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Minority Undergraduate Participation in Postsecondary Education

Contractor Report

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Highlights

The purpose of this report is to provide information concerning minority undergraduate participation in postsecondary education based on the National Postsecondary Student Aid Study (NPSAS:90) and to examine postsecondary persistence among racial–ethnic groups using the longitudinal component of NPSAS:90: Beginning Postsecondary Students (BPS:90/92).

- After a dramatic increase in minority enrollment in the 1960s and 1970s, there was uneven progress made in the decade between 1980 and 1990. For example, the proportion of black, non-Hispanic students enrolled in institutions of higher education changed little between 1980 and 1990, ranging from 9.2 percent of the higher education population in 1980 to 8.7 percent in 1988, and rising again to 8.9 percent in 1990. It is encouraging to note, however, that the share of black, non-Hispanic students increased to 9.6 percent in 1992. This recent increase in black, non-Hispanic enrollment rates was noted for both males (7.6 to 8.2 percent) and females (10.0 to 10.8 percent).

- American Indians/Alaskan Natives also experienced little growth in enrollment in the 1980s, but their enrollment increased from 103,000 to 119,000 between 1990 and 1992, representing an increase of 0.1 percent in their proportion among all undergraduates enrolled in higher education (0.7 to 0.8 percent).

- Among black, non-Hispanic undergraduates, nearly two-thirds of students enrolled were women, compared with 53 percent of Hispanics and 55 percent of white, non-Hispanic students.

- Black, non-Hispanic and Hispanic students were more likely to be enrolled in private, for-profit institutions (20 percent and 15 percent, respectively), and less likely to be enrolled in 4-year colleges or universities than were white, non-Hispanic students. American Indians/Alaskan Natives were also less likely than white, non-Hispanic students to be enrolled in 4-year institutions.

- On the other hand, American Indians/Alaskan Natives; black, non-Hispanics; and Hispanic undergraduates were no less likely than white, non-Hispanic students to aspire to a bachelor's or advanced degree.

  Undergraduates who attended historically black colleges or universities (HBCUs) were more likely to aspire to an advanced degree than were students at other 4-year colleges or universities.

- Persistence rates for 1989–90 beginning postsecondary students pursuing a bachelor's degree tended to be higher for Asian/Pacific Islander students than for black, non-Hispanic or Hispanic students. (Nearly 70 percent of Asians/Pacific

Islanders were continuously enrolled through spring 1992, compared with 50 percent of black, non-Hispanic students and 46 percent of Hispanic students.) However, white, non-Hispanic students' persistence rates (58 percent), did not differ significantly from any other group.

- In 1989–90, undergraduates of all racial–ethnic minority groups were less well off financially than their white, non-Hispanic peers: one-third or more of minority students, including 41 percent of black, non-Hispanic students, were in the lowest family income quartile, compared with about 20 percent of white, non-Hispanic students.

- Among Hispanic ethnic groups, however, Cuban Americans were much more affluent than Mexican Americans and Puerto Ricans: 37 percent of Cuban Americans were in the highest income quartile, compared with about 16 percent of either Mexican Americans or Puerto Ricans.

- Among Asian ethnic groups, Vietnamese undergraduates were among the poorest, with about two-thirds of these students in the lowest income quartile.

Acknowledgments

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Foreword

This report describes the educational experiences of undergraduate minority students for the academic year 1989–90, and the persistence of those minority students who first began their education in 1989–90 as of spring 1992. Specifically, it examines the institutions in which minority undergraduates first enrolled and the reasons they chose to attend these institutions; their degree objectives; and their educational aspirations. Persistence of beginning postsecondary minority undergraduates is presented according to attainment for sub-baccalaureate awards and 3-year persistence rates for those pursuing bachelor's degrees.

The report relies primarily on data from the 1989–90 National Postsecondary Student Aid Study (NPSAS:90) and the first followup of its longitudinal component, the Beginning Postsecondary Students (BPS:90/92) Survey. The NPSAS:90 survey was designed to answer fundamental questions about financial aid and to examine undergraduates' educational expenses, sources, and types of financial aid. The BPS:90/92 survey was designed to follow students just beginning their postsecondary education and to provide information about enrollment, persistence, and attainment.

