

# Teacher Career Choices

## Timing of Teacher Careers Among 1992-93 Bachelor's Degree Recipients

### Postsecondary Education Descriptive Analysis Report



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U.S. Department of Education  
NCES 2008-153

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## Timing of Teacher Careers Among 1992-93 Bachelor's Degree Recipients

### Postsecondary Education Descriptive Analysis Report

**March 2008**

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## Executive Summary

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Teachers' career choices reflect personal decisions about the relative benefits of teaching versus working in other occupations. These benefits include compensation, as well as less tangible benefits such as good working conditions and personal satisfaction. Intrinsic and extrinsic rewards, when combined with positive and negative working conditions, may influence college graduates' decisions to enter teaching, stay in teaching, and leave teaching (Johnson, Berg, and Donaldson 2005). Furthermore, teachers' individual career choices in the aggregate have implications for teacher supply and educational policy. To the extent that high-quality teachers choose to enter and stay in the profession, schools will have fewer vacant teaching positions and a larger pool of qualified applicants to fill those positions.

This report examines the timing of teaching careers of 1992–93 college graduates at three points during the 10 years after graduation. It answers questions about the characteristics of graduates who enter and leave teaching, focusing specifically on their demographic characteristics, academic preparation, teacher working conditions, and compensation.

The report uses data from the 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03), a longitudinal study of students who earned a bachelor's degree in any field during the 1992–93 academic year. Base-year information on this cohort was collected as part of the 1992–93 National Postsecondary Student Aid Study (NPSAS:93). Graduates were interviewed

again in 1994, 1997, and 2003. All comparisons made in the text were tested using Student's *t* statistic. All differences cited were statistically significant at the .05 level. No statistical adjustments to account for multiple comparisons were used.

### Distribution of Graduates' Career Paths

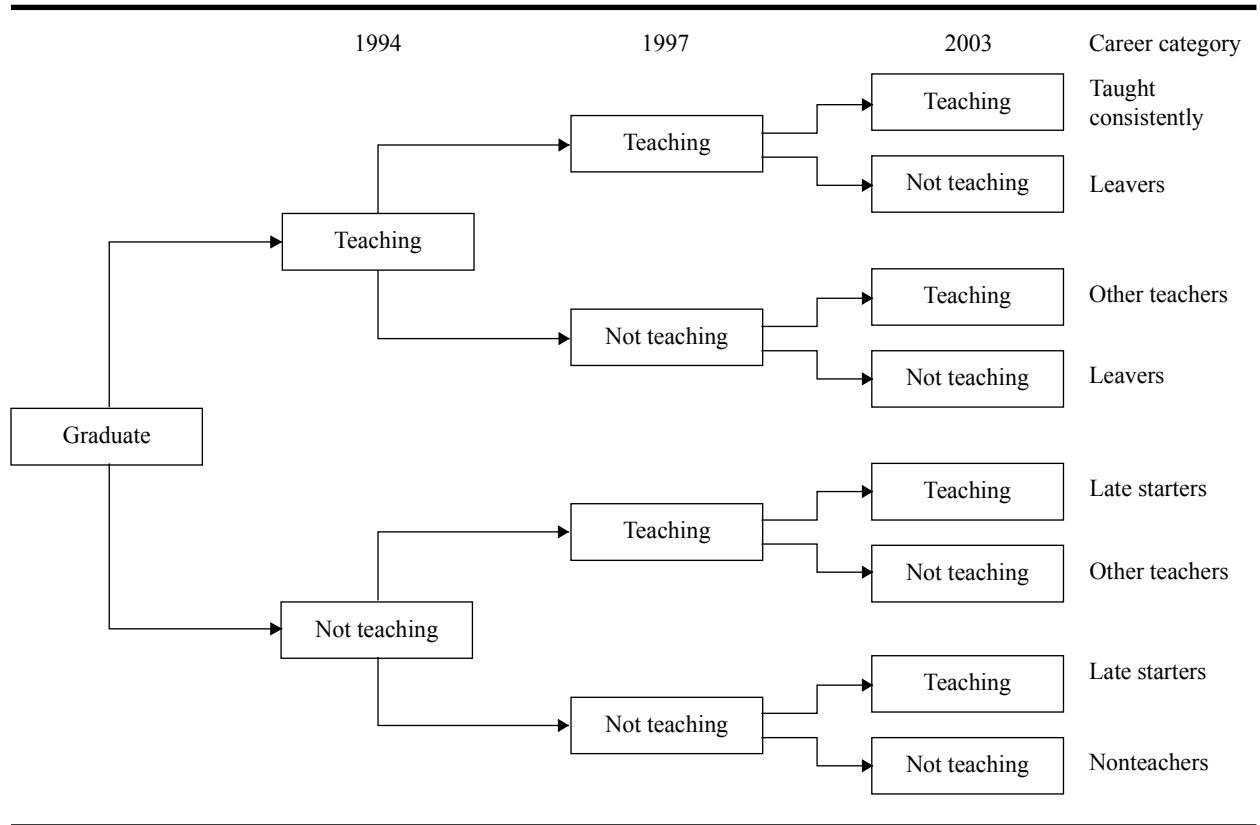
For the purposes of this report, a taxonomy of five career categories was developed based on the B&B:93/03 and NPSAS:93 data. Bachelor's degree recipients in 1992–93 were placed into these five categories related to teaching in elementary and secondary schools based on whether they were teaching at each of the three follow-ups in 1994, 1997, and 2003 (figure A). One category characterizes those graduates who reported not teaching in 1994, 1997, and 2003 (i.e., nonteachers). The other four categories (defined briefly below) characterize those graduates who were teaching in grades K through 12 in at least one of the follow-up years.<sup>1</sup>

As of 2003, some 87 percent of graduates were nonteachers (table 1). Of the remaining graduates

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<sup>1</sup> The five career categories are defined in more detail in the introduction to this report. Note that the category labels serve as shorthand for the various combinations of teaching and not teaching at the time of each of three follow-up interviews. Graduates in any of the five categories could have had unreported teaching or nonteaching periods between data collection years. For example, respondents in the "taught consistently" category could have exited and re-entered teaching in the years between follow-ups (i.e., between 1994 and 1997 or between 1997 and 2003).

**Figure A. Career categories of 1992–93 bachelor’s degree recipients based on teaching or nonteaching status in 1994, 1997, and 2003**



NOTE: Career categories were constructed based on 1992–93 graduates’ teaching status in 1994, 1997, and 2003. For more information, see definitions in Appendix A—Glossary.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

who were teaching at one or more of the three follow-up interviews:

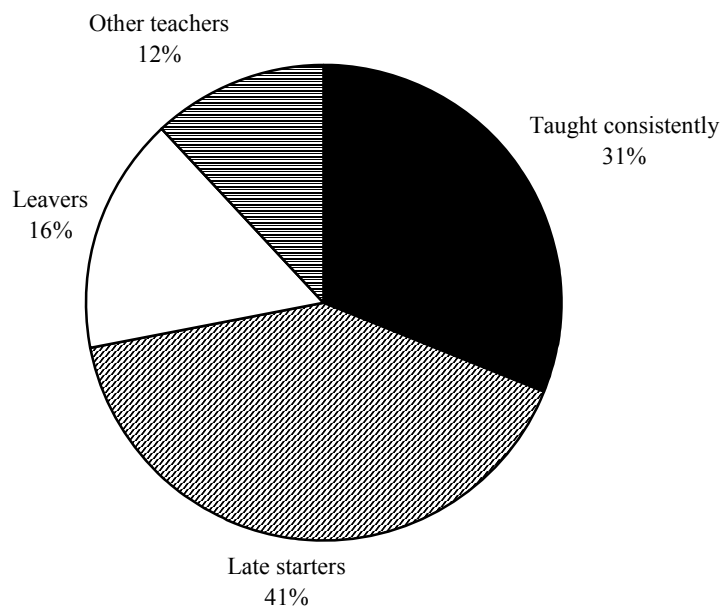
- Thirty-one percent were teaching in 1994, 1997, and in 2003 (taught consistently);
- Forty-one percent were not teaching in 1994, but had begun teaching by 1997 or 2003 (late starters);
- Sixteen percent were teaching in 1994, but had left teaching by 1997 or 2003 (leavers); and

- Twelve percent were either teaching in 1994 and 2003 but not in 1997, or were teaching in 1997 but not in 1994 or 2003 (other teachers) (figure B).

## Graduate Demographics

The demographic characteristics of college graduates are related to their career choices. A graduate’s gender, age, marital status, and number of dependents may be associated with his or her decisions about the relative benefits of teaching versus working in other possible occupations. The analysis shows that among graduates who taught,

**Figure B. Among 1992–93 graduates who were teaching in 1994, 1997, or 2003, percentage distribution of teacher career categories**



NOTE: Career categories were constructed based on 1992–93 graduates' teaching status in 1994, 1997, and 2003. For more information, see definitions in Appendix A—Glossary. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/das/library/reports.asp>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

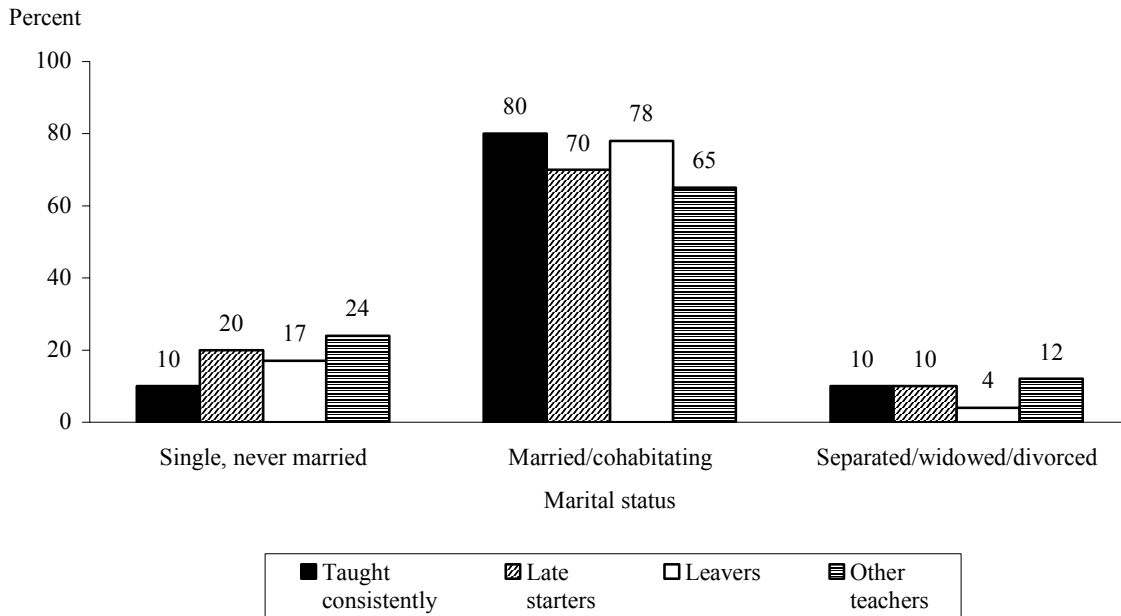
a higher proportion of females than males taught consistently (table 1). White graduates taught consistently at higher rates than Black graduates: while about a third of White graduates taught consistently, 15 percent of Black graduates did so.

Older graduates taught consistently relatively more often than younger graduates. About 40 percent of graduates age 35 or older in 2003 taught consistently, as did 31 percent of graduates ages 33–34 and 19 percent of graduates age 32 or younger.

Marriage and family formation also were related to graduates' career choices. In particular,

married graduates and those with dependents tended to teach with greater consistency than did graduates who had never married (figure C). Specifically, about a third of married, separated, widowed, or divorced graduates taught consistently, while one-fifth of single graduates did so (table 1). Among those who taught, graduates with dependents in each year (1993, 1997, and 2003) taught consistently at higher rates than graduates without dependents (table 3). Male graduates who had dependents by 1993 taught consistently at higher rates than male graduates without dependents (43 percent versus 23 percent).

**Figure C. Percentage of 1992–93 graduates who were teaching in 1994, 1997, or 2003 in each teacher career category, by marital status: 2003**



NOTE: Career categories were constructed based on 1992–93 graduates’ teaching status in 1994, 1997, and 2003. For more information, see definitions in Appendix A—Glossary. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/das/library/reports.asp>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

## Academic Indicators

The “highly qualified teacher”<sup>2</sup> provisions of the No Child Left Behind Act of 2001 (NCLB) codified almost a decade of increased attention to the academic preparation of teachers. This section examines several indicators related to the academic qualifications of prospective teachers and relates these indicators to the career choices made by 1992–93 bachelor’s degree recipients. Among graduates with college entrance exam scores available for analysis who taught between 1994 and 2003, some 15 percent of those with scores in the top 25 percent taught consistently,

compared with 32 to 34 percent of those who scored at lower levels (table 5). On the other hand, graduates who had lower grade point averages (GPAs) taught consistently less often than those with GPAs in the two higher categories. Among graduates who taught at some point and had a cumulative undergraduate GPA of 3.75 or higher, 41 percent taught consistently, while among those who taught and had a GPA of 2.74 or lower, about 23 percent did so. Having a low GPA was associated with being a late starter in the teaching profession, with 49 percent of those with GPAs of 2.74 or lower being late starters, compared with 36 percent of those with GPAs of 3.25 to 3.74 and 29 percent of those with GPAs of 3.75 or higher.

<sup>2</sup> In general, a “highly qualified teacher” under NCLB is one with full certification, a bachelor’s degree, and demonstrated competence in subject knowledge and teaching.

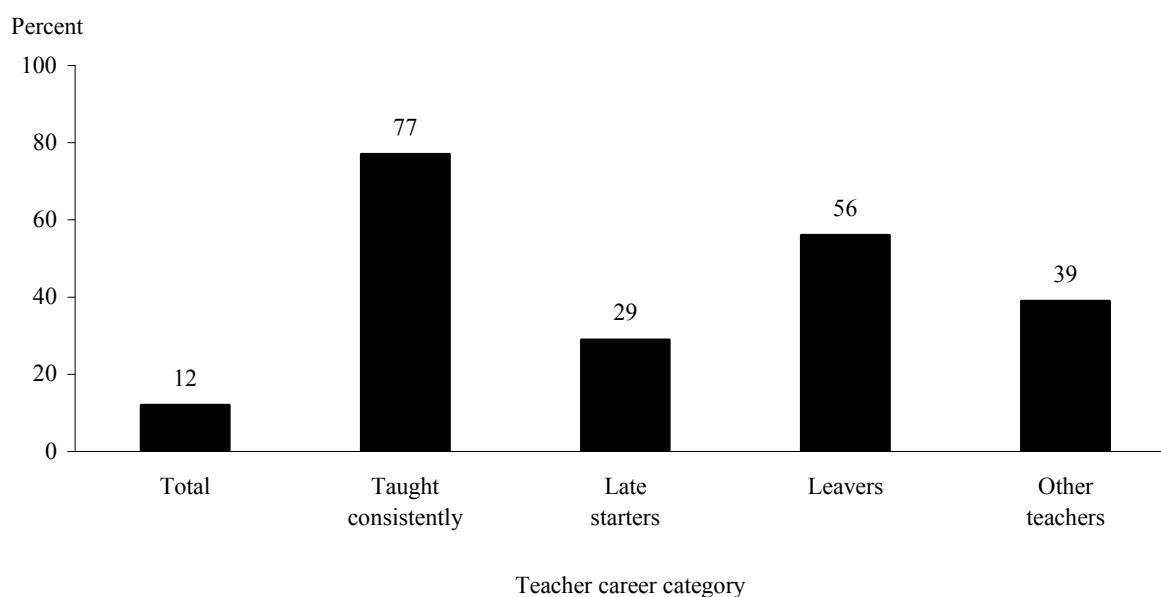


Most graduates who taught consistently had majored in education for their bachelor's degree (77 percent) (figure D). On the other hand, 40 percent of education majors were not teaching at the elementary/secondary level in 1994, 1997, or 2003 (table 5).

Many of the 1992–93 graduates who became teachers had earned a master's degree or higher by

2003 and had done so at higher rates than graduates who did not teach: 39 percent of graduates who taught had attained a master's degree or higher by 2003, compared with about one-quarter of those who did not teach (table 6). About 42 percent of the late starters had attained a master's degree or higher by 2003, perhaps reflecting their pursuit of graduate studies before embarking on their teaching career.

