STATS IN BRIEF

New College Graduates at Work

Employment Among 1992–93, 1999–2000, and 2007–08 Bachelor's Degree Recipients 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.

The economic recession that began in 2008 has affected employment for all workers, including 4-year college graduates (Carnevale, Jayasundera, and Cheah 2012). Compared with graduates who received a bachelor's degree in the early 2000s, current college graduates aged 21–24 are more likely to be unemployed and wages for all graduates are lower (Shierholz, Sabadish, and Wething 2012). Those who find employment may be working in a job unrelated to their field of study (Carnevale, Jayasundera, and Cheah 2012; Roksa and Arum 2012). Moreover, the effects of graduating during a weak economy may have long-lasting consequences in the form of depressed wages and slowed occupational advancement decades after graduation (Oreopoulos, von Wachter, and Heisz 2012; Kahn 2010).

Although economic conditions have a large impact on the labor market outcomes of recent college graduates overall, some graduates may be harder hit than others. For example, unemployment rates during recessions tend to be higher among younger (aged 16–24), male, and Black and Hispanic workers than among older, female, and White workers (Carnevale, Hanson, and Gulish 2013; U.S. Bureau of Labor Statistics 2013; Shierholz, Sabadish, and Wething 2012;

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Elsby, Hobijn, and Sahin 2010).[1] Labor market outcomes are also associated with graduates' college majors. In recent years, graduates who majored in technical fields aligned with specific occupations, such as health care and education, have experienced lower unemployment rates than graduates with more general majors in the liberal arts or humanities (Carnevale, Cheah, and Strohl 2013). Compensation also varies by major (Oreopolous and Petronijevic 2013); for example, graduates who major in female-dominated fields (such as education and some health care professions) earn less than their peers who major in male-dominated fields such as engineering (Roksa 2005). Finally, graduates in occupations that align with their college major earn more than those with mismatches between major and occupation, particularly in technical fields (Bender and Heywood 2011; Melguizo and Wolniak 2012; Robst 2007).

This Statistics in Brief examines the employment outcomes of college graduates 1 year after earning a bachelor's degree.[2] It compares 2007–08 bachelor's degree recipients who graduated at the start of the recent recession with their peers who graduated in 1992–93 and 1999–2000. Different labor market conditions characterized these three time periods. The

U.S. unemployment rate rose from 5.8 percent in 2008 to 9.3 percent in 2009, dropped from 6.9 percent in 1993 to 6.1 percent in 1994, and rose from 4.0 percent in 2000 to 4.7 percent in 2001 (U.S. Census Bureau 2013). The different labor market conditions of the years examined in this study meant that the three cohorts faced different employment prospects as they sought and began their first jobs as college graduates. The Brief begins by examining the employment and enrollment status of all college graduates 1 year after earning a bachelor's degree and then examines their employment experiences in more detail, including employment intensity (whether employed full time, part time, or in multiple jobs), occupation, and salary of those who were employed and not enrolled 1 year after graduation.

DATA

The data analyzed in this Statistics in Brief are from the 1993–94, 2000–01 and 2008–09 administrations of the Baccalaureate and Beyond Longitudinal Study (B&B:93/94, B&B:00/01, and B&B:08/09). These studies followed 1992–93, 1999–2000, and 2007–08 bachelor's degree recipients identified in the National Postsecondary Student Aid Study (NPSAS). The B&B studies focus on 4-year college graduates and do not include individuals who have

not completed a bachelor's degree. In addition to their base-year NPSAS interview, students in each cohort completed a follow-up interview 1 year after graduating. The Brief is based on data from the base-year and 1-year follow-up interviews. More information about the data collected for these cohorts can be found at http://nces.ed.gov/surveys/b&b.

This Brief presents two approaches to measuring the relationship between bachelor's degree recipients' jobs and their undergraduate majors. The estimates in figures 2, 3, 6, 8, and 9 are based on study respondents' subjective assessments of whether their current job was closely, somewhat, or not at all related to their undergraduate major. In contrast, table 1 matches graduates' self-reported undergraduate degree field and occupational title. Although the latter approach avoids respondents' subjective assessments of the match, it may not accurately reflect all of the skills that graduates might gain, particularly for majors that impart skills applicable to a range of occupations (Robst 2007).

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.[3]

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[1] See Hout (2012) for a review of studies on the economic and social outcomes associated with earning a bachelor's degree and how these outcomes vary among individuals and groups.
[2] In this Brief, "college graduates" refers to graduates of 4-year postsecondary institutions who earned a bachelor's degree.

[3] 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=2014003.

STUDY QUESTIONS

1 What was the employment and enrollment status of 2007–08 bachelor's degree recipients 1 year after college? How did the employment and enrollment status of these recent college graduates compare with that of earlier cohorts?

2 How did college graduates' unemployment and employment in fields unrelated to their undergraduate majors vary with their demographic characteristics, including sex, race/ethnicity, and age? Did these outcomes change over time?

3 What were the relationships between college graduates' major field of study and their employment outcomes, including unemployment rates, the relatedness of graduates' majors and jobs, salary levels (among those employed full time), and occupations? How did these relationships vary over time?

KEY FINDINGS

- One year after graduation, the unemployment rate of 2007–08 bachelor degree recipients (9 percent) was higher than for those who attained their degrees in 1992–93 and 1999–2000 (4 percent and 5 percent, respectively) (figure 1).

- Eight percent of female graduates who earned their degrees in 2007–08 were unemployed in 2009, compared with 10 percent of male graduates (figure 2). No female-male differences were found in unemployment after 1 year among 1992–93 and 1999–2000 graduates.

- One year after graduation, unemployment rates for some majors increased between 2001 and 2009,

whereas for other majors there was no measurable change. For example, 2007–08 bachelor's degree recipients who majored in social sciences, humanities, health care, business, education, and other applied fields had higher rates of unemployment than did 1999–2000 graduates with the same majors. In contrast, the 1-year unemployment rates of 2007–08 graduates who majored in computer and information sciences, engineering, and other science, technology, engineering, and mathematics (STEM) fields were not statistically significant from 1999–2000 graduates who majored in the same fields (figure 5).[4]

- In constant dollars, median annual salaries after 1 year were lower in 2009 than in 2001 for graduates in computer and information sciences, engineering, social sciences, humanities, business, and other applied fields. In contrast, median annual salaries were higher in 2001 than in 1994 for all majors except health care (figure 7).

- In 2009, recent graduates who reported that their jobs were closely related to their majors earned more than graduates reporting jobs that were either somewhat or unrelated to their major ($40,000 vs. $35,000 and $31,000, respectively) (figure 8).

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[4] Other STEM fields include biological and physical sciences, science technology, mathematics, and agricultural and natural sciences.

1

What was the employment and enrollment status of 2007–08 bachelor's degree recipients 1 year after college? How did the employment and enrollment status of these recent college graduates compare with that of earlier cohorts?

A higher proportion of bachelor's degree recipients were enrolled in graduate or postbaccalaureate education 1 year after graduation in 2009 and 2001 than in 1994 (22 and 21 percent in 2009 and 2001, respectively, vs. 18 percent in 1994) (figure 1).

