NATIONAL CENTER FOR EDUCATION STATISTICS

Statistical Analysis Report **November 1996**

Postsecondary Education Descriptive Analysis Reports

Nontraditional Undergraduates:

Trends in Enrollment from 1986 to 1992 and Persistence and Attainment Among 1989-90 Beginning Postsecondary Students

Laura J. Horn
MPR Associates, Inc.
2150 Shattuck Ave., Suite 800
Berkeley, CA 94704-1321

C. Dennis Carroll
Project Officer
National Center for Education Statistics

Data Series: NPSAS: 87/90/93, BPS:90/94

U.S. Department of Education
Office of Educational Research and Improvement **NCES 97-578**

Highlights

This report uses data from the three administrations of the National Postsecondary Student Aid Study conducted in 1986–87, 1989–90, and 1992–93 (NPSAS:87, NPSAS:90, and NPSAS:93) to examine enrollment trends of nontraditional students. It then uses data from the Beginning Postsecondary Students (BPS:90/94) longitudinal survey to explore the persistence and attainment of nontraditional students who first began their postsecondary education in 1989–90.

A nontraditional student was identified by the presence of one or more of the following seven characteristics: delayed enrollment into postsecondary education, attended part time, financially independent, worked full time while enrolled, had dependents other than a spouse, was a single parent, or did not obtain a standard high school diploma.

A nontraditional student was further characterized as minimally nontraditional (one characteristic), moderately nontraditional (2 or 3 characteristics), or highly nontraditional (4 or more characteristics). The following are selected findings from the study.

Enrollment Trends

- A majority of undergraduates in all three NPSAS surveys were at least minimally nontraditional. The trends indicated that the proportion of moderately nontraditional students (primarily older-than-typical, attending part time, and financially independent) increased over time from one in four undergraduates in 1986 to nearly one in three (31 percent) in 1992. The proportion of highly nontraditional students, on the other hand, declined from 26 to 23 percent between 1989 and 1992.

- While nontraditional students were concentrated in 2-year institutions, there was discernible growth in the enrollment of moderately nontraditional students in 4-year institutions (e.g., from 31 percent in 1986 to 39 percent in 1992). This was especially true for private, not-for-profit, 4-yearnondoctoral institutions where the proportion of moderately nontraditional students rose from 15 percent in 1986 to 22 percent in 1992.

- With regard to individual nontraditional characteristics, there was a generally increasing trend in the enrollment of older-than-typical students (from 54 percent of undergraduates in 1986 to 59 percent in 1992). Similarly, the proportion attending part time rose from 38 percent to 42 percent for the same time period.

- The proportion of undergraduates who worked full time while enrolled or had dependents increased between 1986 and 1989, but then either leveled off or declined between 1989 and 1992. For example, the percentage of undergraduates who reported having dependents was 20 percent, 22 percent, and 20 percent, respectively, for 1986, 1989, and 1992.

- The proportion of undergraduates who were single parents remained the same over the three time periods (about 7 percent), while enrollment of students who were recipients of a GED or high school equivalent certificate declined from 7 percent in 1986 to 4 percent in 1992.

Persistence and Attainment of Nontraditional Students

- Nontraditional students were much less likely to earn a degree within 5 years of beginning their postsecondary education, and far more likely to have left school without returning than were their traditional counterparts. For example, among undergraduates with a bachelor's degree objective, about one-third (31 percent) of nontraditional students had attained a degree within 5 years, compared with more than half (54 percent) of traditional students.

- Students who were only minimally nontraditional were much more likely to have earned a bachelor's degree (42 percent) than were moderately or highly nontraditional students (17 percent and 11 percent, respectively).

- With regard to timing of departure, nontraditional students were more than twice as likely to leave school in their first year than were traditional students (38 percent versus 16 percent). However, for students who persisted to their second year, nontraditional students' rates of attrition were much closer to the rates of traditional students.

Foreword

This report examines the postsecondary education participation of undergraduates who do not typify what many have considered a "traditional college student"—one who enrolls in college full time immediately after high school graduation. It begins by presenting recent enrollment trends for nontraditional students and then compares the persistence and attainment of these students with that of their traditional counterparts.

The enrollment trend analysis relies on data from the three administrations of the National Postsecondary Student Aid Study (NPSAS), occurring in 1986–87, 1989–90, and 1992–93. These periodic surveys, conducted by the U.S. Department of Education, represent all postsecondary students and collect detailed information about their receipt of financial aid, educational expenses, and family background and demographics.

Nontraditional student enrollment trends are presented in two ways: first, according to each individual characteristic used to define a nontraditional student, and second, according to the degree to which undergraduates are nontraditional. That is, whether students are minimally, moderately, or highly nontraditional.

The persistence and attainment analysis is based on data from the second followup of the 1989–90 Beginning Postsecondary Students (BPS) Longitudinal Study, which was conducted in the spring of 1994. The base-year sample of this survey was derived from NPSAS:90, and thus represents students of all ages and backgrounds who first began their postsecondary education in 1989–90. Because the second BPS followup took place approximately 5 years after participants' first enrollment, it provides attainment rates for students completing associate's degrees and vocational certificates, as well as for those earning bachelor's degrees within 5 years. In addition, since the BPS survey is longitudinal, it provides information on both the timing and nature of departure from school for students who did not persist to attain a degree.

The estimates presented in the report were produced using the NPSAS:87, NPSAS:90, NPSAS:93, and BPS:90/94 Data Analysis Systems (DAS). The DAS, a microcomputer application that allows users to specify and generate their own tables from the NPSAS and BPS data, produces the design-adjusted standard errors that are necessary for testing the statistical significance of differences shown in the tables. For more information about the DAS, readers should consult appendix B of this report.

Acknowledgments

The authors wish to thank all those who contributed to the production of this report. At MPR Associates, Susan Choy and Alex McCormick reviewed the report and provided helpful criticism. Thanks also to Andrea Livingston and Karyn Madden, who edited the report, and to Mary Sukkestad and Connie Yin, who formatted the tables and graphics.

We are grateful to all the reviewers of this report whose insights and helpful criticism strengthened the final product. Department of Education reviewers included Mary Frase, Robert Burton, Susan Broyles, and Kristen Perry. Thanks also to Robert Bergeron from Office of Management and Budget and to Ken Phillippe from the American Association of Community Colleges.

Table of Contents

List of Tables

List of Tables—Continued

List of Figures

Introduction

The traditional path to a college degree, broadly defined as enrolling in college immediately after high school and attending full time until graduation, has become the exception rather than the rule. In 1992–93, for instance, although slightly more than half of undergraduates (57 percent) had enrolled in postsecondary education immediately after high school graduation, only about one-third attended full time for the full 1992–93 academic year.[1]

In a recent report profiling undergraduates enrolled in U.S. postsecondary institutions in 1992–93, undergraduates were characterized according to a number of attributes commonly associated with nontraditional students.[2] These included nontraditional enrollment choices such as delaying enrollment or attending part time, and characteristics associated with financial constraints and family responsibilities such as being financially independent, having dependents to support, or working full time while enrolled. These characteristics, all of which have the potential to increase the risk of attrition, were referred to as risk factors in this study.[3]

The results indicated that a clear majority (three-fourths) of undergraduates were affected by at least one of the risk factors, and that students at risk were concentrated in the 2-year sector (primarily public community colleges). In contrast, students with no risk factors (i.e., traditional students) were almost exclusively enrolled in 4-year colleges and universities.[4]

According to the same study, slightly more than half of all undergraduates were enrolled part time at some point during the academic year (54 percent), and about the same percentage (52 percent) reported being financially independent (according to federal student financial aid regulations). About 43 percent of undergraduates had delayed their enrollment after high school, and about one-third worked full time at some time during their enrollment. Although being responsible for dependents was less common, fully one-fifth of undergraduates were parents.

In a recent analysis, Berkner et al. examined the persistence and attainment of undergraduates 5 years after their first enrollment (in 1989–90).[5] Using the same risk factors as those identified in the undergraduate profile,[6] the analysis revealed that an increase in the number of risk factors was accompanied by a decline in persistence and attainment rates. This was true for undergraduates in both the 2-year and 4-year sectors. According to this study, students with no risk factors were almost twice as likely to have attained a degree or to still be enrolled at the end

---

[1] L. Horn and M. Premo, *Profile of Undergraduates in U.S. Postsecondary Education Institutions: 1992–93* (Washington, D.C.: U.S. Department of Education, National Center for Education Statistics, 1995). Statistics in this report are based on data from the 1992–93 National Postsecondary Student Aid Study (NPSAS:93).

[2] Ibid, 3.

[3] Ibid, 64.

[4] Ibid, 4.

[5] L. Berkner, S. Cuccaro-Alamin, and A. McCormick, *Descriptive Summary of 1989–90 Beginning Postsecondary Students: Five Years Later* (Washington, D.C.: U.S. Department of Education, National Center for Educational Statistics, 1996).

[6] Horn and Premo, *Profile of Undergraduates in U.S. Postsecondary Education Institutions.*

of the 5-year period than were students with three or more risk factors. On the other hand, this analysis also found that the presence of risk factors had little influence on the persistence and attainment of students attending less-than-2-year vocational institutions.

Certainly the changing economy has contributed to the increase in enrollment of students who enter postsecondary education later in life. The decline of the blue-collar manufacturing sector of the economy has displaced many workers, forcing them to choose between lower wage service-sector jobs or enrolling in postsecondary education to obtain the skills necessary for technical- or professional-level jobs.[7] In addition, the increased participation of women in the work force has increased the number of older women returning to complete an interrupted education or enrolling in postsecondary education for the first time.[8] The family and work responsibilities of such individuals often conflict with the time and financial commitments required to attend school.

In developing a conceptual model for nontraditional student attrition, Bean and Metzner emphasized the importance of alleviating external risk factors (nonschool responsibilities that conflict with attendance and progress) in helping nontraditional students realize their educational goals.[9] As these researchers point out, regardless of nontraditional students' academic preparation, if they cannot make adequate child care arrangements, adjust their work schedules, or pay for college, they simply will not persist in school.

The analysis presented here expands on the previous studies in two important ways. First, it examines recent enrollment trends for nontraditional students by comparing their prevalence in the three administrations of the National Postsecondary Student Aid Study (NPSAS:87, NPSAS:90, and NPSAS:93). Second, the analysis uses the Beginning Postsecondary Student (BPS) longitudinal survey to explore in greater depth than previous studies the persistence and attainment of nontraditional students 5 years after starting their postsecondary education. For example, these data identify when students dropped out and whether or not their degree goals changed over time. In addition, the impact of individual nontraditional student characteristics on persistence and attainment is explored using a weighted least squares regression model. Thus, the availability of data from the three NPSAS surveys combined with the BPS longitudinal component permitted a detailed examination of the participation of nontraditional students nationwide.

---

[7] L. Mishel and J. Bernstein, *The State of Working America: 1945-95*, Economic Policy Institute (New York: M.E. Sharp, 1994), 142.

[8] Horn and Premo, *Profile of Undergraduates in U.S. Postsecondary Education Institutions*. For example, in 1993 two-thirds of undergraduates aged 30 or older were women, compared with just over half of students under the age of 30.

[9] J. Bean and M. Metzner, "A Conceptual Model of Nontraditional Undergraduate Student Attrition," *Review of Educational Research* 55 (4) (1985). Note that they define nontraditional as a student who is older than 24, commuting to school, or attending part time.

Definitions and Data

Who Is Nontraditional?

Exactly what constitutes a nontraditional student has been the source of much discussion in recent research. Most often age (especially being over the age of 24) has been the defining characteristic for this population.[10] Age acts as a surrogate variable that captures a large, heterogeneous population of adult students who often have family and work responsibilities as well as other life circumstances that can interfere with successful completion of educational objectives. Other variables typically used to characterize nontraditional students are associated with their background (race and gender),[11] residence (i.e., not on campus), level of employment (especially working full time), and being enrolled in nondegree occupational programs.[12]

In this study, rather than focusing on age or other background characteristics, the criteria chosen to identify nontraditional students pertain to choices and behavior that may increase students' risk of attrition and as such, are amenable to change or intervention at various stages in a student's school life. With this intention, three sets of criteria were used to identify nontraditional students: 1) enrollment patterns, 2) financial and family status, and 3) high school graduation status.

Enrollment patterns. Assuming that traditional enrollment in postsecondary education is defined as enrolling immediately after high school and attending full time, students who diverge from this pattern would be considered nontraditional. In this study, therefore, students who delayed enrollment in postsecondary education by a year or more after high school or who attended part time were considered nontraditional

Financial and family status. Family responsibilities and financial constraints used to identify nontraditional students included having dependents other than a spouse, being a single parent, working full time while enrolled, or being financially independent from parents.

High school graduation status. Students who did not receive a standard high school diploma but who earned some type of certificate of completion were also considered nontraditional. This included GED recipients and those who received a high school certificate of completion. Students who did not graduate from high school or earn a certificate of completion

---

[10] Bean and Metzner, "A Conceptual Model." In their review of the literature, age was one of the most common independent variables in studies of attrition. See also M. Cleveland-Innes, "Adult Student Dropout at Postsecondary Institutions," *Review of Higher Education*, 17 (4) (1994); and S. Hurtado, K. Kurotsuchi, and S. Sharp, "Traditional, Delayed Entry, and Nontraditional Students" (paper presented at the annual meeting of the American Educational Research Association, 1996).

[11] D. Jones and B. Watson, *"High Risk" Students in Higher Education*, ASHE-ERIC Higher Education Report 3 (Washington D.C.: Clearinghouse on Higher Education, The George Washington University, 1990), 6. The authors make a distinction between high risk and nontraditional students, the latter being women, minorities, adults, and part-time students.

[12] Bean and Metzner, "A Conceptual Model."

(less than 2 percent) were removed from the analysis due to their limited access to 4-year colleges and universities.

Data and Nontraditional Variable Construction

The following section describes the survey data sources and how the nontraditional variables were constructed for the analyses. Because the enrollment trend analysis involved comparing enrollment estimates across three different surveys, a number of modifications to the variables were necessary in order to make them comparable. The persistence and attainment analysis, on the other hand, relied on data from one longitudinal survey, and therefore, the most accurate measurement possible was used to identify nontraditional students. Figure 1 summarizes the variables used for each analysis.

Trend Analysis

The analysis of nontraditional student enrollment trends was based on the NPSAS surveys that were conducted in the academic years 1986–87, 1989–90, and 1992–93. These national surveys are cross-sectional and represent all students enrolled in U.S. postsecondary institutions, from less-than-2 year vocational institutions to research universities. The NPSAS:87 survey differed somewhat from the NPSAS:90 and NPSAS:93 surveys because it sampled students enrolled in the fall term only, while the NPSAS:90 and NPSAS:93 were conducted on full-year samples. To maintain comparability across data sets, the analysis was restricted to students who attended in the fall.[13] Table 1 shows the percentage distribution of fall undergraduates according to level and type of institution.

Delayed Enrollment (older than typical age). In previous studies based solely on NPSAS:93 data, it was possible to create a delayed enrollment variable using dates of high school graduation and entry into postsecondary education. However, because of the large number of missing dates of graduation in the NPSAS:87 survey, this analysis uses a surrogate variable that captures delayed entry by identifying undergraduates who are older than typical for their particular year in school. Students who are 20 or older as freshmen, 21 or older as sophomores, 22 or older as juniors, and all students 23 or older were identified as older than typical and considered nontraditional.[14] Obviously, this definition also includes some students who stopped out for a period of time, attended on a very part-time basis, or otherwise took longer to progress even if they did not delay their initial entry. Thus, students are more likely to be identified as nontraditional with this variable than they would be with a direct measurement of delayed enrollment. For example, among 1992–93 undergraduates, 43 percent were identified as having delayed enrollment, while 59 percent were older than typical. At the same time, 14 percent of

[13] About one-quarter of nontraditional students in the NPSAS:90 and NPSAS:93 surveys were excluded. This primarily affected students enrolled in private, for-profit institutions, about 40 percent of whom were not enrolled in the fall. However, only about 8 percent of undergraduates were enrolled in such institutions (1989–90 and 1992–93 National Postsecondary Student Aid Study, Data Analysis Systems.)

[14] The age selected to define older than typical was 1 year above the modal age at the time of the survey for each year in school.