**Figure D. Percentage of 1992–93 graduates who majored in education, by teacher career category: 2003**



NOTE: Career categories were constructed based on 1992–93 graduates' teaching status in 1994, 1997, and 2003. For more information, see definitions in Appendix A—Glossary. Standard error tables are available at <http://nces.ed.gov/das/library/reports.asp>. SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

## Teaching Assignment

Teachers' perceptions of their working environment may influence their decisions to remain teaching in the same school, change schools, or leave the profession altogether. Focusing on graduates who were teaching in 2003, the analysis for this report examines teaching assignments for those who taught consistently,

other teachers, and late starters.<sup>3</sup> Of those 1992–93 graduates who taught consistently, 69 percent taught in elementary schools (table 8). By

<sup>3</sup> Data on teaching assignments and conditions are based on the school in which the respondent was teaching in 2003. Leavers were not teaching in 2003 and so are excluded from the analysis in this section.

comparison, about 55 percent of late starters taught in elementary schools.

## **Salaries**

Because the salaries of public school teachers are most often based on salary schedules that take into account years of experience and degree attainment, teacher career choices may be related to their earnings. Among graduates who taught, those who were in the lowest category of

academic year base salary (less than \$26,000) for their most recent teaching job taught consistently at lower rates than those in the middle or highest categories (\$26,000 to \$40,000 and more than \$40,000), and they left the profession early at higher rates than teachers in the middle or highest base salary categories (table 9). While 12 percent of those in the lowest category of earnings taught consistently, about two-fifths of those in the two higher categories did so.

## Foreword

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This report uses data from the Baccalaureate and Beyond Longitudinal Study (B&B) to examine the timing of teaching careers for bachelor's degree recipients who earned their degrees between July 1992 and June 1993. In particular, the report focuses on those graduates who became teachers in grades kindergarten through 12 at some point over the next 10 years. B&B includes students who were identified in the 1992–93 National Postsecondary Student Aid Study (NPSAS:93) as having earned a bachelor's degree during the 1992–93 academic year. NPSAS is based on a nationally representative sample of students enrolled in postsecondary education. In B&B, the 1992–93 bachelor's degree recipients were interviewed in 1994 (B&B:93/94), 1997 (B&B:93/97), and 2003 (B&B:93/03) to learn about their education and employment experiences after graduation. A special emphasis of B&B is gathering information on the preparation and experiences of those who prepared for teaching and eventually entered the teaching profession. An intentional oversampling of those respondents who prepared to teach or planned to teach during their undergraduate years allows more in-depth analysis of those who eventually teach than would happen for 1992–93 bachelor's degree recipients by chance. The results presented in this report are weighted to account for the sample design and to provide estimates of population parameters.

The estimates presented in this report were produced using the B&B:93/03 Data Analysis System (DAS). The DAS is a computer application that allows users to specify and generate their own tables and produces the design-adjusted standard errors necessary for testing the statistical significance of differences between numbers shown in the tables. It is available for public use on the NCES website at <http://nces.ed.gov/das>. Appendix B of this report contains additional information on the DAS.

## Acknowledgments

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The author wishes to acknowledge the contributions of many individuals. At MPR Associates, Laura Horn and Robin Henke provided overall guidance, advice, and support. Jolene Wu and Shayna Tasoff calculated numerous *t* tests and helped rewrite portions of the report. Joanna Wu ran the analyses using the Data Analysis System. Our production team, consisting of Barbara Kridl, Andrea Livingston, Patti Gildersleeve, Natesh Daniel, and Alicia Broadway edited the text, formatted the tables and figures, and prepared the report for publication.

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## Introduction

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Over the last 10 years, the demands of the teaching profession have changed at least in part due to student demographic shifts and increased accountability requirements. With regard to student demographic shifts, the proportion of Hispanic students in the nation's schools now exceeds the proportion of Black students (KewalRamani et al. 2007). Regarding increased accountability requirements, the adequate yearly progress requirements of the No Child Left Behind Act of 2001 (NCLB) require teachers to analyze and address achievement gaps in their classrooms. In addition, the teacher quality provisions of NCLB require some teaching veterans to seek additional certification or otherwise demonstrate content expertise.

While major shifts in the demands of teaching have occurred, teacher preparation programs continue to evolve and be scrutinized by researchers and policymakers. Alternatives to traditional teacher education programs have increased in number and scope, thus expanding the pool of potential applicants for teaching positions (Feistritzer 2006). Programs such as the Urban Teaching Partnership, Pathways to Teaching, and Teach for America aim to increase the pool of certified (especially minority) teachers, while promoting rigorous preparation and high-quality teaching (Decker, Mayer, and Glazerman 2004). Yet the teacher supply and demand equation depends not only on the number of newly qualified teachers but also on the rate of teacher attrition. Recent research has shown that some 50 percent of beginning teachers leave the profession within 5 to 7 years (Ingersoll 2003; Reed, Ruben, and Barbour 2006). In addition, although some teacher attrition can be attributed to retirement, family responsibilities, or involuntary attrition, almost one-half of teachers leave due to job dissatisfaction or in pursuit of better career opportunities (Luekens, Lyter, and Fox 2004).

Reports based on the 1994 and 1997 follow-ups of the NCES 1993 Baccalaureate and Beyond Longitudinal Study (B&B:93/94 and B&B:93/97) have examined the extent to which those who completed their bachelor's degrees in 1992–93 took steps to enter teaching (by applying for teaching jobs, undertaking professional preparation, and so on) or actually entered the teaching profession by 1994 and 1997, respectively (Henke, Geis, and Giambattista 1996b; Henke, Chen, and Geis 2000). A third report examined the rate at which those who had begun teaching by 1994 had left the teaching profession by 1997 (Henke and Zahn 2001). This third report indicated that one in five of those who had started teaching within a year of completing college were not teaching in 1997, and that graduates whose college entrance examination scores

were in the top category were twice as likely as those with scores in the bottom category to leave the profession and not return by 1997. Henke and Zahn also found that teacher attrition is no higher than the attrition of college graduates in other occupations. In addition, a recent analysis of data from the 2003–04 Schools and Staffing Survey (SASS) showed that 91 percent of public and private school teachers began teaching within 10 years of receiving their bachelor’s degree (Chandler 2006).

The decisions that individual graduates make about whether or not to pursue a teaching career reflect personal decisions about the relative benefits of teaching versus those of other occupations. Such benefits include not only compensation but also less tangible aspects such as working conditions and personal satisfaction. Intrinsic and extrinsic rewards, when combined with positive and negative working conditions, influence decisions to enter teaching, stay in teaching, and leave teaching (Johnson, Berg, and Donaldson 2005; Hanushek, Kain, and Rivkin, 2004; Buckley, Schneider, and Yi 2005). The *opportunity cost* of choosing to teach, and choosing to continue to teach, is defined as the difference between the rewards gained in teaching and the potential rewards of other activities, such as pursuing another profession or deciding to remain out of the workforce for reasons such as child rearing (Guarino, Santibanez, and Daley 2006). Furthermore, the career choices of teachers are individual decisions that have implications in the aggregate for teacher supply and educational policy. To the extent that high-quality teachers choose to enter and stay in the profession, schools will have fewer vacant faculty positions and a larger pool of qualified applicants to fill those positions.

The research literature on teacher attrition and retention addresses the policy and practical implications of these individual career decisions. Studies looking at demographic characteristics (including family composition), academic preparation, teaching assignments, and compensation seek to illuminate the relationships between these variables and decisions to enter or remain in teaching. In this report, “teacher” and “teaching” refer to instructors and instruction in grades K through 12 in public or private schools in the United States, unless otherwise noted.

Studies reviewing the association of demographic factors including gender, race/ethnicity, and age with teachers’ career choices seem to confirm the view that women are attracted to the profession because it is more compatible with family responsibilities than are other occupations (Allen 2005; Guarino, Santibanez, and Daley 2006). Few studies, however, explicitly explore the association between having children and teachers’ careers. With respect to race/ethnicity, while the number of minority teachers has increased in recent years, minorities remain relatively unlikely to enter teaching (Broughman and Rollefson 2000; Henke, Chen, and Geis 2000; Vegas, Murnane, and Willett 2001; Estrada 2004). With respect to age, the association with retention and attrition are similarly well-documented, with young teachers leaving at high rates early in

their careers, with teachers having relatively stable work patterns in their middle-career years, and with teachers having increased attrition as they mature and approach retirement (Boe et al. 1996; Grissmer and Kirby 1997; Ingersoll 2001).

The academic preparation of teachers has received much attention from both researchers and policymakers over the past decade. In the mid-1990s, reports analyzing data from SASS detailed the percentage of high school mathematics and science teachers with less than a major in their main teaching field (Bobbitt and McMillen 1995; Ingersoll, Han, and Bobbitt 1995). These data findings led to a call for higher licensure requirements for content specialists and increased academic requirements for teacher preparation (National Commission on Teaching and America's Future 1996). Research results on the relationship between indicators of academic preparation and teacher attrition and retention vary across studies. While some studies indicate that advanced content preparation is associated with increased teacher attrition, others report associations between having an advanced degree and improved teacher retention (Johnson, Berg, and Donaldson 2005). Studies of two measures of academic achievement of prospective and new teachers, college entrance examinations and grade point averages (GPAs), demonstrate that these measures differ in their association with teaching status. While research conducted since the early 1980s has shown that college graduates who teach tend to have lower ACT and SAT scores than those who do not teach (Murnane et al. 1991; Schlecty and Vance 1983; Weaver 1983), other studies show that teachers tend to have higher GPAs than graduates pursuing other occupations (Henke et al. 2005).

Working conditions and teaching assignments may influence teachers' perceptions of the intrinsic rewards of their chosen occupation. While authors of policy reports have discussed the number of out-of-field teachers, especially in mathematics and science, research shows that teachers themselves desire to teach in their field of preparation (Johnson, Berg, and Donaldson 2005). Working conditions such as class size, administrator support, peer support, and student discipline are associated with teacher retention and attrition. In 2004, Johnson and her colleagues found that new teachers in low-income schools received significantly less support, and had higher attrition, than teachers in high-income schools.<sup>1</sup> Research on induction and mentoring programs, on the other hand, indicates that such support may ameliorate new teacher stress that can lead to attrition. Smith and Ingersoll (2004) found that "beginning teachers who were provided with mentors from the same subject field . . . were less likely to move to other schools and less likely to leave the teaching occupation after their first year of teaching" (p. 681). Analyzing data from the NCES Teacher Follow-up Survey (TFS), Luekens, Lyter, and Fox (2004) found that an opportunity for a better teaching assignment, dissatisfaction with support

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<sup>1</sup> This study defined "low-income schools" as those in which more than 50 percent of students qualify for free or reduced-price lunch and "high-income schools" as those in which less than 15 percent of students qualify.

from administrators, and dissatisfaction with workplace conditions were among the most common reasons teachers gave for moving to a new school. Similarly, a 2005 survey of new teachers sponsored by MetLife (2005) found that new teachers who were satisfied with the support and collegiality in their school planned to leave the teaching profession within 5 years less often than those who reported not being satisfied.

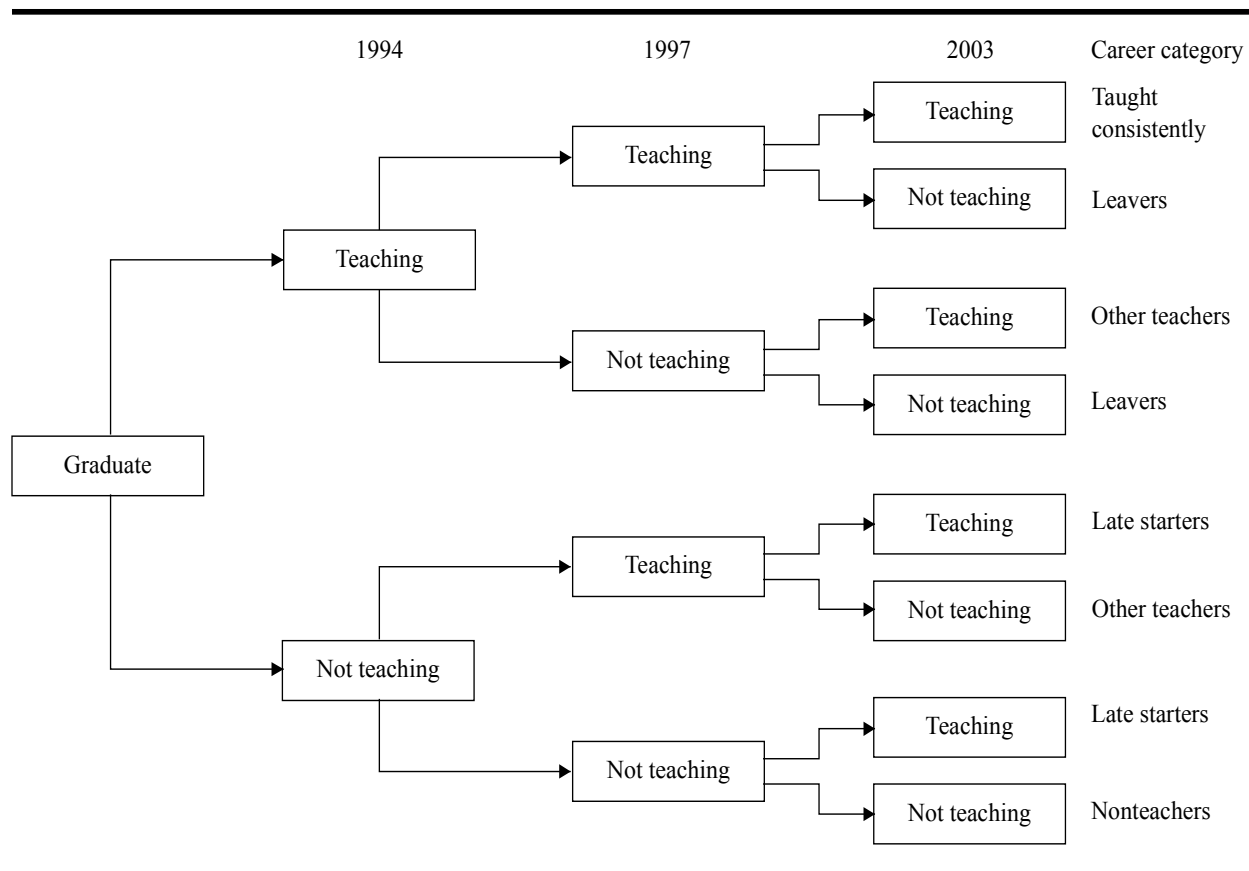
Salary and other forms of compensation such as benefits and professional development time make up the external rewards of teaching. Research indicates that compensation and working conditions interact and are associated with teacher retention and attrition. While higher salaries might induce teachers to remain in less than ideal working environments, positive working conditions may offset lower pay (Johnson, Berg, and Donaldson 2005). Data from the NCES Teacher Follow-up Survey confirm that both salary and working conditions play a role in teachers' decisions to change schools or leave the profession entirely (Luekens, Lyter, and Fox 2004). According to these data, male teachers, in particular, leave the profession in search of higher salaries more often than female teachers.

The Third Follow-up of B&B:93/03 provides a unique opportunity to further examine the timing of teacher careers using longitudinal data to look at three snapshots of the post-baccalaureate career experience. B&B:93/03 includes data on graduates' occupations in 1994, 1997, and 2003, approximately 1, 4, and 10 years after they had received the bachelor's degree, respectively. These data track the experiences of a cohort of college graduates who received their baccalaureate degrees during the 1992–93 academic year, using the National Postsecondary Student Aid Study (NPSAS) as the base year.

This report follows the original cohort at three time points during a 10-year period, looking specifically at how many bachelor's degree recipients reported teaching at one or more time points. It also addresses the characteristics of graduates who enter teaching immediately after graduation or at a later point, focusing specifically on their demographic characteristics, academic preparation, teacher working conditions, and compensation.

With data from three follow-ups available, one can place each 1993 graduate into one of five possible career categories to describe their status in the teaching profession. The five categories are based on whether or not graduates were teaching at each of the three follow-ups in 1994, 1997, and 2003. These categories paths are summarized in figure 1, which shows the three discreet follow-up years and the category assigned to each respondent depending on their teaching status at each time point.