Employment intensity and whether graduates worked in multiple jobs differed among the three cohorts examined. Among graduates not enrolled, relatively fewer had one full-time job in 2009 than in the earlier cohorts (64 percent in 2009 vs. 79 and 78 percent in 1994 and 2001, respectively) and relatively more had multiple jobs (14 percent in 2009 vs. 3 and 7 percent in 1994 and 2001, respectively). Unemployment 1 year after graduation was higher in 2009 than in 1994 and 2001 among graduates who were not enrolled. Nine percent of these 2007–08 graduates were unemployed in 2009, compared with 4 percent in 1994 and 5 percent in 2001.

FIGURE 1.

EMPLOYMENT AND ENROLLMENT STATUS
Employment and enrollment status of 1992–93, 1999–2000, and 2007–08 bachelor degree recipients: 1994, 2001, and 2009
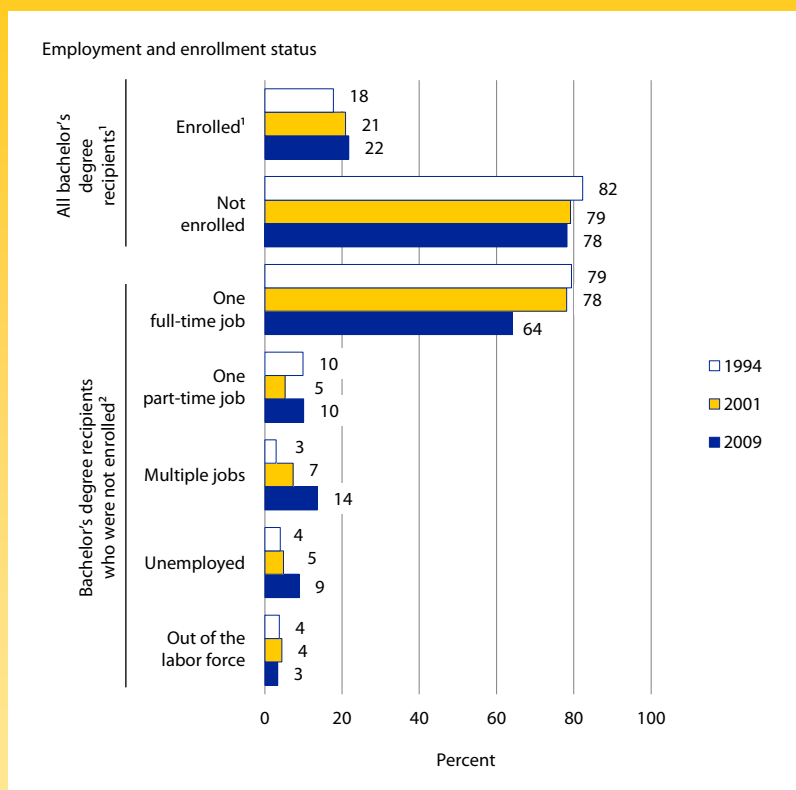
[1] Includes bachelor's degree recipients enrolled in a degree or certificate program 1 year later.

[2] Graduates employed full time worked 35 or more hours per week. Graduates who were out of the labor force were not employed and were not looking for work.

NOTE: Estimates include graduates who received bachelor's degrees from 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=2014003.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/94, 2000/01, and 2008/09 Baccalaureate and Beyond Longitudinal Studies (B&B: 93/94, B&B:2000/01, and B&B:08/09).

2

How did college graduates' unemployment and employment in fields unrelated to their undergraduate majors vary with their demographic characteristics, including sex, race/ethnicity, and age? Did these outcomes change over time?

In 2009, the unemployment rate was lower for female than for male graduates (8 vs. 10 percent) (figure 2). In contrast, 4 and 5 percent of both men and women were unemployed in 1994 and 2001, respectively.[5]

Employed graduates were asked to indicate whether their current job was closely, somewhat, or not at all related to their undergraduate majors. Twenty-seven percent of 2007–08 graduates reported that their jobs were unrelated to their undergraduate major in 2009, compared with 22 percent in 2001, and 24 percent in 1994 (figure 2). The percentage of respondents who reported unrelated employment was higher in 2009 than in 2001 and among both women (28 percent vs. 22 percent) and men (26 percent vs. 23 percent). Apparent differences in the levels of major-job relatedness between men and women were not statistically significant within any of the years that were examined.

FIGURE 2.

UNEMPLOYMENT AND JOB UNRELATED TO MAJOR BY SEX
Among those not enrolled, percentage of 1992–93, 1999–2000, and 2007–08 bachelor degree recipients who were unemployed and employed out of field, by sex: 1994, 2001, and 2009
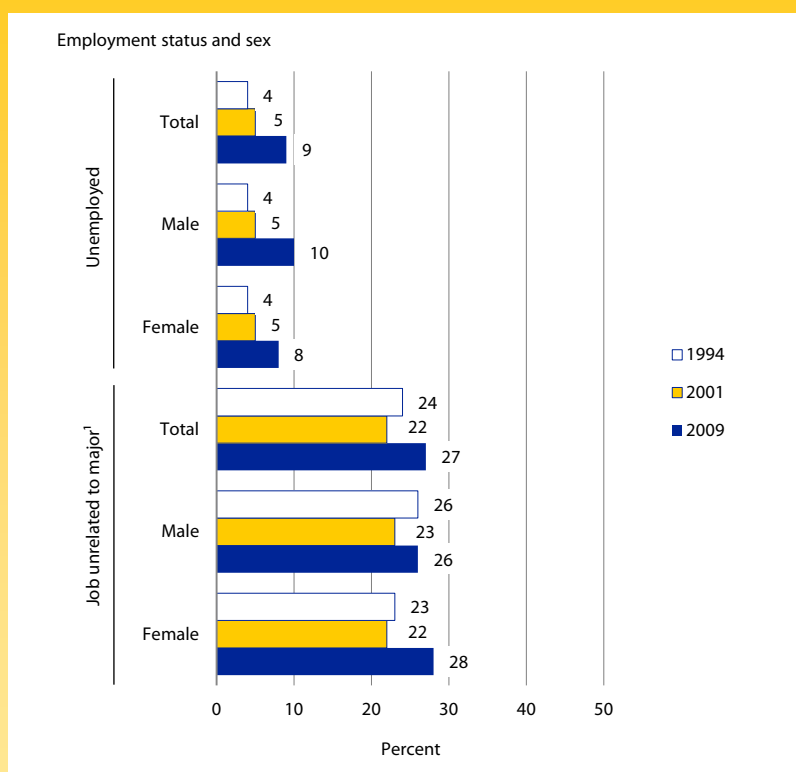
[1] Includes bachelor's degree recipients who reported working in an occupation that was not related to their undergraduate major field of study.
NOTE: Estimates include graduates who received bachelor's degrees from Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014003.
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/94, 2000/01, and 2008/09 Baccalaureate and Beyond Longitudinal Studies (B&B: 93/94, B&B:2000/01, and B&B:08/09).
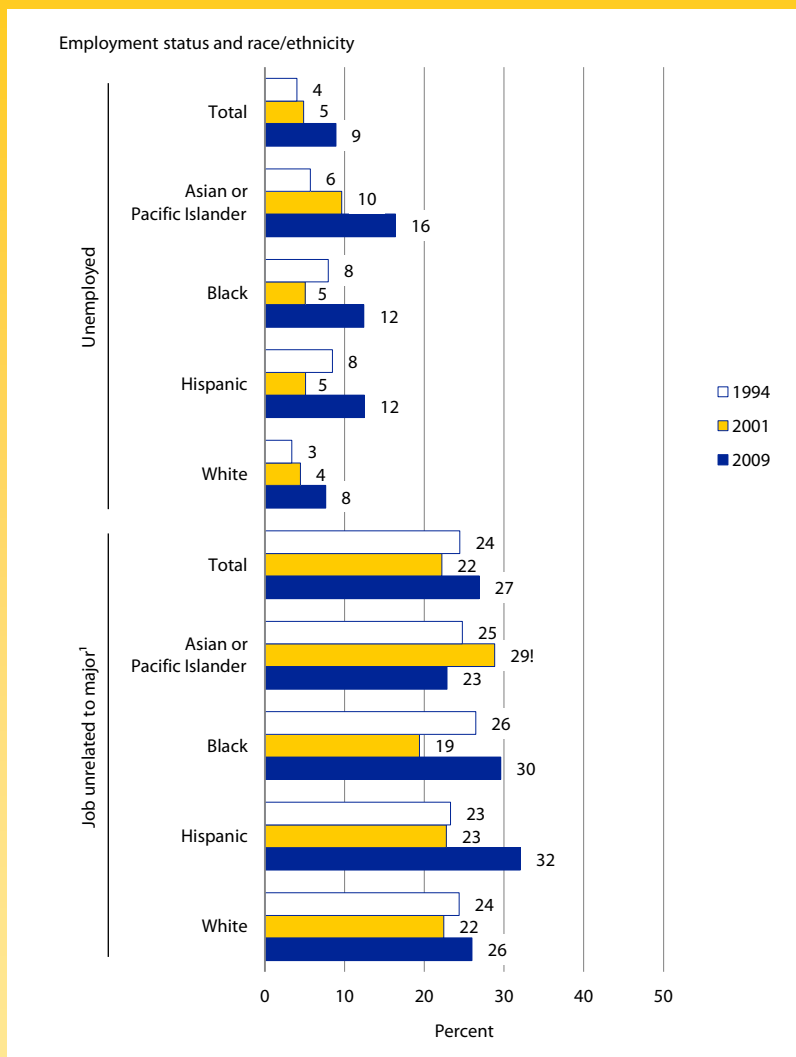
[5] Graduates who are not working include unemployed graduates who are not working and actively looking for work and graduates who are out of the labor force, or not working and not looking for work. Out-of-the-labor-force graduates account for too small a proportion of graduates in each cohort (3 to 4 percent) to be disaggregated further.

