

STATS IN BRIEF

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Who Considers Teaching and Who Teaches?

First-Time 2007–08 Bachelor's Degree Recipients by Teaching Status 1 Year After Graduation

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Statistics in Brief publications present descriptive data in tabular formats to provide useful information to a broad audience, including members of the general public. They address simple and topical issues and questions. They do not investigate more complex hypotheses, account for inter-relationships among variables, or support causal inferences. We encourage readers who are interested in more complex questions and in-depth analysis to explore other NCES resources, including publications, online data tools, and public- and restricted-use datasets. See nces.ed.gov and references noted in the body of this document for more information.

Although school districts across the United States have reduced their K–12 teaching staffs and frozen teacher hiring to meet budget shortfalls in recent years (Young and Fusarelli 2011), the demand for K–12 teachers is likely to increase in the next decade. The U.S. Bureau of Labor Statistics projects employment for K–12 teachers to grow by 17 percent at the kindergarten, elementary, and middle school levels and by 7 percent at the high school level between 2010 and 2020 (U.S. Bureau of Labor Statistics 2012). Factors influencing the projected labor market demand for teachers include anticipated reductions in student–teacher ratios, growth in the school-age population, and the number of teachers nearing retirement age (U.S. Bureau of Labor Statistics 2012).

In addition to these overall trends, some schools continue to have difficulty hiring well-qualified teachers in certain fields. Rural and urban schools that serve predominantly low-income students, for example, have long struggled to find and retain qualified teachers, particularly in math and science (Ingersoll and Perda 2010; Bacolod 2007). Anticipating the need for more highly qualified math and science teachers across the nation, a coalition of more than 100 corporations, foundations, and education institutions is working to recruit or retain 100,000

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math and science teachers over the next 10 years (100Kin10: Answering the Nation's Call).¹

Teacher recruitment strategies have also targeted individuals from specific racial and ethnic groups, an approach that reflects research suggesting that a more diverse teaching force may allay teacher shortages in urban schools that struggle to attract qualified teachers (Achinstein et al. 2010). Researchers have also found improved educational outcomes for students—including higher scores on standardized tests, lower dropout rates, and higher rates of college enrollment—who are taught by teachers of the same race or ethnicity.² Teacher retention is also higher among teachers whose racial and ethnic backgrounds match those of their students in hard-to-staff and disadvantaged urban schools with low proportions of White students than among White teachers in the same setting (Scafidi, Sjoquist, and Stinebrickner 2007; Elfers, Plecki, and Knapp 2006). Recruitment efforts also work to increase the share of male teachers, which has declined from about one-third of the teaching force in 1980 to about one-quarter in 2007–08 (Ingersoll and Merrill 2010).³

The college graduates who will meet the need for teachers may do so at var-

ious points in their post-college careers. While many teachers begin their careers immediately after completing their bachelor's degree, some graduates prepare for and enter the profession following 1 or more years in another career (Anderson 2008; Provasnik and Dorfman 2005).⁴ Some of these later entrants may have considered teaching while undergraduates or shortly after graduation. In fact, among 1992–93 bachelor's degree recipients who had not taught or prepared to teach 1 year after completing their degrees, about 21 percent of those who reported considering teaching had prepared to teach and taught by 2003, 10 years later. In contrast, 4 percent of those who had not considered teaching 1 year after graduation had taught by 2003 (Alt and Henke 2007). Potential teachers therefore also include graduates working in another career who may have prepared for or expressed an interest in teaching. The need for more teachers, especially math and science teachers, therefore, raises questions concerning new college graduates' experience in teaching and inclinations toward teaching in the future. For example, what percentage of graduates prepare to teach but do not enter teaching immediately after graduation? Among graduates who are not prepared to teach, how many consider teaching?

Furthermore, what distinguishes these groups from each other? For example, some researchers and policymakers have feared that the burden of repaying student loan debt may discourage college graduates from teaching careers because teachers receive lower pay relative to college graduates in other occupations (Rothstein and Rouse 2011). Thus, the question of whether graduates with less education debt teach, prepare, or consider teaching relatively more often than graduates with more debt is important to address.

To provide national data relevant to these concerns, this Statistics in Brief compares four groups of 2007–08 first-time bachelor's degree recipients, defined by K–12 teaching status as follows:

- 1. Taught before or after earning a bachelor's degree:** Includes bachelor's degree recipients who taught at the K–12 level by 2009.⁵ *Teaching* includes holding a regular full- or part-time teaching job, working as a long- or short-term substitute teacher, or working as a teacher's aide, all at the K–12 level.
- 2. Prepared to teach:** Includes bachelor's degree recipients who had not taught by 2009 but had taken courses to prepare for teaching, completed student teaching, or were certified to teach at the K–12 level.⁶

¹ For more information on this initiative, see the 100Kin10 website at <http://www.100kin10.org/> (accessed 11/1/12).

² See reviews by Ingersoll and May (2011b) and Villegas and Irvine (2010).

³ See Ingersoll and May (2011b) for a description of these initiatives. According to Villegas and Davis (2008), 36 states have adopted policies aimed at increasing the racial and ethnic diversity of teachers since the early 1990s.

⁴ In this Brief, *college graduates* are graduates of 4-year postsecondary institutions who attained a bachelor's degree.

⁵ Note that graduates who taught may have done so at any time before or since receiving their bachelor's degree and may not have been teaching at the time of the 2009 interview.

⁶ For courses, respondents were asked to self-report whether they had taken any courses to prepare for teaching.

3. Considered teaching: Includes bachelor's degree recipients who reported that they were currently considering teaching in 2007–08 or 2009 (or both years) but did not teach or prepare to teach (as defined above).⁷
4. Did not consider teaching: Includes bachelor's degree recipients who did not teach or prepare to teach and did not report that they had considered teaching by 2009.

The findings are based on data from the first follow-up of the 2008 Baccalaureate and Beyond Longitudinal Study (B&B:08/09), which collected information on the enrollment and employment experiences of a national sample of 2007–08 bachelor's degree recipients in their last year as undergraduates and 1 year after they completed their degrees. In both 2007–08 and 2009, study respondents were asked if they had taught, had

prepared to teach, or were considering a career in K–12 teaching.⁸ In addition, the data used in this Brief include information collected in 2009 on graduates' undergraduate programs and borrowing and their salaries and job satisfaction. All comparisons of estimates were tested for statistical significance using the Student's *t* statistic, and all differences cited are statistically significant at the $p < .05$ level.⁹

⁷ Considering teaching likely encompasses a range of interest levels, but the data do not distinguish between respondents with passing interest in the field and those who intend to pursue this interest.

⁸ In 2007–08, respondents who had not taught at the K–12 level were asked if they were currently considering teaching at this level at a public, private, or parochial school. In 2009, respondents who had not taught or prepared to teach at the K–12 level were asked if they were currently considering a career in teaching at this level.

⁹ No adjustments for multiple comparisons were made. The standard errors for the estimates can be found at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014002>.

STUDY QUESTIONS

1

How do selected demographic and academic characteristics differ among college graduates who taught, prepared to teach, considered teaching, and did not consider teaching?

2

Do college graduates who taught, prepared to teach, considered teaching, and did not consider teaching differ in terms of their undergraduate borrowing and indebtedness and their salaries and job satisfaction?