The NPSAS and BPS data supplement and expand upon the "Fall Enrollment" data routinely collected as part of the Integrated Postsecondary Education Data System (IPEDS) from postsecondary institutions. The latest IPEDS report describing minority enrollments is *Trends in Enrollment in Higher Education, by Racial/Ethnic Category: Fall 1982 Through Fall 1992* (NCES 94-104, March 1994).

The estimates presented in this report were produced using the NPSAS:90 and BPS:90/92 Data Analysis Systems (DAS). The DAS is a microcomputer application that allows users to specify and generate their own tables from the NPSAS and BPS data. The DAS produces design-adjusted standard errors 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.

Table of Contents

List of Tables

List of Figures

Introduction

The transition of the American economy away from manufacturing toward high technology and service industries has made postsecondary education a virtual prerequisite for economic and social advancement. Currently, it is estimated that about 20 percent of all available job openings require 4 years or more of college, and the U.S. Department of Labor estimates the proportion will be 27 percent by the year 2000.[1]

At the same time, there have been dramatic shifts in the nation's demographic profile as non-white and Hispanic populations are becoming an ever larger proportion of the college-age population. The U.S. Bureau of the Census estimates that by the year 2000, nearly one-third of the entire school-age population (5–24 years old) will be non-white or Hispanic.[2] Furthermore, by the end of this century, about 40 percent of the nation's work force will be immigrants who arrived after 1980 (or their descendants).[3] The Population Reference Bureau projects that about half of all Americans will be Hispanic, Asian, or black by the year 2080 if current trends continue.[4]

Concurrent with increasing proportions of minorities in the school-age population has been a decline in the overall college-age population and, thus, in the number of entry-level workers. This shrinking entry-level labor force offers minorities opportunities for advancement provided postsecondary education institutions offer adequate training to meet the demand.[5]

Enrollment of Minority Students in Higher Education: 1980–1992

After a dramatic increase in minority enrollment in the 1960s and 1970s, there was uneven progress made in the decade between 1980 and 1990 (figure 1).[6] For example, the proportion of black, non-Hispanic students enrolled in institutions of higher education changed little between 1980 and 1990, ranging from 9.2 percent of the higher education population in 1980 to 8.7 percent in 1988, and rising once again to 8.9 percent in 1990. It is encouraging to note, however, that the share of black, non-Hispanic students increased

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[1]U.S. Department of Labor, Bureau of Labor Statistics, "BLS Previews the Economy of the Year 2000," 1987.

[2]U.S. Bureau of the Census, 1986, cited in *The Road to College: Educational Progress by Race and Ethnicity*, a joint publication of the Western Interstate Commission for Higher Education and The College Board (Boulder, CO: 1991).

[3]Cited in "A Difference of Degrees: State Initiatives to Improve Minority Student Achievement," (Denver, CO: State Higher Education Executive Officers Association, 1987); 17.

[4]Ibid.

[5]Ibid.

[6]For a detailed review of minority enrollment, attrition, and completion in higher education, see D.J. Carter and R.W. Wilson, *Minorities in Higher Education: 12th Annual Status Report* (Washington, DC: American Council on Education, Office of Minorities in Higher Education, 1993).