Unemployment was higher in 2009 than in 2001 for all racial/ethnic groups that were examined separately, including Asians (16 percent vs. 10 percent), Black graduates (12 percent vs. 5 percent), Hispanics (12 percent vs. 5 percent), and White graduates (8 percent vs. 4 percent) (figure 3).

In addition, in 2009, White graduates' unemployment was lower than the unemployment of all of the other racial/ethnic groups (8 percent vs. 12 to 16 percent). In 2001, unemployment rates between White graduates and graduates from other racial/ethnic groups were not significantly different with one exception: unemployment was higher for Asian than for White graduates (10 percent vs. 4 percent). The proportion of graduates who reported employment unrelated to their majors was higher in 2009 than in 2001 for all racial/ethnic groups except Asians (figure 3). Among Black graduates, for example, 30 percent of recent graduates reported unrelated employment in 2009, compared with 19 percent in 2001.

FIGURE 3.

UNEMPLOYMENT AND JOB UNRELATED TO MAJOR BY RACE/ETHNICITY
Among those not enrolled, percentage of 1992–93, 1999–2000, and 2007–08 bachelor's degree recipients who were unemployed and employed out of field, by race/ethnicity: 1994, 2001, and 2009

Employment status and race/ethnicity

Unemployed

	1994	2001	2009
Total	4	5	9
Asian or Pacific Islander	6	10	16
Black	8	5	12
Hispanic	8	5	12
White	3	4	8

Job unrelated to major[1]

	1994	2001	2009
Total	24	22	27
Asian or Pacific Islander	25	29!	23
Black	26	19	30
Hispanic	23	23	32
White	24	22	26

Legend: □ 1994   ■ 2001 (yellow)   ■ 2009 (blue)

Percent (x-axis: 0, 10, 20, 30, 40, 50)

! Interpret data with caution. Estimate is unstable because the standard error represents more than 30 percent of the estimate.
[1] Includes bachelor's degree recipients who reported working in an occupation that was not related to their undergraduate major field of study.
NOTE: Black includes African American and Hispanic includes Latino. Estimates for American Indian or Alaska Native, Other, or Two or more races are included in the totals but not shown separately. Estimates include graduates who received bachelor's degrees from 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=2014003.
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/94, 2000/01, and 2008/09 Baccalaureate and Beyond Longitudinal Studies (B&B: 93/94, B&B:2000/01, and B&B:08/09).

First-time bachelor's degree recipients in the Baccalaureate and Beyond Longitudinal Study (B&B) include both traditional-age (23 or younger) and graduates 30 or older. In 2009, for example, 19 percent of first-time bachelor's degree recipients were aged 24–29 and 13 percent were 30 or older (Cataldi et al. 2011). A comparison of unemployment rates by age revealed no statistically significant differences in 1-year unemployment among graduates aged 23 or younger, 24–29, and 30 or older in any of the three cohorts (figure 4). In 2009, for example, 8 to 10 percent of graduates in each age group were unemployed.[6]

FIGURE 4.

UNEMPLOYMENT BY AGE
Among those not enrolled, percentage of 1992–93, 1999–2000, and 2007–08 bachelor's degree recipients who were unemployed, by age: 1994, 2001, and 2009
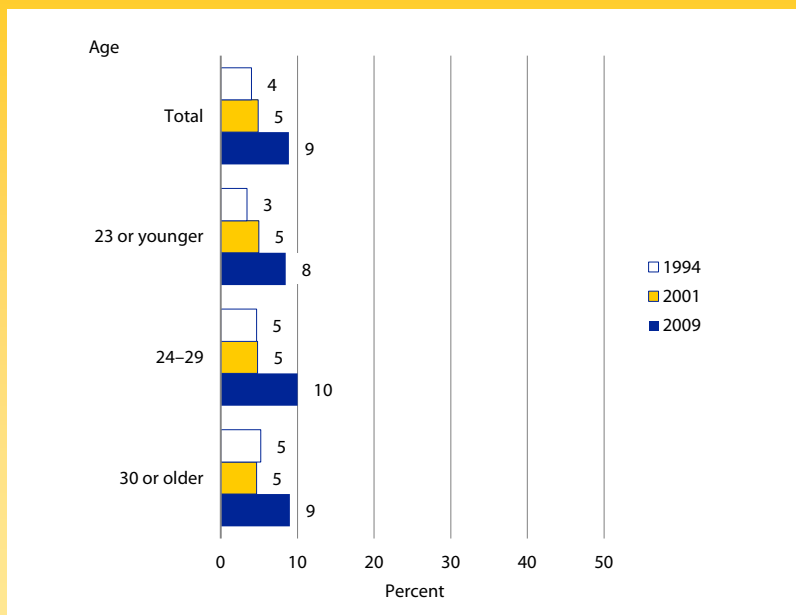
NOTE: Estimates include graduates who received bachelor's degrees from Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014003.
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/94, 2000/01, and 2008/09 Baccalaureate and Beyond Longitudinal Studies (B&B: 93/94, B&B:2000/01, and B&B:08/09).