KEY FINDINGS

- College graduates who considered teaching were more often male than students who taught before or after earning their bachelor's degree or who prepared to teach. The representation of Black and Hispanic graduates was higher among those who considered teaching than among those who taught before or after earning their bachelor's degree.
- Science, technology, engineering, and math (STEM) majors accounted for a higher proportion of those who considered teaching than those who prepared to teach or taught before or after earning their bachelor's degree. The highest proportion of STEM majors, however, was found among graduates who did not consider teaching.
- Regardless of when they taught, college graduates who taught before or after earning their bachelor's degree earned higher median annual incomes in 2009 than those who were not teaching but considered or prepared for teaching. No measurable difference was found between the median incomes of those who taught and did not consider teaching.
- Again, regardless of when they taught, college graduates who taught before or after earning their bachelor's degree reported higher overall job satisfaction and satisfaction with their compensation than those who prepared for or considered teaching but had not taught. Those who taught also reported higher overall job satisfaction than graduates who did not consider teaching.

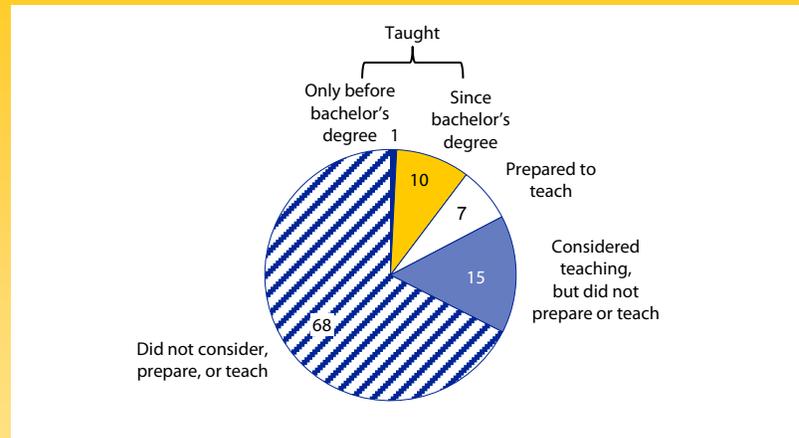
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How do selected demographic and academic characteristics differ among college graduates who taught, prepared to teach, considered teaching, and did not consider teaching?

In 2009, about 10 percent of 2007–08 first-time bachelor’s degree recipients had taught at the K–12 level after earning their degree, and 1 percent reported teaching only before they earned their degree.¹⁰ In addition to the graduates with teaching experience, another 7 percent had taken steps toward preparing for teaching, and 15 percent reported considering teaching in 2007–08 or 2009 (figure 1). The gender balance and race/ethnicity of these three groups differed from each other and from the 68 percent of bachelor’s degree recipients who did not consider teaching.

FIGURE 1.

TEACHING STATUS
Percentage distribution of 2007–08 first-time bachelor’s degree recipients, by teaching status: 2009



NOTE: *Taught* includes bachelor’s degree recipients who held K–12 teaching jobs, worked as short-term substitutes, or worked as teacher’s aides before or after completing their degree. *Prepared to teach* includes bachelor’s degree recipients who took courses to prepare for teaching at the K–12 level, completed student teaching, or were certified to teach at the K–12 level but had not taught. *Considered teaching, but did not prepare or teach* includes bachelor’s degree recipients who reported that they were currently considering teaching in 2007–08 or 2009 but had not prepared to teach or taught by 2009. *Did not consider, prepare, or teach* includes bachelor’s degree recipients who had not prepared to teach, taught, or reported considering teaching in 2007–08 or 2009. Detail may not sum to totals because of rounding. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014002>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2008/09 Baccalaureate and Beyond Study (B&B:08/09).

¹⁰ Because first-time bachelor degree recipients who taught only before earning their degree account for about 1 percent of all undergraduates (or about 8 percent of those who taught), the two groups are combined hereafter to ensure a sufficiently large enough group for analysis.

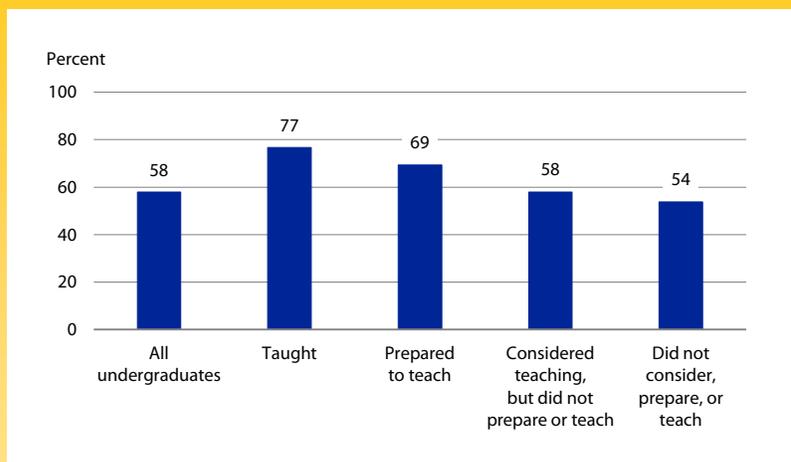
GENDER AND RACE/ETHNICITY

Teaching has long been a predominantly female profession (Tyack and Hansot 1992), and more than one-half of all students earning bachelor's degrees have been women since the 1980s (Goldin, Katz, and Kuziemko 2006). Consistent with these findings, women made up the majority of all four study groups in the analysis, but they represented a larger share of those who taught (77 percent) or prepared to teach (69 percent) than of those who considered (58 percent) or did not consider teaching (54 percent) (figure 2).

FIGURE 2.

PERCENT WOMEN

Percentage of women among 2007–08 first-time bachelor's degree recipients, by teaching status: 2009



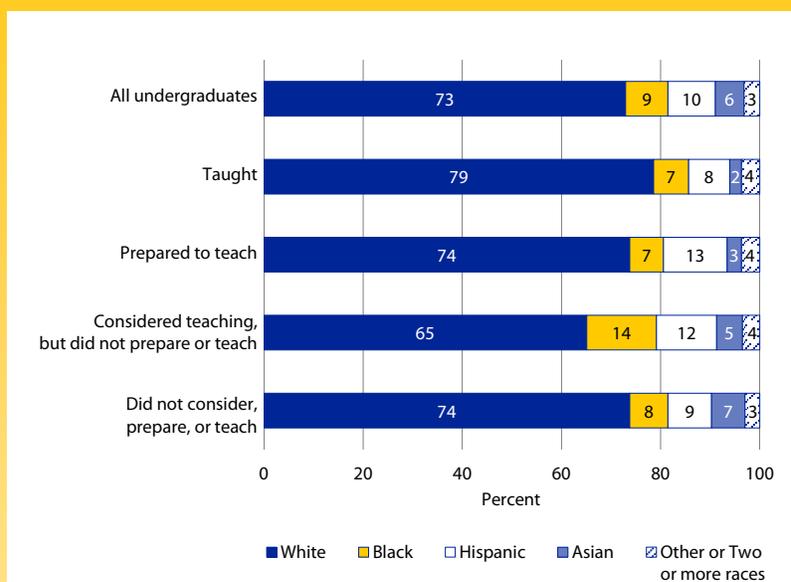
NOTE: *Taught* includes bachelor's degree recipients who held K–12 teaching jobs, worked as short-term substitutes, or worked as teacher's aides before or after completing their degree. *Prepared to teach* includes bachelor's degree recipients who took courses to prepare for teaching at the K–12 level, completed student teaching, or were certified to teach at the K–12 level but had not taught. *Considered teaching, but did not prepare or teach* includes bachelor's degree recipients who reported that they were currently considering teaching in 2007–08 or 2009 but had not prepared to teach or taught by 2009. *Did not consider, prepare, or teach* includes bachelor's degree recipients who had not prepared to teach, taught, or reported considering teaching in 2007–08 or 2009. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014002>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2008/09 Baccalaureate and Beyond Study (B&B:08/09).