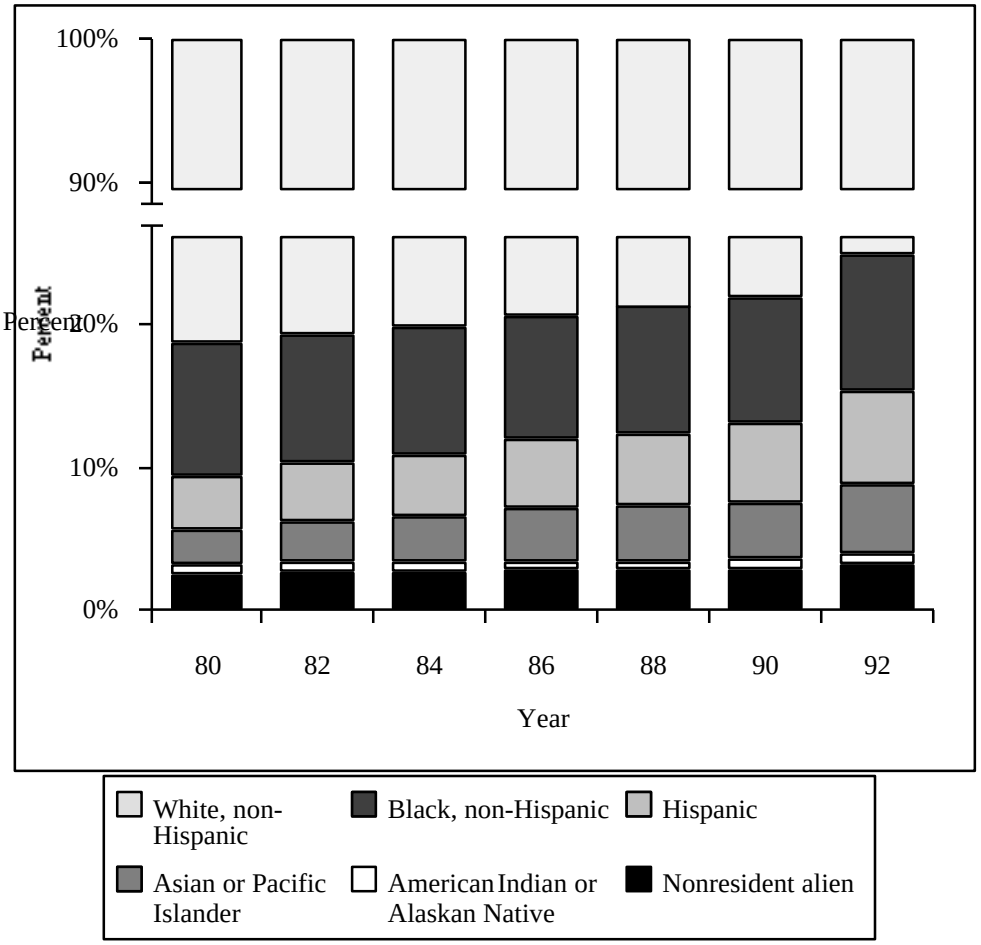
to 9.6 percent in 1992. This recent increase in enrollment was noted for both black, non-Hispanic males (7.6 to 8.2 percent) and females (10.0 to 10.8 percent) (figures 2 and 3).[7]

American Indians/Alaskan Natives also experienced little growth in enrollment in the 1980s; however, like black, non-Hispanic students, their enrollment rose between 1990 and 1992, from 103,000 students to 119,000, representing an increase of 0.1 percent in their proportions among all students in higher education (0.7 to 0.8 percent). Hispanic and Asian/Pacific Islander students, on the other hand, experienced more continual growth in enrollment over the 12-year period between 1980 and 1992. Asian/Pacific Islander students doubled their enrollment rate from 2.4 percent in 1980 to 4.8 percent of the total higher education population in 1992; during the same period, Hispanics increased their enrollment rates from 3.9 to 6.6. In contrast to Asians/Pacific Islanders, however, Hispanics were more heavily concentrated in 2-year institutions than in 4-year institutions (9.5 percent compared with 4.7 percent) (figures 4 and 5).[8]

Even though minorities constitute an increasing proportion of college students, they are still underrepresented in postsecondary education (table 1). In 1990, for example, nearly 29 percent of the population aged 18–24 were non-white or Hispanic, whereas about 23 percent were enrolled in higher education in the same year. Minority representation further declined with respect to degree attainment in the same year: 18 percent of associate's degree recipients and 16 percent of bachelor's degree recipients were non-white or Hispanic students. Lower levels of attainment for American Indians/ Alaskan Natives, Hispanics, and non-Hispanic black students were especially apparent when compared with their non-Hispanic white peers.[9] For example, while black, non-Hispanic students made up about 14 percent of the population aged 18–24 in 1990, they accounted for about 10 percent of those enrolled in higher education, 8 percent of associate's degree recipients, and 6 percent of bachelor's degree recipients. White, non-Hispanic students, on the other hand, represented 72 percent of the population aged 18-24, 78 percent of higher education enrollment, 82 percent of associate's degree recipients, and 84 percent of bachelor's degree recipients.