**Figure 1. Career categories of 1992–93 bachelor’s degree recipients based on teaching or nonteaching status in 1994, 1997, and 2003**



NOTE: Career categories were constructed based on 1992–93 graduates’ teaching status in 1994, 1997, and 2003. For more information, see definitions in Appendix A—Glossary.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

To facilitate discussion in the report, each of the five career categories has been assigned a label that describes the status of graduates’ teaching careers at the time of the three follow-ups:

*Category #1—Taught Consistently:* These respondents were teaching in grades K–12 during each of the three interviews in 1994, 1997, and 2003.<sup>2</sup>

*Category #2—Late Starters:* These respondents were not teaching in 1994, but were teaching in 1997 and 2003, or were not teaching in 1994 and 1997 but were teaching in 2003.

*Category #3—Leavers:* These respondents were teaching in 1994 but were not teaching in 1997 or 2003, or were teaching in 1994 and 1997 but not in 2003.

<sup>2</sup> They could, however, have exited and re-entered the teaching profession in the years between study follow-ups.

*Category #4—Other Teachers:* These respondents were either teaching in 1994 and 2003 but not in 1997, or were teaching in 1997 but not in 1994 or 2003.

*Category #5—Nonteachers:* These respondents were not teaching in 1994, 1997, or 2003.

## **Data**

This report uses data from the Baccalaureate and Beyond Longitudinal Study (B&B:93/03) to examine the career paths of 1992–93 bachelor’s degree recipients who earned their degrees between July 1992 and June 1993, focusing specifically on the career paths of those graduates who reported teaching in grades K–12 in 1994, 1997, or 2003. Base-year information on this cohort was collected as part of the 1992–93 National Postsecondary Student Aid Study (NPSAS:93). Graduates were interviewed again in 1994, 1997, and 2003. B&B places special emphasis on the preparation and experiences of those who prepared for teaching and eventually entered the teaching profession. An intentional oversampling of those respondents who prepared to teach or planned to teach during their undergraduate years allows more in-depth analysis of those who eventually taught than would happen among 1992–93 bachelor’s degree recipients by chance. The results presented in this report are weighted to account for the sample design and to provide estimates of the distribution of population parameters.

NPSAS:93 included about 1,100 institutions and was based on a nationally representative sample of all students enrolled in postsecondary education institutions, including undergraduate, graduate, and first-professional<sup>3</sup> students. One of a series of similar studies conducted every 4 to 5 years since 1987, NPSAS:93 represents more than 16 million undergraduates who were enrolled at some time between July 1, 1992, and June 30, 1993. The sampling frames for NPSAS were built from the 1990–91 “Institutional Characteristics Survey” of the Integrated Postsecondary Education Data System (IPEDS-IC); lists of students were obtained from each participating institution. The estimates presented in this report are based on B&B follow-up interviews conducted in 1994, 1997, and 2003 with approximately 10,000 bachelor’s degree recipients from the NPSAS:93 sampling frame of about 12,500; these recipients represent the approximately 1.2 million bachelor’s degree completers in the United States (U.S. Department of Education 2004). Excluded from the final sample were 760 students who were determined during the initial B&B interview or from transcripts not to have earned a bachelor’s degree during the 1992–93 academic year (see appendix B for more detail). The weighted overall response rate was 74 percent, reflecting an institution response rate (in 1992) of 88 percent and a student response

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<sup>3</sup> First-professional degrees include the following: chiropractic, pharmacy, dentistry, podiatry, medicine, veterinary medicine, optometry, law, osteopathic medicine, and theology.



rate (in 2003) of 83 percent. The data presented in this report cover the 50 states, the District of Columbia (DC), and Puerto Rico.<sup>4</sup>

All comparisons made in the text were tested using Student's *t* statistic. Multivariate analysis was beyond the scope of this report. All differences cited were statistically significant at the .05 level. No statistical adjustments to account for multiple comparisons were used. Appendix B provides information about the formula used and more detail on significance levels. Standard errors for all estimates are available at <http://nces.ed.gov/das/library/reports.asp>.

The sample used for this analysis consists of the NPSAS:93 respondents who earned a bachelor's degree in 1992–93 and participated in all three B&B interviews: 1994, 1997, and 2003. Information that was missing in 1994 or 1997 was updated in 2003 when possible, and a panel weight was created based on respondents to all three surveys. Consequently, some estimates presented here may differ slightly from previously published data.

## **Limitations of the Data**

It is important to note that the teaching career categories reported here are derived from snapshots in graduates' careers. The B&B:93/03 data do not include comprehensive job histories of the graduates but do permit analyses of what graduates were doing when the data were collected. The category labels, therefore, serve as shorthand for the various combinations of teaching and not teaching at the time of each of the three follow-up interviews. Graduates in any of the five categories could have had unreported teaching or nonteaching spells between data collection years. For example, respondents in the "taught consistently" category could have exited and re-entered teaching in the years between follow-ups (i.e., between 1994 and 1997 or between 1997 and 2003). Therefore, although they taught consistently during the 10 years following graduation in 1993, they did not necessarily teach constantly during that period. Similarly, graduates in each of the other categories could have experienced teaching and nonteaching spells between data collection years that are not captured in this study. In addition, because this analysis is based on a longitudinal sample of graduates, the estimates presented here may differ from other research on teacher attrition that examines yearly attrition rates for cross-sectional samples of teachers. Finally, those graduates who taught at the K–12 level and those who had been certified to do so for a year or more before receiving their bachelor's degree in

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<sup>4</sup> The analyses presented in this report included students from Puerto Rico. The exclusion of Puerto Rican students results in minor differences in the estimates but does not change the statistical significance of reported results.

1993 have been excluded from the analysis so that the analysis of first-time post-baccalaureate teachers in this report will be straightforward and clear to the reader.<sup>5</sup>

## **Organization of the Report**

This report examines the characteristics 1992–93 graduates in each of the five career categories related to the teaching profession. Specifically, it provides an in-depth look at the graduates within each category in terms of their demographic characteristics, academic backgrounds, teaching assignments, and salaries. In each section, the report focuses on selected characteristics of graduates by career categories and then changes its perspective to analyze the categories by graduate characteristics. By examining the relationship between the characteristics of graduates and their career choices at different points in time, the report highlights the various factors that relate to individuals' decisions to enter and leave teaching.

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<sup>5</sup> This resulted in the exclusion of 3.3 percent of graduates from the analysis. Of this 3.3 percent who were excluded, 55.7 percent reported teaching in 1994, 1997, or 2003 and 44.3 percent reported working in other professions.

## Comparisons Across Career Categories

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This section provides an examination of the characteristics of 1992–93 bachelor’s degree recipients in each teaching career category between 1994 and 2003. It presents comparisons across the four teacher career categories that included at least one teaching period in 1994, 1997, or 2003, as well as comparisons between those graduates who reported teaching in 1994, 1997, or 2003 and those graduates who did not report teaching at any of the three follow-ups.

As of 2003, some 87 percent of graduates were categorized as nonteachers (table 1). Of the remaining 13.5 percent who were teaching at the time of one or more of the three follow-up interviews:

- Thirty-one percent were teaching in 1994, 1997, and 2003 (taught consistently<sup>6</sup>);
- Forty-one percent were not teaching in 1994, but had begun teaching by 1997 or 2003 (late starters);
- Sixteen percent were teaching in 1994, but had left teaching by 1997 or 2003 (leavers); and
- Twelve percent were either teaching in 1994 and 2003 but not in 1997, or were teaching in 1997 but not in 1994 or 2003 (other teachers) (figure 2).

This report looks at four categories of graduates’ characteristics as they relate to the timing of teachers’ career choices: demographic characteristics, academic indicators, teaching assignment, and salary.

### Demographic Characteristics

A graduate’s gender, race/ethnicity, age, marital status, and number of dependents may be associated with his or her decisions about the benefits of working as a teacher rather than in other occupations. By looking at these characteristics according to career path, this report seeks to provide information about how these factors relate to graduates’ decisions to enter and leave the teaching profession.

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<sup>6</sup> Respondents in the “taught consistently” category could have exited and re-entered teaching in the years between study follow-ups.

**Table 1. Among 1992–93 bachelor’s degree recipients who were teaching in 1994, 1997, or 2003, percentage distribution of those in various teacher career categories and percentage of all bachelor’s degree recipients who were teachers and nonteachers, by selected demographic characteristics: 2003**

Characteristic	Teachers					All bachelor’s degree recipients	
	Taught consistently	Late starters	Leavers	Other teachers	Total	Teachers	Non-teachers
Total	31.0	40.6	15.9	12.4	100.0	13.5	86.5
Gender							
Male	25.0	43.6	17.0	14.4	100.0	7.8	92.2
Female	33.4	39.3	15.6	11.8	100.0	18.4	81.6
Race/ethnicity <sup>1</sup>							
White	32.7	39.5	16.3	11.5	100.0	13.7	86.3
Black	15.3	54.4	13.2	17.1	100.0	15.9	84.1
Hispanic	34.4	38.5	10.9	16.1	100.0	15.7	84.3
Other	‡	‡	‡	‡	100.0	5.1	94.9
Age as of 2003							
32 or younger	18.7	45.4	18.8	17.1	100.0	12.7	87.3
33–34	31.0	38.7	17.7	12.6	100.0	13.8	86.2
35 or older	40.0	39.1	11.8	9.1	100.0	13.6	86.4
Marital status in 2003							
Single, never married	18.5	48.0	16.2	17.2	100.0	11.4	88.6
Married/cohabitating with a partner	33.6	38.5	16.9	10.9	100.0	13.8	86.2
Separated, divorced, widowed	33.6	43.3	7.5	15.6	100.0	16.4	83.6

‡ Reporting standards not met (too few cases).

<sup>1</sup> Black includes African American, Hispanic includes Latino, and Other includes those who identified themselves with a race not shown. Race categories exclude Hispanic origin unless specified.

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

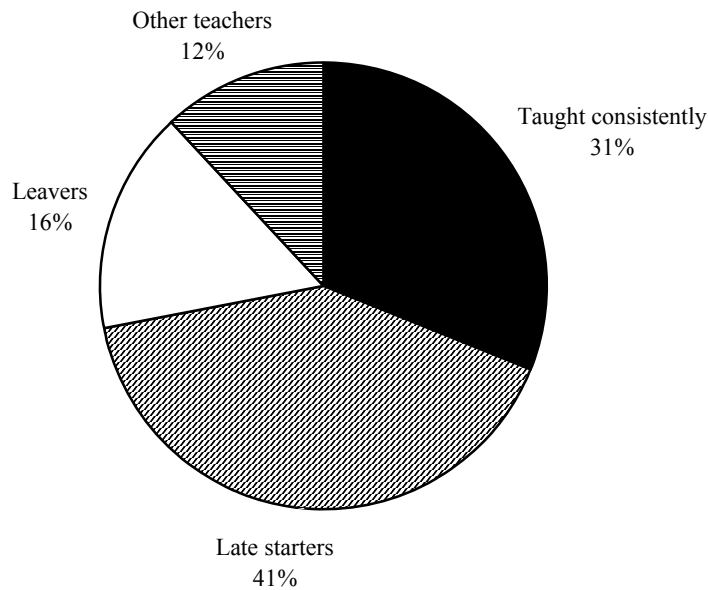
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

## Gender

Although occupational choices for women have expanded greatly over the past 20 years, teaching remains a female-dominated profession (Henke et al. 1997). In fact, while 69 percent of public school teachers were female in 1961, some 79 percent were female in 2001 (U.S. Department of Education 2006, table 68).

As demonstrated in previous reports on this cohort of graduates (Henke, Geis, and Giambattista 1996b; Henke, Chen, and Geis 2000), a greater percentage of female graduates

**Figure 2. Among 1992–93 graduates who were teaching in 1994, 1997, or 2003, percentage distribution of teacher career categories**



NOTE: Career categories were constructed based on 1992–93 graduates’ teaching status in 1994, 1997, and 2003. For more information, see definitions in Appendix A—Glossary. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/das/library/reports.asp>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

than male graduates were teaching at the time of one or more of the follow-ups in 1994, 1997, and 2003. About 18 percent of women had taught by 2003, compared with 8 percent of men (table 1).

When looking across teacher career categories, compared with their male colleagues, women who taught were relatively more often in the taught consistently category than in the other categories (table 2). Overall just over half of all 1992–93 graduates were female, but women represented about 78 percent of those graduates who taught consistently and 69 to 71 percent of each of the other categories (figure 3). Among graduates who had taught, about one-third of women taught consistently, compared with one-fourth of men (table 1).

### ***Race/Ethnicity***

While efforts to recruit minorities into the teaching profession have expanded, relatively few Black or Hispanic teachers work in our nation’s schools, particularly in suburban and rural

**Table 2. Percentage distributions of 1992–93 bachelor’s degree recipients’ selected demographic characteristics, by teacher career category among those who were teaching in 1994, 1997, or 2003, and by teaching status among all bachelor’s degree recipients: 2003**

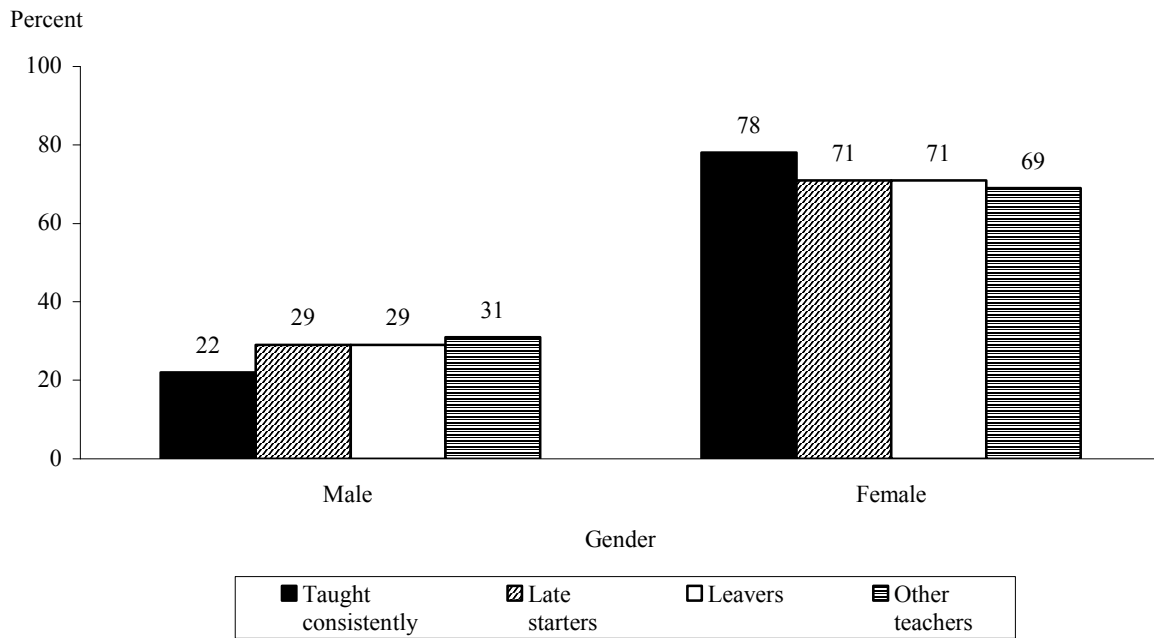
Career category	Gender		Race/ethnicity <sup>1</sup>				Age as of 2003			Marital status in 2003		
	Male	Female	White	Black	Hispanic	Other	32 or younger	33–34	35 or older	Single, never married	Married/co-habiting	Separated, divorced, widowed
Total	46.1	53.9	83.9	5.7	5.0	5.4	25.3	41.1	33.6	20.0	72.5	7.6
Taught consistently	21.6	78.4	89.2	3.3	6.4	1.1	14.4	42.0	43.6	10.2	79.8	10.0
Late starters	29.0	71.0	83.2	9.1	5.5	2.2	28.1	46.8	25.1	20.2	70.0	9.9
Leavers	28.7	71.3	87.0	5.6	4.0	3.5	26.9	40.3	32.8	17.4	78.3	4.3
Other teachers	31.1	68.9	80.8	9.6	7.7	1.8	32.7	42.6	24.7	23.6	64.8	11.6
Teachers	26.9	73.1	85.4	6.8	5.8	2.0	23.9	42.2	33.9	17.0	73.7	9.2
Nonteachers	49.7	50.3	83.7	5.6	4.9	5.8	25.6	40.9	33.5	20.6	72.0	7.4

<sup>1</sup> Black includes African American, Hispanic includes Latino, and Other includes those who identified themselves with a race not shown. Race categories exclude Hispanic origin unless specified.