Although the share of America’s public school children who are White has declined over time, similar changes have not occurred among teachers (Ingersoll and May 2011a; Achinstein et al. 2010). In the 2007–08 school year, about 83 percent of full-time teachers in K–12 public schools were White, compared with about 56 percent of students (Aud et al. 2011). Among 2007–08 bachelor’s degree recipients in 2009, White graduates accounted for 79 percent of those who taught before or after earning their bachelor’s degrees, but smaller proportions of the other groups (figure 3). Among the four groups compared, the highest proportion of Black college graduates was found among those who considered teaching (14 percent), and the highest proportion of Hispanic college graduates was found among those who prepared for or considered teaching (about 12 percent each). In contrast, Asian college graduates represented a higher percentage of those who did not consider teaching (7 percent) than of those who taught or prepared to teach (2 and 3 percent, respectively).

FIGURE 3.

RACE/ETHNICITY
Percentage distribution of 2007–08 first-time bachelor’s degree recipients’ race/ethnicity, by teaching status: 2009



NOTE: *Taught* includes bachelor’s degree recipients who held K–12 teaching jobs, worked as short-term substitutes, or worked as teacher’s aides before or after completing their degree. *Prepared to teach* includes bachelor’s degree recipients who took courses to prepare for teaching at the K–12 level, completed student teaching, or were certified to teach at the K–12 level but had not taught. *Considered teaching, but did not prepare or teach* includes bachelor’s degree recipients who reported that they were currently considering teaching in 2007–08 or 2009 but had not prepared to teach or taught by 2009. *Did not consider, prepare, or teach* includes bachelor’s degree recipients who had not prepared to teach, taught, or reported considering teaching in 2007–08 or 2009. Black includes African American and Hispanic includes Latino. Other includes American Indian or Alaska Native and Native Hawaiian or other Pacific Islander. Detail may not sum to totals because of rounding. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014002>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2008/09 Baccalaureate and Beyond Study (B&B:08/09).

ACADEMIC PREPARATION

A number of current national initiatives, including Teach for America and 100Kin10, seek to attract well-qualified college graduates to teaching, particularly in STEM fields.¹¹ Research suggests that teachers' undergraduate preparation, including taking courses in fields they teach and earning higher cumulative undergraduate grade point averages (GPAs), can affect student outcomes (Jacob et al. 2011; Kukla-Acevedo 2009). Therefore, this analysis examined four indicators of undergraduate academic preparation: cumulative GPA, major field of study, and the number of credits earned in math and in science. In general, proportionately more of those who taught or prepared to teach earned cumulative GPAs of at least 3.0 and majored in education than those who considered teaching. As detailed below, however, a relatively greater share of those who did not consider teaching earned credits in calculus or advanced math and advanced laboratory science credits than the other three groups.

Cumulative GPA

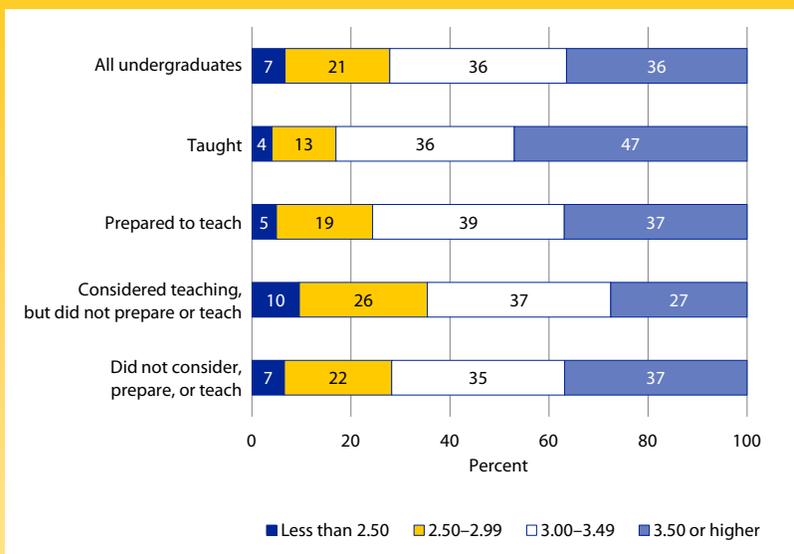
Teachers' cumulative undergraduate GPAs, both overall and in teacher preparation programs, have been positively linked to teacher performance (see D'Agostino and Powers 2009 for a review).¹² Among graduates who

¹¹ For more information about these initiatives, see <http://www.teachforamerica.org/> and <http://www.100kin10.org/>.

¹² GPAs are measures of graduates' aptitudes and the skills they gained in college. Because grades are assigned without reference to an objective standard, they can vary by instructor and by major field of study. For a discussion on the limitations of using GPA as a measure of academic preparation, see Alt and Henke (2007).

FIGURE 4.

CUMULATIVE UNDERGRADUATE GRADE POINT AVERAGE (GPA)
Percentage distribution of 2007–08 first-time bachelor's degree recipients' cumulative undergraduate GPA, by teaching status: 2009



NOTE: *Taught* includes bachelor's degree recipients who held K–12 teaching jobs, worked as short-term substitutes, or worked as teacher's aides before or after completing their degree. *Prepared to teach* includes bachelor's degree recipients who took courses to prepare for teaching at the K–12 level, completed student teaching, or were certified to teach at the K–12 level but had not taught. *Considered teaching, but did not prepare or teach* includes bachelor's degree recipients who reported that they were currently considering teaching in 2007–08 or 2009 but had not prepared to teach or taught by 2009. *Did not consider, prepare, or teach* includes bachelor's degree recipients who had not prepared to teach, taught, or reported considering teaching in 2007–08 or 2009. Detail may not sum to totals because of rounding. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014002>. SOURCE: U.S. Department of Education, National Center for Education Statistics, 2008/09 Baccalaureate and Beyond Study (B&B:08/09).

taught, about one-half (47 percent) earned cumulative GPAs of 3.50 or higher, and another 36 percent earned GPAs between 3.00 and 3.49 (figure 4). Relatively fewer of those who prepared for, considered, or did not consider teaching earned GPAs of 3.50 or higher. For example, about 27 percent of those who considered teaching had a GPA of 3.50 or higher, as did 37 percent of those who did not consider, prepare, or teach. The proportion of graduates who earned GPAs of less than 2.50 was higher among those who considered teaching (10 percent) than among those who prepared to teach or taught

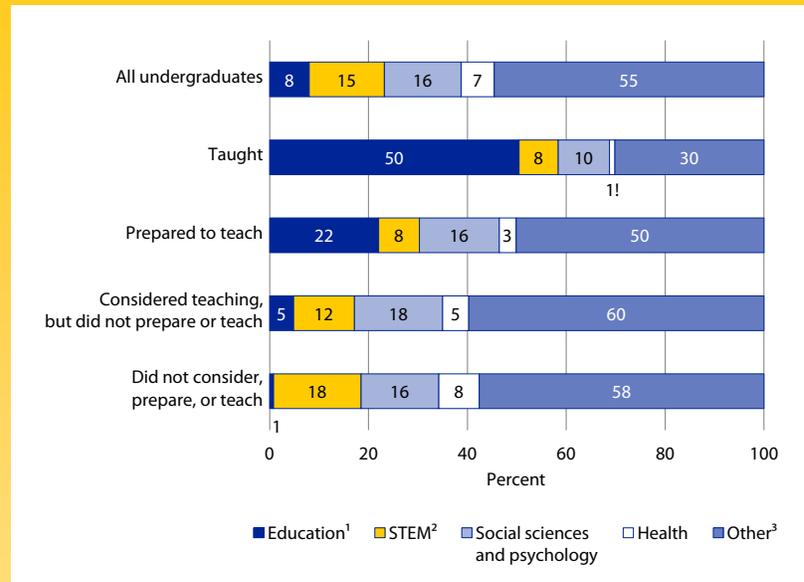
(4–5 percent). GPAs vary, however, across institutions and by majors within institutions, and findings regarding GPAs should therefore be interpreted with caution (see also Henke et al. 2005).