[7]U.S. Department of Education, National Center for Education Statistics, *Trends in Enrollment in Higher Education, by Racial/Ethnic Category: Fall 1982 through Fall 1992* (Washington, DC: 1994).
[8]Ibid.
[9]One exception is the American Indian/Alaskan Native representation in associate degree attainment, which appears to be similar to the population aged 18–24.

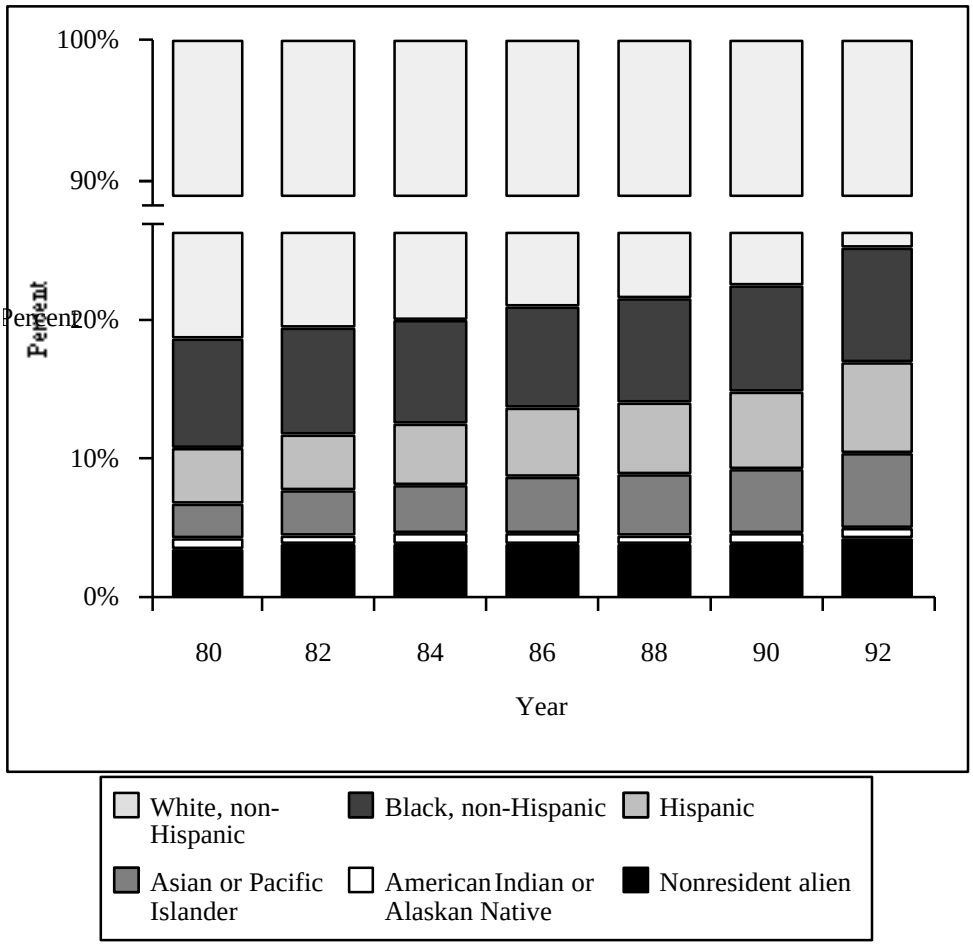
Figure 1—Percentage distribution of all students enrolled in higher education by race–ethnicity, fall 1980–92