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

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

**Figure 3. Percentage of 1992–93 graduates who were teaching in 1994, 1997, or 2003 in each teacher career category, by gender: 2003**



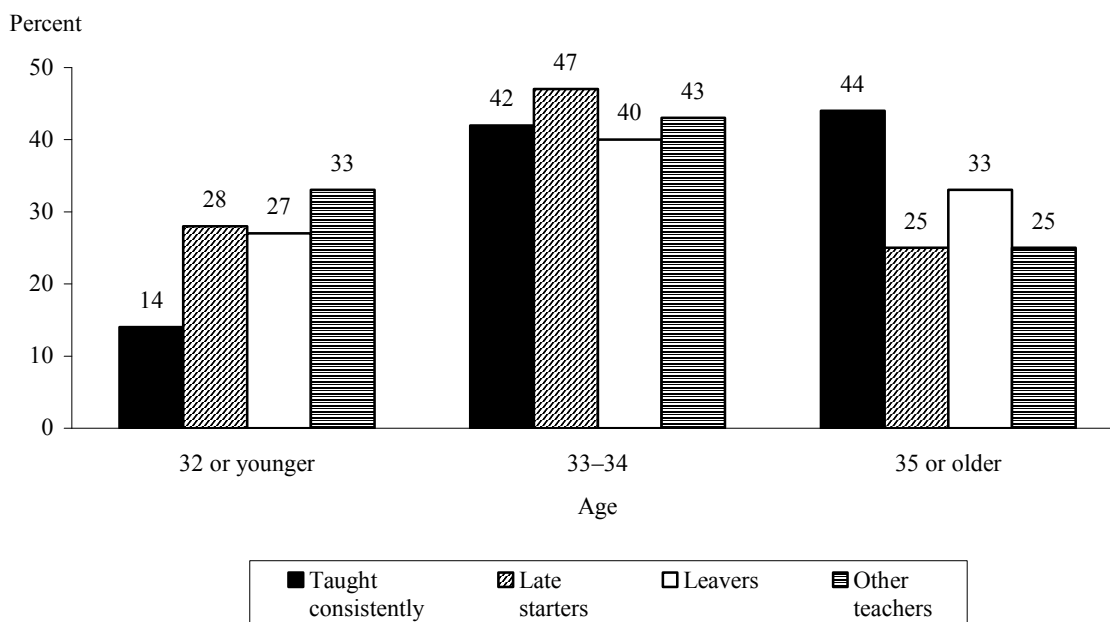
NOTE: Career categories were constructed based on 1992–93 graduates’ teaching status in 1994, 1997, and 2003. For more information, see definitions in Appendix A—Glossary. Standard error tables are available at <http://nces.ed.gov/das/library/reports.asp>. SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

schools (Henke et al. 1997). In this analysis, between 14 and 16 percent of Black, White, and Hispanic bachelor’s degree recipients had taught at some point by 2003 (table 1). When broken out by teacher career path, however, White graduates taught consistently at higher rates than Black graduates among graduates who had taught: about one-third of White graduates taught consistently, compared with about 15 percent of Black graduates. About one-tenth of those graduates who were categorized as late starters or other teachers were Black, compared with 3 percent of those graduates who taught consistently (table 2).

### ***Age in 2003***

By 2003, most of the 1993 college graduates in this study were in their early 30s, with a plurality (41 percent) in the 33–34 age range (table 2). Regardless of age group, between 13 and 14 percent of all graduates had taught by 2003 (table 1). Among graduates who had taught, age was positively associated with teaching consistently since receiving their bachelor’s degree (figure 4). The oldest graduates (age 35 or older in 2003) taught consistently relatively more

**Figure 4. Percentage of 1992–93 graduates who were teaching in 1994, 1997, or 2003 in each teacher career category, by age: 2003**



NOTE: Career categories were constructed based on 1992–93 graduates’ teaching status in 1994, 1997, and 2003. For more information, see definitions in Appendix A—Glossary. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/das/library/reports.asp>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

often than the graduates in the middle age range (ages 33–34), who in turn taught consistently relatively more often than the youngest graduates (age 32 or younger) (table 1). Some 19 percent of the youngest graduates (those age 32 or younger in 2003) taught consistently, compared with 31 percent of those ages 33–34 and 40 percent of those age 35 or older.

Examined within each of the teacher career categories, about 14 percent of those graduates who taught consistently were in the youngest age group (table 2). Between 27 and 33 percent of leavers, late starters, and other teachers were in this age group as well.

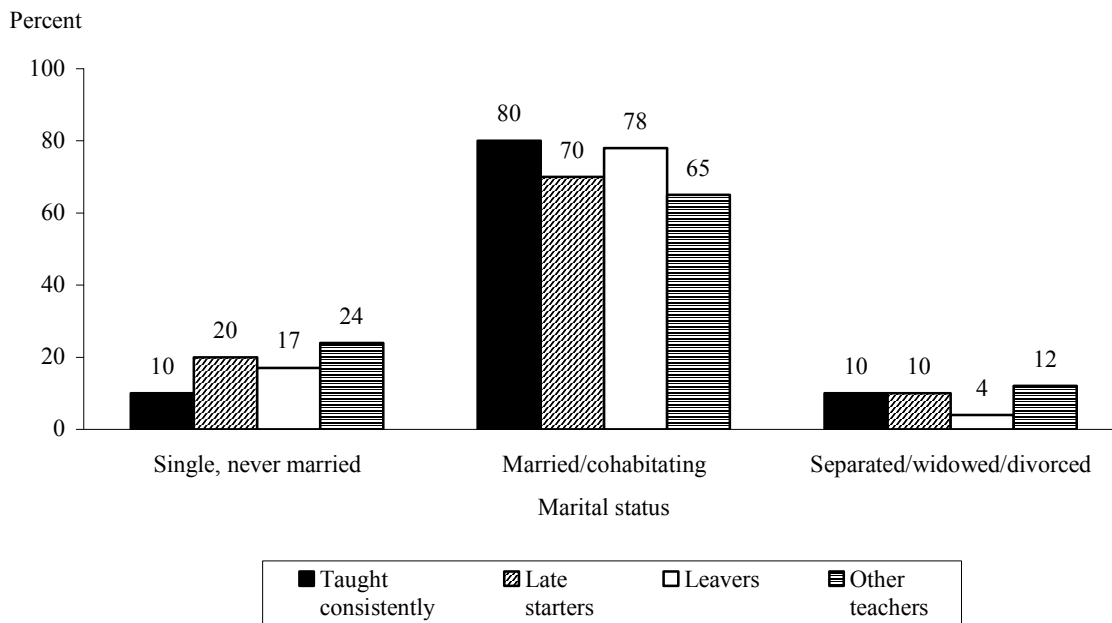
### ***Marital Status in 2003***

The first 10 years after graduation is a time when many graduates marry and begin families. In fact, almost three-quarters of 1993 bachelor’s degree recipients were either married or cohabiting/living with a partner in 2003 (table 2). Another 8 percent had been married at some point and were separated, widowed, or divorced at the time of the 2003 follow-up interview. A



higher proportion of those graduates who had not taught were single in 2003 than graduates who had taught (21 percent vs. 17 percent). Those graduates who taught consistently had the lowest rates of remaining single, compared with those who were leavers, late starters, or other teachers. For example, about 10 percent of those who taught consistently in 1994, 1997, and 2003 were single in 2003 (figure 5). By comparison, between 17 and 24 percent of those who were leavers, late starters, or other teachers were single. From another perspective, the analysis of marital status shows that a greater percentage of graduates who were ever married or cohabitating taught consistently than those who never married. Table 1 shows that among married graduates who taught, about 34 percent taught consistently, compared with 19 percent of teachers who had never married.

**Figure 5. Percentage of 1992–93 graduates who were teaching in 1994, 1997, or 2003 in each teacher career category, by marital status: 2003**



NOTE: Career categories were constructed based on 1992–93 graduates’ teaching status in 1994, 1997, and 2003. For more information, see definitions in Appendix A—Glossary. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/das/library/reports.asp>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

## ***Dependents***

Graduates with children may take time off from their careers for childrearing. Those remaining employed during the time when they have young children may seek family-friendly professions or employers. This analysis, therefore, takes into consideration the relationships between these life events and graduates' choices as they move into and out of the teaching profession. In particular, this section looks at the relationship between career paths and whether 1992–93 graduates had dependents at the initial interview in 1993 and then at the 1997 and 2003 follow-ups. Because mothers have traditionally carried most childrearing responsibilities, the tables present results for all graduates and then for female and male graduates separately.

The results indicate that among those who taught, graduates with dependents in 1993, 1997, and 2003 taught consistently at higher rates than graduates without dependents (table 3). This pattern was also found for male graduates; those who had children in 1993 taught consistently at almost twice the rate as male graduates who did not have children at that time (43 percent versus 23 percent). Results for female graduates generally mirror those for all graduates.

Overall, a higher proportion of graduates with dependents in 1993, 1997, and 2003 had taught than graduates without dependents at these points. For graduates with dependents in 1993, about 21 percent had taught, while the comparable percentages in 1997 and 2003 were about 18 percent and 15 percent, respectively. Among graduates who had taught, 43 percent of those with dependents in 1993, some 39 percent of those with dependents in 1997, and 35 percent of those with dependents in 2003 taught consistently. Among graduates without dependents in each year, a smaller proportion taught consistently.

Within each teacher career category, a higher percentage of graduates who had taught had dependents than those who had not taught, and this pattern was found at each time period (table 4). About 19 percent of those who had taught had dependents in 1993, as did 34 percent in 1997 and 63 percent in 2003. Comparable percentages for those who had not taught were 11 percent, 24 percent, and 56 percent.

The percentages of graduates within each teacher career category who had dependents also varied across teacher career categories for those who taught. Compared with late starters or other teachers, higher percentages of those who taught consistently had dependents at each time period. Also, a higher percentage of graduates who had left the teaching profession by 2003 had dependents in 2003 than those who were late starters or other teachers. While 69 percent of leavers had dependents in 2003, some 58 percent and 54 percent of late starters and other teachers, respectively, had dependents in 2003.

**Table 3. Among 1992–93 bachelor’s degree recipients who were teaching in 1994, 1997, or 2003, percentage distribution of those in various teacher career categories and percentage of all bachelor’s degree recipients who were teachers and nonteachers, by number of dependents in 1993, 1997, and 2003: 2003**

Gender and number of dependents	Teachers					All bachelor’s degree recipients	
	Taught consistently	Late starters	Leavers	Other teachers	Total	Teachers	Non-teachers
Total	31.0	40.6	15.9	12.4	100.0	13.5	86.5
Number of dependents in 1993							
0 dependents	28.3	40.5	17.2	14.0	100.0	12.5	87.5
1 or more dependents	43.1	40.4	10.4	6.0	100.0	20.8	79.2
Number of dependents in 1997							
0 dependents	26.8	42.0	16.1	15.0	100.0	11.9	88.1
1 or more dependents	39.1	37.8	15.6	7.5	100.0	18.2	81.8
Number of dependents in 2003							
0 dependents	25.0	46.0	13.4	15.6	100.0	11.5	88.5
1 or more dependents	35.0	37.0	17.5	10.5	100.0	15.2	84.8
<b>Male</b>							
Total	25.0	43.6	17.0	14.4	100.0	7.8	92.2
Number of dependents in 1993							
0 dependents	22.7	43.9	18.7	14.6	100.0	7.5	92.5
1 or more dependents	42.6	37.9	5.4	14.1	100.0	10.1	89.9
Number of dependents in 1997							
0 dependents	22.0	43.8	19.2	15.0	100.0	7.4	92.6
1 or more dependents	33.7	42.9	10.7	12.7	100.0	9.0	91.0
Number of dependents in 2003							
0 dependents	20.5	48.9	16.5	14.2	100.0	8.2	91.8
1 or more dependents	28.9	40.3	16.0	14.8	100.0	7.6	92.4

See notes at end of table.

**Table 3. Among 1992–93 bachelor’s degree recipients who were teaching in 1994, 1997, or 2003, percentage distribution of those in various teacher career categories and percentage of all bachelor’s degree recipients who were teachers and nonteachers, by number of dependents in 1993, 1997, and 2003: 2003—Continued**

Gender and number of dependents	Teachers					All bachelor’s degree recipients	
	Consistently taught	Late starters	Leavers	Other teachers	Total	Teachers	Non-teachers
<b>Female</b>							
Total	33.4	39.3	15.6	11.8	100.0	18.4	81.6
Number of dependents in 1993							
0 dependents	30.6	38.8	16.7	13.8	100.0	17.0	83.0
1 or more dependents	43.2	41.0	11.6	4.2	100.0	27.2	72.8
Number of dependents in 1997							
0 dependents	29.1	40.9	14.9	15.1	100.0	16.0	84.0
1 or more dependents	40.5	36.5	16.8	6.2	100.0	24.6	75.4
Number of dependents in 2003							
0 dependents	27.6	43.9	11.9	16.5	100.0	14.5	85.5
1 or more dependents	36.8	36.0	18.0	9.2	100.0	21.7	78.3

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

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

**Table 4. Percentage distributions of 1992–93 bachelor’s degree recipients’ number of dependents in 1993, 1997, and 2003, by teacher career category among those who were teaching in 1994, 1997, or 2003, and by teaching status among all bachelor’s degree recipients: 2003**

Career category	Number of dependents in 1993		Number of dependents in 1997		Number of dependents in 2003	
	0 dependents	1 or more dependents	0 dependents	1 or more dependents	0 dependents	1 or more dependents
Total	87.4	12.6	74.7	25.3	43.0	57.0
Taught consistently	73.3	26.7	57.1	42.9	29.2	70.8
Late starters	80.8	19.2	68.3	31.7	41.8	58.2
Leavers	87.4	12.6	66.8	33.2	30.7	69.3
Other teachers	90.7	9.3	79.4	20.6	46.3	53.7
Teachers	80.7	19.3	66.0	34.0	36.6	63.4
Nonteachers	88.5	11.5	76.1	23.9	44.5	55.5

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

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

## Academic Indicators

The “highly qualified teacher”<sup>7</sup> provisions of the No Child Left Behind Act of 2001 (NCLB) codified almost a decade of increased attention to the academic preparation of teachers. Data on teacher qualifications from the mid-1980s led to a call for higher licensure requirements for content specialists and increased academic requirements for teacher preparation (Holmes Group 1986; NCTAF 1996, 2003). Some teacher education institutions responded by creating 5th-year master of education degree programs requiring a bachelor’s degree in a content area prior to completing a master’s program focusing primarily on content-specific pedagogy. Others increased the content rigor of their undergraduate preparation. By 2004, there were 31 states that required a major in a teaching content area to obtain a license to teach high school; in 1995 (the earliest year for which such data are available), only 19 states required this level of content preparation (Cavell et al. 2005). Today, teacher education is most notable for its diversity in delivery models and its relative emphasis on content and pedagogy (Levine 2006). This section examines several indicators related to the academic qualifications and preparation of prospective teachers and relates these indicators to the career choices made by 1992–93 bachelor’s degree recipients in the 10 years following graduation.

### *College Entrance Exam Scores*

College entrance exam scores include SAT and ACT scores that students have received before their matriculation in an institution of postsecondary education. While some schools, districts, and increasingly states require or encourage all of their high school students to take one or both of these exams, not all do (Olsen 2006). However, college entrance exam scores are useful as an indicator of academic ability because they share a common metric across all test-takers (Henke et al. 2005). Research conducted since the early 1980s has shown that college graduates who teach tend to have lower SAT and ACT scores than those who do not teach (Henke, Geis, and Giambattista 1996b; Murnane et al. 1991; Schlecty and Vance 1983).

The relationship of academic ability as measured by SAT and ACT scores and the timing of teacher careers is the focus of this section. Consistent with previous research, the analysis showed that graduates with lower scores were teaching in 1994, 1997, or 2003 relatively more often than those with higher scores<sup>8</sup> (table 5). Among graduates with test scores,<sup>9</sup> the percentage who had taught decreased with the level of their SAT or ACT scores. Whereas 18 percent of

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<sup>7</sup> In general a “highly qualified teacher” under NCLB is one with full certification, a bachelor’s degree, and demonstrated competence in subject knowledge and teaching.