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[6] Due to small sample sizes, data on jobs unrelated to majors by age over time are not available.

3

What were the relationships between college graduates' major field of study and their employment outcomes, including unemployment rates, the relatedness of graduates' majors and jobs, salary levels (among those employed full time), and occupations? How did these relationships vary over time?

While unemployment rates were higher in 2009 than in 2001 overall, this difference was not found for graduates in each major field of study. No statistically significant differences were found in unemployment among the three categories of STEM majors (computer and information sciences, engineering,

and other STEM fields) between the two cohorts (figure 5).[7] In contrast, unemployment was higher in 2009 than in 2001 for graduates in the social sciences, humanities, health care, business, education, and other applied field majors. For example, 12 percent of social science majors were unemployed in 2009,
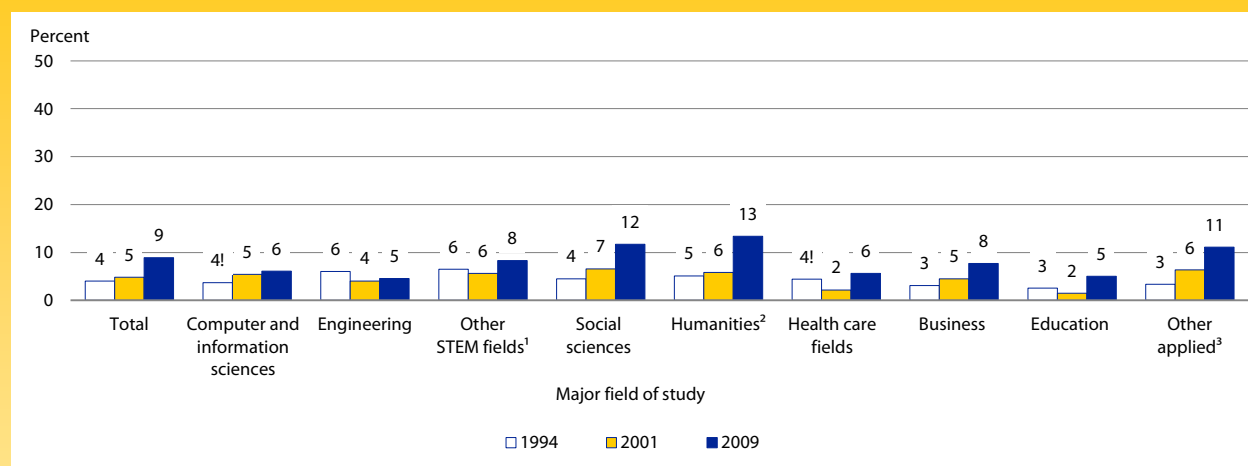
compared with 7 percent in 2001. Between 1994 and 2001, the only significant difference in unemployment was found for graduates who majored in other applied fields; 3 percent of these graduates were unemployed in 1994 versus 6 percent in 2001.

FIGURE 5.

UNEMPLOYMENT AND MAJOR FIELD OF STUDY
Among those not enrolled, percentage of 1992–93, 1999–2000, and 2007–08 bachelor's degree recipients who were unemployed, by major field of study: 1994, 2001, and 2009

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

[1] Other science, technology, engineering, and mathematics (STEM) fields include biological and physical sciences, science technology, mathematics, and agricultural and natural sciences.

[2] Humanities includes history.

[3] Other applied includes architecture; communications; public administration and human services; design and applied arts; law and legal studies; library sciences; and theology and religious vocations.

NOTE: Data for the 1.6 percent (in 1994) and 2.9 percent (in 2001 and 2009) of graduates who majored in general studies; area, ethnic, cultural, and gender studies; and multidisciplinary studies are included in the total but not presented separately. Estimates include graduates who received bachelor's degrees from 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=2014003.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/94, 2000/01, and 2008/09 Baccalaureate and Beyond Longitudinal Studies (B&B: 93/94, B&B:2000/01, and B&B:08/09).

[7] Data on graduates' undergraduate major field of study are not disaggregated by demographic characteristics due to small sample sizes.
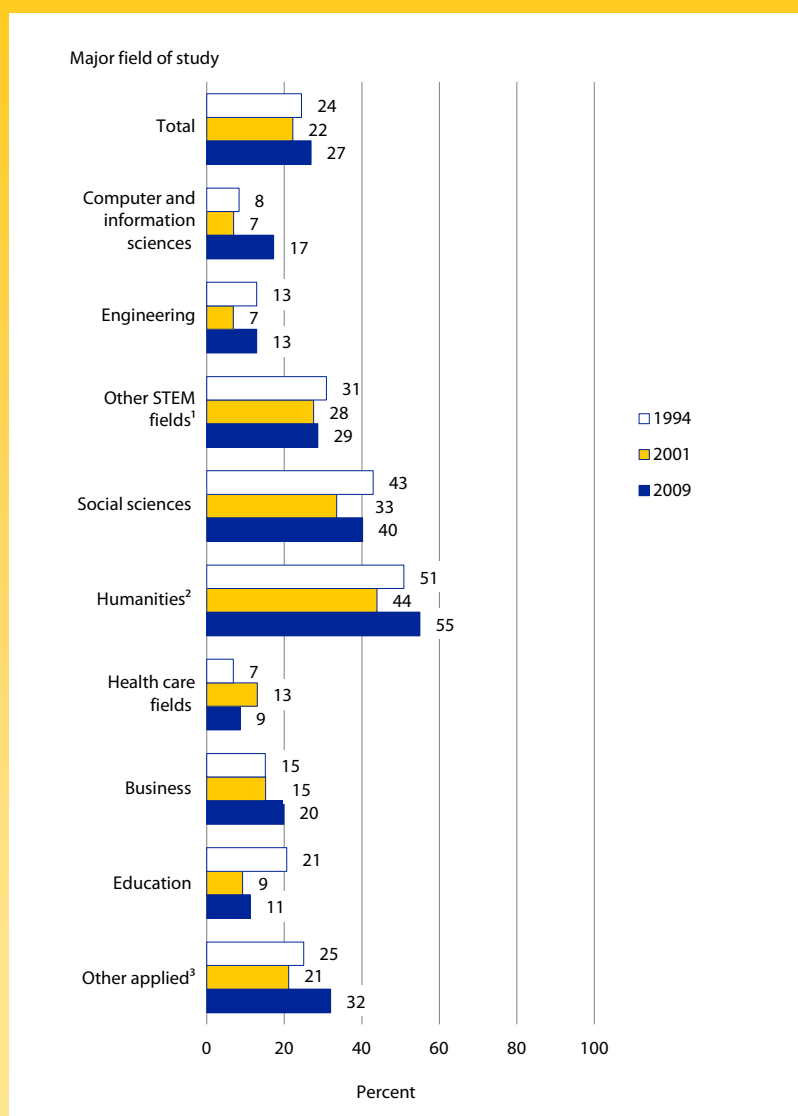
In addition to differences between cohorts, employment rates also differed by major within cohorts in each of the 3 years examined.[8] In 2009, for example, unemployment ranged from 12 to 13 percent among social sciences and humanities majors to 5 and 6 percent among computer and information sciences, engineering, health care, and education majors (figure 5). On the other hand, apparent differences in unemployment rates across the three categories of STEM fields (computers and information sciences, engineering, and other STEM fields) in 2009 were not statistically significant.