Figure 1—Criteria used to identify nontraditional undergraduates

Criteria	Variable definitions*	
	Enrollment trend analysis (NPSAS surveys)	Persistence/attainment analysis (BPS survey)
Enrollment criteria		
(1) Delayed enrollment	Older than typical age 20 years or older in first year 21 years or older in second year 22 years or older in third year 23 years or older in any year	Delayed postsecondary entry by 1 year or longer from high school graduation or did not receive standard high school diploma
(2) Part-time enrollment	Enrolled part time in fall of survey year (1986, 1989, 1992)	Enrolled part time in fall of first year of enrollment (1989)
Financial and family status		
(3) Financial independence	Defined according to 1989–90 financial aid criteria	Defined according to federal income tax criteria (not claimed as a dependent on parents' 1988 federal income tax forms)
(4) Full-time employment while enrolled	Worked 35 or more hours per week in the month of October of survey year	Worked 35 or more hours per week during any month of enrollment in the 1989–90 academic year
(5) Have dependents	Student reported any nonspouse dependents	Student reported child(ren) living in the household
(6) Single parent	Not married or separated and has nonspouse dependents	Not married or separated and has child(ren) living in the household
High school graduation status		
(7) Did not receive standard high school diploma	GED or high school equivalent or certificate of completion	GED or high school equivalent or certificate of completion

Scale of nontraditional status

The sum of nontraditional characteristics (0–7)

Minimally nontraditional	1 nontraditional characteristic
Moderately nontraditional	2 or 3 nontraditional characteristics
Highly nontraditional	4 or more nontraditional characteristics

*See appendix A for more detailed definitions of variables.

Table 1—Percentage distribution (by columns) of undergraduates according to institutional level, control, and type: Fall 1986, 1989, and 1992

	1986	1989	1992
Total	100.0	100.0	100.0
Level of institution			
Less-than-2-year	4.7	4.7	5.0
2-year	40.3	42.8	44.2
4-year or more	55.0	52.5	50.8
Control of institution			
Public	76.5	76.8	76.6
Private, not-for-profit	18.1	17.1	17.1
Private, for-profit	5.4	6.1	6.4
Institutional type			
Public			
Less-than-2-year	1.2	1.0	1.3
2-year	37.4	39.7	41.2
4-year nondoctorate-granting	15.1	15.8	14.1
4-year doctorate-granting	22.9	20.4	20.0
Private, not-for-profit			
Less-than-4-year	1.3	1.3	1.4
4-year nondoctorate-granting	10.0	9.9	8.8
4-year doctorate-granting	6.8	5.9	6.8
Private, for-profit	5.4	6.1	6.4

NOTE: Details may not add to 100 percent due to rounding.

SOURCES: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study: 1986–87 (NPSAS:87), 1989–90 (NPSAS:90), 1992–93 (NPSAS:93), Data Analysis Systems.

those who actually delayed enrollment were not identified as older than typical. Attempting to reduce the proportion of older-than-typical students by increasing the age requirement only increased the proportion of missed delayed entrants, especially among 20- to 23-year-olds,[15] an age group that has been shown to differ considerably from traditional students.[16]

[15] 1992–93 National Postsecondary Student Aid Study (NPSAS:93) Data Analysis System.

[16] Hurtado et al., in a comparison of traditional students (age 19 or younger when first enrolled), 20- to 24-year-old students who delayed enrollment, and older students (25 or older), demonstrated that students aged 20–24 who delayed enrollment were very different from traditional students with regard to many factors, including student background characteristics, self-reports of ability, sources of financial support, and institutional characteristics. Thus, the authors concluded that the 20–24 age group who had delayed entry should not be considered traditional for policy purposes. See S. Hurtado, K. Kurotsuchi, and S. Sharp, "Traditional, Delayed Entry, and Nontraditional Students" (paper presented at the annual meeting of the American Educational Research Association, 1996).

Part-Time Enrollment. Students who attended school part time when they enrolled in the fall of the survey year (i.e., 1986, 1989, and 1992) were considered nontraditional. Again, in previous studies based only on NPSAS:93 data, a full-year definition of part-time enrollment was used. That is, anyone who was not enrolled full time for a full academic year was considered part time. Because NPSAS:87 is based only on a fall sample, the full-year definition could not be applied. As a point of comparison, the full-year definition of part-time status resulted in about 54 percent of 1992–93 undergraduates being identified as part time, while the definition used in this study resulted in about 42 percent being so identified.[17]

Financial Independence. Whether or not a student is considered financially independent of his or her parents is determined when assessing the student's need for financial aid. Parents of dependent students are expected to pay for a portion of their child's education, while parents of independent students are not obliged to do so (though many parents do provide assistance). Therefore, independent students often carry a greater financial burden than dependent students and as such are considered nontraditional. It is important to note that the definition of independence changed between 1986 and 1989. In 1989, all students 24 or older were considered independent, which substantially increased the proportion of independent students due only to the change definition. For comparability in this analysis, the latter definition was applied to the 1986 undergraduates.

Full-Time Employment While Enrolled (in October). The most comparable employment variable across the three surveys was one that determined employment status in the month of October.[18] Therefore, if a student indicated working 35 or more hours per week during October, the student was considered nontraditional.

Dependents. Undergraduates who reported having dependents other than a spouse were also designated as nontraditional. In addition to children, dependents may include elder parents, siblings, or other members of the family for whom the student is financially responsible.

Single Parents. If a student was not married but reported having dependents other than a spouse, that student was identified as a single parent and nontraditional. Although an unmarried person with dependents other than children (such as older parents) is not technically a single parent, the financial burden and time constraints could be similar.

GED Recipient or Certificate of Completion. A student who did not receive a standard high school diploma, but reported completing high school either through passing a General Education Development (GED) exam or other equivalency exam, or receiving a certificate of high school completion was considered nontraditional.

[17] 1992–93 National Postsecondary Student Aid Study (NPSAS:93) Data Analysis System.

[18] Since October is typically the second month of enrollment, it was assumed that working full time during this month represented a dominant pattern of work throughout a student's enrollment for that year.

Persistence and Attainment Analysis

The analysis of persistence and attainment was based on data from the Beginning Postsecondary Students (BPS) survey, the longitudinal component of the NPSAS:90 survey consisting of all students who first began their postsecondary education in 1989-90. The second followup of BPS was conducted in 1994, approximately 5 years after students first enrolled. Thus, attainment rates are available for students who received associate's degrees and vocational certificates as well as for those who completed bachelor's degrees within 5 years.

Four differences in the definition of nontraditional status for the analysis of persistence and attainment compared to the enrollment analysis using NPSAS data should be noted (see appendix A for explanations): 1) an actual delayed entry variable was constructed (rather than using older-than-typical proxy); 2) the employment variable identifies students who worked full time at any time during their 1989-90 enrollment; 3) students were defined as financially independent according to federal income tax criteria (i.e., they were not claimed on their parents' 1988 federal income tax return); and 4) only children were considered dependents of undergraduates.

Nontraditional Scale

Clearly, many of the characteristics used to identify nontraditional undergraduates are strongly interrelated. For example, students may delay enrolling in postsecondary education or attend part time because of family and work responsibilities. In 1992-93, about 80 percent of students working full time while enrolled attended part time.[19] Similarly, in the same year, nearly two-thirds of undergraduates with dependents had delayed their enrollment. In addition, for certain nontraditional characteristics, a student necessarily has more than one. For example, a single parent is by definition, responsible for dependents and is almost always independent, resulting in a minimum of three characteristics. Thus, undergraduates with any nontraditional characteristics usually have more than one. In this study, therefore, the changing trends of undergraduates with multiple characteristics are presented and discussed. In order to examine this phenomenon, a scale was constructed that represents a simple sum of all nontraditional characteristics (from 0 to 7), with zero representing traditional students. The degree to which students were considered nontraditional is described below:

Minimally Nontraditional. Students with only one nontraditional characteristic were considered "minimally nontraditional." In general, these students were most often either older than typical or enrolled part time in postsecondary education (table 2).[20] Minimally nontraditional undergraduates accounted for about 14 to 15 percent of students in each of the three NPSAS samples.

[19] Horn and Premo, *Profile of Undergraduates in U.S. Postsecondary Institutions.*

[20] In 1989, minimally nontraditional undergraduates were slightly more likely to be working full time than to be attending part time.

Table 2—Composition of undergraduates according to nontraditional (NT) characteristics among all undergraduates: Fall 1986, 1989, and 1992

		Nontraditional characteristics							
	Year	Percent with any NT characteristics	Older than typical	Attend part time	Work full time	Independent[1]	Have dependents	Single parent	GED[2] or high school completion certificate
All undergraduates	86	64.6	53.9	37.8	25.6	46.3	19.9	6.5	7.0
	89	68.6	56.2	38.7	32.7	48.6	22.2	7.2	4.9
	92	69.6	59.2	42.2	27.6	48.3	20.0	6.9	4.0
Nontraditional undergraduates:		Total percent with status							
Minimally nontraditional	86	13.8	37.6	34.4	12.3	11.3	0.0	0.0	4.4
	89	15.1	36.1	24.7	31.1	10.9	0.0	0.0	1.5
	92	15.1	48.4	32.5	12.0	11.1	0.0	0.0	0.9
Moderately nontraditional	86	24.8	89.0	44.5	24.8	73.0	12.0	0.8	8.2
	89	27.5	89.8	48.3	30.3	74.6	13.5	1.5	4.5
	92	31.1	93.9	56.3	25.9	73.4	11.3	2.1	3.3
Highly nontraditional	86	26.0	99.3	83.2	69.5	99.6	63.1	22.8	19.5
	89	25.9	99.4	83.6	72.6	99.9	66.5	24.6	13.0
	92	23.4	99.0	83.7	68.4	99.9	68.9	27.1	12.2

[1]This category was defined in 1986 according to the 1989 and 1992 definitions for dependency status.
[2]GED refers to the General Education Development exam.

NOTE: Nontraditional status is based on the presence of one or more of seven possible nontraditional characteristics: minimal=1, moderate=2 or 3, highly=4 or more.

SOURCES: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study: 1986–87 (NPSAS:87), 1989–90 (NPSAS:90), 1992–93 (NPSAS:93), Data Analysis Systems.

Moderately Nontraditional. Students with two or three nontraditional characteristics were considered moderately nontraditional. These students, who made up 25 to 31 percent of undergraduates in the three NPSAS surveys, tended to be older than typical, independent, and to attend part time.

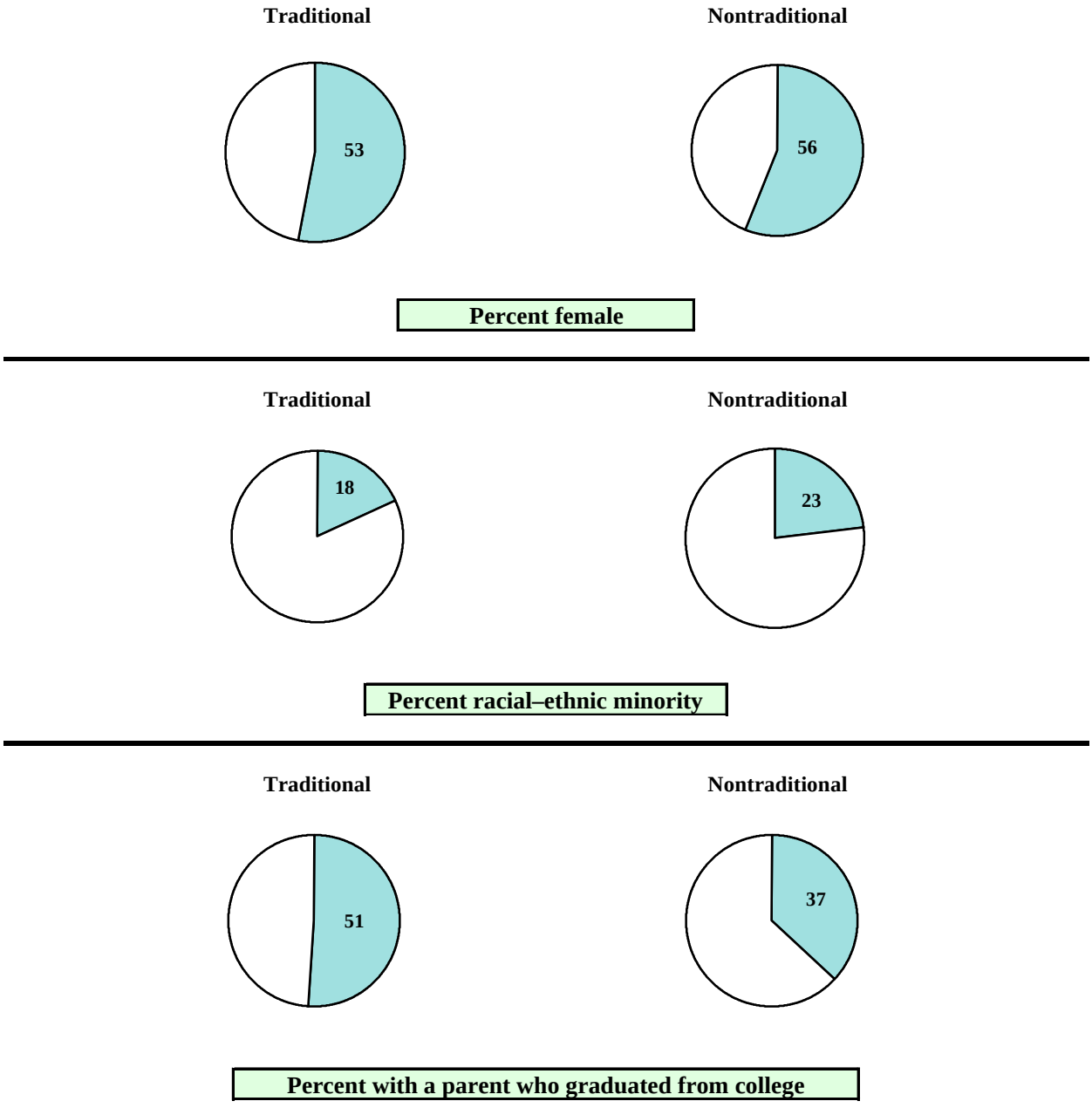
Highly Nontraditional. Having four or more nontraditional characteristics distinguished students identified as highly nontraditional. In addition to those characteristics associated with moderately nontraditional students, about two-thirds of highly nontraditional students either had dependents or worked full time, and about one-quarter were single parents. Highly nontraditional students accounted for about one in four undergraduates in the three NPSAS surveys.

Overall, students who are identified as nontraditional according to these criteria are more likely to be women, to belong to a racial–ethnic minority group, and to have less educated parents than traditional students (figure 2). However, as previously noted, rather than focusing on background characteristics, the criteria chosen to identify nontraditional students in this study are ones that are subject to intervention or change at various stages of a student's academic life. For example, high school students who are prepared to enter postsecondary education but who are uncertain about whether they should attend immediately or delay their enrollment, could be encouraged to do the former. Alternatively, adults who make the commitment to return to school or enroll for the first time later in life could be offered assistance in a number of ways to help them persist and attain their educational goals. Such assistance might be flexible class scheduling, child care arrangements, part-time job placement, and so on.

Finally, with regard to outcome measures, it should be noted that the intention of this study is not to imply that degree attainment is the only way that students can profit from postsecondary education. While the labor market benefits of those who earn a bachelor's degree relative to those who attend college but do not attain a degree have long been known,[21] it is possible that nontraditional students who do not attain a degree benefit in other ways not measured in this study. For example, nontraditional students may enroll in an associate's degree program with the intention of taking specific courses toward enhancing an established career, rather than to earn a degree. In doing so, their combined work experience and postsecondary course taking may improve their marketability in ways not yet possible for their traditional counterparts who have not begun a career.

[21] See, for example, E. Pascarella and P. Terenzini, *How College Affects Students* (San Francisco: Jossey Bass, 1991), 502.

Figure 2—Composition of 1992 fall undergraduates according to gender, race–ethnicity, and parents' education for traditional and nontraditional students



NOTE: Nontraditional status is based on the presence of one or more of seven possible nontraditional characteristics. These characteristics include older than typical age, part-time attendance, being independent of parents, working full time while enrolled, having dependents, being a single parent, and being a recipient of a GED or high school completion certificate.

SOURCES: U.S. Department of Education, National Center for Education Statistics (NCES), National Postsecondary Student Aid Study: 1986–87 (NPSAS:87), 1989–90 (NPSAS:90), 1992–93 (NPSAS:93), Data Analysis Systems.

Trends in Nontraditional Student Enrollment

Nontraditional students, as broadly defined by this study, accounted for a substantial proportion of the undergraduate population in all three surveys (figure 3). A clear majority of undergraduates were at least minimally nontraditional, and about half were either moderately or highly nontraditional. The trend over the 6-year period indicates that the enrollment of nontraditional students overall increased between 1986 and 1989, and then leveled off in 1992.