<sup>8</sup> The bottom, middle, and top SAT and ACT categories are defined in appendix A.

<sup>9</sup> Some 80 percent of respondents had college entrance examination scores available.

**Table 5. Among 1992–93 bachelor’s degree recipients who were teaching in 1994, 1997, or 2003, percentage distribution of those in various teacher career categories and percentage of all bachelor’s degree recipients who were teachers and nonteachers, by selected academic indicators: 2003**

Academic indicator	Teachers					All bachelor’s degree recipients	
	Taught consistently	Late starters	Leavers	Other teachers	Total	Teachers	Non-teachers
Total	31.0	40.6	15.9	12.4	100.0	13.5	86.5
College entrance examination score category							
No scores available	37.3	40.7	12.6	9.5	100.0	13.1	86.9
Scores available	29.5	40.6	16.7	13.2	100.0	13.6	86.4
Low	33.8	42.2	11.3	12.6	100.0	18.4	81.6
Middle	31.8	38.7	18.1	11.4	100.0	13.3	86.7
High	15.0	43.1	22.5	19.4	100.0	9.7	90.3
Baccalaureate degree major							
Business/management	2.1	77.4	8.1	12.4	100.0	4.1	95.9
Education	48.3	23.7	18.0	10.0	100.0	59.6	40.4
Humanities	22.9	50.6	12.6	14.0	100.0	15.7	84.3
Mathematics/computer/natural sciences	20.9	43.3	22.3	13.5	100.0	7.9	92.1
Social sciences	9.2	57.9	11.9	21.0	100.0	11.3	88.7
Other	10.6	67.2	11.4	10.9	100.0	5.0	95.0
Cumulative undergraduate GPA							
2.74 or lower	23.1	48.8	15.1	13.1	100.0	9.1	90.9
2.75–3.24	33.8	42.7	10.8	12.6	100.0	15.7	84.3
3.25–3.74	31.0	36.4	20.4	12.3	100.0	14.8	85.2
3.75 or higher	40.8	29.5	20.7	9.0	100.0	15.4	84.6
Undergraduate GPA in major							
2.74 or lower	21.8	53.4	18.7	6.0	100.0	8.2	91.8
2.75–3.24	27.8	44.6	13.5	14.1	100.0	12.4	87.6
3.25–3.74	33.2	37.8	14.6	14.3	100.0	14.8	85.2
3.75 or higher	35.6	35.7	20.4	8.3	100.0	16.0	84.0
Highest degree attained as of 2003							
Bachelor’s degree	32.8	38.0	17.5	11.7	100.0	11.2	88.8
Master’s degree or higher	28.2	44.6	13.4	13.7	100.0	20.3	79.7
Field of study for highest graduate degree received							
Education	39.0	37.1	6.9	17.0	100.0	83.3	16.7
Not education	‡	‡	‡	‡	100.0	10.7	89.3

See notes at end of table.

**Table 5. Among 1992–93 bachelor’s degree recipients who were teaching in 1994, 1997, or 2003, percentage distribution of those in various teacher career categories and percentage of all bachelor’s degree recipients who were teachers and nonteachers, by selected academic indicators: 2003—Continued**

Academic indicator	Teachers					All bachelor’s degree recipients	
	Consistently taught	Late starters	Leavers	Other teachers	Total	Teachers	Non-teachers
Highest degree expected in 1994							
Bachelor’s degree	24.1	55.0	14.3	6.6	100.0	6.3	93.7
Master’s degree (M.A., M.S., M.B.A.)	37.2	37.1	14.1	11.6	100.0	15.1	84.9
First-professional degree	‡	‡	‡	‡	100.0	5.2	94.8
Doctoral degree (Ph.D., Ed.D.)	17.9	44.9	20.9	16.3	100.0	18.3	81.7

‡ Reporting standards not met (too few cases).

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

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

graduates with scores in the lowest category of this cohort had taught by 2003, some 13 percent of those with scores in the middle category and 10 percent of those with scores in the highest category had done so. In addition, among graduates who had test scores available and who had taught since 1992–93, some 15 percent of graduates with scores in the highest category had taught consistently since 1992–93, compared with 32 to 34 percent of other graduates.

Furthermore, those with higher scores taught consistently during these years less often. Leavers, other teachers, and late starters scored in the highest SAT or ACT score category at higher rates than those graduates who taught consistently (table 6). About 9 percent of those with available scores who taught consistently scored in the top 25 percent of the distribution. In comparison, a larger percentage of those who were leavers, other teachers, or late starters had SAT or ACT scores at this level. Of those with scores, a lower percentage of graduates who had taught scored in the highest category (17 percent) than those who had not taught (25 percent).

### ***Baccalaureate Degree Major***

Graduates who had majored in education taught consistently relatively more often than graduates who had majored in other fields (table 5). About 60 percent of bachelor’s degree recipients who had majored in education were teaching in 1994, 1997, or 2003. The remaining 40 percent were not teaching at one of the three follow-up periods in the 10 years after completing their bachelor’s degree in education. Among graduates who taught, about 48 percent of the

**Table 6. Percentage distributions of 1992–93 bachelor’s degree recipients’ selected academic indicators, by teacher career category among those who were teaching in 1994, 1997, or 2003, and by teaching status among all bachelor’s degree recipients: 2003**

Career category	College entrance examination score					Baccalaureate degree major					
	No scores available	Scores available	Category			Business/management	Education	Mathematics/computer/natural sciences		Social sciences	Other <sup>1</sup>
			Low	Middle	High			Humanities			
Total	19.9	80.1	22.9	53.4	23.7	24.6	11.9	10.1	19.8	15.3	18.3
Taught consistently	23.2	76.8	35.3	56.0	8.7	0.5	76.9	8.6	7.8	3.8	2.3
Late starters	19.3	80.7	32.1	49.7	18.2	14.3	29.0	14.6	12.4	18.4	11.2
Leavers	15.2	84.8	20.8	56.2	23.0	3.8	56.1	9.3	16.3	9.6	4.9
Other teachers	14.6	85.4	29.6	45.2	25.2	7.4	39.5	13.1	12.6	21.5	5.9
Teachers	19.3	80.7	30.9	52.1	17.1	7.5	49.5	11.7	11.6	12.9	6.8
Nonteachers	19.9	80.1	21.5	53.4	25.0	27.5	5.2	9.8	21.3	15.8	20.4

Career category	Cumulative undergraduate GPA				Highest degree attained as of 2003	
	2.74 or lower	2.75–3.24	3.25–3.74	3.75 or higher	Bachelor’s degree	Master’s degree
						or higher
Total	28.5	31.8	29.4	10.3	74.3	25.7
Taught consistently	14.0	39.5	31.5	15.0	64.9	35.1
Late starters	23.3	39.1	29.1	8.5	57.6	42.4
Leavers	18.3	25.2	41.3	15.2	67.6	32.4
Other teachers	20.6	38.3	32.4	8.6	57.5	42.5
Teachers	19.3	36.9	32.2	11.6	61.4	38.6
Nonteachers	30.0	31.0	29.0	10.0	76.4	23.6

<sup>1</sup> Other includes health, vocational/technical, and other technical/professional.

NOTE: Career path categories were constructed based on 1992–93 graduates’ teaching status in 1994, 1997, and 2003. For more information, see definitions in Appendix A—Glossary. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/das/library/reports.asp>.

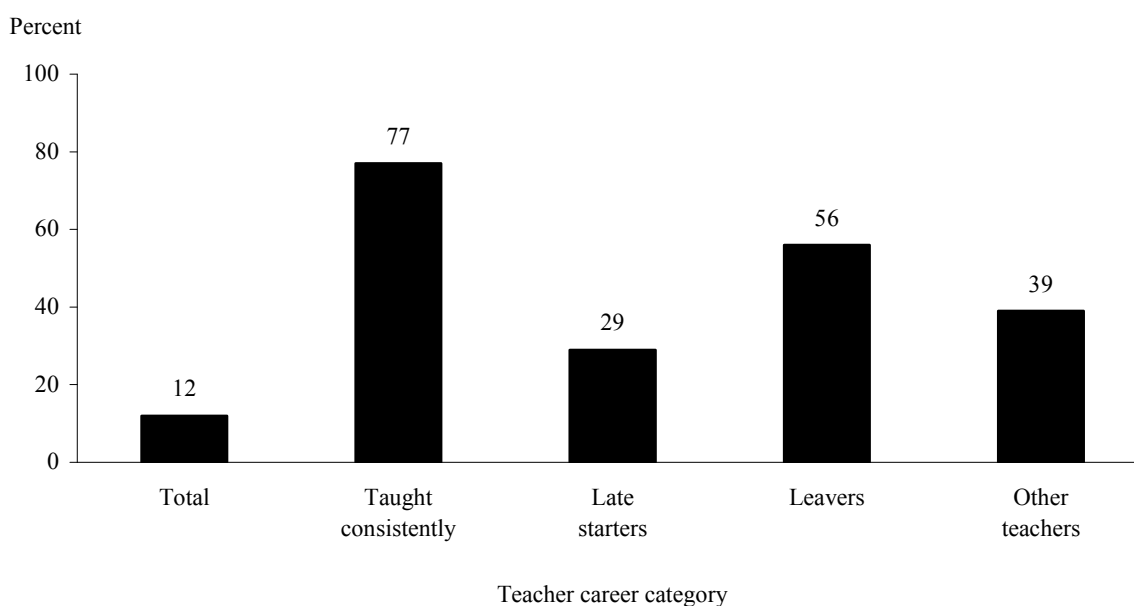
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).



education majors had taught consistently since 1994, compared with about 23 percent of humanities majors, 21 percent of mathematics/computer/natural sciences majors, and 9 percent of social science majors. While 12 percent of all 1992–93 graduates had majored in education, about three-quarters of those who taught consistently had done so (table 6; figure 6). About 56 percent of leavers had majored in education, as had 29 percent of late starters and 39 percent of other teachers. Overall, about half of those graduates who taught at some point between 1994 and 2003 had majored in education, with 12 to 13 percent coming from each of the social sciences, humanities, and mathematics/computer/natural sciences (table 6).

Those 1992–93 graduates who were late starters to the teaching profession had majored in business and management for their bachelor’s degree (14 percent) relatively more often than those graduates who taught consistently (less than 1 percent). Overall, about 28 percent of those graduates who did not teach had majored in business and management, while 7 percent of those graduates who taught did so.

**Figure 6. Percentage of 1992–93 graduates who majored in education, by teacher career category: 2003**



NOTE: Career categories were constructed based on 1992–93 graduates’ teaching status in 1994, 1997, and 2003. For more information, see definitions in Appendix A—Glossary. Standard error tables are available at <http://nces.ed.gov/das/library/reports.asp>. SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

A higher proportion of leavers (16 percent) had majored in mathematics/computer/natural sciences for their bachelor's degree than had those who taught consistently (8 percent). Among those graduates who taught consistently, less than 4 percent had majored in the social sciences. Between 10 and 22 percent of leavers, late starters, and other teachers had majored in the social sciences.

### ***Cumulative Undergraduate GPA and GPA in Major***

Student grades can also provide a picture of the academic preparation of teachers. Virtually all postsecondary institutions calculate grade point averages (GPAs); therefore, this measure is commonly available for all graduates. While college entrance exams have a common metric, GPAs vary across institutions and within institutions across majors (Henke et al. 2005), so they should be viewed with caution. For example, if undergraduate programs that prepare teachers tend to give students higher grades than other programs, graduates of those programs (who go on to teach at higher rates than graduates of other programs) would have higher GPAs. Conversely, if undergraduate teacher education programs tend to give students lower grades than other programs, their graduates would tend to have lower GPAs.

Among graduates with a cumulative undergraduate GPA of 2.74 or lower, 9 percent were teaching at one of the three follow-up points between 1994 and 2003, compared with about 15 percent of those with undergraduate GPAs of 2.75 or higher (table 5). Among graduates who taught and had a cumulative undergraduate GPA of 3.75 or higher, 41 percent taught consistently, while among those who taught and had a GPA of 2.74 or lower, about 23 percent taught consistently.

Looking from the perspective of teacher career categories, 19 percent of those graduates who were teaching at one of the three follow-up points between 1994 and 2003 had a cumulative undergraduate GPA of 2.74 or lower, compared with 30 percent of those who did not teach (table 6). Of those graduates who taught consistently, 14 percent had a cumulative undergraduate GPA of 2.74 or lower. The percentage of late starters with GPAs in this range was about 23 percent. Those graduates who taught consistently and who were leavers had cumulative undergraduate GPAs in the highest range of 3.75 or higher relatively more often than late starters. While around 15 percent of the first group had such high GPAs, about 9 percent of late starters did so. An analysis of graduates' GPAs in their majors shows that among graduates who taught, about 36 percent of those with the highest GPAs in their majors taught consistently between 1994 and 2003 (table 5). In contrast, among graduates who taught at some point and who had the lowest GPAs in their majors, about 22 percent taught consistently.

### ***Highest Degree Attained as of 2003***

A master's degree has become the terminal degree of choice for many teachers and is associated with higher steps on salary schedules and improved pedagogy and content expertise (U.S. Department of Education 2004; Goldhaber and Brewer 1998). Of the 1993 graduates who had earned a master's degree or higher by 2003, one-fifth were teaching at one of the three follow-ups between 1994 and 2003 (table 5), compared with about 11 percent of those whose highest degree was a bachelor's degree. From another perspective, 39 percent of 1992–93 graduates who taught had attained a master's degree or higher by 2003 (table 6), while less than one-fourth of those graduates who did not teach had achieved this level of degree attainment.

### ***Field of Study for Highest Graduate Degree Received and Highest Degree Expected***

The pursuit of an advanced degree in education is a strong indication that a graduate is planning to teach or pursue other education-related careers such as administration or counseling. Among graduates whose major field of study for their highest graduate degree was education, 83 percent were teaching at one of the three follow-ups between 1994 and 2003 (table 5). Among graduates who had majored in other fields for their highest graduate degrees, 11 percent taught. About 39 percent of those who had majored in education for their highest graduate degree taught consistently, while 37 percent were late starters to the teaching profession. Those 1993 graduates who, in 1994, anticipated that their highest degree would be a master's or doctoral degree taught relatively more often than those graduates who anticipated that it would be a bachelor's degree (15 and 18 percent, respectively, vs. 6 percent).

## **Teaching Assignment**

Teachers' perceptions of their working environment may be associated with their decisions to remain teaching in the same school, change schools, or leave the profession altogether. Working conditions may vary depending on whether the teaching position is in a public or private school, at the elementary or secondary level, or in a high- or low-poverty school. In addition, the support (or lack thereof) that teachers receive from administrators, other teachers, and parents can affect career choices to stay in or leave teaching (Johnson et al. 2004; MetLife 2005). This section looks at the characteristics of the teaching environment in 2003 for those graduates who taught consistently, started teaching late, and other teachers.<sup>10</sup>

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<sup>10</sup> Data on teaching assignments and conditions are based on the school in which the respondent was teaching in 2003. Leavers were not teaching in 2003 and so are excluded from the analysis in this section.

### ***Sector and Level***

The timing of teacher careers for 1992–93 graduates who were teaching in 2003 was related to both the sector (public or private) and level (elementary, secondary, combined) of the school where they taught. Those graduates who began teaching immediately after receiving their bachelor’s degree and taught consistently tended to be teaching in public schools and in elementary schools in 2003 (table 7).

Across these teacher career categories, a higher proportion of graduates who were teaching in public schools in 2003 taught consistently than those teaching in private schools. While 48 percent of the graduates who were teaching in public schools taught consistently, 28 percent of those who were teaching in private schools did so.

Among those graduates who taught in an elementary school in 2003, some 49 percent taught consistently (figure 7). By contrast, 39 percent of teachers in secondary schools taught consistently, and 17 percent of teachers in combined schools did so.

From the perspective of teacher career categories, table 8 shows that of those graduates who taught consistently, 6 percent were teaching in private schools in 2003. Among late starters, 13 percent were teaching in private schools. Graduates who taught consistently were teaching at the elementary level at a higher rate than late starters: while 69 percent of those who taught consistently were teaching in elementary schools, 55 percent of late starters were doing so. A higher percentage of late starters than of those who taught consistently were teaching in combined elementary and secondary schools in 2003 (11 percent versus 3 percent).