A higher proportion of graduates reported employment unrelated to their undergraduate major in 2009 than in 2001 for six of the 10 major fields of study: computer and information sciences (17 percent vs. 7 percent), engineering (13 percent vs. 7 percent), social sciences (40 percent vs. 33 percent), humanities (55 percent vs. 44 percent), business (20 percent vs. 15 percent), and other applied fields (32 percent vs. 21 percent) (figure 6). In each of the 3 years examined, cross-major comparisons revealed that unrelated employment was highest for humanities majors (44 to 55 percent).

FIGURE 6.

JOB UNRELATED TO MAJOR AND MAJOR FIELD OF STUDY
Among those employed and not enrolled, percentage of 1992–93, 1999–2000, and 2007–08 bachelor's degree recipients who reported jobs that were unrelated to their undergraduate major field of study, by major field of study: 1994, 2001, and 2009

[1] Other science, technology, engineering, and mathematics (STEM) fields include biological and physical sciences, science technology, mathematics, and agricultural and natural sciences.
[2] Humanities includes history.
[3] Other applied includes architecture; communications; public administration and human services; design and applied arts; law and legal studies; library sciences; and theology and religious vocations.
NOTE: Data for the 1.6 percent (in 1994) and 2.9 percent (in 2001 and 2009) of graduates who majored in general studies; area, ethnic, cultural, and gender studies; and multidisciplinary studies are included in the total but not presented separately. Estimates include graduates who received bachelor's degrees from 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=2014003.
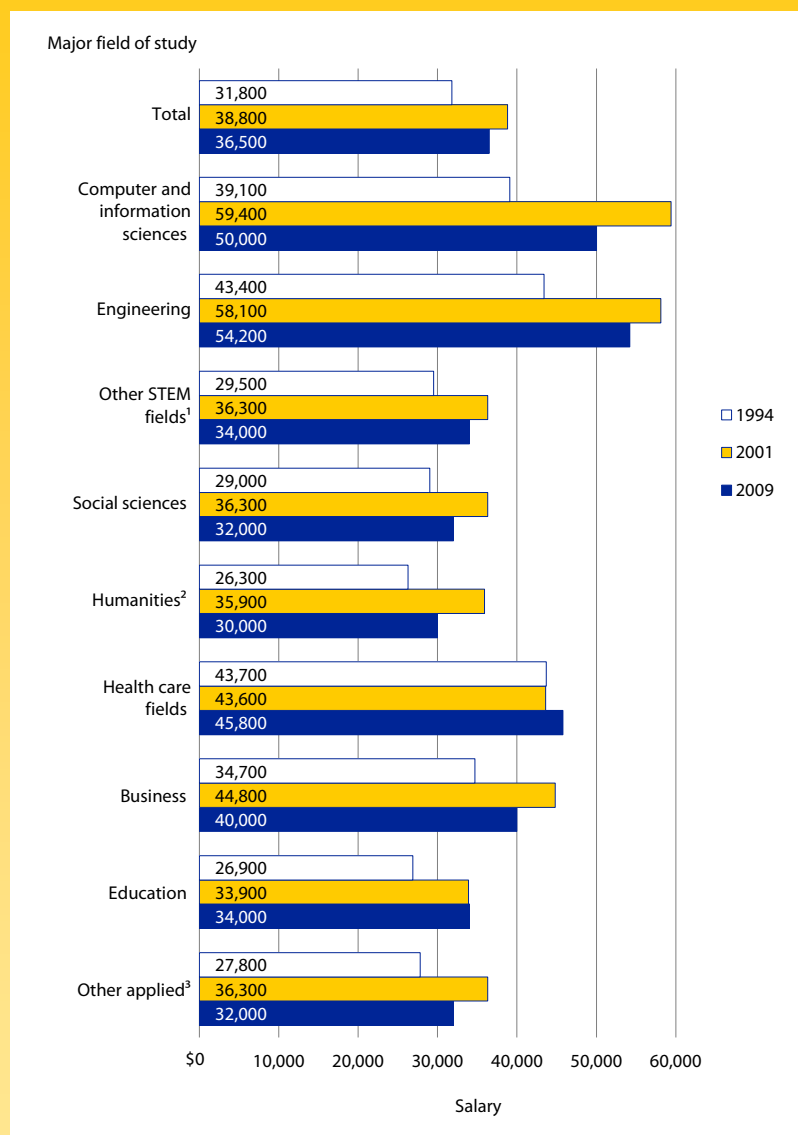SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/94, 2000/01, and 2008/09 Baccalaureate and Beyond Longitudinal Studies (B&B: 93/94, B&B:2000/01, and B&B:08/09).

Like unemployment rates, graduates' salaries also differed between 2009 and 2001 by field of study (figure 7). Median annual salaries were lower in 2009 than in 2001 for computer and information sciences ($50,000 vs. $59,400), engineering ($54,200 vs. $58,100), social sciences ($32,000 vs. $36,300), humanities ($30,000 vs. $35,900), business ($40,000 vs. $44,800), and other applied fields ($32,000 vs. $36,300) majors. In contrast, comparing the two earlier cohorts, median annual salaries were higher in the later cohort (2001) than in the earlier cohort (1994) for all majors except health care.

In addition to salary differences over time, graduates' salaries also varied by their major fields of study in all three cohorts. In 2009, for example, median annual salaries ranged from $30,000 to $32,000 for humanities, social sciences, and other applied majors. In contrast, the salary range for health care, computer and information sciences, and engineering majors was $45,800 to $54,200.

FIGURE 7.

MEDIAN SALARIES AND UNDERGRADUATE MAJOR
Median annual salaries (in 2009 dollars) of 1992–93, 1999–2000, and 2007–08 bachelor's degree recipients who were working full time for pay and not enrolled, by major field of study: 1994, 2001, and 2009

[1] Other science, technology, engineering, and mathematics (STEM) fields include biological and physical sciences, science technology, mathematics, and agricultural and natural sciences.
[2] Humanities includes history.
[3] Other applied includes architecture; communications; public administration and human services; design and applied arts; law and legal studies; library sciences; and theology and religious vocations.
NOTE: Data for the 1.6 percent (in 1994) and 2.9 percent (in 2001 and 2009) of graduates who majored in general studies; area, ethnic, cultural, and gender studies; and multidisciplinary studies are included in the total but not presented separately. Graduates employed full time worked 35 or more hours per week. Amounts for 1994 and 2000 have been adjusted for inflation using the U.S. Bureau of Labor Statistics Consumer Price Index for All Urban Consumers (CPI-U). Estimates include graduates who received bachelor's degrees from 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=2014003.
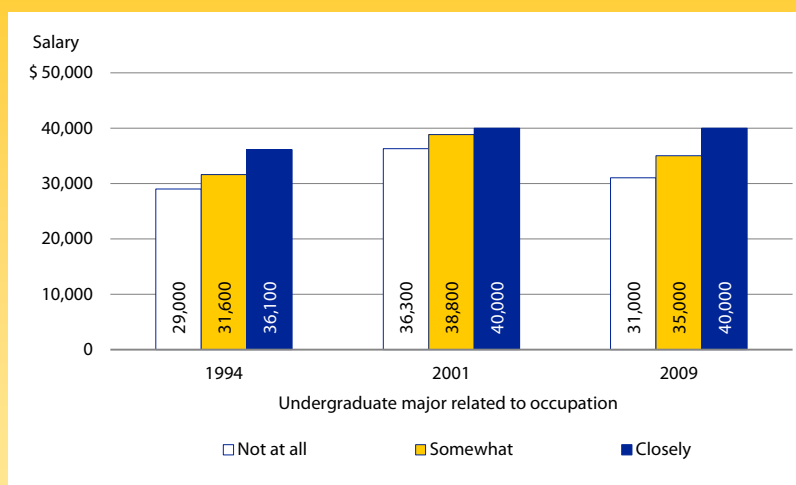SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/94, 2000/01, and 2008/09 Baccalaureate and Beyond Longitudinal Studies (B&B: 93/94, B&B:2000/01, and B&B:08/09).