Undergraduate Major

Education is a common major among teachers, but not all teachers major in education as undergraduates. One-half of those who taught and 22 percent of those who prepared to teach majored in education, compared with about 5 percent of those who considered teaching (figure 5). STEM majors accounted for 8 percent of graduates who taught or prepared to teach and 12 percent of those who considered teaching, compared with 18 percent of those who did not consider teaching.

FIGURE 5.

UNDERGRADUATE MAJOR Percentage distribution of 2007–08 first-time bachelor's degree recipients' undergraduate majors, by teaching status: 2009



! Interpret data with caution. Estimate is unstable because the standard error represents more than 30 percent of the estimate.

¹ Includes majors in K–12 teaching and other education fields, such as counseling, curriculum and instruction, and education administration.

² STEM (science, technology, engineering, and math) majors include computer and information systems, math, engineering, life scientists, and physical science.

³ Other includes agriculture and natural resources; general studies and other; humanities; history; personal and consumer services; manufacturing, construction, repair, and transportation; military technology and protective services; business; architecture; communications; public administration and human services; design and applied arts; law and legal studies; library sciences; and theology and religious vocations.

NOTE: *Taught* includes bachelor's degree recipients who held K–12 teaching jobs, worked as short-term substitutes, or worked as teacher's aides before or after completing their degree. *Prepared to teach* includes bachelor's degree recipients who took courses to prepare for teaching at the K–12 level, completed student teaching, or were certified to teach at the K–12 level but had not taught. *Considered teaching, but did not prepare or teach* includes bachelor's degree recipients who reported that they were currently considering teaching in 2007–08 or 2009 but had not prepared to teach or taught by 2009. *Did not consider, prepare, or teach* includes bachelor's degree recipients who had not prepared to teach, taught, or reported considering teaching in 2007–08 or 2009. Detail may not sum to totals because of rounding. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014002>.

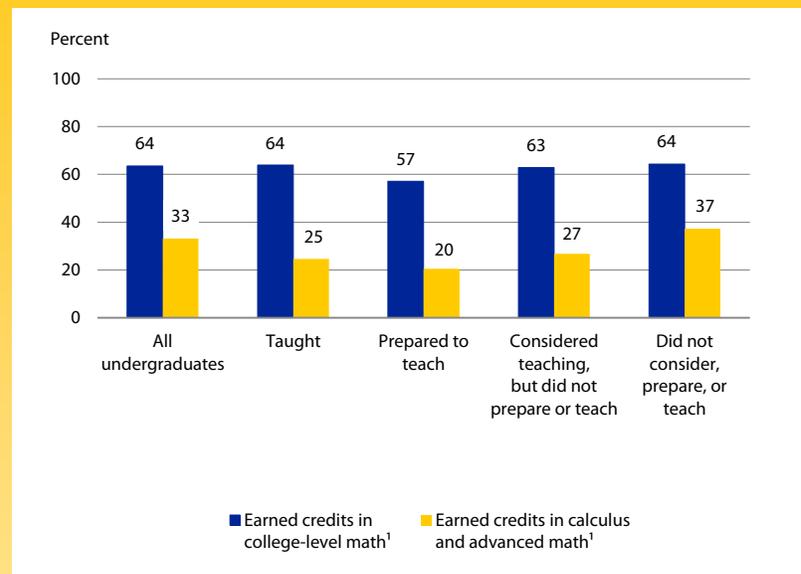
SOURCE: U.S. Department of Education, National Center for Education Statistics, 2008/09 Baccalaureate and Beyond Study (B&B:08/09).

Math and Science Coursetaking

In addition to majoring in a STEM field, prospective teachers might also prepare for teaching math or science by taking courses in these subjects as undergraduates.¹³ About 64 percent of graduates who taught, considered teaching, or did not consider teaching earned credits in college-level math, compared with 57 percent of those who prepared to teach (figure 6). A higher proportion of those who did not consider teaching earned credits in calculus and advanced math courses (37 percent) than among those who taught (25 percent), prepared to teach (20 percent), and considered teaching (27 percent).

FIGURE 6.

UNDERGRADUATE MATH CREDITS Percentage of 2007–08 first-time bachelor's degree recipients who earned undergraduate credits in college-level math and in calculus and advanced math, by teaching status: 2009



¹ College-level mathematics and calculus and advanced math are mutually exclusive categories. The Classification of Instructional Programs (CIP) course numbers included in each variable can be found in the B&B:09 PowerStats. For more information about how college courses are classified, see the 2010 College Course Map (CCM:2010) at <http://nces.ed.gov/surveys/pets/ccm.asp>.

NOTE: *Taught* includes bachelor's degree recipients who held K–12 teaching jobs, worked as short-term substitutes, or worked as teacher's aides before or after completing their degree. *Prepared to teach* includes bachelor's degree recipients who took courses to prepare for teaching at the K–12 level, completed student teaching, or were certified to teach at the K–12 level but had not taught. *Considered teaching, but did not prepare or teach* includes bachelor's degree recipients who reported that they were currently considering teaching in 2007–08 or 2009 but had not prepared to teach or taught by 2009. *Did not consider, prepare, or teach* includes bachelor's degree recipients who had not prepared to teach, taught, or reported considering teaching in 2007–08 or 2009. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014002>.

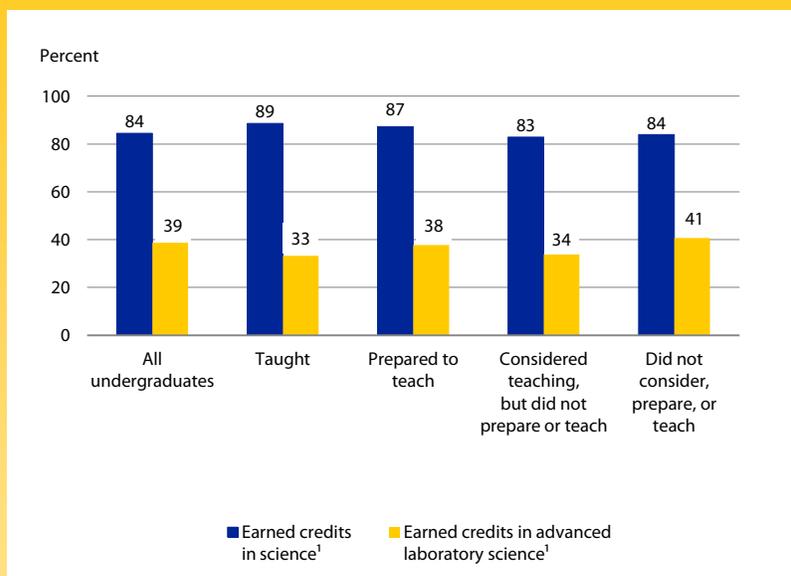
SOURCE: U.S. Department of Education, National Center for Education Statistics, 2008/09 Baccalaureate and Beyond Study (B&B:08/09).