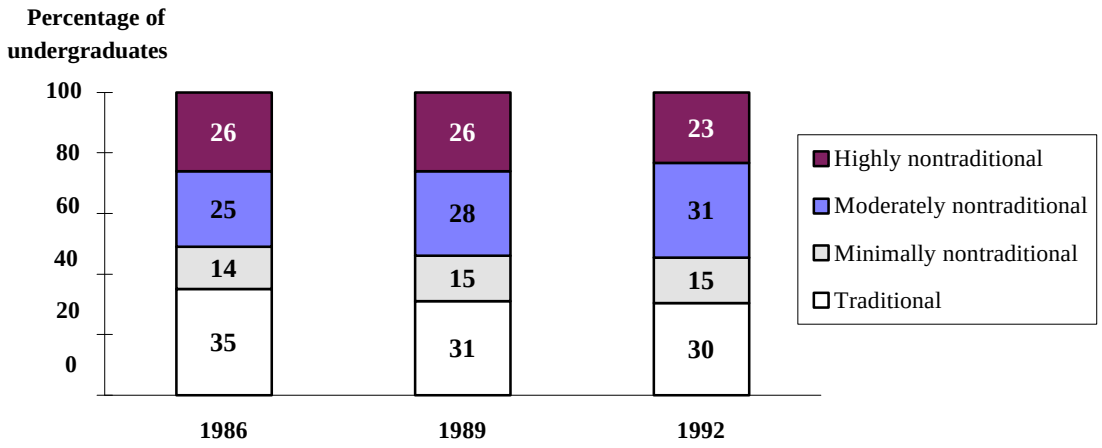
While the overall proportion of nontraditional students did not change between 1989 and 1992, the composition relative to the number of nontraditional characteristics did. That is, the proportion who were moderately nontraditional increased from 28 to 31 percent, while the proportion who were highly nontraditional declined from 26 to 23 percent. If one looks at enrollment according to level of institution, the changes can primarily be attributed to the trends of enrollment in 2-year institutions where the highest proportion of nontraditional students are enrolled.

Changes in enrollment relative to institution type can provide some indication of whether institutions are successfully reaching out to less traditional students in order to maintain or increase their enrollment. This appears to be true for private, not-for-profit 4-year colleges (table 3). Between 1986 and 1992, for example, the proportion of moderately nontraditional students who were enrolled in private, not-for-profit 4-year colleges (both nondoctoral and doctoral) increased. At the same time, the proportion of highly nontraditional students enrolled in these institutions remained stable. Public 2-year institutions, on the other hand, experienced no meaningful change in the proportion of moderately nontraditional students between 1986 and 1989 (31 and 33 percent), but their enrollment increased from 33 to 39 percent between 1989 and 1992. At the same time, unlike the private, not-for-profit 4-year nondoctoral colleges, the proportion of highly nontraditional students who were enrolled in these institutions actually declined from 42 to 35 percent.

While it appears as though there are large fluctuations in nontraditional student enrollment in other institutions such as public less-than-2-year and private, not-for-profit less-than-4-year institutions, it is important to remember that only about 1 to 2 percent of undergraduates are enrolled in these institutions (see table 1) and therefore, there is not enough statistical evidence to conclude that actual changes occurred.

Trends in nontraditional enrollment are also apparent when examined according to the average number of nontraditional characteristics among the undergraduate population (figure 4). Among students in public 2-year institutions, for example, the average number of nontraditional characteristics peaked in 1989 and declined in 1992 (from 2.7 to 2.9 to 2.7). Among students in private, not-for-profit 4-year nondoctoral institutions, on the other hand, the average number of nontraditional characteristics for the 3 years was 1.3, 1.4, and 1.6, respectively, demonstrating a gradual increase over time.

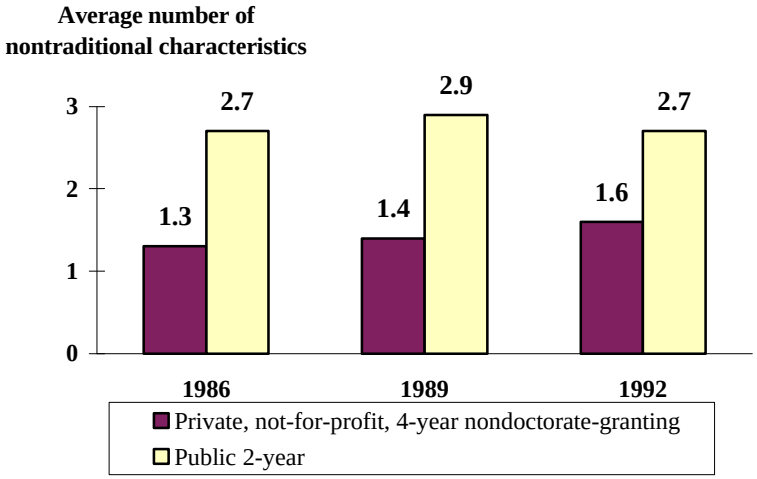
Figure 3—Percentage distribution of undergraduates, by nontraditional status: Fall 1986, 1989, and 1992



NOTE: Nontraditional status is based on the presence of one or more of seven possible nontraditional characteristics: minimal=1, moderate=2 or 3, highly=4 or more. These characteristics include older than typical age, part-time attendance, being independent of parents, working full time while enrolled, having dependents, being a single parent, and being a recipient of a GED or high school completion certificate. Details may not add to 100 percent due to rounding.

SOURCES: U.S. Department of Education, National Center for Education Statistics (NCES), National Postsecondary Student Aid Study: 1986–87 (NPSAS:87), 1989–90 (NPSAS:90), 1992–93 (NPSAS:93), Data Analysis Systems.

Figure 4—Average number of nontraditional characteristics among all undergraduates, by institution type: Fall 1986, 1989, and 1992



NOTE: Nontraditional status is based on the presence of one or more of seven possible nontraditional characteristics. These characteristics include older than typical age, part-time attendance, being independent of parents, working full time while enrolled, having dependents, being a single parent, and being a recipient of a GED or high school completion certificate.

SOURCES: U.S. Department of Education, National Center for Education Statistics (NCES), National Postsecondary Student Aid Study: 1986–87 (NPSAS:87), 1989–90 (NPSAS:90), 1992–93 (NPSAS:93), Data Analysis Systems.

Table 3—Percentage of undergraduates according to nontraditional status, by institutional type: Fall 1986, 1989, and 1989

	1986	1989	1992
Institutional type		**Traditional**	
Total	35.4	31.4	30.4
Public			
Less-than-2-year	15.0	9.0	5.7
2-year	13.9	12.7	12.6
4-year nondoctorate-granting	42.1	39.2	36.9
4-year doctorate-granting	52.7	49.1	50.8
Private, not-for-profit			
Less-than-4-year	35.5	33.0	21.6
4-year nondoctorate-granting	54.4	50.0	45.9
4-year doctorate-granting	64.2	59.4	60.0
Private, for-profit	21.0	15.8	16.8
		Minimally nontraditional	
Total	13.8	15.1	15.2
Public			
Less-than-2-year	9.8	11.3	13.2
2-year	13.5	12.1	14.3
4-year nondoctorate-granting	15.6	18.6	18.0
4-year doctorate-granting	15.4	18.9	18.1
Private, not-for-profit			
Less-than-4-year	14.1	16.1	12.4
4-year nondoctorate-granting	11.3	14.5	11.1
4-year doctorate-granting	9.2	15.4	11.8
Private, for-profit	14.3	14.3	14.8
		Moderately nontraditional	
Total	24.8	27.5	31.1
Public			
Less-than-2-year	36.7	43.8	46.2
2-year	30.7	33.0	38.5
4-year nondoctorate-granting	23.3	25.6	28.1
4-year doctorate-granting	20.3	22.3	22.4
Private, not-for-profit			
Less-than-4-year	28.7	31.9	35.5
4-year nondoctorate-granting	15.3	18.0	22.0
4-year doctorate-granting	13.3	15.7	17.6
Private, for-profit	37.9	40.2	42.1

Table 3—Percentage of undergraduates according to nontraditional status, by institutional type: Fall 1986, 1989, and 1989—Continued

	1986	1989	1992
		Highly nontraditional	
Total	26.0	25.9	23.4
Public			
Less-than-2-year	38.6	35.9	34.8
2-year	42.0	42.3	34.6
4-year nondoctorate-granting	19.0	16.6	17.0
4-year doctorate-granting	11.7	9.7	8.7
Private, not-for-profit			
Less-than-4-year	21.7	19.0	30.6
4-year nondoctorate-granting	18.9	17.6	21.1
4-year doctorate-granting	13.3	9.5	10.6
Private, for-profit	26.8	29.7	26.4

NOTE: Nontraditional status is based on the presence of one or more of seven possible nontraditional characteristics: minimal=1, moderate=2 or 3, highly=4 or more. These characteristics include older than typical age, part-time attendance, being independent of parents, working full time while enrolled, having dependents, being a single parent, and being a recipient of a GED or high school completion certificate.

SOURCES: U.S. Department of Education, National Center for Education Statistics (NCES), National Postsecondary Student Aid Surveys: 1986–97 (NPSAS:87), 1989–90 (NPSAS:90), 1992–93 (NPSAS:93), Data Analysis Systems.

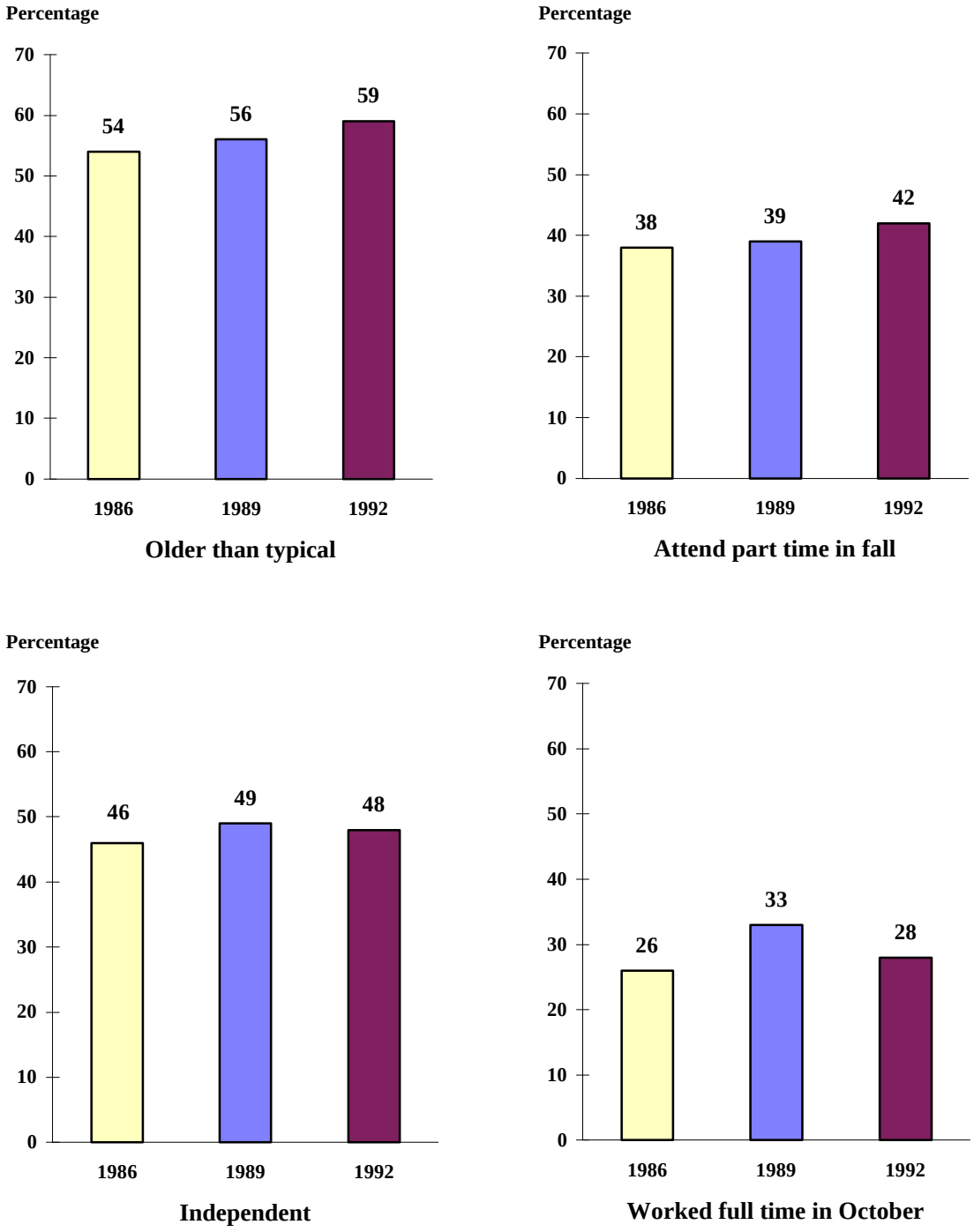
Trends for Individual Nontraditional Characteristics

Looking at each characteristic separately, the patterns of change tended to vary over the 6-year period (figures 5a and 5b). For example, the most notable increases between 1986 and 1992 occurred for the proportion of students who were older than typical or who attended part time. The only significant decline between 1986 and 1992 was found for undergraduates who had a GED or certificate of high school completion.

Older Than Typical Age

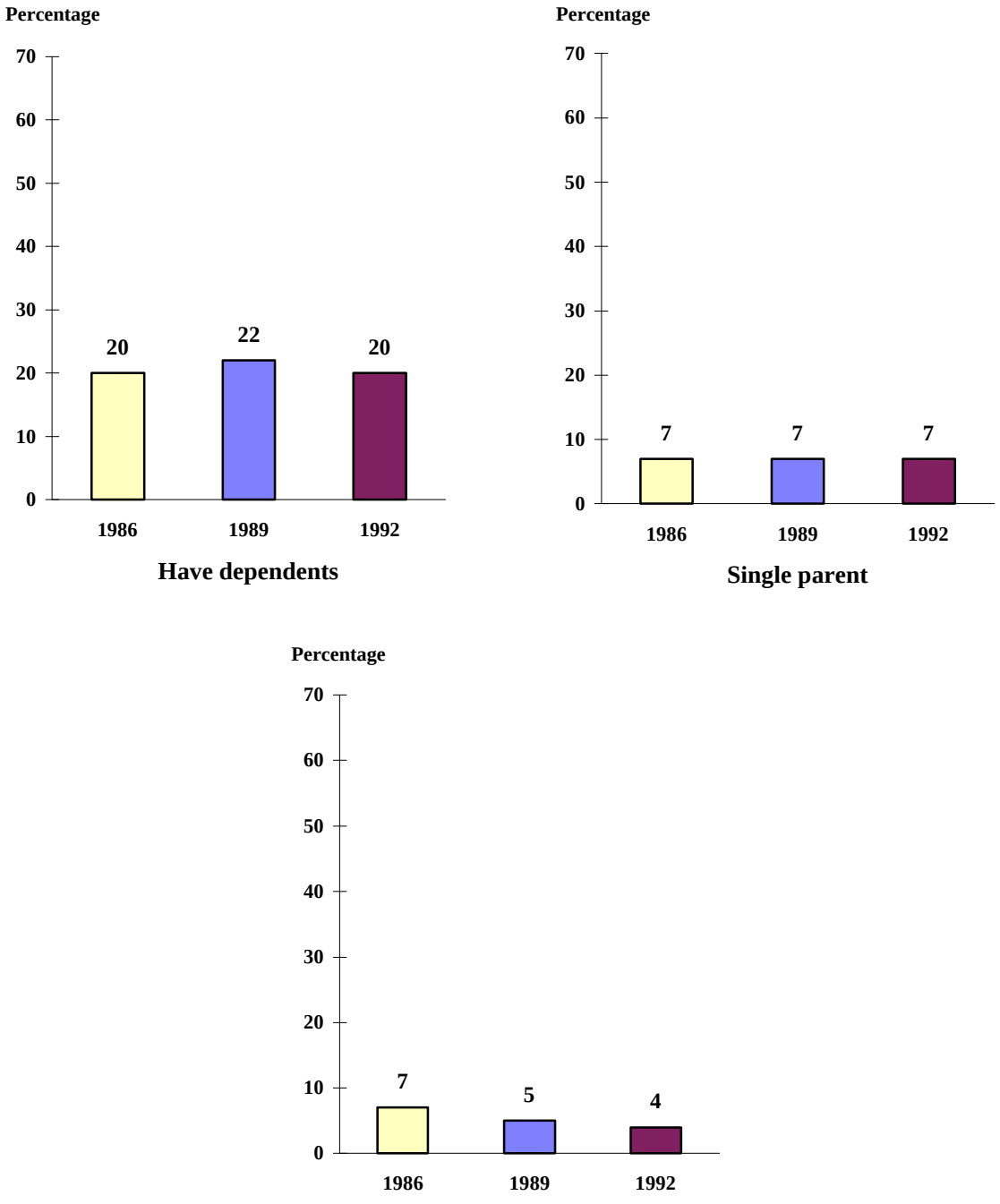
The proportion of undergraduates enrolled in postsecondary education who were older than typical increased, from 54 to 59 percent between 1986 and 1992 (figure 5a). The proportion of older-than-typical students rose substantially in private, not-for-profit nondoctoral 4-year colleges (table 4). In these colleges, about one-third of the student population (38 percent) was older than typical in 1986, compared with nearly one-half (47 percent) in 1992. As a point of comparison, in 1986, the proportion of older-than-typical students enrolled in private, not-for-profit nondoctoral 4-year colleges was much lower than in the corresponding public 4-year colleges (38 percent compared with 47 percent). By 1992, however, the gap between private and public institutions narrowed to 47 and 52 percent, respectively, a difference that is not statistically significant.