	1980	1982	1984	1986	1988	1990	1992
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
American Indian/ Alaskan Native	0.7	0.7	0.7	0.7	0.7	0.7	0.8
Asian/Pacific Islander	2.4	2.8	3.2	3.6	3.8	4.0	4.8
Black, non-Hispanic	9.2	8.9	8.8	8.7	8.7	8.9	9.6
Hispanic	3.9	4.2	4.4	4.9	5.2	5.5	6.6
White, non-Hispanic	81.4	80.7	80.2	79.3	78.8	77.9	75.0
Nonresident alien	2.5	2.7	2.7	2.8	2.8	2.9	3.2

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Trends in Racial/Ethnic Enrollment in Higher Education: Fall 1980 through Fall 1990* (NCES 92-024) and *Trends in Enrollment in Higher Education, by Racial/Ethnic Category: Fall 1982 through Fall 1992* (NCES 94-104); based on Integrated Postsecondary Education Data System (IPEDS) "Fall Enrollment" surveys.

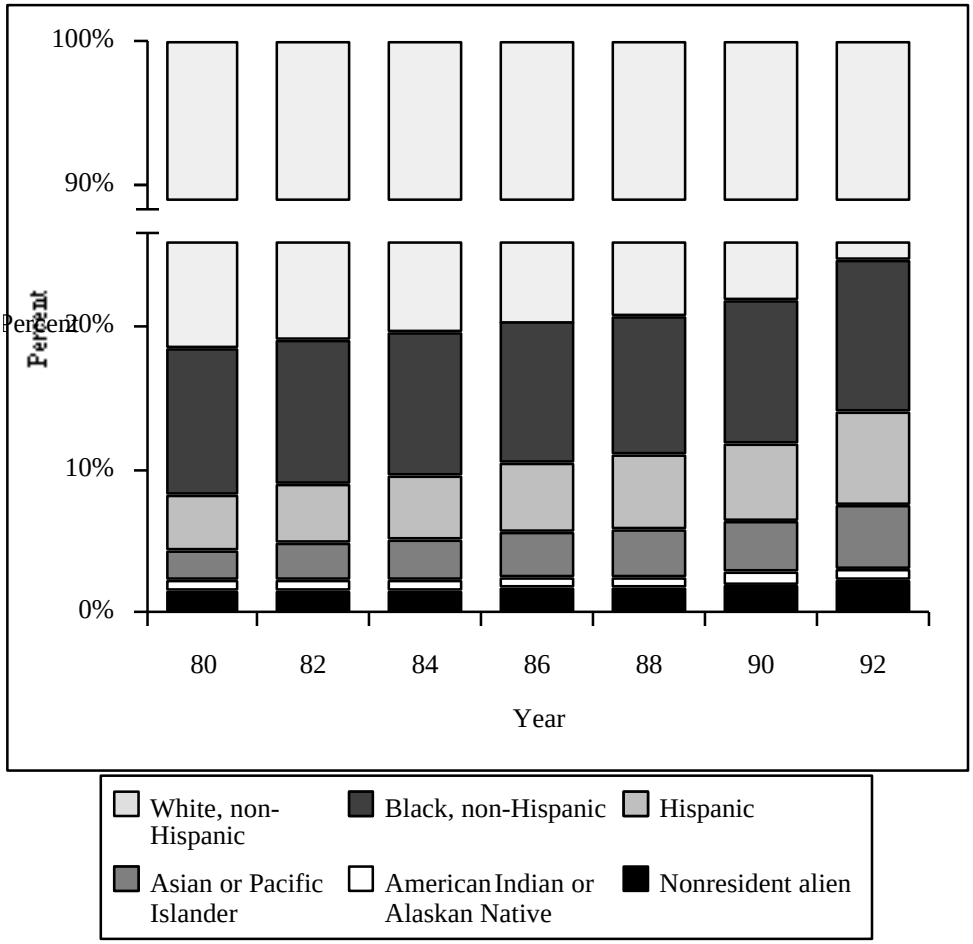
Figure 2—Percentage distribution of all male students enrolled in higher education by race–ethnicity, fall 1980–92