### ***Student Demographics***

Studies have shown that teachers in high-minority and high-poverty schools tend to have fewer years of experience (Henke et al. 1996a). In schools where 1992–93 graduates were teaching in 2003, there were few measurable differences found by teacher career categories in the percentage of teachers in schools with varying levels of minority enrollment or in the percentage of students eligible for free or reduced-price lunch in their schools (table 7). Among 1992–93 graduates who were teaching in 2003, some 50 percent of those in schools with 5 to 19 percent of students eligible for free and reduced-price lunch were late starters.

**Table 7. Among 1992–93 bachelor’s degree recipients who were teaching in 2003, percentage distribution of those in various teacher career categories, by selected school and teacher characteristics: 2003**

School or teacher characteristic	Taught consistently	Late starters	Other teachers
Total	41.5	54.2	4.3
Sector of most recent school			
Public	47.6	48.7	3.8
Private	27.7	65.2	7.1
Level of most recent school			
Elementary	49.3	45.9	4.8
Secondary	39.3	56.8	3.9
Combined	17.3	78.4	4.3
Percent minority enrollment in most recent school			
0–4	49.1	46.4	4.5
5–19	47.6	50.0	2.3
20–49	45.1	49.6	5.3
50 or more	42.5	53.6	3.9
Percent eligible for free/reduced-price lunch in most recent school			
0–4	52.4	47.6	#
5–19	46.9	49.3	3.9
20–49	49.4	47.1	3.5
50 or more	48.5	48.0	3.5
Most recent main subject taught			
Elementary, early childhood education	53.5	44.1	2.4
Science and mathematics	44.6	51.5	3.9
Special education	35.6	59.7	4.7
English, journalism, reading, writing	39.4	53.6	7.0
Art, drama, music	42.8	49.7	7.5
Other	37.9	57.8	4.3
In most recent teaching position, percent satisfied with			
Student motivation	42.8	53.0	4.2
School environment	45.0	51.3	3.6
Student discipline	43.2	52.8	4.0
Class size	44.2	51.5	4.4
Parent support	45.8	51.7	2.5
Would go into teaching again			
Yes	44.0	52.1	3.9
No	48.0	48.3	3.7

See notes at end of table.

**Table 7. Among 1992–93 bachelor’s degree recipients who were teaching in 2003, percentage distribution of those in various teacher career categories, by selected school and teacher characteristics: 2003—Continued**

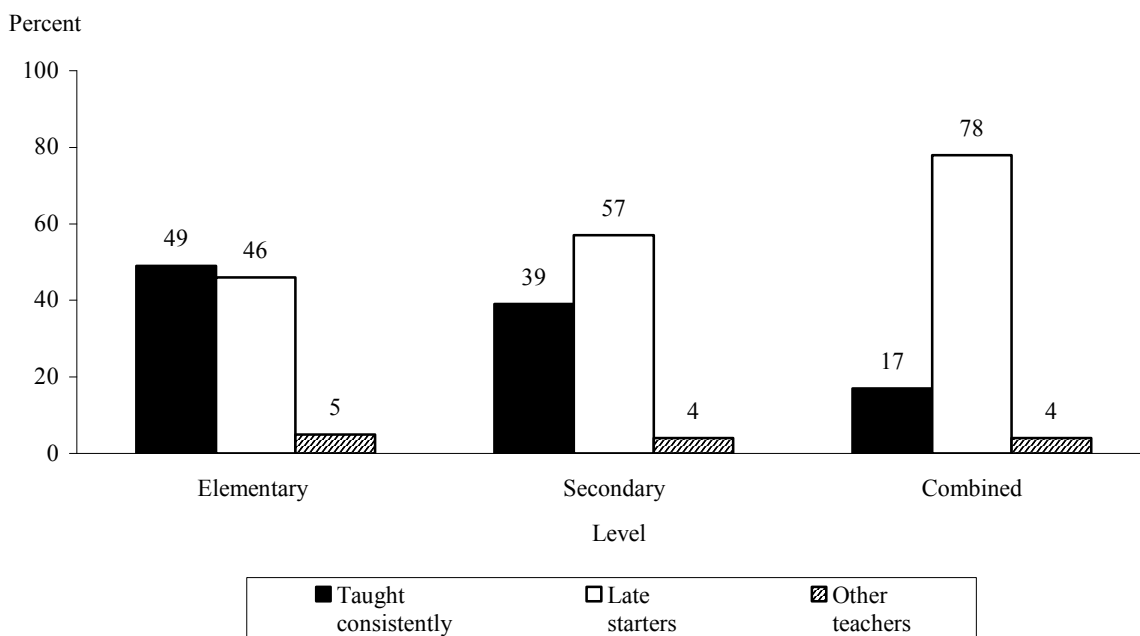
School or teacher characteristic	Taught consistently	Late starters	Other teachers
Participated in teacher induction program by 2003			
Yes	42.7	52.4	4.9
No	44.7	50.9	4.4
Plan to continue teaching			
Yes	45.1	50.9	4.1
No	40.5	56.9	2.6
Expect to be teaching in the long term			
Yes	48.0	50.9	1.2
No	37.7	59.1	3.2

# Rounds to zero.

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

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

**Figure 7. Percentage distribution of 1992–93 graduates who were teaching in 2003 in each teacher career category, by level of 2003 school**



NOTE: Career categories were constructed based on 1992–93 graduates’ teaching status in 1994, 1997, and 2003. For more information, see definitions in Appendix A—Glossary. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/das/library/reports.asp>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

**Table 8. Percentage distributions of 1992–93 bachelor’s degree recipients’ selected school and teacher characteristics, by teacher career category among those who were teaching in 2003: 2003**

Career category	Sector		Level			Percent minority enrollment				Percent eligible for free/reduced-price lunch			
	Public	Private	Elementary	Secondary	Combined	0–4	5–19	20–49	50 or more	0–4	5–19	20–49	50 or more
Total	90.1	9.9	62.0	30.6	7.4	16.0	26.4	27.4	30.3	8.9	29.2	38.3	23.6
Taught consistently	94.1	5.9	69.4	27.6	2.9	17.1	27.4	27.2	28.3	9.6	28.0	39.2	23.3
Late starters	87.3	12.7	54.9	33.8	11.3	14.7	26.0	27.1	32.2	8.8	29.9	37.9	23.4
Other teachers	82.9	17.1	66.4	26.6	7.1	‡	‡	‡	‡	‡	‡	‡	‡

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

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

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

### ***Teacher Satisfaction***

For those graduates who were teaching in 2003, few measurable differences were found in measures of teacher satisfaction by graduates' teaching career category (table 7). Specifically, no significant differences were found in the percentage of teachers satisfied with student motivation, school environment, student discipline, class size, or parent support by teaching career category. Forty-eight percent of those graduates who were teaching in 2003 and expected to be teaching in the long term taught consistently. About 38 percent of those who taught and did not expect to be teaching in the long term taught consistently. While the research shows that teacher induction programs may improve teacher satisfaction and minimize attrition (Smith and Ingersoll 2004), no significant differences were found in the percentage of graduates who had participated in a teacher induction program by 2003.

### **Salary**

Almost all public school systems in the United States compensate teachers using salary schedules based on education (highest degree earned or postsecondary education credits earned) and years of teaching experience (Henke et al. 1996a). As a result, the timing of teachers' careers can have a large impact on their salaries. For example, those 1992–93 bachelor's degree recipients who delayed entering teaching to pursue a master's degree would have gained a salary advantage by earning a higher degree that could be somewhat offset by the loss of years in service. Similarly, those graduates who taught consistently beginning in 1994 would have the most possible years of experience, and may or may not have also completed a master's degree or higher by 2003.

Table 9 displays the distribution of salary information for 1992–93 graduates who were in each teaching career category. The table includes information by salary category on graduates' current or most recent salary as of 2003, and, for only those graduates who were teaching at one of the three follow-ups, the academic year (AY) base salary for their most recent teaching job. For those graduates who were teaching in 1994 and 1997, it also presents their AY base salary in categories for those years.

Overall, graduates' current salary in 2003 was related to their teaching status. While about 22 percent of those graduates who earned salaries in the lowest category (less than \$34,934) were teaching at one of the three follow-ups, 15 percent of those who earned salaries in the middle category (\$34,934–68,000) and about 3 percent of those who earned salaries in the highest category (more than \$68,000) had taught.



**Table 9. Among 1992–93 bachelor’s degree recipients who were teaching in 1994, 1997, or 2003, percentage distribution of those in various teacher career categories and percentage of all bachelor’s degree recipients who were teachers and nonteachers, by most recent salary for all bachelor’s degree recipients by academic year base for bachelor’s degree recipients who were teaching in 1994, 1997, or 2003: 1994, 1997, and 2003**

Most recent salary and base teaching salary	Teachers					All bachelor’s degree recipients	
	Taught consistently	Late starters	Leavers	Other teachers	Total	Teachers	Non-teachers
Total	31.0	40.6	15.9	12.4	100.0	13.5	86.5
Current/most recent salary in 2003							
Lowest quarter (less than \$34,934)	28.0	44.7	15.3	12.1	100.0	22.5	77.5
Middle two quarters (\$34,934–68,000)	35.4	41.7	12.5	10.4	100.0	15.0	85.0
Highest quarter (more than \$68,000)	17.5	13.8	31.4	37.2	100.0	2.6	97.4
Academic year base salary in most recent teaching job							
Lowest quarter (less than \$26,000)	12.3	33.7	32.9	21.2	100.0	67.6	32.4
Middle two quarters (\$26,000–40,000)	38.8	36.9	12.9	11.4	100.0	87.8	12.2
Highest quarter (more than \$40,000)	37.9	48.0	7.1	7.0	100.0	93.7	6.3
Academic year base salary in 1994							
Lowest quarter (less than \$15,000)	33.3	12.6	35.0	19.1	100.0	69.8	30.2
Middle two quarters (\$15,000–23,000)	56.7	9.2	28.0	6.1	100.0	94.1	5.9
Highest quarter (more than \$23,000)	63.5	10.4	17.9	8.2	100.0	98.3	1.7
Academic year base salary in 1997							
Lowest quarter (less than \$22,000)	46.3	29.2	12.7	11.8	100.0	96.4	3.6
Middle two quarters (\$22,000–28,800)	51.2	28.5	10.9	9.4	100.0	99.8	0.2
Highest quarter (more than \$28,800)	47.5	31.1	11.1	10.4	100.0	100.0	#
Academic year base salary in 2003							
Lowest quarter (less than \$30,867)	30.4	63.6	#	6.0	100.0	100.0	#
Middle two quarters (\$30,867–43,000)	48.2	47.3	#	4.5	100.0	100.0	#
Highest quarter (more than \$43,000)	42.6	54.5	#	2.8	100.0	100.0	#

# Rounds to zero.

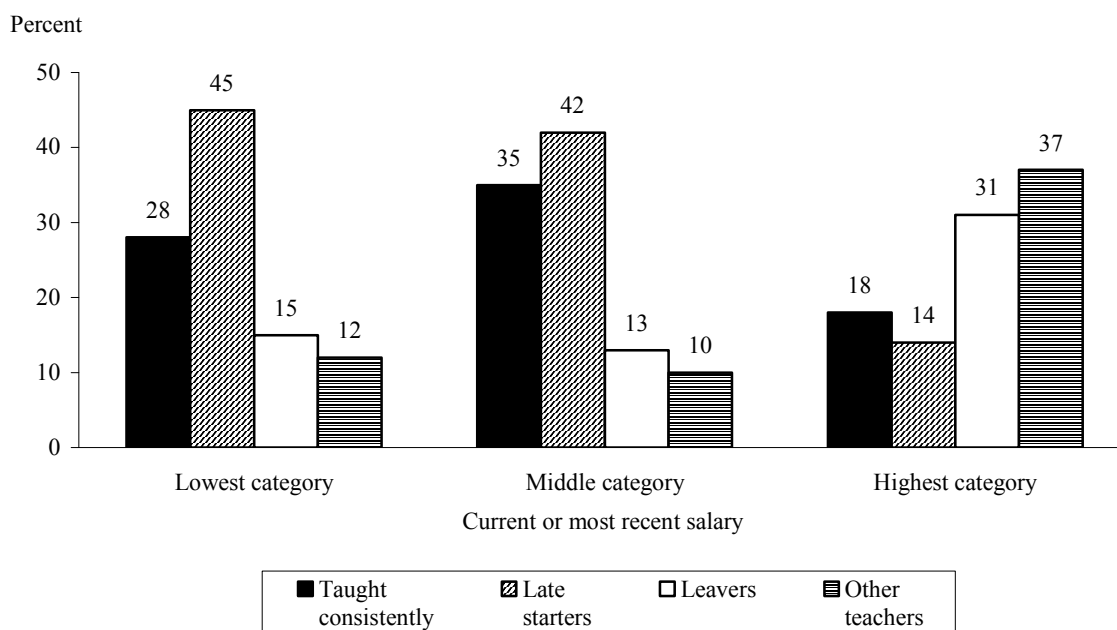
† Not applicable.

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

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

Those graduates in the lowest and middle categories of current salary in 2003 were late starters to the teaching profession at higher rates than those in the highest<sup>11</sup> category (figure 8). In contrast, those in the highest category were leavers or other teachers at higher rates than those in the middle or lowest category.

**Figure 8. Percentage distribution of 1992–93 graduates who were teaching in 1994, 1997, or 2003 in each teacher career category, by current or most recent salary category in 2003**



NOTE: Career categories were constructed based on 1992–93 graduates’ teaching status in 1994, 1997, and 2003. For more information, see definitions in Appendix A—Glossary. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/das/library/reports.asp>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

Among those who were teaching at one of the three follow-ups in the 10 years following graduation, a smaller proportion of those in the lowest category of AY base salary for their most recent job (less than \$26,000) taught consistently than those in the middle category (\$26,000–40,000) or those in the highest category (more than \$40,000) (table 9). Those in the lowest category of earnings tended to leave the profession relatively more often than those in the middle or highest categories (33 percent vs. 13 and 7 percent, respectively). In addition, those in the

<sup>11</sup> The estimate for the percentage of graduates in the highest category of current salary who were late starters is unstable because the size of the standard error is at least one-third the size of the estimate. This is due to the relatively small number of teachers in the highest salary category. Therefore, results based on these estimates should be viewed with caution.

lowest category of earnings in their most recent teaching job were relatively more often other teachers than those in the higher categories of earnings.

While about one-third of those in the lowest category of AY base salary in 1994 (less than \$15,000) taught consistently, 57 and 64 percent of those in the middle category (\$15,000–23,000) and in the highest category (more than \$23,000), respectively, did so.

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## Summary and Conclusions

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For the purposes of this report, a taxonomy of five teaching career categories was developed based on the B&B:93/03 and NPSAS:93 data. Bachelor's degree recipients in 1992–93 were placed into one of the five career categories related to teaching in elementary and secondary schools at the three follow-ups in 1994, 1997, and 2003. As noted in the Limitations of Data section in the Introduction, the B&B:93/03 data do not include comprehensive job histories of the graduates but do permit analyses of what graduates were doing when the data were collected. The category labels, therefore, serve as shorthand for the various combinations of teaching and not teaching at the time of each of the three follow-up interviews. Graduates in any of the five categories could have had unreported teaching or nonteaching spells between data collection years.

As of 2003, some 87 percent of graduates had not taught at any of those three points. Of the remaining graduates who were teaching at one or more of the three follow-up points between 1994 and 2003, some 31 percent taught consistently, about 41 percent began teaching later in their career, and 12 to 16 percent taught at some point over the 10 years, but irregularly (i.e., other teachers or leavers).

The analysis shows that among those who taught, a higher proportion of female graduates than male graduates taught consistently, White graduates taught consistently at higher rates than Black graduates, and older graduates at higher rates than younger graduates.

Marriage and family formation were related to the timing of teachers' careers. A higher proportion of graduates who had been married by 2003 taught consistently than those who had remained single. Among those who taught, graduates with dependents taught consistently at higher rates than graduates without dependents. Male graduates who had dependents by 1994 taught consistently at higher rates than male graduates without dependents.

Among graduates who taught with college entrance exam scores available for analysis, a lower percentage of those with scores in the top 25 percent taught consistently than did those who scored at the lower levels. Having a low GPA was associated with being a late starter in the teaching profession, with 49 percent of those with GPAs of 2.74 or lower being late starters, compared with 36 percent of those with GPAs between 3.23 and 3.75 and 29 percent of those with GPAs of 3.75 or higher.