Figure 5a—Percentage of undergraduates with each nontraditional characteristic: Fall 1986, 1989, and 1992



SOURCES: U.S. Department of Education, National Center for Education Statistics (NCES), National Postsecondary Student Aid Study: 1986–97 (NPSAS:87), 1989–90 (NPSAS:90), 1992–93 (NPSAS:93), Data Analysis Systems.

Figure 5b—Percentage of undergraduates with each nontraditional characteristic: Fall 1986, 1989, and 1992



* GED refers to General Education Development exam.

SOURCES: U.S. Department of Education, National Center for Education Statistics (NCES), National Postsecondary Student Aid Study: 1986–97 (NPSAS:87), 1989–90 (NPSAS:90), 1992–93 (NPSAS:93), Data Analysis Systems.

Table 4—Percentage of older-than-typical undergraduates, by selected institutional characteristics: Fall 1986, 1989, and 1992

	1986	1989	1992
Total	53.9	56.2	59.2
Level of institution			
Less-than-2-year	76.8	80.6	80.3
2-year	72.1	74.1	75.2
4-year or more	38.7	39.6	43.9
Control of institution			
Public	57.0	59.1	61.5
Private, not-for-profit	36.2	37.0	43.4
Private, for-profit	70.3	74.3	76.4
Institutional type			
Public			
Less-than-2-year	79.4	81.7	84.8
2-year	73.2	74.8	75.6
4-year nondoctorate-granting	47.3	47.4	52.0
4-year doctorate-granting	35.8	36.5	38.7
Private, not-for-profit			
Less-than-4-year	54.8	58.3	70.4
4-year nondoctorate-granting	38.1	38.8	46.9
4-year doctorate-granting	29.7	29.3	33.3
Private, for-profit	70.3	74.3	76.4

NOTE: Older than typical is defined as students 20 or older in their first year, 21 or older in their second year, 22 or older in their third year, or anyone 23 or older.

SOURCES: U.S. Department of Education, National Center for Education Statistics (NCES), National Postsecondary Student Aid Study: 1986–87 (NPSAS:87), 1989–90 (NPSAS:90), 1992–93 (NPSAS:93), Data Analysis Systems.

Independent

Unlike older-than-typical students, the overall proportion of students identified as independent of their parents changed little during the time period (figure 5a, table 5). This indicates that the increase among older-than-typical students is occurring among undergraduates under the age of 24 (the age criterion for independence).[22]

[22] The proportion of older-than-typical students among those under age 24 increased from about one-quarter to one-third between 1986 and 1992 (1986–87 and 1992–93 NPSAS Data Analysis Systems).

Table 5—Percentage of independent undergraduates, by selected institutional characteristics: Fall 1986, 1989, and 1992

	1986*	1989	1992
Total	46.3	48.6	48.3
Level of institution			
Less-than-2-year	68.8	75.0	73.1
2-year	60.8	64.4	60.1
4-year or more	33.8	33.2	35.5
Control of institution			
Public	48.7	50.5	49.0
Private, not-for-profit	31.5	32.7	37.6
Private, for-profit	61.8	68.7	68.3
Institutional type			
Public			
Less-than-2-year	69.0	74.8	72.3
2-year	62.1	65.0	60.3
4-year nondoctorate-granting	40.2	38.7	41.4
4-year doctorate-granting	31.6	30.2	29.5
Private, not-for-profit			
Less-than-4-year	40.4	50.6	59.5
4-year nondoctorate-granting	34.2	34.5	41.8
4-year doctorate-granting	25.8	25.9	27.6
Private, for-profit	61.8	68.7	68.3

* According to 1989 and 1992 definitions of dependency status (see appendix A for details).

SOURCES: U.S. Department of Education, National Center for Education Statistics (NCES), National Postsecondary Student Aid Study: 1986–87 (NPSAS:87), 1989–90 (NPSAS:90), 1992–93 (NPSAS:93), Data Analysis Systems.

Part-Time Enrollment

More than one-third of undergraduates in all three NPSAS surveys reported attending part time in the fall (figure 5a). The changes in part-time enrollment, however, differed from the overall trend, in that part-time enrollment remained stable between 1986 and 1989 (38 and 39 percent, respectively), and increased to 42 percent in 1992.

There was discernible growth in part-time enrollment in private, not-for-profit institutions overall (from 20 to 26 percent between 1989 and 1992) (table 6). The same was true for 4-year institutions overall, where the proportion of part-time students increased from 22 to 25 percent between 1989 and 1992.

Table 6—Percentage of undergraduates who attended part time in the fall, by selected institutional characteristics: Fall 1986, 1989, and 1992

	1986	1989	1992
Total	37.8	38.7	42.2
Level of institution			
Less-than-2-year	20.5	21.4	26.8
2-year	60.6	61.9	63.9
4-year or more	22.5	21.6	24.9
Control of institution			
Public	43.2	44.6	47.5
Private, not-for-profit	21.2	19.7	25.9
Private, for-profit	16.1	16.5	21.8
Institutional type			
Public			
Less-than-2-year	29.0	31.3	50.8
2-year	63.8	65.4	66.2
4-year nondoctorate-granting	27.7	26.5	31.1
4-year doctorate-granting	20.7	19.7	20.4
Private, not-for-profit			
Less-than-4-year	29.9	21.3	45.9
4-year nondoctorate-granting	22.4	22.8	28.4
4-year doctorate-granting	17.6	14.2	18.5
Private, for-profit	16.1	16.5	21.8

SOURCES: U.S. Department of Education, National Center for Education Statistics (NCES), National Postsecondary Student Aid Study: 1986–87 (NPSAS:87), 1989–90 (NPSAS:90), 1992–93 (NPSAS:93), Data Analysis Systems.

Full-Time Employment

One-quarter or more of undergraduates in all three surveys reported working full time while enrolled (figure 5a and table 7). The proportion of students who reported working full time during the month of October increased between 1986 and 1989 (from 26 to 33 percent), and then declined between 1989 and 1992 (to 28 percent). It should be noted, however, that the difference observed may be partially attributable to differences in the way the questions were asked in the surveys.[23] Comparable data from the Current Population Survey (CPS) did not show any significant changes for the equivalent time periods for members of households who were enrolled and working full time in October (33 percent for both 1987 and 1989 and 31 percent for 1992).[24]

[23]See appendix A for definitions.

[24]Represents household members enrolled in either collegiate or vocational education programs who reported working full time during the week of October at the time they were interviewed. Results for 1987 instead of 1986 were reported here because the former was the first year CPS collected employment information for both collegiate and vocational education respondents.

Table 7—Percentage of undergraduates who worked full time in October, by selected institutional characteristics: Fall 1986, 1989, and 1992

	1986	1989	1992
Total	25.6	32.7	27.6
Level of institution			
Less-than-2-year	20.0	30.8	20.4
2-year	38.8	43.8	38.3
4-year or more	16.4	23.3	18.5
Control of institution			
Public	27.6	34.5	29.1
Private, not-for-profit	18.4	24.6	21.9
Private, for-profit	20.5	31.7	22.9
Institutional type			
Public			
Less-than-2-year	24.1	35.9	34.7
2-year	40.2	44.8	38.9
4-year nondoctorate-granting	19.0	25.7	21.5
4-year doctorate-granting	13.1	19.9	13.3
Private, not-for-profit			
Less-than-4-year	18.6	23.6	30.5
4-year nondoctorate-granting	20.2	28.1	26.0
4-year doctorate-granting	15.7	19.0	14.9
Private, for-profit	20.5	31.7	22.9

NOTE: In each survey, questions about jobs were not asked exactly the same way. See appendix A for details.

SOURCES: U.S. Department of Education, National Center for Education Statistics (NCES), National Postsecondary Student Aid Study: 1986–87 (NPSAS:87), 1989–90 (NPSAS:90), 1992–93 (NPSAS:93), Data Analysis Systems.

Students with Dependents

Among the three survey years, the enrollment of students responsible for dependents other than a spouse was highest in 1989 (at 22 percent) (figure 5b and table 8). Between 1989 and 1992, the proportion of students with dependents declined to the 1986 level of 20 percent. The proportion of students who were single parents (7 percent) did not change at all over the 6 years (figure 5b and table 9).

The change in the enrollment trends of students with dependents was primarily due to changes in public 2-year enrollment, where one in three students had dependents in 1989, followed by a decline to about one in four (27 percent) in 1992 (table 8). Paralleling the growth in part-time enrollment, the proportion of students with dependents who were enrolled in private, not-for-profit 4-year nondoctoral colleges grew from 14 to 18 percent between 1986 and 1992.

Table 8—Percentage of undergraduates with dependents other than a spouse, by selected institutional and educational characteristics: Fall 1986, 1989, and 1992

	1986	1989	1992
Total	19.9	22.2	20.0
Level of institution			
Less-than-2-year	38.2	43.0	41.6
2-year	28.8	32.3	26.8
4-year or more	11.9	12.1	12.1
Control of institution			
Public	20.9	22.8	19.9
Private, not-for-profit	12.1	13.3	14.8
Private, for-profit	31.9	37.9	36.2
Institutional type			
Public			
Less-than-2-year	41.4	43.9	34.1
2-year	29.3	32.5	26.8
4-year nondoctorate-granting	15.2	14.9	15.2
4-year doctorate-granting	10.0	9.5	8.1
Private, not-for-profit			
Less-than-4-year	20.4	24.1	29.5
4-year nondoctorate-granting	13.5	15.5	17.6
4-year doctorate-granting	8.4	7.4	8.1
Private, for-profit	31.9	37.9	36.2

SOURCES: U.S. Department of Education, National Center for Education Statistics (NCES), National Postsecondary Student Aid Study: 1986–87 (NPSAS:87), 1989–90 (NPSAS:90), 1992–93 (NPSAS:93), Data Analysis Systems.

Table 9—Percentage of undergraduates who were single parents, by selected institutional characteristics: Fall 1986, 1989, and 1992

	1986	1989	1992
Total	6.5	7.2	6.9
Level of institution			
Less-than-2-year	19.9	22.8	23.0
2-year	9.1	10.1	8.8
4-year or more	3.4	3.5	3.7
Control of institution			
Public	6.3	6.7	6.4
Private, not-for-profit	3.6	3.9	4.7
Private, for-profit	18.0	21.6	19.4
Institutional type			
Public			
Less-than-2-year	16.9	15.3	14.0
2-year	9.0	9.7	8.5
4-year nondoctorate-granting	4.4	4.2	5.0
4-year doctorate-granting	2.8	2.8	2.5
Private, not-for-profit			
Less-than-4-year	7.7	9.5	12.2
4-year nondoctorate-granting	4.0	4.1	5.3
4-year doctorate-granting	2.1	2.4	2.3
Private, for-profit	18.0	21.6	19.4

SOURCES: U.S. Department of Education, National Center for Education Statistics (NCES), National Postsecondary Student Aid Study: 1986–87 (NPSAS:87), 1989–90 (NPSAS:90), 1992–93 (NPSAS:93), Data Analysis Systems.

GED or High School Certificate of Completion

The only consistent enrollment decline from 1986 to 1992 among the nontraditional characteristics identified in this study occurred for undergraduates with a GED or high school certificate of completion (figure 5b, table 10). The proportion of these students enrolled in postsecondary education declined from 7 to 4 percent. This trend may in part be due to the stricter enforcement of financial aid regulations applied to students in for-profit institutions, where GED recipients tend to be concentrated. Students in these institutions have experienced particularly high loan default rates.

Table 10—Percentage of undergraduates who received a GED or high school completion certificate, by selected institutional and educational characteristics: Fall 1986, 1989, and 1992

	1986	1989	1992
Total	7.0	4.9	4.0
Level of institution			
Less-than-2-year	20.5	14.9	13.7
2-year	10.6	7.6	6.1
4-year or more	3.3	1.9	1.5
Control of institution			
Public	7.1	4.9	4.0
Private, not-for-profit	3.5	2.2	2.0
Private, for-profit	17.9	13.0	10.1
Institutional type			
Public			
Less-than-2-year	19.0	18.3	12.5
2-year	10.5	7.4	6.0
4-year nondoctorate-granting	4.5	2.6	2.0
4-year doctorate-granting	2.9	1.3	0.9
Private, not-for-profit			
Less-than-4-year	12.6	6.6	7.4
4-year nondoctorate-granting	3.0	2.0	1.7
4-year doctorate-granting	2.5	1.5	1.4
Private, for-profit	17.9	13.0	10.1

NOTE: GED refers to the General Education Development exam.

SOURCES: U.S. Department of Education, National Center for Education Statistics (NCES), National Postsecondary Student Aid Study: 1986–87 (NPSAS:87), 1989–90 (NPSAS:90), 1992–93 (NPSAS:93), Data Analysis Systems.

Persistence and Attainment of Nontraditional Students

The 1994 followup of the Beginning Postsecondary Students (BPS) cohort provides the most up-to-date national assessment of how well nontraditional students persist in postsecondary education relative to their traditional peers. The BPS followup was conducted about 5 years after the cohort's initial enrollment in 1989–90. For this analysis, only students who specified a degree objective (bachelor's, associate's, or certificate) when they first enrolled were included. This was done to avoid confounding the attainment results with students whose intentions were only to take a few courses rather than to earn a degree.

The nontraditional status of the BPS participants was determined in 1989–90 when they were first-time, first-year students. Since many nontraditional students are returning to their postsecondary education, one would expect to see fewer nontraditional students in the BPS cohort than in the NPSAS surveys, which represent undergraduates at all levels regardless of whether they had ever enrolled in the past. This was found to be the case; among the 1989–90 beginning postsecondary students, 58 percent were nontraditional, compared with about two-thirds of the NPSAS participants who were at least minimally nontraditional (see figure A). As shown in table 11, the prevalence of the seven nontraditional characteristics in the BPS cohort in 1989–90 was as follows: 36 percent were independent; 31 percent delayed enrollment; 27 percent worked full time at some point during their enrollment; 22 percent attended part time; 13 percent had children; 6 percent had a GED or high school certificate of completion; and 5 percent were single parents.

Status of Undergraduates 5 Years After Beginning

The overall results demonstrate an obvious negative association between degree attainment and the presence of any nontraditional characteristics (table 12). Overall, 43 percent of nontraditional undergraduates had attained some postsecondary credential by 1994, compared with about 64 percent of traditional undergraduates.

Even minimally nontraditional students were less likely than traditional students to attain a degree (52 percent versus 64 percent). They were also far more likely than traditional students to have left school without a degree and without re-enrolling (35 percent versus 22 percent).

While minimally nontraditional students were much less likely to attain their degree objective than their traditional counterparts, they fared better than did moderately or highly nontraditional students. That is, they were more likely to attain a degree than were moderately or highly nontraditional students (52 percent compared with 41 and 33 percent, respectively).

Table 11—Among 1989–90 beginning postsecondary students, the average number of nontraditional characteristics and the percentage of students with each characteristic, by all other nontraditional characteristics

	Average number of NT characteristics	Independent	Delayed enrollment	Work full time	Enrolled part time	Have children	GED[1]/ high school completion certificate	Single parent
Total	1.4	36.2	31.1	27.3	21.6	13.1	6.3	5.1
Nontraditional status[2]								
All nontraditional students	2.4	64.6	55.4	48.7	39.1	23.6	11.3	9.2
Minimally nontraditional	1.0	29.2	12.3	43.1	21.3	0.0	0.0	0.0
Moderately nontraditional	2.5	79.9	72.7	43.2	30.9	17.2	11.8	3.8
Highly nontraditional	4.5	98.7	99.6	63.8	72.8	67.3	28.3	29.1
Dependency status 1989–90								
Dependent	0.4	†	7.9	18.6	10.4	1.4	1.5	0.9
Independent	3.1	†	71.2	42.7	42.6	34.3	15.0	13.0
Delayed enrollment								
Did not delay	0.5	15.1	†	20.0	10.9	1.1	0.0	0.8
Delayed	3.3	83.6	†	43.6	46.5	40.7	20.5	15.1
Employment while enrolled 1989–90								
Did not work full time	0.9	28.3	23.9	†	13.6	11.1	6.3	5.0
Worked full time	2.7	56.2	49.2	†	42.6	19.0	6.7	5.5
Attendance status 1989–90								
Full-time	0.8	25.4	20.5	20.0	†	8.7	4.9	4.1
Part-time	3.3	68.6	64.7	54.0	†	31.5	9.9	8.1
Number of children 1989–90								
None	0.9	26.7	20.8	25.5	16.9	†	3.4	0.0
One or more	4.3	93.3	94.3	39.2	49.5	†	23.9	39.4
High school standing 1994								
High school diploma	1.2	32.9	26.4	27.2	20.7	10.6	†	4.0
GED or high school equivalent	4.1	85.0	100.0	28.5	35.7	51.5	†	22.3
Single parent status 1989–90								
Not a single parent	1.2	32.3	27.0	27.2	20.6	8.3	4.9	†
Single parent	4.6	89.1	89.3	29.4	34.8	100.0	26.3	†

†Not applicable.