One year after graduation, 2009 graduates who reported that their jobs were related to their undergraduate majors had higher salaries than other graduates. In 2009, the annual median salary for those who reported that their job was closely related to their major was $40,000, compared with $35,000 for those reporting jobs that were somewhat related, and $31,000 for those reporting unrelated jobs (figure 8). The median salary of graduates with jobs closely related to their major ($40,000) in 2001 exceeded that of their peers who reported unrelated jobs ($36,300). In 1994, graduates who reported jobs closely related to their major had higher salaries ($36,100) than those with jobs that were not at all related ($29,000) or somewhat related ($31,600).

FIGURE 8.

MEDIAN SALARIES AND EMPLOYMENT RELATED TO UNDERGRADUATE MAJOR
Median annual salaries (in 2009 dollars) of 1992–93, 1999–2000, and 2007–08 bachelor's degree recipients who were working full time for pay and not enrolled, by whether their occupation was not at all, somewhat, or closely related to their undergraduate major: 1994, 2001, and 2009

Salary

	1994	2001	2009
Not at all	29,000	36,300	31,000
Somewhat	31,600	38,800	35,000
Closely	36,100	40,000	40,000

Undergraduate major related to occupation

☐ Not at all   ☐ Somewhat   ■ Closely

NOTE: Graduates employed full time worked 35 or more hours per week. Amounts for 1994 and 2001 have been adjusted for inflation using the Consumer Price Index for urban households (CPI-U). Estimates include graduates who received bachelor's degrees from 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=2014003.
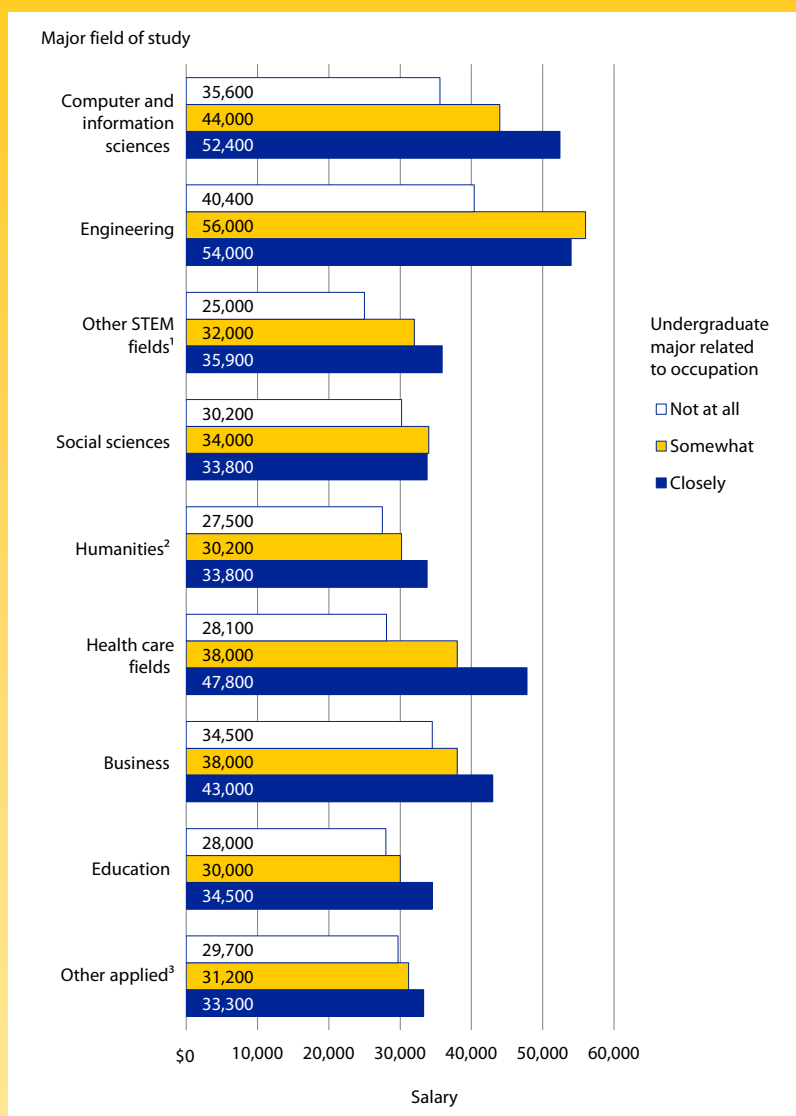SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/94, 2000/01, and 2008/09 Baccalaureate and Beyond Longitudinal Studies (B&B: 93/94, B&B:2000/01, and B&B:08/09).

Comparable data on the relationship between specific majors and salaries is not available over time. In 2009, graduates who reported jobs closely related to their major earned more than those reporting unrelated jobs in computer and information sciences ($52,400 vs. $35,600), other STEM fields ($35,900 vs. $25,000), humanities ($33,800 vs. $27,500), health care ($47,800 vs. $28,100), business ($43,000 vs. $34,500), and other applied fields ($33,300 vs. $29,700) (figure 9).

FIGURE 9.

MEDIAN SALARIES AND EMPLOYMENT RELATED TO UNDERGRADUATE MAJOR FIELDS OF STUDY
Median annual salaries of 2007–08 bachelor's degree recipients who were working full time for pay and not enrolled by whether their occupation was not at all, somewhat, or closely related to their undergraduate major, by major field of study: 2009

Major field of study

Major field of study	Not at all	Somewhat	Closely
Computer and information sciences	35,600	44,000	52,400
Engineering	40,400	56,000	54,000
Other STEM fields[1]	25,000	32,000	35,900
Social sciences	30,200	34,000	33,800
Humanities[2]	27,500	30,200	33,800
Health care fields	28,100	38,000	47,800
Business	34,500	38,000	43,000
Education	28,000	30,000	34,500
Other applied[3]	29,700	31,200	33,300

Undergraduate major related to occupation
☐ Not at all
☐ Somewhat
■ Closely

Salary axis: $0, 10,000, 20,000, 30,000, 40,000, 50,000, 60,000

Salary

[1] Other science, technology, engineering, and mathematics (STEM) fields include biological and physical sciences, science technology, mathematics, and agricultural and natural sciences.
[2] Humanities includes history.
[3] Other applied includes architecture; communications; public administration and human services; design and applied arts; law and legal studies; library sciences; and theology and religious vocations.
NOTE: The estimates exclude the 2.9 percent of graduates who majored in general studies; area, ethnic, cultural, and gender studies; and multidisciplinary studies. Graduates employed full time worked 35 or more hours per week. Amounts for 1994 and 2000 have been adjusted for inflation using the Consumer Price Index for urban households (CPI-U). Estimates include graduates who received bachelor's degrees from 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=2014003.
SOURCE: U.S. Department of Education, National Center for Education Statistics, 2008/09 Baccalaureate and Beyond Longitudinal Studies (B&B:08/09).