¹³ College-level mathematics and calculus and advanced math are mutually exclusive categories, as are science and advanced laboratory science. The classification of Instructional Programs (CIP) course numbers included in each variable can be found in the B&B:09 PowerStats. For more information about how college courses are classified, see the 2010 College Course Map (CCM:2010) at <http://nces.ed.gov/surveys/pets/ccm.asp>.

More than 80 percent of graduates in each of the comparison groups earned undergraduate credits in science (figure 7). However, about 41 percent of those who had not considered teaching and 38 percent of those who prepared to teach earned credits in advanced laboratory sciences, a higher proportion than among those who taught (33 percent) or considered teaching (34 percent). Among college graduates who earned credits in math and science, no measurable difference was found between those who taught and those who prepared to teach in the median number of credits earned (table 1).¹⁴

FIGURE 7.

UNDERGRADUATE SCIENCE CREDITS
Percentage of 2007–08 first-time bachelor’s degree recipients who earned undergraduate credits in science and in advanced laboratory science, by teaching status: 2009



¹ Science and advanced laboratory science are mutually exclusive categories. The Classification of Instructional Programs (CIP) course numbers included in each variable can be found in the B&B:09 PowerStats. For more information about how college courses are classified, see the 2010 College Course Map (CCM:2010) at <http://nces.ed.gov/surveys/pets/ccm.asp>. NOTE: *Taught* includes bachelor’s degree recipients who held K–12 teaching jobs, worked as short-term substitutes, or worked as teacher’s aides before or after completing their degree. *Prepared to teach* includes bachelor’s degree recipients who took courses to prepare for teaching at the K–12 level, completed student teaching, or were certified to teach at the K–12 level but had not taught. *Considered teaching, but did not prepare or teach* includes bachelor’s degree recipients who reported that they were currently considering teaching in 2007–08 or 2009 but had not prepared to teach or taught by 2009. *Did not consider, prepare, or teach* includes bachelor’s degree recipients who had not prepared to teach, taught, or reported considering teaching in 2007–08 or 2009. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014002>. SOURCE: U.S. Department of Education, National Center for Education Statistics, 2008/09 Baccalaureate and Beyond Study (B&B:08/09).

¹⁴ Medians rather than means are reported throughout this study to minimize the influence of a small number of extremely low or high values, or outliers, on the estimates.

TABLE 1.

NUMBER OF CREDITS EARNED
Median number of credits earned in college-level math, calculus and advanced math, science, and advanced laboratory science among 2007–08 first-time bachelor’s degree recipients who earned undergraduate credits in these subjects, by teaching status: 2009

Course type ¹	All under-graduates	Taught	Prepared to teach	Considered teaching, but did not prepare or teach	Did not consider, prepare, or teach
College-level math	3.7	3.8	3.0	3.0	3.8
Calculus and advanced math	4.0	5.0	4.0	3.8	4.8
Science	8.0	7.5	7.8	7.0	8.0
Advanced laboratory science	4.2	3.8	3.0	4.0	5.4

¹ College-level mathematics and calculus and advanced math are mutually exclusive categories, as are science and advanced laboratory science. The Classification of Instructional Programs (CIP) course numbers included in each variable can be found in the B&B:09 PowerStats. For more information about how college courses are classified, see the 2010 College Course Map (CCM:2010) at <http://nces.ed.gov/surveys/pets/ccm.asp>.

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SOURCE: U.S. Department of Education, National Center for Education Statistics, 2008/09 Baccalaureate and Beyond Study (B&B:08/09).

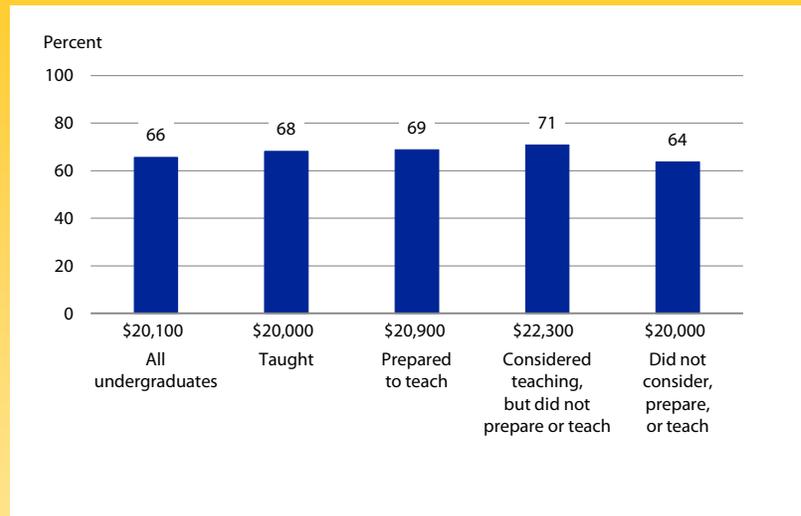
2 Do college graduates who taught, prepared to teach, considered teaching, and did not consider teaching differ in terms of their undergraduate borrowing and indebtedness and their salaries and job satisfaction?

UNDERGRADUATE BORROWING AND STUDENT LOAN DEBT

Undergraduate borrowing and student loan debt have been associated with the occupation choices that students make while enrolled and after graduation. For example, studies have found that recent graduates with relatively large student loan debt are less likely to work in comparatively low-paying jobs, particularly in education, than are graduates with lower levels of student loan debt (Rothstein and Rouse 2011; Minicozzi 2005). While the analysis included in this Brief cannot examine the effects of graduates' borrowing and debt levels on their career choices, it looks at the association between borrowing teacher status. For example, among 2007–08 graduates, about 70 percent of graduates who taught, prepared to teach, or considered teaching had borrowed for their undergraduate education, compared with about 64 percent of those who never considered teaching (figure 8). While borrowing rates differed, no statistically significant differences were found in the median amounts owed in 2009 among the four groups.

FIGURE 8.

UNDERGRADUATE BORROWING AND AMOUNT OWED
Percentage of 2007–08 first-time bachelor's degree recipients who took out undergraduate loans and, among those who borrowed for their undergraduate education, the median amount owed, by teaching status: 2009