[1]GED refers to the General Education Development exam.

[2]Nontraditional status is based on the presence of one or more nontraditional characteristics: minimal=1, moderate=2 or 3, and high=4 or more.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Postsecondary Students Longitudinal Study, Second Followup (BPS:90/94).

Table 12—Percentage distribution of all 1989–90 beginning postsecondary students who had the intention of earning a degree according to their persistence and attainment, by nontraditional status

	Attained any degree	No degree attained, enrolled in 1994	No degree attained, not enrolled in 1994
Total	52.3	13.1	34.7
Traditional	63.8	14.1	22.1
Nontraditional*	43.3	12.2	44.5
Minimally nontraditional	51.8	13.3	34.8
Moderately nontraditional	40.6	10.9	48.5
Highly nontraditional	33.3	12.3	54.3

*Nontraditional status refers to the presence of one or more nontraditional characteristics: minimal=1, moderate=2 or 3, high=4 or more. Nontraditional characteristics include delayed enrollment, part-time attendance, being independent, working full time while enrolled, having children, being a single parent, or being a recipient of a GED or high school completion certificate.

NOTE: Details may not add to 100 percent due to rounding.

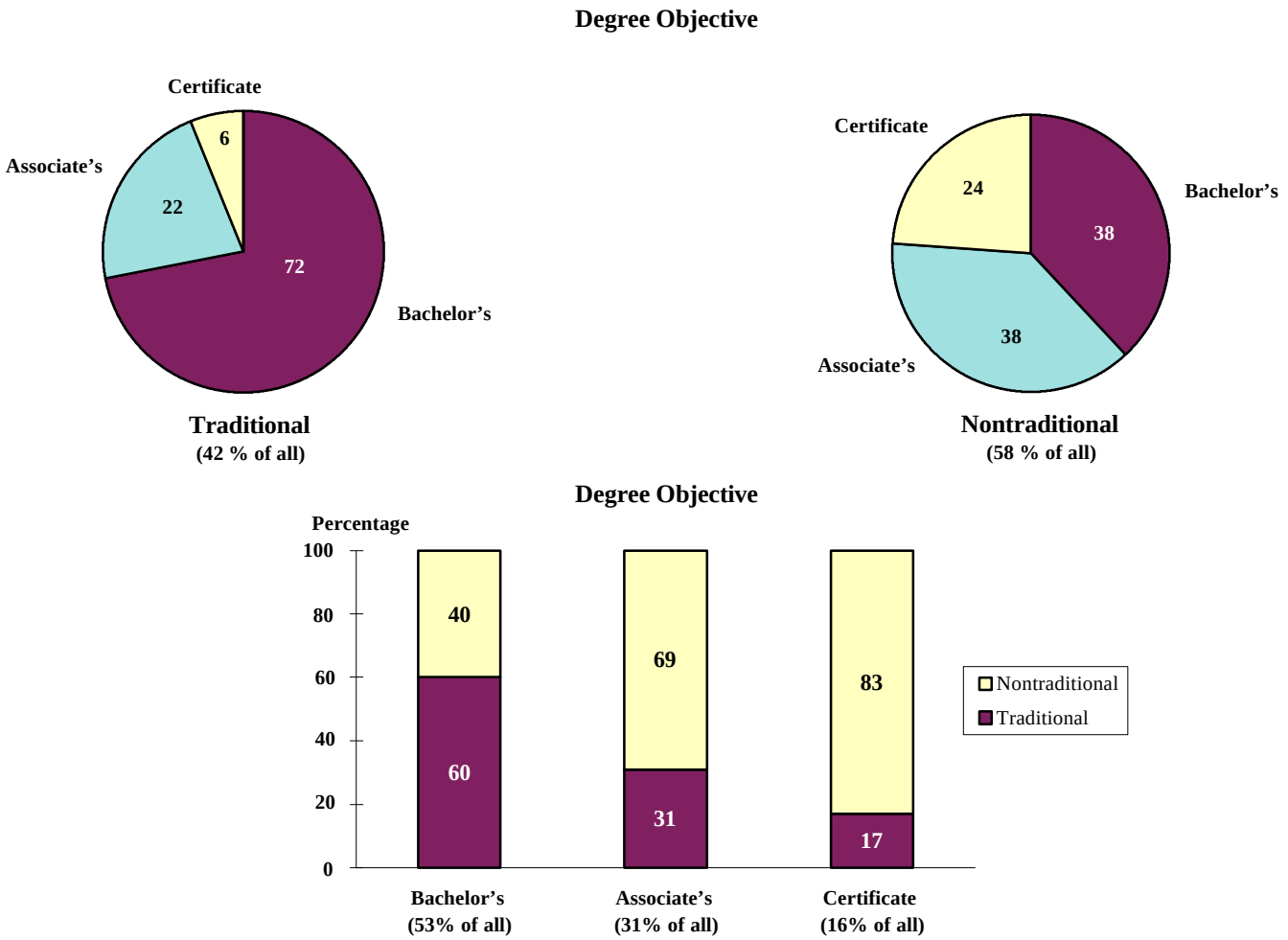
SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Postsecondary Students Longitudinal Study, Second Followup (BPS:90/94).

Persistence by Degree Objective

The BPS participants indicated their initial degree objective when they first enrolled in 1989–90, which is illustrated in Figure 6. They were subsequently tracked through their program to see how they progressed toward that objective. If they did not attain their degree objective, it was determined whether they were still enrolled toward the degree in 1994, had left without attaining, or if they had changed their degree objective. Table 13 shows the status of the BPS cohort in the spring of 1994 for each degree attempted.

Among students who ever reported a bachelor's degree objective, about one in three nontraditional students (31 percent) had attained a degree within 5 years, while roughly half (54 percent) of traditional students had done so (table 13). Given the propensity of nontraditional students to attend part time, one might expect them to take longer to attain a degree than their traditional counterparts. If this were the case, a greater proportion of nontraditional students would be enrolled in 1994 compared with traditional students. But no such difference was found. The percentage of nontraditional and traditional students who sought a bachelor's degree and were still enrolled was similar (23 percent and 20 percent, respectively). Nontraditional students had either left completely without a degree (33 percent) or had changed their degree objective (13 percent) at higher rates than traditional students (19 percent and 7 percent, respectively).

Figure 6—Percentage of 1989–90 beginning postsecondary students who reported a degree objective, by their initial degree objective and traditional/nontraditional status when they first began postsecondary education



NOTE: Nontraditional status is based on the presence of one or more of seven possible nontraditional characteristics. These characteristics include delayed enrollment, part-time attendance, being independent of parents, working full time while enrolled, having dependents, being a single parent, and being a recipient of a GED or high school completion certificate.

SOURCES: U.S. Department of Education, National Center for Education Statistics, 1989–90 Beginning Postsecondary Students Longitudinal Study (BPS:89/94), Data Analysis System.

Table 13—Percentage distribution of all 1989–90 beginning postsecondary students with a reported degree objective[1] according to their persistence and attainment of degree objective, by nontraditional status

		Did not attain degree objective		
	Attained degree objective	Enrolled toward degree objective in 1994	No change in degree objective, not enrolled in 1994	Changed degree objective[2]
		Bachelor's degree objective		
Total	44.5	21.2	24.7	9.6
Traditional	53.9	19.7	19.2	7.2
Nontraditional[3]	31.3	23.2	32.5	12.9
Minimally nontraditional	42.4	22.5	26.6	8.6
Moderately nontraditional	16.9	25.4	40.7	17.0
Highly nontraditional	11.2	21.7	42.1	25.0
		Associate's degree objective		
Total	35.5	8.7	38.7	17.2
Traditional	53.4	8.4	22.4	15.8
Nontraditional[3]	26.7	8.8	46.6	17.8
Minimally nontraditional	37.2	5.8	35.3	21.7
Moderately nontraditional	24.5	6.4	52.6	16.5
Highly nontraditional	15.6	16.0	54.0	14.4
		Vocational certificate objective		
Total	55.8	4.5	31.0	8.7
Traditional	61.3	4.8	23.2	10.7
Nontraditional[3]	54.0	4.4	33.5	8.1
Minimally nontraditional	55.4	6.3	26.9	11.3
Moderately nontraditional	56.6	6.4	28.7	8.4
Highly nontraditional	50.3	1.1	42.9	5.7

[1]Degree objective in this table refers to students who had ever had the specified degree objective. Therefore, it is possible for a student who changed objectives to appear more than once in the table. For example, a student with an initial objective of a bachelor's degree who changed his or her objective to an associate's would appear under "changed degree objective" in the bachelor's table and would also appear in the associate's group.

[2]May or may not be enrolled in 1994.

[3]Nontraditional status refers to the presence of one or more nontraditional characteristics: minimal=1, moderate=2 or 3, high=4 or more. Nontraditional characteristics include delayed enrollment, part-time attendance, being independent, working full time while enrolled, having children, being a single parent, or being a recipient of a GED or high school completion certificate.

NOTE: Details may not add to 100 percent due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Postsecondary Students Longitudinal Study, Second Followup (BPS:90/94).

Among students seeking an associate's degree, traditional and nontraditional students exhibited patterns of persistence and attainment that were similar to those found for bachelor's degree seekers. Nontraditional students who sought an associate's degree were half as likely as their traditional counterparts to have attained their objective (27 percent versus 53 percent), and were twice as likely to have left school without either attaining a degree or changing their degree objective (47 percent versus 22 percent). However, among nontraditional students, there was an important distinction between students with an associate's degree objective and those seeking a bachelor's degree: associate's degree seekers were much more likely to have left school without a degree or changing their objective (47 percent) than were nontraditional bachelor's degree seekers (33 percent). In contrast, traditional students left school at similar rates regardless of their degree objective (19 percent seeking a bachelor's degree, and 22 percent with an associate's degree objective). It is possible that this reflects the tendency of nontraditional students to enroll in associate's degree programs for purposes of obtaining occupational skills through coursework, rather than specifically to earn a degree.

Among students whose educational goal was a vocational certificate, having nontraditional characteristics was not associated with overall persistence and attainment. For example, 54 percent of nontraditional students had attained a certificate, as had 61 percent of traditional students, a difference that is not statistically significant. Only the highly nontraditional group had rates of persistence that were lower than those of all others who sought certificates. Forty-three percent of these students left school without a credential, compared with 27 to 29 percent of other nontraditional certificate seekers and 23 percent of traditional students.

When Do Students First Leave?

Knowing exactly when students leave school is important for designing programs to reduce nontraditional student attrition. In this analysis, students' first departure from their initial enrollment path (i.e., their "persistence track") was identified.[25] A departure from the persistence track was defined as an interruption in enrollment in one of three ways: a downward transfer (e.g., from a 4-year to a 2-year institution or from a 2-year to less-than-2-year institution); stopping out for more than 4 months and then returning to the same or higher level institution; or leaving without returning by 1994. The first column in table 14 shows the percentage of students who never departed from their initial persistence track. These students had either attained a degree or were still enrolled approximately 5 years after their initial enrollment.[26] For students who did depart from their persistence track, columns 2-5 show the year of their first departure.

[25] The concept of "persistence track" was first developed by C. Dennis Carroll in a study of how traditional students persist to their bachelor's degree. See C. D. Carroll, *College Persistence and Degree Attainment for 1980 High School Graduates: Hazards for Transfers, Stopouts, and Part-timers* (Washington, D.C.: U.S. Department of Education, National Center for Education Statistics, 1989).

[26] In most cases the degree attained is the initial degree objective. However, in the remote case of a student changing degree objectives with no enrollment interruption and attaining a degree from the same level of institution (such as a bachelor's degree seeker earning an associate's degree at a 4-year college), then it is possible that the degree attained was different from the initial objective.

Table 14—Percentage of 1989–90 beginning postsecondary students according to their enrollment continuity, by nontraditional status and initial degree objective

	Attained any degree or still enrolled with no interruption[1]	Annual rates of attrition (first enrollment interruption)[2]			
		First year	Second year	Third year	Fourth year or later
Total	45.3	28.4	16.3	17.5	8.8
Traditional	56.8	16.2	12.2	14.8	8.8
Nontraditional[3]	36.0	38.3	20.7	20.6	8.8
Initial degree objective[4]					
Bachelor's degree	52.3	19.1	12.5	17.3	10.8
Traditional	58.9	13.6	10.0	15.8	10.0
Nontraditional[3]	42.3	27.2	17.0	20.1	12.4
				Third year or later	
Associate's degree	32.2	39.2	24.0	30.5	
Traditional	52.3	23.1	17.3	17.8	
Nontraditional[3]	23.1	46.4	28.7	40.0	
Certificate	45.3	39.8	18.3	7.8	
Traditional	52.3	23.1	23.2	11.5	
Nontraditional[3]	43.9	43.2	17.0	14.9	

[1]Had either attained a degree or were still enrolled in 1994 and had never had an enrollment interruption.
[2]An interruption is defined as leaving without returning, a downward transfer (e.g., 4-year to 2-year institution with or without an interruption), or a period of interruption of more than 4 months (stopout) and then returning to the same level or higher institution. It is possible for some students who had an interruption to have returned and either attained or still be enrolled. The percentages represent annual rates (i.e. base includes only students still enrolled at the beginning of the year).
[3]Nontraditional status refers to the presence of one or more nontraditional characteristics including delayed enrollment, part-time attendance, being independent, working full time while enrolled, having children, being a single parent, or being a recipient of a GED or high school completion certificate.
[4]It is possible that the degree attained was not the initial objective. For example if a student initially had a BA objective but earned an AA and had no enrollment interruption (defined in footnote 2), that student would appear in column 1 under bachelor's degree objective.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Postsecondary Students Longitudinal Study, Second Followup (BPS:90/94).

It is clear from this table that nontraditional students are most at risk to depart from their persistence track in their first year. In fact, nontraditional students were just as likely to depart in their first year as they were to persist or attain a degree over the five year period (36 percent and 38 percent, respectively). In contrast, traditional students were far more likely to remain on their persistence track than they were to depart in their first year (57 percent and 16 percent, respectively).

While nontraditional students were more than twice as likely as traditional students to depart from their persistence track in their first year (16 percent versus 38 percent), the gap in attrition between the two groups closed considerably once they reached their second year (figure 7). Taking degree objective into account, the attrition of nontraditional students seeking a bachelor's degree was higher than their traditional counterparts until the fourth year, but the gap continued to close over time. Among certificate seekers (most of whom are in programs lasting no longer than one year), there was no difference in attrition between traditional and nontraditional students after the first year. For associate degree seekers, on the other hand, the gap in attrition rates between traditional and nontraditional students did not close after the second year.