Among graduates who were not enrolled, a plurality (23 to 26 percent) worked in business/management occupations 1 year after graduation in all three cohorts (table 1). An examination of the alignment of occupations with graduates' major field of study in each cohort revealed that about 50 percent or more of graduates who majored in computer and information sciences, engineering and engineering technology (53 to 59 percent); health care fields (65 to 81 percent); and education (51 to 81 percent) were working in occupational areas aligned with their majors (STEM, health care, and education, respectively).

Table 1. OCCUPATION AND UNDERGRADUATE MAJOR
Among those employed and not enrolled, percentage distribution of 1992–93, 1999–2000, and 2008–09 bachelor's degree recipients by occupational area and major field of study: 1994, 2001, and 2009

Graduation year and undergraduate major	Occupation							
	Business/ management	STEM[1]	Pre K-12 educators	Health care	Sales	Business support/ administrative	Trades and technical[2]	Other[3]
2009								
All fields	23.5	7.9	9.1	8.7	8.6	12.5	14.5	15.3
Computer and information sciences, engineering, and engineering technology[4]	25.4	53.0	‡	1.0 !	1.7	5.6	9.2	3.6
Other STEM fields[5]	13.7	18.3	8.0	10.9	7.9	7.8	13.0	20.3
Social sciences	22.6	1.5 !	3.4	4.5	8.7	15.6	18.0	25.7
Humanities[6]	10.8	1.0 !	9.4	2.7	9.6	16.9	23.9	25.8
Health care fields	7.0	‡	0.9 !	78.7	1.8 !	3.9	3.4	3.2
Business	47.4	3.7	1.0 !	1.2	13.5	16.8	11.8	4.5
Education	3.2	‡	68.7	0.9 !	1.8	3.8	6.9	14.7
Other applied[7]	15.6	1.3	2.6	3.2	10.8	13.9	23.6	29.0
2001								
All fields	25.8	9.9	13.8	7.1	8.7	8.7	11.7	14.4
Computer and information sciences, engineering, and engineering technology[4]	24.5	58.9	‡	‡	2.8 !	2.6	8.1	1.9 !
Other STEM fields[5]	13.2	21.2	12.9	6.5	8.0	5.4	15.1	17.7
Social sciences	26.8	1.4	10.5	2.7	8.4	11.0	13.0	26.2
Humanities[6]	18.3	2.4 !	20.7	1.2 !	8.6	13.8	12.7	22.2
Health care fields	8.3	1.2 !	4.8	64.6	2.8	3.7	8.4	6.4
Business	53.9	5.7	1.0 !	0.8 !	15.1	11.0	8.8	3.7
Education	3.0	‡	80.5	‡	2.5	3.8	5.6	3.7
Other applied[7]	20.7	2.2 !	4.8	1.8	9.6	9.0	18.0	33.9

See notes at end of table.

Table 1. OCCUPATION AND UNDERGRADUATE MAJOR
Among those employed and not enrolled, percentage distribution of 1992–93, 1999–2000, and 2008–09
bachelor's degree recipients by occupational area and major field of study: 1994, 2001, and 2009—continued

Graduation year and undergraduate major	Occupation							
	Business/ management	STEM[1]	Pre K-12 educators	Health care	Sales	Business support/ administrative	Trades and technical[2]	Other[3]
1994								
All fields	22.6	7.5	9.6	7.7	12.3	12.9	12.5	14.9
Computer and information sciences, engineering, and engineering technology[4]	17.3	57.5	0.8 !	0.5 !	4.6	4.8	10.4	4.0
Other STEM fields[5]	11.2	11.4	10.6	7.1	11.3	11.2	17.7	19.4
Social sciences	22.5	1.9 !	3.3	2.7	15.5	17.8	15.7	20.7
Humanities[6]	18.7	1.2 !	10.8	3.3 !	10.5	16.2	16.8	22.5
Health care fields	5.6	‡	1.5 !	80.8	2.3 !	3.1	3.6 !	3.2 !
Business	43.7	2.4	0.9 !	1.0	20.1	18.6	9.3	4.0
Education	7.4	0.5 !	50.8	3.0	5.8	7.3	7.3	17.9
Other applied[7]	18.3	3.1	1.6	1.2 !	13.5	11.3	18.7	32.4

! Interpret data with caution. Estimate is unstable because the standard error represents more than 30 percent of the estimate.
‡ Reporting standards not met.
[1] Science, technology, engineering, and mathematics (STEM) occupations include computer occupations; software developers and programmers; computer support specialists; mathematical science occupations; engineers; drafters, engineering technicians, and mapping technicians; life scientists; and physical scientists.
[2] Trades and technical include supervisors and workers in media and communications equipment; protective service; food preparation and serving; building and groups cleaning; personal care and service; farming, fishing, and forestry; construction and extraction; installation, maintenance, and repair occupations; production occupations; transportation and material moving occupations; and military specific occupations.
[3] Other include architects; social scientists and related workers; life, physical, and social science technicians; legal occupations; postsecondary teachers; graduate teaching assistants; librarians, curators, and archivists; other education, training, and library occupations; art and design workers; entertainers and performers, sports, and related workers; and media and communication workers.
[4] Computer and information sciences and engineering and engineering technology are combined due to small sample sizes.
[5] Other science, technology, engineering, and mathematics (STEM) majors include biological and physical sciences, science technology, mathematics, and agricultural and natural sciences.
[6] Humanities includes history.
[7] Other applied majors include architecture; communications; public administration and human services; design and applied arts; law and legal studies; library sciences; and theology and religious vocations.
NOTE: Data for the 1.6 percent (in 1994) and 2.9 percent (in 2001 and 2009) of graduates who majored in general studies; area, ethnic, cultural, and gender studies; and multidisciplinary studies are included in the "all fields" category but not presented separately. Estimates include graduates who received bachelor's degrees from Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Detail may not sum to totals because of rounding. Standard error tables are available at http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014003.
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/94, 2000/01, and 2008/09 Baccalaureate and Beyond Longitudinal Studies (B&B: 93/94, B&B:2000/01, and B&B:08/09).

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More detailed information on postbaccalaureate employment of recent bachelor's degree recipients can be found in Web Tables produced by the National Center for Education Statistics (NCES) using the Baccalaureate and Beyond Longitudinal Study data. The Web Tables provide information about demographic characteristics, educational experience, student loan borrowing, and employment experiences of recent bachelor's degree recipients.

Web Tables—Profile of 2007–08 First-Time Bachelor's Degree Recipients in 2009 (NCES 2013-150)
https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2013150

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)
https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2011236

Early K–12 Teaching Experiences of 2007–08 Bachelor's Degree Recipients (NCES 2013-154)
https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2013154

Ten Years After College: Comparing the Employment Experiences of 1992–93 Bachelor's Degree Recipients With Academic and Career-Oriented Majors (NCES 2008-155)
https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2008155

Web Tables—Trends in Debt for Bachelor's Degree Recipients a Year After Graduation: 1994, 2001, and 2009 (NCES 2013-156)
https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2013156

TECHNICAL NOTES
Survey Methodology

The estimates provided in this Statistics in Brief are based on data collected through the first follow-up of each of the Baccalaureate and Beyond Longitudinal Studies of 1993, 2000, and 2008 (B&B:93/94 , B&B:2000/01, and B&B:08/09). The B&B studies contain comprehensive data on enrollment, attendance, and student demographic characteristics and provide a unique opportunity to understand the immediate transitions of college graduates into work, graduate school, or other endeavors.