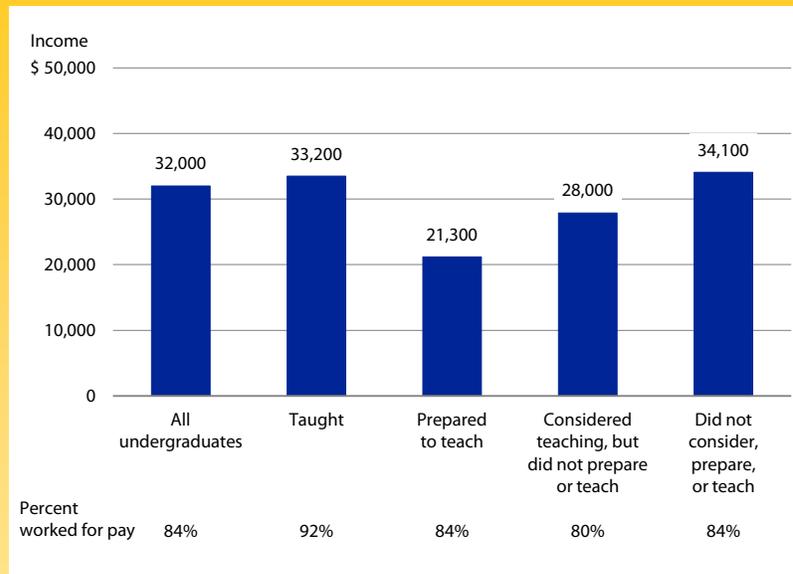
NOTE: Excludes graduates who were not working for pay in 2009. *Taught* includes bachelor's degree recipients who held K–12 teaching jobs, worked as short-term substitutes, or worked as teacher's aides before or after completing their degree. *Prepared to teach* includes bachelor's degree recipients who took courses to prepare for teaching at the K–12 level, completed student teaching, or were certified to teach at the K–12 level but had not taught. *Considered teaching, but did not prepare or teach* includes bachelor's degree recipients who reported that they were currently considering teaching in 2007–08 or 2009 but had not prepared to teach or taught by 2009. *Did not consider, prepare, or teach* includes bachelor's degree recipients who had not prepared to teach, taught, or reported considering teaching in 2007–08 or 2009. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014002>. SOURCE: U.S. Department of Education, National Center for Education Statistics, 2008/09 Baccalaureate and Beyond Study (B&B:08/09).

POSTBACCALAUREATE EMPLOYMENT

Studies have found a positive relationship between teacher salary levels and successful teacher recruitment (Guarino, Santibanez, and Daley 2006); in addition, both job satisfaction and compensation affect teacher retention (Cha and Cohen-Vogel 2011; Guarino, Santibanez, and Daley 2006). While findings from the current study cannot directly address issues of teacher recruitment and retention, it may be of interest to compare compensation and job satisfaction among those who taught with those who prepared for, considered, or did not consider teaching. A higher percentage of graduates who taught before or after earning their bachelor's degree (92 percent) were working for pay in 2009 than graduates who prepared for, considered, or did not consider teaching (80 to 84 percent) (figure 9). The successful recruitment and retention of teachers in teaching employment has been linked to a number of job-related factors. Among graduates working for pay in 2009, the 2009 median annual earnings of those who taught either before or after earning their bachelor's degree

FIGURE 9.

EMPLOYMENT AND INCOME
Percentage of 2007–08 first-time bachelor's degree recipients who worked for pay and their median annual income, by teaching status: 2009



NOTE: *Taught* includes bachelor's degree recipients who held K–12 teaching jobs, worked as short-term substitutes, or worked as teacher's aides before or after completing their degree. *Prepared to teach* includes bachelor's degree recipients who took courses to prepare for teaching at the K–12 level, completed student teaching, or were certified to teach at the K–12 level but had not taught. *Considered teaching, but did not prepare or teach* includes bachelor's degree recipients who reported that they were currently considering teaching in 2007–08 or 2009 but had not prepared to teach or taught by 2009. *Did not consider, prepare, or teach* includes bachelor's degree recipients who had not prepared to teach, taught, or reported considering teaching in 2007–08 or 2009. For respondents with multiple jobs, earnings are only for the primary job, which is the job at which the respondent worked the most hours. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014002>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2008/09 Baccalaureate and Beyond Study (B&B:08/09).

(\$33,200) did not differ measurably from that of those who did not consider teaching (\$34,100). However, graduates who taught had higher

median earnings than those who were not teaching but prepared to teach (\$21,300) and those who considered teaching (\$28,000).¹⁵

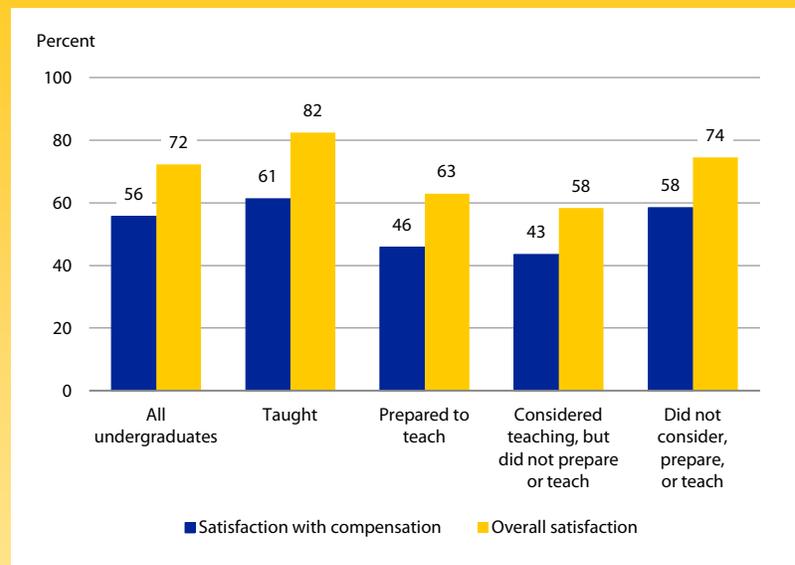
¹⁵ For respondents with multiple jobs, earnings are only for the primary job, which is the job at which the respondent worked the most hours.

Among graduates who were employed in 2009, relatively more of those who taught (82 percent), whether or not they were teaching when surveyed in 2009, expressed overall satisfaction with their jobs than did those who prepared to teach, considered teaching, and did not consider teaching (58 to 74 percent) (figure 10). Also, relatively more graduates who taught (61 percent) reported satisfaction with their compensation than did those who prepared for or considered teaching (46 and 43 percent, respectively), but no measureable difference in compensation satisfaction was found between those who taught and those who did not consider teaching (58 percent).

FIGURE 10.

JOB SATISFACTION

Among 2007–08 first-time bachelor’s degree recipients who were employed, percentage who reported satisfaction with their compensation and with their job overall, by teaching status: 2009



NOTE: *Taught* includes bachelor’s degree recipients who held K–12 teaching jobs, worked as short-term substitutes, or worked as teacher’s aides before or after completing their degree. *Prepared to teach* includes bachelor’s degree recipients who took courses to prepare for teaching at the K–12 level, completed student teaching, or were certified to teach at the K–12 level but had not taught. *Considered teaching, but did not prepare or teach* includes bachelor’s degree recipients who reported that they were currently considering teaching in 2007–08 or 2009 but had not prepared to teach or taught by 2009. *Did not consider, prepare, or teach* includes bachelor’s degree recipients who had not prepared to teach, taught, or reported considering teaching in 2007–08 or 2009. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014002>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2008/09 Baccalaureate and Beyond Study (B&B:08/09).

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Readers may also be interested in the following NCES products related to the topic of this Statistics in Brief:

2008–09 Baccalaureate and Beyond Longitudinal Study (B&B:08/09): A First Look at Recent College Graduates (NCES 2011-236).

<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2011236>

Education and Certification Qualifications of Departmentalized Public High School-Level Teachers of Core Subjects: Evidence From the 2007–08 Schools and Staffing Survey (NCES 2011-317).

<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2011317>

Teacher Career Choices: Timing of Teacher Careers Among 1992–93 Bachelor’s Degree Recipients (NCES 2008-153).

<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2008153>

To Teach or Not to Teach? Teaching Experience and Preparation Among 1992–93 Bachelor’s Degree Recipients 10 Years After College (NCES 2007-163).