The persistence and timing of students' departure relative to their initial degree objective is shown as a distribution in figure 8. Viewed from this perspective, it is very obvious that nontraditional students whose initial degree objective was an associate's degree were about twice as likely to depart in their first year as they were to stay on their persistence track (46 percent compared with 23 percent). The opposite was true for nontraditional students seeking a bachelor's degree: 27 percent left in their first year, while 42 percent persisted. It should be noted however, that nontraditional students seeking an associate's degree were far more likely to be highly nontraditional and less likely to be minimally nontraditional when compared to their counterparts pursuing a bachelor's degree.[27]

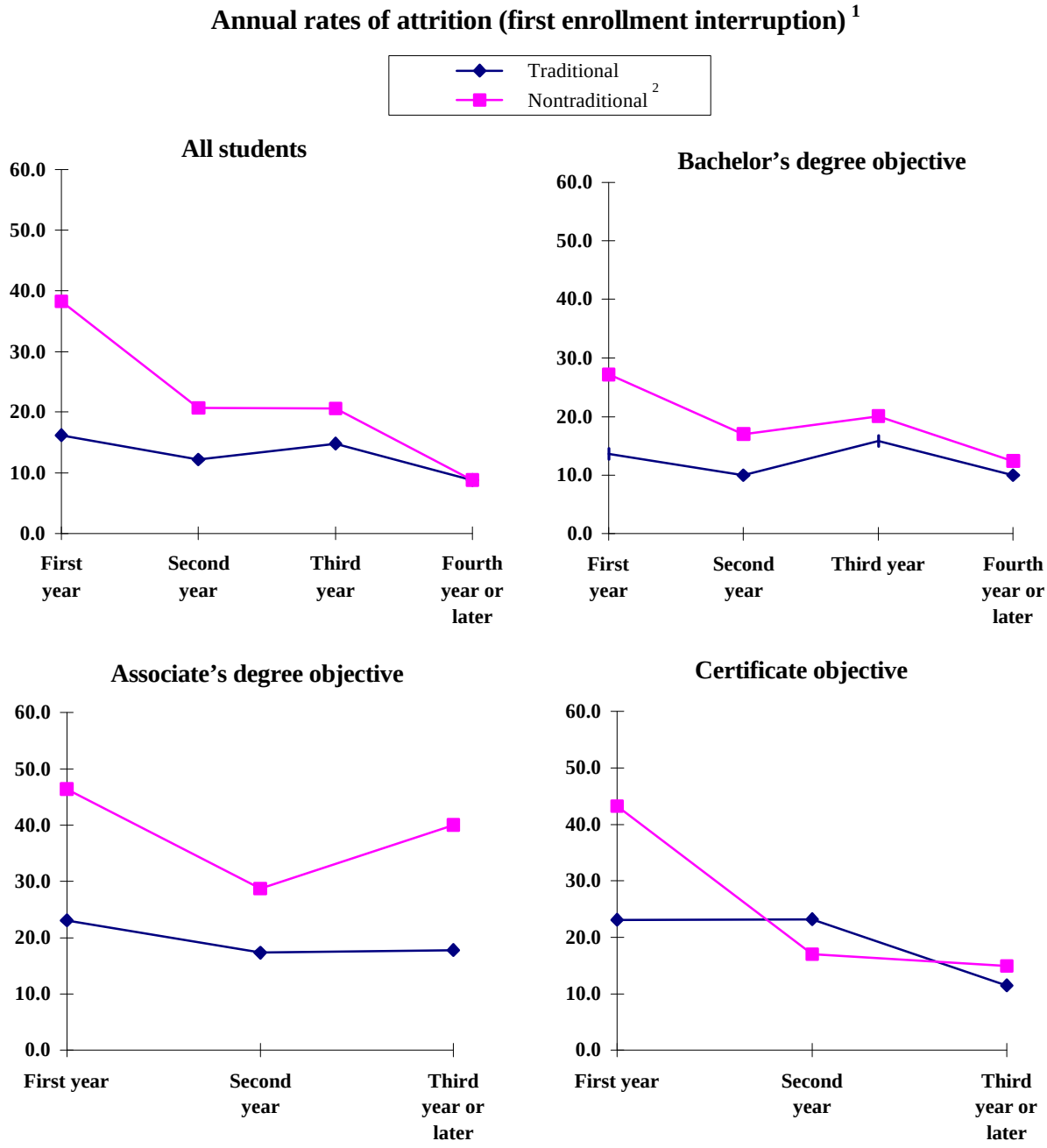
How Do They Leave?

If students leave their persistence track, it is instructive to determine how traditional students' methods of departure differ from those of nontraditional students. As noted above, types of departure included any downward transfer (e.g., from a 4-year to a 2-year institution); stopping out for more than 4 months but then returning to the same or higher level institution; or leaving without returning by 1994. Given nontraditional students' family and work responsibilities, one might expect them to stop out more frequently than their traditional peers. But this did not appear to be the case, at least within 5 years of students' initial enrollment (table 15).

Traditional and nontraditional leavers had similar rates of stopping out (28 and 26 percent, respectively). About half of nontraditional leavers departed without returning by 1994 (47 percent), compared with about one-third of traditional leavers. Traditional leavers, on the other hand, were more likely to experience a downward transfer than their nontraditional counterparts (40 percent compared with 27 percent).

[27] For example, nearly one-third of nontraditional students seeking an associate degree were highly nontraditional, compared with 11 percent of those with a bachelor's degree objective (BPS:90/94 Data Analysis System).

Figure 7—Percentage of 1989–90 beginning postsecondary students according to the year they first interrupted their enrollment, by nontraditional status and initial degree objective

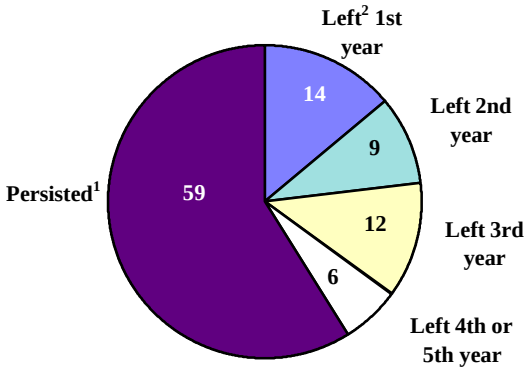


[1]Represents the percentage of students who departed in that year among students still enrolled at the beginning of the year. An interruption is defined as leaving without returning, a downward transfer (e.g., 4-year to 2-year institution with or without an interruption), or a period of interruption of more than 4 months (stopout) and then returning to the same level or higher institution. It is possible for some students who had an interruption to have returned and either attained or still be enrolled.
[2]Nontraditional status refers to the presence of one or more nontraditional characteristics including delayed enrollment, part-time attendance, being independent, working full time while enrolled, having children, being a single parent, or being a recipient of a GED or high school completion certificate.

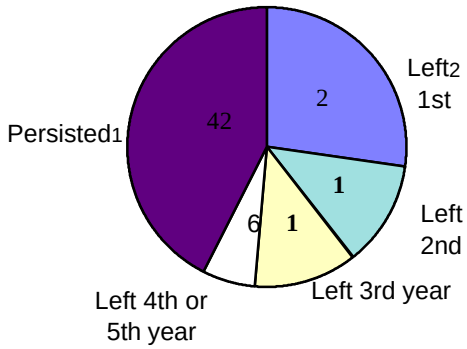
SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Postsecondary Students Longitudinal Study, Second Followup (BPS:90/94).

Figure 8—Percentage of 1989–90 beginning postsecondary students according to their enrollment continuity 5 years after beginning (as of 1994) by nontraditional status and initial degree objective

Bachelor's degree objective

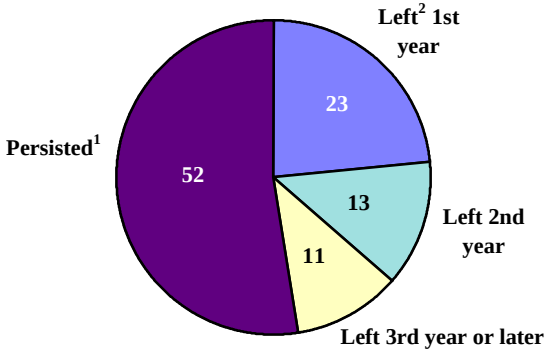


Traditional

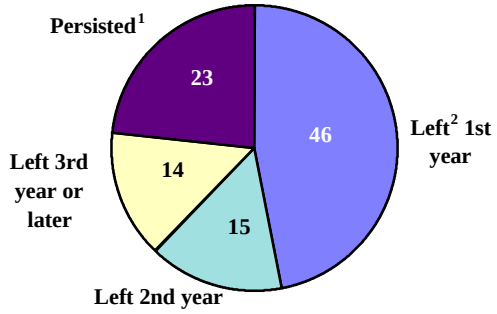


Nontraditional[3]

Associate's degree objective



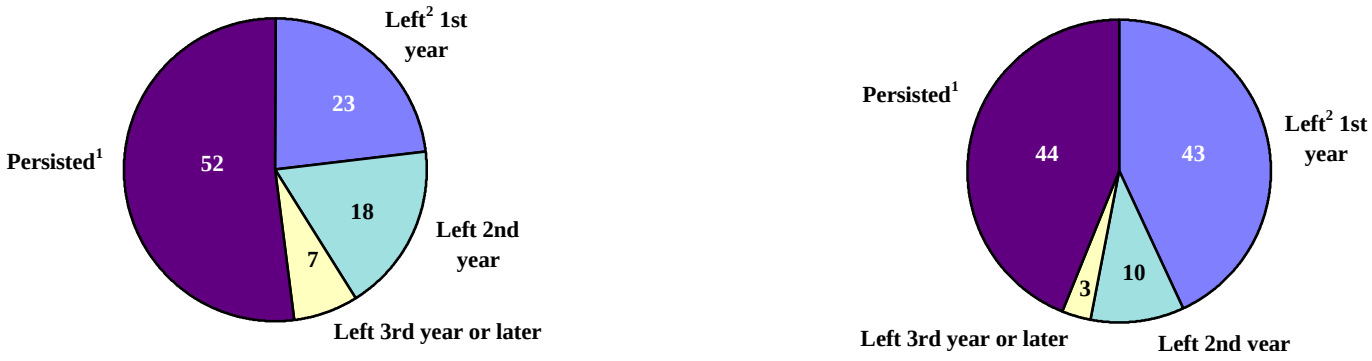
Traditional



Nontraditional[3]

Figure 8—Percentage of 1989–90 beginning postsecondary students according to their enrollment continuity 5 years after beginning (as of 1994), by nontraditional status and initial degree objective—Continued

Vocational certificate objective



[1]Had either attained a degree or were still enrolled in 1994 and had never had an enrollment interruption. It is possible that the degree attained was not the original objective. For example if a student has a BA objective but earned an AA and had no enrollment interruption (defined in footnote 2), that student would be classified as persisted under bachelor's degree objective.

[2]"Left" is defined as leaving without returning, a downward transfer (e.g., 4-year to 2-year institution with or without an interruption), or a period of interruption of more than 4 months (stopout) and then returning to the same or higher level of institution. It is possible for some students who had an interruption to have returned and either attained or still be enrolled.

[3]Nontraditional status is based on the presence of one or more of seven possible nontraditional characteristics. These characteristics include delayed enrollment, part-time attendance, being independent of parents, working full time while enrolled, having dependents, being a single parent, and being a recipient of a GED or a high school completion certificate.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 Beginning Postsecondary Students Longitudinal Study (BPS:89/94), Data Analysis System.

Table 15—Among 1989–90 beginning postsecondary students who had the intention of earning a degree and interrupted their enrollment, the percentage distribution according to type of first interruption, by initial degree objective

	Downward transfer[1]	Stopout[2]	Left without return
Total	31.4	26.4	42.3
Traditional	39.6	28.0	32.4
Nontraditional[3]	27.1	25.5	47.4
Bachelor's degree objective	38.3	30.5	31.3
Traditional	41.5	31.5	27.0
Nontraditional[3]	34.8	29.4	35.8
Associate's degree objective	28.9	25.0	46.1
Traditional	37.3	22.9	39.8
Nontraditional[3]	26.6	25.5	47.8
Certificate objective	17.5	17.9	64.5
Traditional	28.1	11.8	60.0
Nontraditional[3]	15.8	19.0	65.3

[1]Transfered to an institution with a shorter maximum degree offering (e.g., from a 4-year to a 2-year institution) with or without an interruption of enrollment.
[2]Left school for a period of 4 months or more and then returned to the same level of institution.
[3]Nontraditional status refers to the presence of one or more nontraditional characteristics: minimal=1, moderate=2 or 3, high=4 or more. Nontraditional characteristics include delayed enrollment, part-time attendance, being independent, working full time while enrolled, having children, being a single parent, or being a recipient of a GED or high school completion certificate.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Postsecondary Students Longitudinal Study, Second Followup (BPS:90/94).

Relative to their initial degree objectives, students who initially sought a bachelor's degree exhibited similar differences as those found for all leavers. That is, nontraditional and traditional bachelor's degree seekers had similar stopout rates, while those who were nontraditional were more likely to leave without returning by 1994. There were no statistically significant differences between traditional and nontraditional leavers with either an associate's degree or certificate objective with regard to how they interrupted their initial enrollment.

Influence of Individual Nontraditional Characteristics on Persistence and Attainment

As illustrated in Table 11, nontraditional students often have multiple nontraditional characteristics. For example, students who attended part time in their first year of enrollment had an average of 3.3 nontraditional characteristics. In order to measure the influence of a single variable on persistence and attainment, one must control for the effects of related variables. In this

analysis, a weighted least squares regression model was used to measure how each nontraditional characteristic affected persistence and attainment. In the model, the dependent variable is defined as the proportion of undergraduates who had attained any degree (regardless of objective) or who were still enrolled at the time of the 1994 follow-up survey. The independent variables included the seven nontraditional characteristics and the following background and institutional variables: gender, race–ethnicity, socioeconomic status, institution control (public, private, not-for-profit; and private, for-profit), and institutional level (less-than-2-year, 2-year, and 4-year). The regression coefficients were subsequently used to adjust the original estimates of persistence and attainment, taking into account the joint effects of all the independent variables (see appendix B for methodology details).

The results are displayed in Table 16. The original (unadjusted) estimates of the proportion of students who had attained or persisted as of 1994 are in the first column, and the adjusted percentages after controlling for the variation of all other variables are in the second. Asterisks in the these columns identify cases in which the percentage of students in a given category who had attained or persisted is significantly different from the percentage of the reference group (always the last category for each characteristic). For example, part-time enrollment (unadjusted) was associated with lower rates of persistence and attainment compared with full-time enrollment (49 percent compared with 72 percent). This pattern held even after controlling for all other characteristics in the model (58 percent compared with 67 percent, adjusted).

The initial negative associations with persistence and attainment found for several other nontraditional characteristics also remained after controlling for the variation of other variables. These included delaying enrollment, being financially independent, and having a GED or high school certificate of completion.

The initial negative impact on persistence and attainment of the remaining three nontraditional characteristics—working full time in a student's first year of enrollment, having children, or being a single parent—is no longer directly apparent once all other variables are held constant. However, these three characteristics may be indirectly related to persistence and attainment by virtue of the fact that students who work full time, have children, or are single parents are far more likely to attend part time or delay their enrollment than their counterparts (see table 11). The enrollment options of attending part time and delaying enrollment, in turn, have a significant negative effect on persistence and attainment.[28]

[28] A way to test for these indirect effects is to determine whether each of the three characteristics in question significantly affect the likelihood of part-time enrollment or delayed enrollment using regression models where these outcomes are the dependent variables. The results of these models indicated that both working full time and having children had significant effects on part-time and delayed enrollment, but this was not true for single parents. It is possible that the motivation and commitment required for single parents just to enroll in postsecondary education helps to mitigate the potential barriers they face in progressing toward and attaining their educational goals.

Table 16—Percentage of 1989–90 beginning postsecondary students with a degree objective who attained any degree or were still enrolled in 1994, and the adjusted percentage after taking into account the covariation of the variables listed in the table [1]

	Unadjusted percentage[2]	Adjusted percentage[3]	WLS coefficient[4]	Standard error[5]
Total	65.2	65.2	0.742	0.021
Timing of enrollment entry				
Delayed enrollment	48.5*	59.0*	-0.091	0.030
Did not delay	72.9	68.1	†	†
Attendance status 1989–90				
Part-time	48.6*	57.7*	-0.096	0.031
Full-time	71.6	67.3	†	†
Dependency status 1989–90				
Independent	50.9*	59.6*	-0.088	0.026
Dependent	74.2	68.4	†	†
Employment status 1989–90				
Worked full time while enrolled	55.9*	62.9	-0.032	0.020
Did not work full time	69.2	66.1	†	†
Number of children 1989–90				
One or more	49.1*	70.1	0.056	0.035
None	68.0	64.5	†	†
Single parent status 1989–90				
Single parent	49.8*	61.8	-0.036	0.044
Not a single parent	67.0	65.4	†	†
High school diploma or equivalent				
GED or certificate of completion[6]	40.9*	51.3*	-0.148	0.039
High school diploma	67.0	66.1	†	†
Institution level 1989–90				
Less-than-2-year	65.5*	71.6	0.024	0.050
2-year institution	55.2*	60.1*	-0.091	0.030
4-year	75.6	69.2	†	†
Institution control 1989–90				
Private, not-for-profit	77.9*	68.6	0.046	0.026
Private, for-profit	62.7	68.6	0.046	0.042
Public	62.8	64.0	†	†

Table 16—Percentage of 1989–90 beginning postsecondary students with a degree objective who attained any degree or were still enrolled in 1994, and the adjusted percentage after taking into account the covariation of the variables listed in the table [1]—Continued

	Unadjusted percentage[2]	Adjusted percentage[3]	WLS coefficient[4]	Standard error[5]
Gender				
Female	66.4	66.8*	0.034	0.015
Male	64.0	63.4	†	†
Race–ethnicity				
American Indian/Alaskan Native	76.9	82.5	0.176	0.094
Asian/Pacific Islander	77.0	76.5*	0.116	0.041
Black, non-Hispanic	54.9*	56.4*	-0.085	0.034
Hispanic	65.7	72.2	0.073	0.038
White, non-Hispanic	65.9	64.9	†	†
Socioeconomic status 1989–90				
Low quartile	49.1*	60.6	-0.037	0.029
High quartile	74.1*	67.8	0.035	0.020
Middle quartiles	62.3	64.3	†	†

*$p \leq .05$.

†Not applicable for the reference group.

[1]The last group in each category is the reference group being compared.

[2]The estimates are from the BPS:90/94 Data Analysis Systems.

[3]The percentages are adjusted for differences associated with other variables in the table (see appendix B).

[4]Weighted least squares (WLS) coefficient (see appendix B).

[5]Standard error of WLS coefficient, adjusted for design effect (see appendix B).

[6]GED refers to the General Education Development or high school equivalency tests.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Postsecondary Student Longitudinal Study, Second Followup (BPS:90/94), Data Analysis System.