	1980	1982	1984	1986	1988	1990	1992
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
American Indian/ Alaskan Native	0.6	0.7	0.6	0.7	0.7	0.7	0.8
Asian/Pacific Islander	2.6	3.2	3.6	4.1	4.3	4.6	5.4
Black, non-Hispanic	7.9	7.6	7.5	7.4	7.4	7.6	8.2
Hispanic	4.0	4.2	4.3	4.9	5.2	5.5	6.5
White, non-Hispanic	81.3	80.5	80.0	79.0	78.6	77.6	74.8
Nonresident alien	3.6	3.8	3.9	4.0	3.9	4.0	4.3

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Trends in Racial/Ethnic Enrollment in Higher Education: Fall 1980 through Fall 1990* (NCES 92-024) and *Trends in Enrollment in Higher Education, by Racial/Ethnic Category: Fall 1982 through Fall 1992* (NCES 94-104); based on Integrated Postsecondary Education Data System (IPEDS) "Fall Enrollment" surveys.

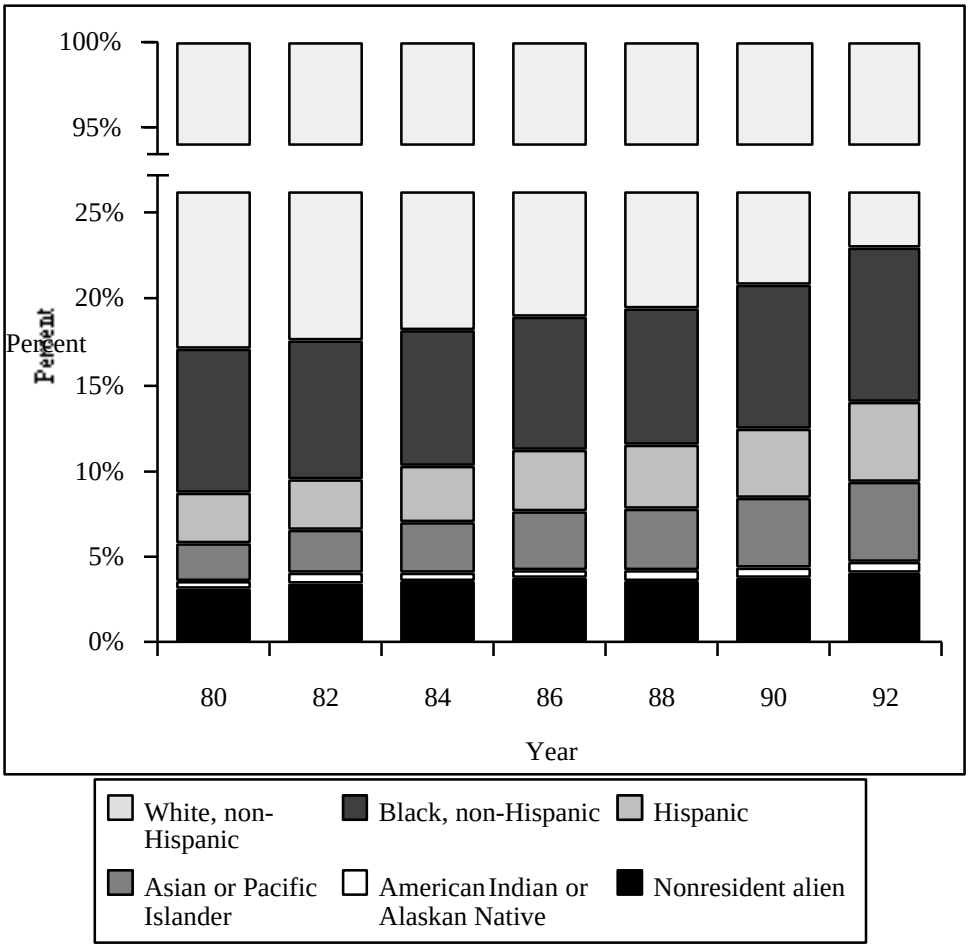
Figure 3—Percentage distribution of all female students enrolled in higher education by race–ethnicity, fall 1980–92