<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2007163>

Attrition of New Teachers Among Recent College Graduates: Comparing Occupational Stability Among 1992–93 College Graduates Who Taught and Those Who Worked in Other Occupations (NCES 2001-189).

<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2001189>

TECHNICAL NOTES

Survey Methodology

The estimates provided in this Statistics in Brief are based on data collected through the first follow-up of the 2008 Baccalaureate and Beyond Longitudinal Study (B&B:08/09), which describes the enrollment and employment experiences of a national sample of 2007–08 bachelor’s degree recipients 1 year after graduation. The first follow-up study explores both undergraduate education experiences and early postbaccalaureate employment and enrollment. The second follow-up of this cohort began in 2012. B&B:08 is the third in a series of studies of bachelor’s degree recipients that have previously covered 1992–93 graduates through 2003 (B&B:93) and 1999–2000 graduates through 2001 (B&B:2000). The B&B studies allow researchers to address questions regarding the experiences of bachelor’s degree recipients, including participation in various undergraduate financial aid programs, undergraduate debt, and repayment of that debt; entrance into and progress through postbaccalaureate education; and postbaccalaureate employment, particularly as elementary/secondary teachers.

In B&B:08/09, students provided data through instruments administered via the Internet or telephone. In addition to student responses, data were collected from the institutions that granted the sampled students’ bachelor’s degrees, and the U.S. Department of Education supplied respondent-level

data on student loan and grant programs (i.e., the National Student Loan Data System) and federal student financial aid applications (i.e., the Central Processing System), matching student records using a common identifier. Students’ transcripts through the 2008–09 academic year were also collected as part of the Postsecondary Education Transcript Study (PETS), creating a record of academic enrollment including coursetaking, credit accumulation, academic performance, and degree receipt.

Among the approximately 137,800 undergraduate students who were sampled for the 2007–08 National Postsecondary Student Aid Study (NPSAS:08), approximately 17,160 students were determined to be eligible for B&B:08/09. Eligible students were those who had enrolled at an institution that was eligible to participate in Title IV federal student aid programs and was located in one of the 50 states, the District of Columbia, or Puerto Rico; had completed requirements for a bachelor’s degree between July 1, 2007, and June 30, 2008; and were awarded a baccalaureate degree by the institution from which they were sampled no later than June 30, 2009. These students represent approximately 1.6 million students who completed the requirements for a baccalaureate degree between July 1, 2007, and June 30, 2008. In this Brief, the 7 percent of 2007–08 bachelor’s degree recipients who had earned another bachelor’s (or higher) degree before the 2007–08

bachelor’s were excluded from the analyses. Table A-1 provides detailed information about the B&B:08/09 data collection.

The institution sampling frame for NPSAS:08 was constructed from the 2004–05 and 2005–06 Institutional Characteristics, Fall Enrollment, and Completions files of the Integrated Postsecondary Education Data System (IPEDS), which includes all U.S. postsecondary institutions that are eligible to participate in federal financial aid programs under Title IV of the Higher Education Act. The sampling design consisted of first selecting eligible institutions and then selecting students from these institutions. Institutions were selected with probabilities proportional to a composite measure of size based on expected 2007–08 enrollment. With approximately 1,700 institutions participating in the study, the weighted institution response rate was 90 percent. Eligible sampled students were defined as study respondents if at least 11 key data elements were available from any data source. Approximately 114,000 undergraduates and 14,000 graduate students were study respondents, and the weighted student response rates for both levels were 96 percent.¹⁶ Estimates were weighted to adjust for the unequal probability of selection into the sample and for nonresponse.

¹⁶ Data on graduate students from NPSAS:08 are not included in this study.

TABLE A-1. Selected statistics on B&B:08/09 data collections

Statistic	B&B:08/09
Target population	BA recipients in 2008–09
Target population size	1.6 million
Sampling frame (institutions)	2004–05 and 2005–06 IPEDS IC, ¹ Fall Enrollment, and Completion files
Number of sampled institutions (NPSAS)	1,960
Number of eligible institutions (NPSAS)	1,940
Number of participating institutions (NPSAS)	1,730
Percent of institutions that provided student enrollment lists (unweighted)	89.0
Percent of institutions that provided student enrollment lists (weighted)	90.1
Number of sampled students	18,500
Number of eligible students	17,160 for interview and transcript individual; 17,060 for combined (due to perturbation)
Interview response rate (unweighted)	87.7
Interview response rate (weighted)	78.3
Combined interview and transcript response rate (unweighted)	82.2
Combined interview and transcript response rate (weighted)	73.1

¹ Integrated Postsecondary Education Data System, Institutional Characteristics file.

SOURCE: Henke, R.R., Cataldi, E.F., Green, C., Lew, T., Woo, J., Sheperd, B., and Siegel, P. (2011). *2008–09 Baccalaureate and Beyond Longitudinal Study (B&B:08/09): A First Look at Recent College Graduates* (NCES 2011-236). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.

Two broad categories of error occur in estimates generated from surveys: sampling and nonsampling errors. Sampling errors occur when observations are based on samples rather than on entire populations. The standard error of a sample statistic is a measure of the variation due to sampling and indicates the precision of the statistic. The complex sampling design used in

NPSAS:08 must be taken into account when calculating variance estimates such as standard errors. NCES’s online PowerStats, which generated the estimates in this Statistics in Brief, uses the balanced repeated replication (BRR) method to adjust variance estimation for the complex sample design (Kaufman 2004; Wolter 1985).

Nonsampling errors can be attributed to several sources: incomplete information about all respondents (e.g., some students or institutions refused to participate, or students participated but answered only certain items); differences among respondents in question interpretation; inability or unwillingness to give correct information; mistakes in recording or coding data; and other errors of collecting, processing, sampling, and imputing missing data.

For more information on B&B:08/09 and NPSAS:08 methodology, see the following:

2008–09 Baccalaureate and Beyond Longitudinal Study (B&B:08/09): A First Look at Recent College Graduates (NCES 2011-236).
<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2011236>

2007–08 National Postsecondary Student Aid Study (NPSAS:08) Full-scale Methodology Report (NCES 2011-188).
<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2011188>

Response Rates

NCES Statistical Standard 4-4-1 states that “[a]ny survey stage of data collection with a unit or item response rate less than 85 percent must be evaluated for the potential magnitude of nonresponse bias before the data or any analysis using the data may be released” (U.S. Department of Education 2002). In the case of B&B:08/09, this means that nonresponse bias analysis could be required at any of three levels: institutions, study respondents, or items. Because the institutional response rate for NPSAS:08 was 90 percent, nonresponse bias analysis was not required at that level.

Of 17,160 eligible sample students, the B&B:08/09 weighted interview response rate was 78 percent, the transcript weighted response rate was 92 percent, and the combined interview and transcript weighted response rate was 73 percent. Because the weighted rate is less than 85 percent for those who responded to the interview and those with both an interview and transcript, nonresponse bias analysis was required for those variables based in whole or in part on these sources. In this Brief, one variable required nonresponse bias analysis: B1TSTATB (2009 teaching status (alternative)). For B1TSTATB, nonresponse bias analyses were conducted to determine whether respondents and nonrespondents differed on the following characteristics: institution

VARIABLES USED

All estimates presented in this Statistics in Brief were produced using PowerStats, a web-based software application that allows users to generate tables for many of the postsecondary surveys conducted by NCES. See “Run Your Own Analysis With DataLab” below for more information on PowerStats. The variables used in this Brief are listed below. Visit the NCES DataLab website <http://nces.ed.gov/datalab> to view detailed information on how these variables were constructed and their sources. Under *Codebooks*, select *B&B: 2008–2009* under *View by subject* or *View by variable name*. The program files that generated the statistics presented in this Brief can be found at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014002>.