The model also reveals some interesting findings related to student background characteristics. For example, even though the adjusted percentages changed little, women were significantly more likely than men to persist or attain only after controlling for the other variables in the model. This may be related to the fact that women are more likely to be independent,[29] and once this covariation was controlled for, women fared slightly better than men. A similar explanation is possible for the change in significance for the persistence and attainment of Asian/Pacific Islander students as compared with their white counterparts. Asian/Pacific Islander students were more likely than white, non-Hispanic students to be in the lowest socioeconomic status quartile (and low SES students are less likely to persist than those at higher SES levels[30]). However, once SES was controlled for, Asian/Pacific Islanders' persistence and attainment rates were significantly higher than their white, non-Hispanic counterparts.

Not surprisingly, given the higher attrition rates of students with associate degree objectives relative to those with bachelor's degree objectives, students attending 2-year institutions were less likely to persist or attain than those in 4-year institutions, even after controlling for all other variables. Once other variables were held constant, however, students attending less-than-2-year institutions had similar rates of persistence and attainment as those in 4-year institutions. This may be related to the fact that students in less-than-2-year institutions are much more likely to be from low SES backgrounds than those in 4-year institutions,[31] and once SES was controlled for, the persistence and attainment rates no longer differed among students in the two types of institutions. The reduction in the adjusted persistence and attainment rate for students in private, not-for-profit institutions may have been similarly affected in the opposite way. That is, private, not-for-profit institutions have a higher proportion of high SES students than do public institutions,[32] and once SES was controlled for, the persistence and attainment of students in these institutions declined.

Finally, after controlling for the variation of all other variables included in the model, the adjusted persistence and attainment rates for high and low SES students were no longer significantly different from middle SES students. Thus, it appears that SES per se is not directly influencing persistence and attainment; rather, it seems to be related to a number of other characteristics (such as delayed enrollment, part-time attendance, independence, and so on) which in turn negatively affect persistence and attainment.

---

[29] About 29 percent of women were independent students, compared with 22 percent of men. See Berkner et al., *Descriptive Summary of 1989-90 Beginning Postsecondary Students*.

[30] About 22 percent of Asian/Pacific Islander students, compared with 12 percent of white students are in the lowest SES quartile. See Berkner et al., *Descriptive Summary of 1989–90 Beginning Postsecondary Students*.

[31] One-third of students attending less-than-2-year institutions were low SES, compared with 7 percent of students in 4-year institutions (BPS:90/94 Data Analysis System).

[32] 58 percent of students in private, not-for-profit institutions were high SES, compared with 39 percent in public institutions (BPS:90/94 Data Analysis System).

Summary and Conclusions

The term "nontraditional" as applied to students who do not follow an educational path historically perceived as traditional—enrolling full time in college immediately after graduating from high school—has become a misnomer. A clear majority of undergraduates diverge in some manner from this path whether they begin their postsecondary education later in life, interrupt their education and return, or just take longer to progress due to reduced enrollment intensity.

This analysis attempted to characterize the degree to which undergraduates were nontraditional based on the presence of seven possible nontraditional characteristics. These characteristics included delaying enrollment into postsecondary education, attending part time, being independent from parents, having dependents, working full time while enrolled, being a single parent, or having a GED or high school equivalent certificate.

The enrollment trends over the 6-year period from 1986 to 1992 indicated that the prevalence of moderately nontraditional students (those with two or three nontraditional characteristics) increased over the time period from one in four undergraduates in 1986 to almost one in three in 1992. The proportion of highly nontraditional students (those with four or more characteristics), on the other hand, declined from 26 percent to 23 percent.

The results of this study also revealed differences in the enrollment trends of nontraditional undergraduates according to type of institution. Even though moderately and highly nontraditional students were most numerous in public 2-year institutions, there was discernible growth in the nontraditional student population enrolled in 4-year colleges, especially in private, not-for-profit, nondoctoral institutions. These findings suggest that private 4-year colleges, which have historically attracted traditional students, may be reaching out to a less traditional population to maintain their enrollment levels.

Consistent with the findings of earlier research, this study found that nontraditional students, even those who are minimally nontraditional, do not persist in postsecondary education as well as traditional students. For example, one in three minimally nontraditional students left school without a credential, compared with one in five traditional students.

An important consideration when designing and implementing programs to reduce attrition among nontraditional students is to determine when these students leave postsecondary education. Nontraditional students are highly likely to leave in their first year of postsecondary education. However, evidence from this study suggests that the gap in attrition between nontraditional and traditional students closes considerably from the second year on. Thus, it seems crucial that programs aimed at reducing nontraditional attrition rates be implemented from the very start of a student's enrollment in postsecondary education.

Appendix A

Glossary

This glossary describes the variables used in this report, which come from the NPSAS:87, NPSAS:90, NPSAS:93, and BPS:90/94 Data Analysis System (DAS) (see appendix B for a description of the DAS). These variables were either items taken directly from the NPSAS or BPS surveys, or they were derived by combining one or more items in these surveys. For all variables in this glossary, the variable name contained in the DAS is identified in the right-hand column.

The individual variables used to identify nontraditional students in the trend analysis (i.e., the NPSAS variables) are listed first, followed by the description of the nontraditional scale. This section is followed by the corresponding BPS nontraditional variables and the persistence and attainment variables. The final section consists of the institutional variables and student background variables not used in the nontraditional definition.

Glossary Index

Nontraditional Characteristics

Older than typical age	NPSAS:87/90	**TYPAGE**
	NPSAS:93	**TYPAGE2**

This variable was used as a surrogate for determining whether or not a student delayed enrollment into postsecondary education. It determines whether a student is older than typical for undergraduate level (year) in school. Typical age was based on the modal age for each year; anything older was considered older than typical. For all three surveys the variable was based on the variable AGE, which is the reported age as of 12/31 of the survey year (1986, 1989, 1992). Older than typical is defined as:

20 or older in first year
21 or older in second year
22 or older in third year
23 or older in any year

Attend part time	NPSAS:87/90/93	**ATTEND**

Intensity of enrollment in the fall term of the survey year (1986, 1989, 1992) reported by the sample institution (according to institution's definition of part time). It is possible that some students were enrolled in more than one institution, but they were characterized only by their enrollment intensity in the sampled institution.

Full time	Student enrolled full time in the fall
Part time	Student enrolled part time in the fall

Work full time in October

Each NPSAS survey determined this information differently. The following describes each variable for the corresponding survey. The variable represents the average number of hours worked per week in the month of October. Full-time work was defined as working 35 or more hours per week.

NPSAS:87 **EMWKHR3**

Respondents were asked if they were working full or part time during the fall of 1986 (s17), and then asked how many hours they were working at this job (s22). If they reported working in the fall, it was assumed they worked in October.

NPSAS:90 **WHRS4**

Respondents were asked about each job they worked during the year including the dates and average weekly hours. A monthly variable was created by adding all the jobs for each month the student was both working and enrolled. WHRS4 represents the number of hours worked per week in the month of October.

NPSAS:93 **OCTWORK**

In the NPSAS:93 survey, students were asked only about their primary job, so even if they had worked more than one job, they were characterized only according to their primary job. This variable was constructed by first determining if respondent held her or his primary job in October 1992 using the job start and end dates reported by the student. If she or he worked in the month of October, the hours per week worked was assumed from the question "How many hours did you work while attending school?" Note, if students worked during the year and if their work dates were missing (about 5%), it was assumed they worked in October.

Financial independence NPSAS:87 **CMPDEP93**
NPSAS:87/90/93 **DEPEND**

Based on the dependency status determined for federal financial aid purposes. The definition of independence changed between 1986 and 1989. In the latter definition, all students who reached the age of 24 by December 31 in the survey year were considered independent. This resulted in a substantial increase in the proportion of independent students due only to the change in definition. Therefore, for the sake of comparability, the new definition was applied to the 1986 sample of students. The way this was accomplished was to re-code all 1986 dependent students who were age 24 by December 31, 1986 as independent.

Independent

Student was considered independent by meeting one of the following criteria:

(1) 24 years of age by December 31 of survey year;
(2) a military veteran;
(3) a ward of the court or both parents are deceased;
(4) had legal dependents other than a spouse;[33]
(5) was married or a graduate student and not claimed as a tax exemption for the 2 years previous to the beginning of the academic year and had at least $4,000 in financial resources;

[33]This particular item was also considered a nontraditional characteristic. Therefore, if a student had dependents, he or she automatically had two nontraditional characteristics—having dependents and being financially independent.

(6) was a single undergraduate but not claimed as a tax exemption for the 2 years previous to the beginning of the academic year and had at least $4,000 in financial resources.

Dependent — Students were considered financially dependent if they did not meet any of the criteria for independence.

Nonspouse dependents — NPSAS:87/93 **RDEPENDS**; NPSAS:90 **NUMDEPNDS**

Any student with dependents other than a spouse was coded as having dependents. Dependents were most often children but could include other family members such as elderly parents.

Single parent — NPSAS:87/90/93 **SINGLPAR**

A student who was not married in the survey year but had nonspouse dependents was coded as a single parent.

GED recipient or high school completion certificate

NPSAS:87/90/93 **HSDEG**

Student received a GED (General Education Development) certificate or a certificate of high school completion. Students who never completed high school (about 2 percent of NPSAS samples) were excluded from the analysis because of their limited access to 4-year institutions.

Nontraditional scale — NPSAS:87/90/93 **RISKNDX2**

Represents an index based on the sum of seven nontraditional characteristics:

Older than typical age for year in school
Attend on a part-time basis
Financially independent
Have dependents other than spouse
Worked full time in October
Single parent
GED recipient or high school completion certificate

Traditional	No nontraditional characteristics
Minimally nontraditional	1 nontraditional characteristic
Moderately nontraditional	2 or 3 nontraditional characteristics
Highly nontraditional	4 or more nontraditional characteristics

BPS Persistence and Attainment Analysis

Nontraditional Characteristics

Delayed postsecondary enrollment **DELAYENR**

Students who did not enter postsecondary education in the same calendar year as high school graduation were considered to have delayed their enrollment. Students who did not graduate from high school, but received a GED or a certificate of high school completion, were also considered to have delayed enrollment. Most of these students were GED recipients, a majority of whom received their GED a year or more after leaving high school. Thus even if these students entered postsecondary education in the same calendar year as they received their GED, they were still considered to have delayed because of the elapsed time from leaving high school. In a very small number of cases (less than 0.2 percent) students may have earned a certificate of completion before or at the expected time of high school graduation (i.e., they were 18 or younger).

Attend part time **ATT8990**

Student attended part time when he or she first began postsecondary education in 1989–1990.

Worked full time while enrolled **HRS8990**

Employment status when student began postsecondary education in 1989–90. Full time was defined as working 35 or more hours per week during those months when enrolled for at least part of the month. If the student was employed (including college work-study) during a given month, the average number of hours worked per week across all jobs held during the month was derived based on the start and end dates and the average hours worked per week of each job as reported during the interview. In calculating this average, the denominator was increased by 1 if the student was employed and enrolled at any time during the month. For this variable, employment was only considered if the student was enrolled during part of the month. For example, if students worked 20 hours per week for three months during the year they were enrolled, but worked 40 hours per week at other times, their value for this variable would be 20 (i.e., in deriving this variable, the hours employed while not enrolled were ignored).

Financial independence **DEP8990**

An independent student was one who was not claimed as an exemption on his or her parents' 1988 federal income tax return. Note, this variable differs from the one used for the NPSAS trend analysis (see Financial Independence under NPSAS Trend Analysis), which is based on federal financial aid criteria. The BPS definition was used because it was believed to be a more accurate representation of a student's actual financial status when they began postsecondary education (this information was not available for NPSAS participants). However, more than 90 percent of students identified as independent according to financial aid criteria were also identified as independent for federal tax purposes.

Dependent children **KIDS8990**

Student had child(ren) living in household when he or she first began postsecondary education in 1989–90.

Single parent status **SING8990**

Students were considered single parents if they reported having child(ren) but were never married, divorced, widowed, or separated when they first began postsecondary education in 1989–90.

GED recipient or high school completion certificate **H_HSDIP**

Student received a GED (General Education Development) certificate or a certificate of high school completion.

Nontraditional scale **ATRS8990**

Represents an index based on the sum of seven nontraditional characteristics:

- Delayed enrollment into postsecondary education
- Attended on a part-time basis when first began in 1989–90
- Financially independent in 1989–90 according to federal income tax criteria
- Had children living in household in 1989–90
- Worked full time while enrolled during any period of 1989–90 enrollment
- Single parent in 1989–90
- GED or high school completion certificate

Traditional	No nontraditional characteristics
Minimally nontraditional	1 nontraditional characteristic
Moderately nontraditional	2 or 3 nontraditional characteristics
Highly nontraditional	4 or more nontraditional characteristics

Persistence and Attainment Variables

Initial degree objective **GOAL8990**

Student's reported degree objective when first enrolled in 1989–90. This variable was used to subset the BPS sample so that only students with a specific degree objective were included in the persistence and attainment analysis.

Certificate	Student reported working toward a certificate or formal award other than an associate's or bachelor's degree.

Associate's degree	Student reported working toward an associate's degree.
Bachelor's degree	Student reported working toward a bachelor's degree.

Overall persistence and attainment in postsecondary education **PERACUM**

Refers to persistence and attainment toward any degree as of spring 1994.

Attained degree	Student had attained any degree.
No degree, enrolled	Student had not attained a degree and was enrolled.
No degree, not enrolled	Student had not attained a degree and was not enrolled.

Persistence and attainment toward specific degree

Represents the persistence and attainment patterns of students according to specific degree objectives. Students who*ever* reported the objective were classified for that degree variable. Therefore, some students were classified for more than one degree. For example, if a student began with a bachelor's degree objective and had not attained the degree as of 1994, it was determined whether the student had reported a new degree intention, such as an associate's degree, subsequent to the bachelor's degree objective. If so, that student would be coded as having changed objectives for the bachelor's degree variable and also classified according to his or her status toward an associate's degree. For students who ever specified a degree, but had not attained it by 1994, they were coded in one of three ways: enrolled toward the degree in 1994, not enrolled toward the degree in 1994 and never changed degree objective, or changed degree objective. Students classified as having changed their degree objective may or may not be enrolled in the spring of 1994.

Associate's degree	**PERAAA**
Bachelor's degree	**PERABA**
Certificate	**PERACT**

Attained degree	Student had attained the degree objective as of spring 1994.
Enrolled toward degree objective	Student was enrolled toward the degree as of spring 1994.

Not enrolled, never changed degree objective	Student had not attained the degree objective, had never changed degree objective, and was not enrolled in postsecondary education in spring 1994.
Changed degree objective	Student had not attained the reported degree objective, was no longer working toward this degree, but had subsequently enrolled toward a different degree objective. Students in this category were also classified according to the new degree objective.

Timing of departure from the persistence track **LEFTYR**

Academic year the student first departed from the "persistence track." Persistence track refers to enrollment continuity and is defined as uninterrupted year-to-year enrollment at the institution level the student first enrolled. A departure from the persistence track is defined in one of three ways: a downward transfer (e.g., from a 4-year to a 2-year institution, or from a 2-year to a less-than-2-year institution) with or without an enrollment interruption, an interruption in enrollment of more than 4 months and returning to the same or higher level institution (stopout), or leaving school and not returning as of the spring 1994 followup. LEFTYR identifies a student's persistence track status and the academic year of a nonpersister's first departure. Note that this variable is not connected to a specific degree objective, but in the report is presented according to students' initial degree objectives. It is possible that students identified as persisters may have either attained or be working toward a degree other than the initial objective. For example, if a student enrolled in a 4-year college with a bachelor's degree objective earned an associate's degree at the same level institution and never interrupted his or her enrollment, that student would be classified as a persister.

Persisted (no interruption)	Student did not depart from the persistence track.
First year departure	Student's first departure from the persistence track occurred during the 1989–90 academic year.
Second year departure	Student's first departure from the persistence track occurred during the 1990–91 academic year.
Third year departure	Student's first departure from the persistence track occurred during the 1991–92 academic year.
Fourth year departure	Student's first departure from the persistence track occurred during the 1992–93 academic year.
Fifth year departure	Student's first departure from the persistence track occurred during the 1993–94 academic year.

First type of departure from the persistence track **LEFTPT**

The manner in which student first departed from enrollment persistence track (see LEFTYR above) among those who ever departed.

Downward transfer	Before degree attainment or last enrollment student transferred to a lower level institution (with or without a break in enrollment continuity).
Stopout	Before degree attainment or last enrollment student left and re-enrolled at the same or higher level of institution after a period of more than 4 months.
Left without return	Before degree attainment or last enrollment student left school and had not re-enrolled in postsecondary education as of spring 1994.

Institutional Characteristics

Level of institution

Aggregates level and control of institution according to level. For the BPS survey, level refers to the first institution attended.