In B&B:93/94 and B&B:2000/01, students provided data through surveys administered over the telephone, and in B&B:08/09, through surveys administered over the Internet or by telephone. In addition to student responses, data were collected from the institutions that granted the bachelor's degrees of sample students, 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.

The B&B studies follow bachelor's degree recipients from the 1992–93, 1999–2000, and 2007–08 National Postsecondary Student Aid Studies (NPSAS:93, NPSAS:2000, and NPSAS:08). NPSAS is based on a nationally representative sample of all students in postsecondary education institutions,

Label	Name
Baccalaureate and Beyond, B&B:93/03	
Age group while enrolled 1992–93	AGEATBA
Enrollment status April 1994	B2EN9404
Job related to undergraduate major	JBMAJREL
Labor force participation in April 1994	B1LFP94
Occupation in 1994, computed for trends	B1OCCTREND
Race/ethnicity	RETHNIC
Relationship between job and undergraduate degree	AJOBRELT
Salary in 1994	APRANSAL
Sex	GENDER
Undergraduate major field of study	MAJORS
Baccalaureate and Beyond, B&B:2000/01	
Age group while enrolled 1999–2000	AGEATBA
Current employment status	EMPCUR
Job related to undergraduate major	CERELMAJ
Post-BA degree: current enrollment	ENRCUR
Labor force participation as of 2001 interview	LFP2001
Occupation in 2001, computed for trends	B1OCCTREND
Race/ethnicity	RACE2
Salary in 2001	B1ANNERN
Sex	GENDER
Undergraduate major field of study	MAJORS
Baccalaureate and Beyond, B&B:08/09	
Age group while enrolled 2007–08	AGEATBA
Job related to undergraduate major	B1NSF19B
Employment and enrollment status in 2009	B1LFP09
Occupation in 2009, computed for trends	B1OCCTREND
Race/ethnicity	RACE
Salary in 2009	B1ERNINC
Sex	GENDER
Undergraduate major field of study	MAJORS4Y

including undergraduate and graduate students. For B&B, those members of the NPSAS sample who completed a bachelor's degree between July 1 and June 30 of the survey academic year were identified and contacted for a follow-up interview 1 year later. The studies included approximately 11,000 bachelor's degree recipients, representing about 1.2 million bachelor's degree completers, in both 1992–93 and 1999–2000, and 17,000 bachelor's degree recipients,

representing about 1.6 million bachelor's degree completers in 2007–08. Table A-1 provides detailed information about the B&B:93/94, B&B:2000/01, and B&B:08/09 data collections.

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 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 complex sample designs (Kaufman 2004; Wolter 1985).

Table A-1. Selected statistics on B&B:93/94, B&B:2000/01, and B&B:08/09 data collections

Statistic	B&B:93/94	B&B:2000/01	B&B:08/09
Target population	BA recipients in 1993–94	BA recipients in 1999–2000	BA recipients in 2008–09
Target population size	1.2 million	1.2 million	1.6 million
IPEDS[1] datafile(s) used as NPSAS sampling frame	1990–91 IPEDS IC file	1997–98 IPEDS IC file	2004–05 and 2005–06 IPEDS IC, Fall Enrollment, and Completion files
Number of sampled institutions (unweighted)	1,386	1,083	1,960
Number of eligible institutions (unweighted)	1,243	1,072	1,940
Number of participating institutions (unweighted)	1,098	999	1,730
Institution response rate[2] (unweighted)	98.3	93.0	89.0
Institution response rate[2] (weighted)	96.9	90.0	90.1
Number of sampled students	12,731	11,700	18,500
Number of eligible students	11,192	11,630	17,160 for interview and transcript individual, 17,060 for combined (due to perturbation)
Interview response rate (unweighted)	90.0	86.0	87.7
Interview response rate (weighted)	89.7	82.0	78.3
Study response rate[3] (unweighted)	88.5	80.0	78.0
Study response rate[3] (weighted)	86.9	74.0	70.5

[1] Integrated Postsecondary Education Data System, Institutional Characteristics file.
[2] Percentage of institutions that provided enrollment lists.
[3] Institution response rate times the interview response rate.
SOURCE: Loft, J.D., Riccobono, J.A., Whitmore, R.W., Fitzgerald, R.A., and Berkner, L.K. (1995). *Methodology Report for the 1993 National Postsecondary Student Aid Study* (NCES 95-211). National Center for Education Statistics, U.S. Department of Education. Washington, DC. Green, P.J., Meyers, S.L., Giese, P., Law, J., Speizer, H.M., and Tardino, V.S. (1996). *Baccalaureate and Beyond Longitudinal Study: 1993/94 First Follow-up Methodology Report* (NCES 96-149). National Center for Education Statistics, U.S. Department of Education. Washington, DC. Riccobono, J.A., Cominole, M.B., Siegel, P.H., Gabel, T.J., Link, M.W., and Berkner, L.K. (2002). *National Postsecondary Student Aid Study 1999–2000 (NPSAS:2000) Methodology Report* (NCES 2002-152). National Center for Education Statistics, U.S. Department of Education. Washington, DC. Charleston, S., Riccobono, J., Mosquin, P., and Link, M. (2003). *Baccalaureate and Beyond Longitudinal Study: 2000–01 (B&B: 2000/01) Methodology Report* (NCES 2003-156). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC. 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.

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.

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. Because the weighted rate is less than 85 percent for those who responded to the interview, nonresponse bias analysis was required

for those variables based in whole or in part on the interview. None of the variables in this Statistics in Brief required nonresponse bias analyses.

For more detailed information on nonresponse bias analysis and an overview of the survey methodology for B&B:08/09, 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/pubsinfo.asp?pubid=2011236.

Nonresponse bias analyses were not conducted for the earlier B&B studies. For an overview of the survey methodology for B&B:93/03, see *1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03) Methodology Report* (NCES 2006-166) http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2006166.

For an overview of the survey methodology for B&B:2000/01, see *Baccalaureate and Beyond Longitudinal Study: 2000/01 Methodology Report* (NCES 2003-156) http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2003156.

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Statistical Procedures

Comparisons of means, medians, and proportions were tested using Student's t statistic. Differences between estimates were tested against the probability of a Type I error[9] 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.

When making a part-to-whole comparison, e.g., comparing the percentage of a subgroup of graduates who borrowed to the percentage of all graduates who borrowed, the following formula was used. This formula takes the covariance of the two estimates into account when computing the t value.

$$t = \frac{E_{subgroup} - E_{whole}}{\sqrt{SE_{subgroup}^2 + SE_{whole}^2 - 2pSE_{subgroup}^2}}$$

---

[9] 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.

There are hazards in reporting statistical tests for each comparison. First, comparisons based on large t statistics may appear to merit special attention. 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 report 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.[10] 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 the values are the same or equivalent.

[10] No adjustments were made for multiple comparisons.

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