About 39 percent of the 1992–93 graduates who became teachers had earned a master’s degree or higher by 2003, and they had done so at higher rates than those who had not taught (24 percent). Forty-two percent of the late starters had attained a master’s degree or higher by 2003, in part reflecting the pursuit of graduate studies before embarking on teaching careers.

Of those 1992–93 graduates who taught consistently, 69 percent taught in elementary schools, compared with 55 percent of late starters. Public school teachers taught consistently at higher rates than private school teachers (48 vs. 28 percent).

Staying in teaching was associated with teaching salary. A higher proportion of those in the lowest academic year base salary category (less than \$26,000) for the most recent teaching job were leavers and other teachers compared with those in the middle (\$26,000–40,000) and highest (more than \$40,000) salary categories. In addition, among graduates who were teaching in 2003, a higher proportion of those in the lowest earning category (less than \$30,867) were late starters than were those in the middle earning category (\$30,867–43,000).

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## Appendix A—Glossary

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This glossary describes the variables used in this report. The items were taken directly from the National Center for Education Statistics (NCES) 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03) Data Analysis System (DAS), a web-based NCES analysis tool that generates tables from the B&B:93/03 data. (See appendix B for a description of the DAS.) In the index below, the variables are organized by general topic and, within topic, listed alphabetically. The glossary is in alphabetical order by variable name (displayed in capital letters to the right of the label below).

### GLOSSARY INDEX

#### DEMOGRAPHIC CHARACTERISTICS

Gender .....GENDER  
 Marital status as of 2003..... B3MAR  
 Number of dependents in 1993..... RDEPENDS  
 Number of dependents in 1997..... B2NDEP  
 Number of dependents in 2003..... B3D3NUM  
 Race/ethnicity ..... B2ETHNIC  
 Student's age in 2003 .....AGE

#### ACADEMIC INDICATORS

Availability of college entrance exam  
 scores..... SACTACTQ2  
 Baccalaureate degree major..... MAJORS3  
 Cumulative undergraduate GPA..... NORMGPA  
 Field of study for highest graduate  
 degree received..... GRMAJOR3  
 Highest degree attained as of 2003..... B3HDG03  
 Highest degree expected in 1994..... HIGHDEG  
 Undergraduate major GPA..... GPAMAJ

#### TEACHING ASSIGNMENT

Expects to teach in the long term..... B3EXPTCH  
 Had participated in a teacher induction  
 program by 2003 ..... B3COMIND  
 In most recent teaching position, percent  
 satisfied with class size..... B3TSATD  
 In most recent teaching position, percent  
 satisfied with parent support..... B3TSATE

In most recent teaching position, percent  
 satisfied with student discipline ..... B3TSATC  
 In most recent teaching position, percent  
 satisfied with school environment ..... B3TSATB  
 In most recent teaching position, percent  
 satisfied with student motivation..... B3TSATA  
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 Most recent main subject taught..... B3FLD1  
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 recent school ..... B3MRSFLE  
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 recent school ..... B3MRSMP  
 Plans to continue teaching..... B3TCHFTR  
 Sector of most recent school ..... B3MRSECT  
 Teacher career category ..... B3TCT  
 Would go into teaching again..... B3TCHAGN

#### SALARY

Academic year base salary 1994 ..... SALARY  
 Academic year base salary 1997 ..... B2SALTEA  
 Academic year base salary 2003 ..... B3ESALR1  
 Academic year base salary, most recent  
 teaching job ..... B3TSALR  
 Current/most recent salary ..... B3CRSAL

**DAS Variable**

***Student's age in 2003***

**AGE**

The variable in the DAS indicates the respondent's age in 2003. The categories used in this report are as follows:

- 32 or younger
- 33–34
- 35 or older

***Race/ethnicity***

**B2ETHNIC**

Indicates the race and ethnicity of the respondent. Created by combining two items respondents reported, their race (American Indian/Alaska Native, Asian/Pacific Islander, Black, White, and Other) and whether or not they were of Hispanic origin. Other included Asian/Pacific Islander and those who identified themselves with another race not shown. The categories used in this report are as follows:

- White, non-Hispanic
- Black, non-Hispanic
- Hispanic
- Other

***Number of dependents in 1997***

**B2NDEP**

Indicates the number of dependents the respondent had in 1997. This variable was recoded from B2NDEPEN with legitimate skips (no children) assigned to zero. The categories used in this report are as follows:

- 0 dependents
- 1 or more dependents

***Academic year base salary 1997***

**B2SALTEA**

Indicates the academic year base salary for the respondent's primary teaching job in 1997, for those who were working as teachers at the K–12 level in 1997. The categories for this variable were created by converting dollar values to percentiles and then grouping the bottom 25 percent, the middle 50 percent, and the top 25 percent together. The ranges are as follows:

- |        |                                       |
|--------|---------------------------------------|
| Low    | Bottom 25 percent; less than \$22,000 |
| Middle | Middle 50 percent; \$22,000–28,800    |
| High   | Top 25 percent; more than \$28,800    |

***Had participated in a teacher induction program by 2003***

**B3COMIND**

Indicates whether the respondent had participated in a teacher induction program as of 2003. Based on the composite variable from 1997 (B2COMIND) and the variable from 2003 (B3INDUCT).

**DAS Variable****Teacher career category<sup>1</sup>****B3TCT**

Indicates which of the five possible career categories describes the respondent's entry into and exit from the teaching profession between 1994 and 2003. The assignment of career category is based on whether or not the respondent was teaching at the K–12 level at the time of the interviews in 1994, 1997, and 2003. Respondents working in the field of education but not as teachers at the K–12 level were considered to be not teaching. The categories are as follows:

Taught consistently	Was teaching at the K–12 level in 1994, 1997, and 2003
Late starters	Was not teaching at the K–12 level in 1994, but was teaching in 1997 and 2003, or was not teaching in 1994 and 1997 but was teaching at the K–12 level in 2003
Leavers	Was teaching at the K–12 level in 1994 but not in 1997 or 2003, or was teaching at the K–12 level in 1994 and 1997 but not in 2003
Other teachers	Was teaching at the K–12 level in 1994 and in 2003, but not in 1997, or was teaching at the K–12 level in 1997 but not in 1994 or 2003
Had taught	Was teaching at the K–12 level in 1994, 1997, or 2003
Had not taught	Was not teaching at the K–12 level in 1994, 1997, or 2003

*Category #1—Taught Consistently:* These respondents were teaching in grades K–12 during each of the three interviews in 1994, 1997, and 2003.

*Category #2—Late Starters:* These respondents were not teaching in 1994, but were teaching in 1997 and 2003, or were not teaching in 1994 and 1997 but were teaching in 2003.

*Category #3—Leavers:* These respondents were teaching in 1994 but were not teaching in 1997 or 2003, or were teaching in 1994 and 1997 but not in 2003.

*Category #4—Other Teachers:* These respondents were either teaching in 1994 and 2003 but not in 1997, or were teaching in 1997 but not in 1994 or 2003.

*Category #5—Nonteachers:* These respondents were not teaching in 1994, 1997, or 2003.

**Current/most recent salary****B3CRSAL**

Indicates the current or most recent salary for all respondents, including teachers. Respondents who have not worked since 1997 are not included. The categories for this variable were created by converting dollar values to percentiles and then grouping the bottom 25 percent, the middle 50 percent, and the top 25 percent together. The ranges are as follows:

---

<sup>1</sup> Note that the category labels serve as shorthand for the various combinations of teaching and not teaching at the time of each of three follow-up interviews. Graduates in any of the five categories could have had unreported teaching or nonteaching spells between data collection years. For example, respondents in the “taught consistently” category could have exited and re-entered teaching in the years between follow-ups (i.e., between 1994 and 1997 or between 1997 and 2003).

**DAS Variable**

***Current/most recent salary—continued***

**B3CRSAL**

Low	Bottom 25 percent; less than \$34,934
Middle	Middle 50 percent; \$34,934–68,000
High	Top 25 percent; more than \$68,000

***Number of dependents in 2003***

**B3D3NUM**

Indicates the number of dependents the respondent had in 2003. The categories used in this report are as follows:

- 0 dependents
- 1 or more dependents

***Academic year base salary 2003***

**B3ESALR1**

Indicates the academic year base salary for the respondent’s primary teaching job in 2003, for those who were working as teachers at the K–12 level in 2003. The categories for this variable were created by converting dollar values to percentiles and then grouping the bottom 25 percent, the middle 50 percent, and the top 25 percent together. The ranges are as follows:

Low	Bottom 25 percent; less than \$30,867
Middle	Middle 50 percent; \$30,867–43,000
High	Top 25 percent; more than \$43,000

***Expects to teach in the long term***

**B3EXPTCH**

Indicates whether respondents who have taught expect to be teaching in the long term. Based on variables from 1994, 1997, and 2003. In 1994, respondents who expected to be teaching in 2 years and whose long-term career expectation was the same as their 2-year expectation were considered to expect to be teaching in the long term. In 1997, respondents who expected to be teaching more than 3 years were considered to expect to be teaching in the long term. In 2003, respondents who reported that they expect to stay in teaching for the rest of the time they are working were considered to expect to be teaching in the long term. The response to this variable is based upon the most recent valid response with the 2003 response taking precedence over the 1997 response, which takes precedence over the 1994 response. Respondents who expected to be teaching in the long term in 2003, 1997, or 1994 (in that order) were included in the “yes” category of this variable:

- Yes
- No

***Most recent main subject taught***

**B3FLD1**

Response to the question “What was the main subject you taught in your most recent position as a regular, itinerant, or support teacher? What is the main subject you teach at your current school?” The categories for this variable were created by combining subjects as follows:

Elementary, early childhood education	Elementary, early childhood education
Science and mathematics	Science Mathematics



**DAS Variable*****Most recent main subject taught—continued*****B3FLD1**

Special education	Special education
English, journalism, reading, writing	English, journalism, reading, writing
Art, drama, music	Art, drama, music
Other	Business Economics, political systems ESL, bilingual Foreign languages Health, physical education Secondary education <sup>2</sup> Social studies, history, civics Vocational, occupational Social sciences Other

***Highest degree attained as of 2003*****B3HDG03**

The highest degree the respondent had attained as of 2003.

Bachelor's	Includes bachelor's degree and postbaccalaureate certificate
Master's	Includes master's degree, postmaster's certificate, doctoral, and first-professional degrees

***Marital status as of 2003*****B3MAR**

Respondents were asked "Are you currently: single, never married; married; cohabiting/living with a partner; separated; divorced; or widowed?" This report uses the following categories:

Single, never married  
Married or cohabiting  
Separated/divorced/widowed

***Sector of most recent school*****B3MRSECT**

Indicates the sector of the school in which the respondent most recently taught as of 2003.

Public  
Private

<sup>2</sup> A small number of teachers, mostly older teachers and those in rural areas, have general secondary education certificates or main assignments.

*DAS Variable*

***Percent free/reduced-price lunch in most recent school***

**B3MRSFLE**

Indicates the percentage of free/reduced-price lunch recipients at the most recent school in which the respondent taught as of 2003. The categories for this report are as follows:

- 0–4 percent
- 5–19 percent
- 20–49 percent
- 50 percent or more

***Level of most recent school***

**B3MRSLEV**

Indicates the level of the school in which the respondent most recently taught as of 2003.

- Elementary
- Secondary
- Combined

***Percent minority enrollment in most recent school***

**B3MRSMPC**

Indicates the percentage of students who were of minority racial/ethnic backgrounds in the school in which the respondent most recently taught as of 2003. The categories for this report are as follows:

- 0–4 percent
- 5–19 percent
- 20–49 percent
- 50 percent or more

***Would go into teaching again***

**B3TCHAGN**

Indicates whether the respondent would go into teaching again if they had to start all over.

- Yes
- No

***Plans to continue teaching***

**B3TCHFTR**

Indicates whether the respondent plans to continue teaching (or plans to return to teaching if the respondent is no longer teaching as of 2003).

- Yes
- No

**DAS Variable*****Academic year base salary, most recent teaching job*****B3TSALR**

Response to the question “What [is/was] your academic year base salary at your [current/most recent] teaching job, not including extra pay for things like summer teaching, coaching, or extracurricular activities?” Indicates the academic year base salary for the respondent’s most recent teaching job as of 2003. The categories for this variable were created by converting dollar values to percentiles and then grouping the bottom 25 percent, the middle 50 percent, and the top 25 percent together. The ranges are as follows:

Low	Bottom 25 percent; less than \$26,000
Middle	Middle 50 percent; \$26,000–40,000
High	Top 25 percent; more than \$40,000

***In most recent teaching position, percent satisfied with student motivation*****B3TSATA**

Response to the question “In your most recent job as a regular, itinerant, or support teacher, with which of the following aspects of teaching [are/were] you very satisfied? (Please check all that apply.)” Indicates the percentage of respondents who replied that they were very satisfied with student motivation at the school in which they most recently taught as of 2003.

***In most recent teaching position, percent satisfied with school environment*****B3TSATB**

Response to the question “In your most recent job as a regular, itinerant, or support teacher, with which of the following aspects of teaching [are/were] you very satisfied? (Please check all that apply.)” Indicates the percentage of respondents who replied that they were very satisfied with school environment at the school in which they most recently taught as of 2003.

***In most recent teaching position, percent satisfied with student discipline*****B3TSATC**

Response to the question “In your most recent job as a regular, itinerant, or support teacher, with which of the following aspects of teaching [are/were] you very satisfied? (Please check all that apply.)” Indicates the percentage of respondents who replied that they were very satisfied with student discipline at the school in which they most recently taught as of 2003.

***In most recent teaching position, percent satisfied with class size*****B3TSATD**

Response to the question “In your most recent job as a regular, itinerant, or support teacher, with which of the following aspects of teaching [are/were] you very satisfied? (Please check all that apply.)” Indicates the percentage of respondents who replied that they were very satisfied with class size at the school in which they most recently taught as of 2003.

***In most recent teaching position, percent satisfied with parent support*****B3TSATE**

Response to the question “In your most recent job as a regular, itinerant, or support teacher, with which of the following aspects of teaching [are/were] you very satisfied? (Please check all that apply.)” Indicates the percentage of respondents who replied that they were very satisfied with parent support at the school in which they most recently taught as of 2003.

**DAS Variable**

**Gender**

**GENDER**

Indicates the respondent's gender.

- Male
- Female

**Undergraduate major GPA**

**GPAMAJ**

Indicates the respondent's cumulative undergraduate grade point average (GPA) in their major field of study on a 4.0 scale. The categories for this report are as follows:

- 2.74 or lower
- 2.75–3.24
- 3.25–3.74
- 3.75 or higher

**Field of study for highest graduate degree received**

**GRMAJOR3**

Indicates the field of study for the highest graduate degree received by the respondent as of 2003. The categories for this report are as follows:

- |                                                                                    |                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Education</li> <li>Not education</li> </ul> | <ul style="list-style-type: none"> <li>Education</li> <li>Arts and humanities</li> <li>Social and behavioral sciences</li> <li>Life and physical sciences</li> <li>Engineering/mathematics/computer science</li> <li>Business and management</li> <li>Medicine/dentistry</li> <li>Health</li> <li>Law</li> <li>Other</li> </ul> |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Highest degree expected in 1994**

**HIGHDEG**

Indicates the highest degree the respondent expected to attain as of 1994. Response to the question "Now, talking about your future, what is the highest degree you expect to attain?" The categories for this report are as follows:

- |                                                                                                                                                                               |                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Bachelor's degree</li> <li>Master's degree (M.A., M.S., M.B.A.)</li> <li>First-professional degree</li> <li>Doctoral degree</li> </ul> | <ul style="list-style-type: none"> <li>Includes bachelor's degree and postbaccalaureate certificate</li> <li>Includes master's degree</li> <li>Includes M.D. and J.D.</li> <li>Includes Ph.D. and Ed.D.</li> </ul> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**DAS Variable*****Baccalaureate degree major*****MAJORS3**

Indicates field of study for the respondent's baccalaureate degree major. The categories used in this report are as follows:

Business/management	Business/management
Education	Education
Humanities	Humanities
Mathematics/computer/natural sciences	Life sciences Physical sciences Mathematics Computer/information science Engineering
Social sciences	Social/behavioral science
Other	Health Vocational/technical Other technical/professional

***Cumulative undergraduate GPA*****NORMGPA**

Indicates the respondent's cumulative undergraduate grade point average (GPA) on a 4.0 scale. The categories for this report are as follows:

Less than 2.75  
2.75–3.24  
3.25–3.74  
3.75 or higher

***Number of dependents in 1993*****RDEPENDS**

Indicates the number of dependents the respondent had in 1993. This variable refers to the student's own family, rather than the parent's family, regardless of whether student was dependent or independent. It does not include the spouse or student. Note that, by definition, dependent students had no dependents.