Label	Name
2009 teaching status (alternative)	B1TSTATB
Bachelor’s degree major (detailed) in 2007–08	MAJORS23
Borrowed any undergraduate loans through 2007–08	B1LOANS
Cumulative amount owed for undergraduate education as of 2008–09	B1OWAMT1
Earned income in 2009	B1ERNINC
Highest degree completed before 2007–08 bachelor’s degree	H1OTHDEG
Race/ethnicity	RACE
Satisfaction with employment in 2009: Compensation	B1JBPAY
Satisfaction with employment in 2009: Overall satisfaction	B1JBOVER
Sex	GENDER
Transcript: Advanced laboratory science: credits earned	QEALBERN
Transcript: Calculus/advanced math: credits earned	QECLCERN
Transcript: College-level mathematics: credits earned	QEMATERN
Transcript: Science: credits earned	QESCIERN
Undergraduate GPA as of 2007–08	GPA

sector, region, and total enrollment; student type, sex, and age group; whether the student had submitted the Free Application for Federal Student Aid, was a federal aid recipient, was a Pell Grant recipient, or took out a Stafford Loan; and the amount, if any, of a student’s Pell Grant or Stafford Loan. A summary of nonresponse bias analysis results for B1TSTATB appears in table A-2 below.

“Region, other jurisdictions-PR” was the characteristic with the greatest significant bias. Enrollment at an institution located in Puerto Rico constitutes 1 percent of all bachelor’s degree recipients, however, and therefore the large bias exhibited between respondents and nonrespondents for this category is likely to have minimal impact when all bachelor’s degree recipients are considered.

TABLE A-2. Summary of item-level nonresponse bias for all students at all institution types: 2008–09

Variable name	Pre-imputation			Average percent difference across all categories pre- and post-imputation
	Median percent relative bias across characteristics	Percentage of characteristics with significant bias	Characteristic with greatest significant bias	
B1TSTATB 2009 teaching status (alternative)	1.31	43.24	Region, other jurisdiction - PR	0.60

NOTE: Relative bias is computed by dividing a variable's estimated bias for a given characteristic by the variable's mean. Relative bias is defined as significant if its difference from zero is statistically significant at $p < 0.05$.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2008/09 Baccalaureate and Beyond Study (B&B:08/09).

Any bias due to nonresponse, however, is based upon responses prior to stochastic imputation in which missing data were replaced with valid data from the records of donor cases that matched the recipients on selected demographic, enrollment, institution, and financial aid-related variables (Krotki, Black, and Creel 2005). Potential bias may have been reduced due to imputation. Because imputation procedures are designed specifically to identify donor cases with characteristics similar to those with missing data, the imputation procedure is assumed to reduce bias. While the level of item-level bias before imputation is measurable, the same measurement cannot be made after imputation. Although the magnitude of any change in item-level bias cannot be determined, the item estimates before and after imputation were compared to determine whether the imputation changed the biased estimate as an indication of a possible reduction in bias.

For B1TSTATB, the estimated pre-/post-imputation difference for each category (i.e., the percentage of students in that category before imputation minus the percentage of students in that category after imputation) was computed, after which the mean of the absolute value of those differences was computed (table A-2). The mean difference between pre- and post-imputation percentages, 0.60, was not statistically significant, which suggests that imputation may not have reduced bias, that the sample size was too small to detect a significant difference, or that there was little bias to be reduced.

For more detailed information on nonresponse bias analysis and an overview of the survey methodology, see *2008–09 Baccalaureate and Beyond Longitudinal Study (B&B:08/09): A First Look at Recent College Graduates* (NCES 2011-236). <http://nces.ed.gov/pubsearch/pubinfo.asp?pubid=2011236>

For more information, contact:

National Center for Education Statistics
NCES.Info@ed.gov

Statistical Procedures

Comparisons of means, medians, and proportions were tested using Student's t statistic.¹⁷ Differences between estimates were tested against the probability of a Type I error¹⁸ or significance level. The statistical significance of each comparison was determined by calculating the Student's t value for the difference between each pair of means or proportions and comparing the t value with published tables of significance levels for two-tailed hypothesis testing. Student's t values were computed to test differences between independent estimates using the following formula:

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

where E_1 and E_2 are the estimates to be compared and se_1 and se_2 are their corresponding standard errors.

There are hazards in reporting statistical tests for each comparison. First, comparisons based on large t statistics may appear to merit special attention.

¹⁷ Differences between medians were tested using Student's t statistic because nonparametric tests of differences in rank do not take the complex sample design of these data into account when estimating variance. For more information, see Shao and Tu (1996) and Francisco and Fuller (1991).

¹⁸ 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.

This can be misleading because 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 (and thus possibly statistically significant) t statistic.

A second hazard in reporting statistical tests is the possibility that one can report a “false positive” or Type I error. Statistical tests are designed to limit the risk of this type of error using a value denoted by alpha. The alpha level of .05 was selected for findings in this Brief and ensures that a difference of a certain magnitude or larger would be produced when there was no actual difference between the quantities in

the underlying population no more than 1 time out of 20.¹⁹ When analysts test hypotheses that show alpha values at the .05 level or smaller, they reject the null hypothesis that there is no difference between the two quantities. Failing to reject a null hypothesis (i.e., detect a difference), however, does not imply that the values are the same or equivalent.

¹⁹ No adjustments were made for multiple comparisons.

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RUN YOUR OWN ANALYSIS WITH DATALAB

You can replicate or expand upon the figures and tables in this report, or even create your own. DataLab has several different tools that allow you to customize and generate output from a variety of different survey datasets. Visit DataLab at:

<http://nces.ed.gov/datalab/>

The screenshot shows the DATALAB website interface. At the top, there is a green header with the text "DATALAB" and "Postsecondary & Pre-Elementary Education Data". Below this, the page is divided into several sections:

- PowerStats:** A section with a colorful logo of numbers. The text reads: "Create, save and share tables and regressions, using 15 NCES postsecondary survey datasets and 1 pre-elementary education dataset." Below the text is an orange "GO" button.
- College & Career Tables Library:** A section with a logo of a bookshelf. The text reads: "Browse through 5,000+ tables from NCES' postsecondary publications that cover a comprehensive range of topics." Below the text is an orange "GO" button.
- QuickStats:** A section with a logo of a blue circle and a star. The text reads: "Quickly create simple tables using the most frequently used variables from recent postsecondary and pre-elementary survey data." Below the text is an orange "GO" button.
- IPEDS ANALYTICS: Delta Cost Project Database:** A section with a logo of a bar chart. The text reads: "Download IPEDS institutional data from 1986-87 to 2008-09 that have been translated for longitudinal analysis." Below the text is an orange "GO" button.
- What's New:** A section with the heading "What's New" and a date "5/24/2012". The text reads: "Now available in PowerStats: National Postsecondary Student Aid Study (NPSAS:96) Undergraduate and Graduate Students."
- Questions?:** A section with the heading "Questions?" and the text "Contact PowerStats@ed.gov."
- Code Books:** A section with the heading "Code Books" and the text "View/download variable information for PowerStats datasets. Files are PDFs." Below this text are two dropdown menus: "View by subject" and "View by variable name". Each dropdown menu has an orange "GO" button next to it.