	1980	1982	1984	1986	1988	1990	1992
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
American Indian/ Alaskan Native	0.7	0.8	0.7	0.8	0.8	0.8	0.9
Asian/Pacific Islander	2.2	2.5	2.8	3.2	3.4	3.6	4.3
Black, non-Hispanic	10.3	10.1	10.0	9.8	9.8	10.0	10.8
Hispanic	3.9	4.2	4.4	5.0	5.3	5.5	6.6
White, non-Hispanic	81.4	80.9	80.4	79.7	79.1	78.1	75.2
Nonresident alien	1.5	1.6	1.6	1.7	1.8	2.0	2.3

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Trends in Racial/Ethnic Enrollment in Higher Education: Fall 1980 through Fall 1990* (NCES 92-024) and *Trends in Enrollment in Higher Education, by Racial/Ethnic Category: Fall 1982 through Fall 1992* (NCES 94-104); based on Integrated Postsecondary Education Data System (IPEDS) "Fall Enrollment" surveys.

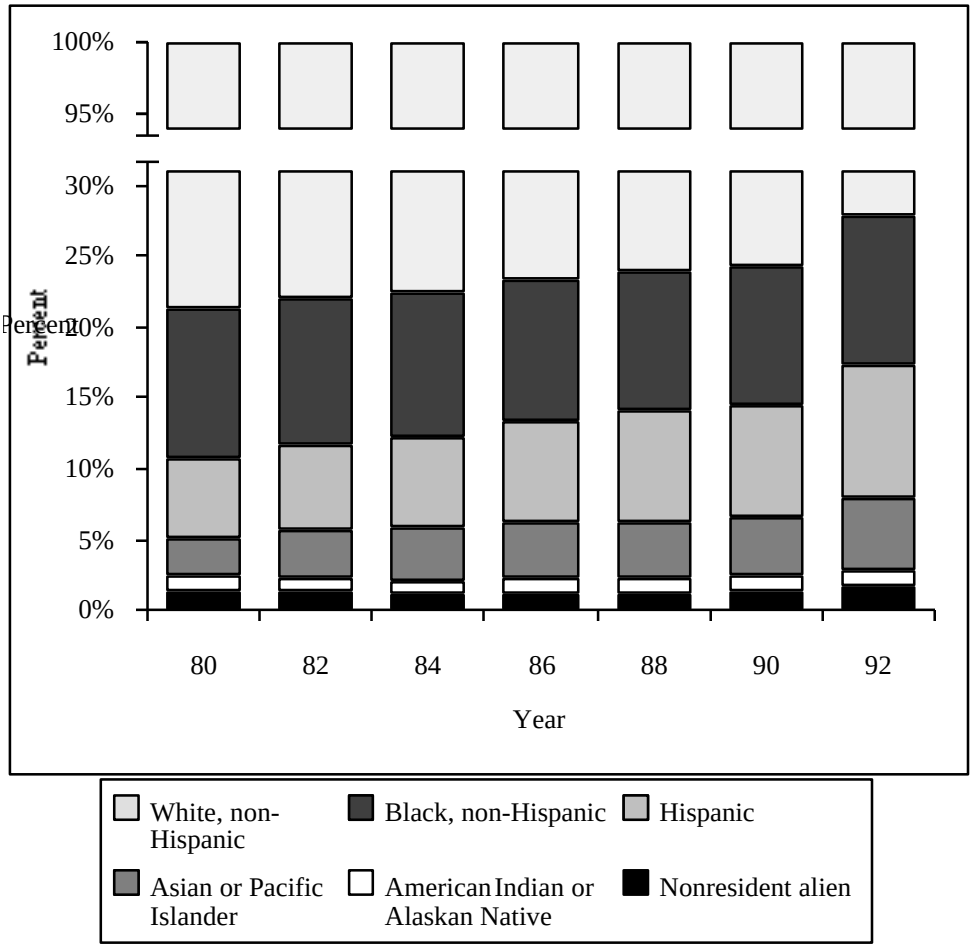
Figure 4—Percentage distribution of all students enrolled in 4-year institutions of higher education by race–ethnicity, fall 1980–92



