary least squares (OLS) regression analysis was used to describe the relationship between specific student characteristics and time to degree, which is a continuous variable. Logit analysis was used in the analysis of graduate school enrollment because the outcome variable (e.g., whether one enrolled in graduate school or not) is dichotomous.

Handling of Missing Data

In regression analysis, there are several common approaches to the problem of missing data. The two simplest approaches are pairwise deletion of missing data and listwise deletion of missing data. The DAS covariance mode uses listwise deletion. In listwise deletion, cases missing on any of the variables included in the regression model are excluded from the analysis.

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[7] The standard that $p \leq .05/k$ for each comparison is more stringent than the criterion that the significance level of the comparisons should sum to $p \leq .05$. For tables showing the t statistic required to ensure that $p \leq .05/k$ for a particular family size and degrees of freedom, see Dunn (1961).

Interpretation of Multivariate Results

The DAS generates standardized regression coefficients for ordinary least squares (OLS) regression analyses and odds ratios for logit analysis. Significant regression coefficients generated by the OLS procedure indicate the units of change in the outcome variable for each unit of change in the independent variable, after taking into account all of the other independent variables in the model.

An odds ratio is the ratio of the odds of an event or condition occurring in one group to the odds of it occurring in another group. Significant odds ratios greater than 1 mean that those in the analysis group are more likely to have that outcome or condition than those in the comparison group. Significant odds ratios less than 1 mean that those in the analysis group are less likely to have that outcome than those in the comparison group. An odds ratio that is equal to or not statistically different from 1 indicates that the odds of having an outcome are the same for the two groups under comparison.

For example, as shown in table 16, the odds ratio of 1999–2000 college graduates having enrolled in graduate school in 2001 was 0.991 for Pell Grant recipients. This ratio is interpreted to mean that Pell Grant recipients who graduated in 1999–2000 were not more likely than nonrecipients to have enrolled in graduate school, after adjusting for covariation between Pell Grant status and such other independent variables as parent's education, undergraduate GPA, and institution type.


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