0 dependents  
1 or more dependents

***Academic year base salary 1994*****SALARY**

Response to the question "What was your academic year base salary for this job?" Indicates the academic year base salary for the respondent's primary teaching job in 1994, for those who were working as teachers at the K–12 level in 1994. The categories for this variable were created by converting dollar values to percentiles and then grouping the bottom 25 percent, the middle 50 percent, and the top 25 percent together. The ranges are as follows:

**DAS Variable**

**Academic year base salary 1994—continued**

**SALARY**

Low	Bottom 25 percent; less than \$15,000
Middle	Middle 50 percent; \$15,000–23,000
High	Top 25 percent; more than \$23,000

**Availability of college entrance exam scores**

**SATACTQ2**

This composite variable represents the respondent's scores on both the SAT and ACT college entrance examinations, classified into categories as follows:

No scores available	Respondent did not take the SAT or ACT or scores were not reported
Scores available	SAT or ACT scores were available for respondent
No scores available	Respondent did not take the SAT or ACT or scores were not reported
Bottom category	SAT scores between 0 and 841, or, if SAT scores were not available, ACT scores between 0 and 18
Middle category	SAT scores between 842 and 1133, or, if SAT scores were not available, ACT scores between 19 and 25
Top category	SAT scores above 1133, or, if SAT scores were not available, ACT scores above 25

## **Appendix B—Technical Notes and Methodology**

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### **The 1993/03 Baccalaureate and Beyond Longitudinal Study**

The estimates and statistics in the tables and figures of this report are based on data from the first, second, and third follow-ups of the 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03). This study tracks the experiences of a cohort of college graduates who received a baccalaureate degree during the 1992–93 academic year and were first interviewed as part of the 1992–93 National Postsecondary Student Aid Study (NPSAS:93), conducted by the U.S. Department of Education’s National Center for Education Statistics (NCES). NPSAS is based on a nationally representative sample of all students in postsecondary education institutions, including undergraduate, graduate, and first-professional students. For NPSAS:93, information was obtained from about 1,100 postsecondary institutions on approximately 53,000 undergraduates and about 13,000 graduate and first-professional students who were enrolled at some time between July 1, 1992, and June 30, 1993.

For B&B:93/03, those members of the NPSAS:93 sample who completed a bachelor’s degree between July 1, 1992, and June 30, 1993 were identified and contacted for a 1-year follow-up interview in 1994. The second follow-up of the B&B cohort occurred in 1997, approximately 4 years after graduation. The final follow-up survey, 10 years after graduation in 2003, is the focus of this report. However, the estimates in this report are based on the approximately 8,100 bachelor’s degree recipients who participated in all four surveys—the NPSAS base-year survey and the three follow-ups—representing about 1.2 million bachelor’s degree recipients (U.S. Department of Education 2002, table 247).

The NPSAS:93 sample, while representative and statistically accurate, was not a simple random sample. Instead, the survey sample was selected using a more complex three-step procedure with stratified samples and differential probabilities of selection at each level. Postsecondary institutions were initially selected within geographic strata. Once institutions were organized by zip code and state, they were further stratified by control (i.e., public, private not-for-profit, or private for-profit) and degree offering (less-than-2-year, 2- to 3-year, 4-year non-doctorate-granting, and 4-year doctorate-granting). The NPSAS:93 survey sample yielded an overall weighted institutional response rate of 88 percent. For more information on the

NPSAS:93 survey, refer to the *Methodology Report for the National Postsecondary Student Aid Study, 1992–93* (Loft et al. 1995).

## **Response Rates**

For the first follow-up B&B interview in 1994, a total of about 10,100 eligible individuals completed the interview between June and December—using computer-assisted telephone interviewing (CATI), with field interviewing when necessary—which corresponds to a weighted response rate of 90 percent (from the NPSAS:93-identified B&B eligible sample of about 11,000 cases). Data collection for the second follow-up interview of the B&B cohort took place between April and December 1997; about 10,100 individuals completed the interview, yielding a weighted response rate of 90 percent. For more information on procedures for the first and second follow-ups, consult the respective methodology reports (Green et al. [1996] for the first follow-up and Green et al. [1999] for the second follow-up).

Between February and September 2003, the third and final follow-up of the 1992–93 cohort of bachelor’s degree recipients was conducted. For the first time, students were offered the opportunity to conduct the B&B interview via the Internet. A single web-based interview was designed and programmed for use as a self-administered interview, a telephone interview, and an in-person interview. All respondents to the 1997 interview were included for participation in the 2003 follow-up; a subsample of about one-third of nonrespondents from 1997 was also included, resulting in a final sample of about 10,400 individuals. Almost 9,000 members of this final sample responded, yielding a weighted response rate of 83 percent. For more details about the third follow-up survey procedures, consult the *1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03) Methodology Report* (Wine et al. 2006).

Except for having all graduated in the same academic year, the 1992–93 graduate cohort members could be as diverse as possible in other aspects (e.g., the degree recipients could have been enrolled sporadically over time or enrolled continuously; some might have delayed their entry into postsecondary education, while others might have entered college right after completing high school). Therefore, the B&B:93/03 data provide the first opportunity to examine how a nationally representative, cross-sectional group of college graduates pursued graduate education over a period of 10 years after their graduation. The B&B dataset contains comprehensive data on postbaccalaureate graduate enrollment, attainment, student demographic characteristics, and labor force participation and finances (including education loans).



## Weighting

All estimates in this report are weighted to compensate for unequal probability of selection into the B&B sample and to adjust for nonresponse. Two weights were developed. Cross-sectional weights were constructed for analyzing respondents to B&B:93/03. In addition, a panel (longitudinal) weight was constructed for analyzing those students who responded to all four surveys: NPSAS:93 (computer-assisted telephone interview component) and the 1994, 1997, and 2003 B&B interviews. The weights for the B&B:93/03 respondents were constructed by applying a series of adjustments to the 1994 B&B base weight. Specifically, adjustments were made to account for subsampling of nonrespondents from 1997, for sample members not located, for refusals among those who were located, and for types of nonresponse other than refusals among those who were located and did not refuse. Construction of the panel weight (WTC00), to be used for analyzing those who responded to all four surveys, included an additional adjustment for nonresponse for the B&B:93/03 respondents who did not respond to all three of the previous surveys. The weight variable used in this report is WTC00. For more information on weighting, consult chapter 6, “Weighting and Variance Estimation,” of the B&B:93/03 methodology report (Wine et al. 2006).

## Quality of Estimates

Survey weights are computed with the goal of removing any bias that might result due to differential nonresponse and undercoverage. In order to measure the efficacy of bias-reducing adjustments, a series of analyses were conducted at the item and record levels. The subsequent sections summarize highlights of these analyses.

### *Unit Response Rates and Bias Analysis*

For the approximately 10,400 sample members who were eligible for B&B, the unweighted response rate was 86.3 percent, and the weighted response rate was 83.4 percent. For some items, the weighted response rate at the national level was also less than 85 percent. The effects of any potential bias due to nonresponse can influence overall data quality with greater proportions of missing information. Consequently, nonresponse bias analyses were conducted at the student and item levels when the corresponding weighted response rates were below 85 percent.

The bias in an estimated mean based on respondents,  $\bar{y}_R$ , is the difference between this estimate and the target parameter,  $\mu$ , which is the mean that would result if a complete census of the target population was conducted and all units responded. This bias can be expressed as follows:

$$B(\bar{y}_R) = \bar{y}_R - \mu$$

However, for variables that are available from the frame and base year (NPSAS:93) respondents,  $\mu$  can be estimated by  $\hat{\mu}$  without sampling error, in which case the bias in  $\bar{y}_R$  can then be estimated by:

$$\hat{B}(\bar{y}_R) = \bar{y}_R - \hat{\mu}$$

Moreover, an estimate of the population mean based on respondents and nonrespondents can be obtained by:

$$\hat{\mu} = (1 - \hat{\eta})\bar{y}_R + \hat{\eta}\bar{y}_{NR}$$

where  $\hat{\eta}$  is the weighted unit nonresponse rate, based on weights prior to nonresponse adjustment. Consequently, the bias in  $\bar{y}_R$  can then be estimated by:

$$\hat{B}(\bar{y}_R) = \hat{\eta}(\bar{y}_R - \bar{y}_{NR})$$

That is, the estimate of the nonresponse bias is the difference between the mean for respondents and nonrespondents multiplied by the weighted nonresponse rate, using the student base weight prior to nonresponse adjustment.

### *Student-Level Nonresponse Bias Analysis*

A student respondent is defined as any sample member who is determined to be eligible for the study and has valid data for the selected set of analytical variables. As noted earlier, the unweighted student response rate was 86.3 percent, and the weighted response rate was 83.4 percent. A nonresponse bias analysis was conducted as a part of the nonresponse adjustment for the analysis weight. The nonresponse bias was estimated for the variables known for both respondents and nonrespondents within each institution type. These variables included the following:

- Age in the base year (NPSAS:93);
- Race/ethnicity;
- Gender;
- U.S. citizenship status;
- Attendance status in the base year;
- Institution control;
- Bureau of Economic Analysis Code (OBE) Region;

- Type of institution/enrollment category;
- B&B institution stratum;
- B&B student stratum;
- Whether applied for aid in the base year;
- Receipt of federal aid in the base year;
- Receipt of Pell Grant in the base year;
- Receipt of Stafford Loan in the base year;
- Receipt of state aid in the base year;
- Receipt of institution aid in the base year;
- Receipt of any aid in the base year;
- Prior respondent to either 1994 or 1997 interview;
- Income in the base year (parent income for dependent students and student income for independent students);
- Number of telephone numbers available during B&B:93/03 data collection;
- Number of times an answering machine was encountered during B&B:93/03; and
- Whether the student was located in a field cluster for B&B:93/03.

The steps for nonresponse bias analysis included estimating the nonresponse bias and testing (adjusting for multiple comparisons) to determine if the bias is significant at the 5 percent level. Second, nonresponse adjustment factors were computed using a subset of variables listed above. The nonresponse adjustments were designed to significantly reduce or eliminate nonresponse bias for variables included in the corresponding models. Third, after the weights were computed, any remaining bias was estimated for the variables listed above and statistical tests were performed to determine the significance of any remaining nonresponse bias.

The weighting adjustments reduced, and in some cases eliminated, bias for students. Prior to the nonresponse weighting adjustment, the response bias was statistically significantly different from zero for 21 percent of the variables; the mean of the absolute values of the biases was 0.40 and the median was 0.20. After the nonresponse weighting adjustment, none of the biases were significantly different from zero; the mean of the absolute values of the biases was 0.01 and median was 0.002.

### *Item-Level Bias Analysis*

All the variables used in this report and defined in appendix A had item response rates above 85 percent. Therefore, a bias analysis for individual survey items was not necessary.

## **Data Analysis System**

The estimates presented in this report were produced using the B&B:93/03 Data Analysis System (DAS). (The data from the 1994, 1997, and 2003 interviews were incorporated into one DAS.) The DAS software makes it possible for users to specify and generate their own tables. The DAS also contains a detailed description of how each variable was created and includes question wording for items coming directly from an interview.

With the DAS, users can replicate or expand upon the tables presented in this report. In addition to the table estimates, the DAS calculates the proper standard errors<sup>1</sup> and weighted sample sizes for these estimates. For example, table B-1 contains standard errors that correspond to estimates in table 1 in the report. If the number of valid cases is too small to produce a reliable estimate (fewer than 30 cases), the DAS prints the message “low-N” instead of the estimate. All standard errors for estimates presented in this report can be viewed at <http://nces.ed.gov/das/library/reports.asp>. In addition to tables, the DAS will also produce a correlation matrix of selected variables to be used for linear regression models. Included in the output with the correlation matrix are the design effects (DEFTs) for each variable in the matrix. Because statistical procedures generally compute regression coefficients based on simple random sample assumptions, the standard errors must be adjusted with the design effects to take into account the stratified sampling method used in the NPSAS surveys.

The DAS can be accessed electronically at <http://nces.ed.gov/das>. For more information about the Data Analysis System, contact:

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<sup>1</sup> The B&B samples are not simple random samples, and therefore, simple random sample techniques for estimating sampling error cannot be applied to these data. The DAS takes into account the complexity of the sampling procedures and calculates standard errors appropriate for such samples. The method for computing sampling errors used by the DAS involves approximating the estimator by balanced repeated replication of the sampled population. The procedure is typically referred to as the “balanced repeated replication technique” (BRR).

**Table B-1. Standard errors for table 1: Among 1992–93 bachelor’s degree recipients who were teaching in 1994, 1997, or 2003, percentage distribution of those in various teacher career categories and percentage of all bachelor’s degree recipients who were teachers and nonteachers, by selected demographic characteristics: 2003**

Characteristic	Teachers					All bachelor’s degree recipients	
	Taught consistently	Late starters	Leavers	Other teachers	Total	Teachers	Non-teachers
Total	1.71	1.32	1.88	1.30	†	0.50	0.50
Gender							
Male	3.45	2.24	3.15	2.68	†	0.57	0.57
Female	1.80	1.58	2.15	1.44	†	0.76	0.76
Race/ethnicity							
White	1.69	1.22	2.07	1.32	†	0.65	0.65
Black	4.24	5.19	7.63	4.81	†	2.34	2.34
Hispanic	10.59	3.93	10.88	6.15	†	2.30	2.30
Other	†	†	†	†	†	1.20	1.20
Age as of 2003							
32 or younger	2.13	2.04	2.30	1.77	†	0.70	0.70
33–34	3.75	2.20	3.55	1.71	†	0.82	0.82
35 or older	3.78	2.38	4.20	1.94	†	0.96	0.96
Marital status in 2003							
Single, never married	3.68	2.80	3.54	2.65	†	1.10	1.10
Married/cohabitating with a partner	1.96	1.73	2.02	1.38	†	0.52	0.52
Separated, divorced, widowed	4.71	2.45	6.17	5.18	†	1.82	1.82

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/03 Baccalaureate and Beyond Longitudinal Study (B&B:93/03).

## Statistical Procedures

### *Differences Between Means*

The descriptive comparisons in this report were tested using Student’s *t* statistic. Differences between estimates are tested against the probability of a Type I error<sup>2</sup> or significance level. The significance levels were determined by calculating the Student’s *t* values for the differences between each pair of means or proportions and comparing these with commonly-

<sup>2</sup> 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.

available published tables of significance levels for two-tailed hypothesis testing ( $p < .05$ ). A student's  $t$  value larger than the critical value for the significance level results in a rejection of the null hypothesis.

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

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

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

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

where  $r$  is the correlation between the two estimates.<sup>3</sup> This formula is used when comparing two percentages from a distribution that adds to 100. If the comparison is between the mean of a subgroup and the mean of the total group, the following formula is used:

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

where  $p$  is the proportion of the total group contained in the subgroup.<sup>4</sup> The estimates, standard errors, and correlations can all be obtained from the DAS.

There are some hazards in using statistical tests for each comparison. First, comparisons based on large  $t$  statistics may appear to merit special attention. This can be misleading 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  $t$  statistic.

A second hazard in using statistical tests is the possibility of a “false positive” or Type I error. In the case of a  $t$  statistic, this false positive would result when a difference measured with a particular sample showed a statistically significant difference when there is no difference in the

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<sup>3</sup> U.S. Department of Education, National Center for Education Statistics, *A Note from the Chief Statistician*, no. 2, 1993.

<sup>4</sup> Ibid.

underlying population. Statistical tests are designed to control for this type of error, denoted by alpha. The alpha level of .05 selected for findings in this report indicates that a difference of a certain magnitude or larger would be produced no more than one time out of 20 when there was no actual difference in the quantities in the underlying population. When researchers test hypotheses that show  $t$  values below the .05 significance level, they treat this finding as rejecting the null hypothesis that there is no difference between the two quantities. Failing to reject the null hypothesis (i.e., finding no difference), however, does not necessarily imply that the values are the same or equivalent.