	NPSAS:87/90/93 BPS:90/94	**LEVEL** **OFCO899O**
Less-than-2-year	An institution whose normal program of study is less than 2 years in duration.	
2-year	An institution whose program of study results in an award or degree below the baccalaureate level, and is at least 2 years but less than 4 years in duration. These institutions include many community and junior colleges.	
4-year	An institution that offers 4-year baccalaureate degrees. These institutions may or may not also offer master's, doctoral, or first-professional degrees in one or more programs as the highest degree awarded.	

Control of institution

Aggregates level and control of institution according to control. For BPS, control refers to first institution attended.

	NPSAS:87/90/93 BPS:90/94	**CONTROL** **OFCO8990**
Public	A postsecondary educational institution operated by publicly elected or appointed school officials in which the program and activities are under the control of these officials and that is supported primarily by public funds.	
Private, not-for-profit	A postsecondary educational institution that is controlled by an independent governing board and incorporated under Section 501(c)(3) of the Internal Revenue Code.	
Private, for-profit	A postsecondary educational institution that is privately owned and operated as a profit-making enterprise. These institutions include career colleges and proprietary institutions.	

Level and control of first institution	NPSAS:87/90 NPSAS:93	**OFCON1** **SECTOR_B**

See definitions above for control and level. The only added information in this variable is whether or not a 4-year institution has a doctoral or first-professional program. Nondoctorate-granting institutions may offer up to a master's degree as their highest award.

Public
- Less-than-2-year
- 2-year
- 4-year nondoctorate granting
- 4-year doctorate granting

Private, not-for-profit
- Less-than-4-year
- 4-year nondoctorate granting
- 4-year doctorate granting

Private, for-profit

Student Characteristics

The following variables were used in the multivariate analysis as independent variables describing student background characteristics. All were taken from the BPS:90/94.

Gender	BPS:90/94	**H_GENDER**
Male	Student was male.	
Female	Student was female.	

Race–ethnicity of student	BPS:90/94	**BPSRACE**
Asian/Pacific Islander	A person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or Pacific Islands. This includes people from China, Japan, Korea, the Philippine Islands, Samoa, India, and Vietnam.	
Black, non-Hispanic	A person having origins in any of the black racial groups of Africa, not of Hispanic origin.	
Hispanic	A person of Mexican, Puerto Rican, Cuban, Central or South America or other Spanish culture or origin, regardless of race.	
American Indian/Alaskan Native	A person having origins in any of the original peoples of North America and who maintains cultural identification through tribal affiliation or community recognition.	
White, non-Hispanic	A person having origins in any of the original peoples of Europe, North Africa, or the Middle East (except those of Hispanic origin).	

Socioeconomic status	BPS:90/94	**SESPERC**

Composite variable combining parent's education and occupation, dependent student's family income, and the existence of a series of material possessions in respondent's home.

Lowest quartile	Socioeconomic status fell at or below the lowest 25th percentile.

Middle quartiles	Socioeconomic status fell between the 25th percentile and the 75th percentile.
Highest quartile	Socioeconomic status fell at or above the 75th percentile.

Appendix B

Technical Notes and Methodology

The National Postsecondary Student Aid Study: 1986–87, 1989–90, 1992–93

The need for a nationally representative database on postsecondary student financial aid prompted the U.S. Department of Education to conduct the National Postsecondary Student Aid Study (NPSAS), a survey conducted every three years beginning in 1987. The NPSAS sample was designed to include students enrolled in all types of postsecondary education. Thus, it included students enrolled in public institutions; private, not-for-profit institutions; and private, for-profit institutions. The sample included students at 4-year and 2-year institutions, as well as students enrolled in occupationally specific programs that lasted for less than 2 years. United States service academies were not included in the institution sample because of their unique funding and tuition base, and certain other type of institutions were also excluded.[34]

NPSAS surveys include a stratified sample of approximately 50,000 students (about 90% of whom were undergraduates) from about 1,100 institutions. Students were included in the samples if they attended a NPSAS-eligible institution; were enrolled on October 15, 1986 in the NPSAS:87 survey, and between July 1 and June 30 of the academic year of the survey for the NPSAS:90 and NPSAS:93 surveys; and were enrolled in one or more courses or programs including courses for credit, a degree or formal award program of at least 3 months' duration, or an occupationally or vocationally specific program of at least 3 months' duration. Regardless of their postsecondary status, however, students who were also enrolled in high school were excluded. NPSAS:87 differed from NPSAS:90 and NPSAS:93 in that the sample represents postsecondary students enrolled in the fall term only. The subsequent surveys represent students enrolled in all terms.

The NPSAS survey samples, while representative and statistically accurate, are not simple random samples. Instead, the samples are selected using a more complex three-step procedure with stratified samples and differential probabilities of selection at each level. First, postsecondary institutions are initially selected within geographical strata. Once institutions are organized by zip code and state, they are further stratified by control (i.e., public; private, not-for-profit; or private, for-profit) and offering (less-than-2-year, 2-year, 4-year nondoctorate-granting, and 4-year doctorate-granting). Sampling rates for students enrolled at different institutions and levels (undergraduate or other) vary, resulting in better data for policy purposes, but at a cost to statistical efficiency.

[34]Other excluded institutions were those offering only avocational, recreational, or remedial courses; those offering only in-house business courses; those offering only programs of less than 3 months' duration; and those offering only correspondence courses.

For each student in the NPSAS sample, there are up to three sources of data. First, institution registration and financial aid records are extracted. Second, a Computer Assisted Telephone Interview (CATI) is conducted with each student.[35] Finally, a CATI designed for the parents or guardians of a subsample of students is conducted. Data from these three sources are synthesized into a single system with overall response rates of about 67 percent, 89 percent, and 85 percent, respectively, for NPSAS:87, NPSAS:90, and NPSAS:93.

For more information on the NPSAS surveys, consult the three corresponding methodology reports—*Methodology Report for the National Postsecondary Student Aid Study* (1987, 1989, and 1992, Washington, D.C.: U.S. Department of Education, National Center for Education Statistics).

Beginning Postsecondary Student Longitudinal Study

The Beginning Postsecondary Student Longitudinal Study (BPS) follows NPSAS:90 students who enrolled in postsecondary education for the first time in 1989–90. The first followup was conducted in spring 1992 and the second in spring 1994. BPS collected information from students on their persistence, progress, and attainment and on their labor force experience using a CATI. Approximately 8,000 students were included in the BPS sample with an overall response rate of 91 percent.

Unlike other NCES longitudinal surveys (such as High School and Beyond) which are based on age-specific cohorts, the BPS sample is more likely to include some of the increasing numbers of "nontraditional" postsecondary students, such as those who have delayed their education due to financial needs or family responsibilities. Students who began their postsecondary studies during some other period and then returned to them in 1989–90, however, were not included nor were those who were still enrolled in high school.

Accuracy of Estimates

The statistics in this report are estimates derived from a sample. Two broad categories of error occur in such estimates: sampling and nonsampling errors. Sampling errors occur because observations are made only on samples of students, not on entire populations. Nonsampling errors occur not only in sample surveys but also in complete censuses of entire populations.

Nonsampling errors can be attributed to a number of sources: inability to obtain complete information about all students in all institutions in the sample (some students or institutions refused to participate, or students participated but answered only certain items); ambiguous definitions; differences in interpreting questions; inability or unwillingness to give correct information; mistakes in recording or coding data; and other errors of collecting, processing, sampling, and imputing missing data.

[35] The CATI system was begun in 1989–90, NPSAS:87 was a mailed questionnaire.

Data Analysis System

The estimates presented in this report were produced using the NPSAS:87, NPSAS:90, NPSAS:93 Undergraduate Data Analysis Systems (DAS), and the BPS:90/94 DAS. The DAS software makes it possible for users to specify and generate their own tables from the NPSAS data. With the DAS, users can re-create or expand upon the tables presented in this report. In addition to the table estimates, the DAS calculates proper standard errors[36] and weighted sample sizes for these estimates. For example, tables B1 and B2 present the standard errors that corresponds to table 2 and table 12, respectively in the text. If the number of valid cases is too small to produce an estimate, the DAS prints the message "low-N" instead of the estimate.

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 (DEFT) for all the variables identified in the matrix. Since statistical procedures generally compute regression coefficients based on simple random sample assumptions, the standard errors must be adjusted with the design effects to take into account the NPSAS stratified sampling method. (See discussion under "Statistical Procedures" below for the adjustment procedure.)

For more information about the NCES NPSAS:87, NPSAS:90, NPSAS:93, and BPS:90/94 Data Analysis Systems, contact:

Aurora D'Amico
NCES Longitudinal Studies Branch
555 New Jersey Avenue, NW
Washington, DC 20208-5652
(202) 219-1365
Internet address: Aurora_D'Amico@ED.GOV

Statistical Procedures

Two types of statistical procedures were employed in this report: testing differences between means, and adjustment of means after controlling for covariation among a group of variables. Each procedure is described below.

Differences Between Means

The descriptive comparisons were tested in this report using Student's *t* statistic. Differences between estimates are tested against the probability of a Type I error, or significance level. The significance levels were determined by calculating the Student's *t* values for the differences

[36] The NPSAS and BPS 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 the linear terms of a Taylor series expansion. The procedure is typically referred to as the Taylor series method.

between each pair of means or proportions and comparing these with published tables of significance levels for two-tailed hypothesis testing.

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. Note that this formula is valid only for independent estimates. When the estimates were not independent (for example, when comparing the percentages across a percentage distribution), a covariance term was added to the denominator of the *t* test formula.

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

A second hazard in reporting statistical tests for each comparison occurs when making multiple comparisons among categories of an independent variable. For example, when making paired comparisons among different levels of income, the probability of a Type I error for these comparisons taken as a group is larger than the probability for a single comparison. When more than one difference between groups of related characteristics or "families" are tested for statistical significance, one must apply a standard that assures a level of significance for all of those comparisons taken together.

Comparisons were made in this report only when $p \leq .05/k$ for a particular pairwise comparison, where that comparison was one of *k* tests within a family. This guarantees both that the individual comparison would have $p \leq .05$ and that for *k* comparisons within a family of possible comparisons, the significance level for all the comparisons will sum to $p \leq .05$.[37]

For example, in a comparison of the percentages of males and females who enrolled in postsecondary education only one comparison is possible (males versus females). In this family, $k=1$, and the comparison can be evaluated without adjusting the significance level. When students are divided into five racial-ethnic groups and all possible comparisons are made, then $k=10$ and the significance level of each test must be $p \leq .05/10$, or $p \leq .005$. The formula for calculating family size (k) is as follows:

[37]The standard that $p \leq .05/k$ for each comparison is more stringent than the criterion that the significance level of the comparisons should sum to $p \leq .05$. For tables showing the *t* statistic required to ensure that $p \leq .05/k$ for a particular family size and degrees of freedom, see Olive Jean Dunn, "Multiple Comparisons Among Means," *Journal of the American Statistical Association* 56: 52–64.

$$k = \frac{j(j-1)}{2} \quad (2)$$

where j is the number of categories for the variable being tested. In the case of race–ethnicity, there are five racial–ethnic groups (American Indian, Asian/Pacific Islander, black non-Hispanic, Hispanic, and white non-Hispanic), so substituting 5 for j in equation 2,

$$k = \frac{5(5-1)}{2} = 10$$

Adjustment of Means

Tabular results are limited by sample size when attempting to control for additional factors that may account for the variation observed between two variables. For example, when examining the percentages of those who completed a degree, it is impossible to know to what extent the observed variation is due to socioeconomic status (SES) differences and to what extent it is due to differences in other factors related to SES, such as type of institution attended, intensity of enrollment, and so on. However, if a nested table were produced showing SES within type of institution attended, within enrollment intensity, the cell sizes would be too small to identify the patterns. When the sample size becomes too small to support controls for another level of variation, one must use other methods to take such variation into account.

To overcome this difficulty, multiple linear regression was used to obtain means that were adjusted for covariation among a list of control variables. Adjusted means for subgroups were obtained by regressing the dependent variable on a set of descriptive variables such as gender, race–ethnicity, SES, etc. Substituting ones or zeros for the subgroup characteristic(s) of interest and the mean proportions for the other variables results in an estimate of the adjusted proportion for the specified subgroup, holding all other variables constant. For example, consider a hypothetical case in which two variables, age and gender, are used to describe an outcome, Y (such as completing a degree). The variables age and gender are recoded into a dummy variable representing age and a dummy variable representing gender:

Age	A
24 years or older	1
Under 24 years old	0

and

Gender	G
Female	1
Male	0

The following regression equation is then estimated from the correlation matrix output from the DAS:

$$\hat{Y} = a + \beta_1 A + \beta_2 G \quad (3)$$

To estimate the adjusted mean for any subgroup evaluated at the mean of all other variables, one substitutes the appropriate values for that subgroup's dummy variables (1 or 0) and the mean for the dummy variable(s) representing all other subgroups. For example, suppose we had a case where Y was being described by age (A) and gender (G), coded as shown above, and the means for A and G are as follows:

Variable	Mean
A	0.355
G	0.521

Suppose the regression equation results in:

$$\hat{Y} = 0.15 + (0.17)A + (0.01)G \quad (4)$$

To estimate the adjusted value for older students, one substitutes the appropriate parameter values into equation 3.

Variable	Parameter	Value
a	0.15	—
A	0.17	1.000
G	0.01	0.521

This results in:

$$\hat{Y} = 0.15 + (0.17)(1) + (0.01)(0.521) = 0.325 \quad (5)$$

In this case the adjusted mean for older students is 0.325 and represents the expected outcome for older students who look like the average student across the other variables (in this example, gender).

It is relatively straightforward to produce a multivariate model using NPSAS or BPS:90/94 data, since one of the output options of the DAS is a correlation matrix, computed using pair-wise missing values[38]. This matrix can be used by most commercial regression packages as the input data to produce least-squares regression estimates of the parameters. That was the general approach used for this report, with two additional adjustments described below to

[38] Although the DAS simplifies the process of making regression models, it also limits the range of models. Analysts who wish to use other than pairwise treatment of missing values or to estimate probit/logit models can apply for a restricted data license from NCES.

incorporate the complex sample design into the statistical significance tests of the parameter estimates.

Most commercial regression packages assume simple random sampling when computing standard errors of parameter estimates. Because of the complex sampling design used for the NPSAS and BPS surveys, this assumption is incorrect. A better approximation of their standard errors is to multiply each standard error by the average design effect of the dependent variable (DEFT),[39] where the DEFT is the ratio of the true standard error to the standard error computed under the assumption of simple random sampling. It is calculated by the DAS and produced with the correlation matrix.

[39]The adjustment procedure and its limitations are described in C.J. Skinner, D. Holt, and T.M.F. Smith, eds. *Analysis of Complex Surveys* (New York: John Wiley & Sons, 1989).

Table B1—Standard errors for report table 2: composition of undergraduates according to nontraditional (NT) characteristics among all undergraduates in the fall of 1986, 1989, and 1992

		Nontraditional characteristics							
	Year	Percent with any NT characteristics	Older than typical	Attend part time	Work full time	Independent[1]	Have dependents	Single parent	GED or high school completion certificate
All undergraduates	86	0.86	0.82	1.01	0.71	0.77	0.51	0.26	0.28
	89	0.81	0.90	1.05	0.64	0.88	0.62	0.35	0.25
	92	0.76	0.75	0.95	0.66	0.74	0.51	0.26	0.24
Nontraditional undergraduates:		Total percent with status							
Minimally nontraditional	86	0.30	1.12	1.04	0.77	0.69	0.00	0.00	0.46
	89	0.32	1.04	1.25	1.11	0.52	0.00	0.00	0.21
	92	0.30	1.13	1.20	0.68	0.58	0.00	0.00	0.16
Moderately nontraditional	86	0.49	0.62	0.54	0.96	1.08	0.62	0.12	0.48
	89	0.48	0.54	1.23	0.93	0.89	0.62	0.20	0.35
	92	0.50	0.33	1.04	0.82	0.77	0.50	0.24	0.31
Highly nontraditional	86	0.68	0.14	0.13	0.95	0.11	0.98	0.85	0.77
	89	0.77	0.13	0.78	0.87	0.07	0.90	0.95	0.71
	92	0.61	0.18	0.79	0.91	0.05	0.79	0.89	0.70

SOURCES: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study: 1986–87 (NPSAS:87), 1989–90 (NPSAS:90), 1992–93 (NPSAS:93), Data Analysis Systems.

Table B2—Standard errors for report table 12: percentage distribution of all 1989–90 beginning postsecondary students with a degree goal according to their persistence and attainment, by nontraditional status

	Attained any degree	No degree attained, enrolled in 1994	No degree attained, not enrolled in 1994
Total	1.09	0.76	1.07
Traditional	1.40	0.95	1.22
Nontraditional	1.43	1.08	1.49
Minimally nontraditional	2.08	1.59	1.88
Moderately nontraditional	2.50	2.02	2.85
Highly nontraditional	3.07	2.25	3.09

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Postsecondary Studen Longitudinal Study, Second Followup (BPS:90/94).