	1980	1982	1984	1986	1988	1990	1992
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
American Indian/ Alaskan Native	0.5	0.5	0.5	0.5	0.5	0.6	0.6
Asian/Pacific Islander	2.1	2.5	2.9	3.3	3.6	4.0	4.7
Black, non-Hispanic	8.4	8.0	8.0	7.9	8.0	8.4	9.0
Hispanic	2.9	3.0	3.2	3.6	3.6	4.0	4.7
White, non-Hispanic	82.9	82.5	81.7	81.0	80.5	79.2	77.0
Nonresident alien	3.2	3.5	3.7	3.7	3.7	3.8	4.1

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Trends in Racial/Ethnic Enrollment in Higher Education: Fall 1980 through Fall 1990* (NCES 92-024) and *Trends in Enrollment in Higher Education, by Racial/Ethnic Category: Fall 1982 through Fall 1992* (NCES 94-104); based on Integrated Postsecondary Education Data System (IPEDS) "Fall Enrollment" surveys.

Figure 5—Percentage distribution of all students enrolled in 2-year institutions of higher education by race–ethnicity, fall 1980–92



	1980	1982	1984	1986	1988	1990	1992
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
American Indian/ Alaskan Native	1.0	1.0	1.0	1.1	1.0	1.0	1.1
Asian or Pacific Islander	2.7	3.3	3.7	4.0	4.1	4.1	5.0
Black, non-Hispanic	10.4	10.3	10.1	10.0	9.7	9.8	10.5
Hispanic	5.6	6.1	6.4	7.3	7.9	8.0	9.5
White, non-Hispanic	78.7	77.9	77.6	76.6	76.0	75.6	72.0
Nonresident alien	1.4	1.3	1.2	1.1	1.2	1.4	1.7

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Trends in Racial/Ethnic Enrollment in Higher Education: Fall 1980 through Fall 1990* (NCES 92-024) and *Trends in Enrollment in Higher Education, by Racial/Ethnic Category: Fall 1982 through Fall 1992* (NCES 94-104); based on Integrated Postsecondary Education Data System (IPEDS) "Fall Enrollment" surveys.

Table 1—Percentage distribution of students in the college-age population and the percentage distribution according to participation and completion in secondary and postsecondary education, by race-ethnicity: 1990

	Population aged 18–24	1990 high school graduates	Enrolled in higher education	Completed associate's degree	Completed bachelor's degree
Total	100.0	100.0	100.0	100.0	100.0
Race–ethnicity					
American Indian/ Alaskan Native	0.7	0.5	0.8	0.8	0.4
Asian/Pacific Islander	2.7	3.3	4.2	3.0	3.7
Black, non-Hispanic	13.9	14.1	9.6	7.8	5.8
Hispanic	11.1	5.1	6.1	4.9	3.1
White, non-Hispanic	71.5	77.0	77.5	82.1	84.3
Nonresident alien	—	—	1.8	1.4	2.5

—Noncitizens not presented separately.

SOURCE: Percentage of population 18–24 and 1990 high school graduates: U.S. Department of Commerce, Bureau of Census, Current Population Survey, October 1990; Enrollment and degree completion: U.S. Department of Education, *Digest of Education Statistics, 1993*, based on Integrated Postsecondary Education Data System (IPEDS) "Fall Enrollment and Completion" surveys, 1989–90.

Background

In recent years, a number of researchers have examined the attrition of minority students in postsecondary education.[10] This research has identified academic background and high school preparation—in particular, students' grade point average, study habits, and high school curricula—as factors that have the most impact on students' progress in postsecondary education.[11] As one would expect, background characteristics associated with socioeconomic status are also strongly related to college persistence: minority students whose parents are better educated and have higher incomes are more likely to succeed than those whose parents are less educated or have lower incomes.[12]

This research has also identified a number of college environmental factors that bear a strong relationship to attrition. For example, initial enrollment in a community college reduces students' chances of attaining a bachelor's degree,[13] while enrollment in a

[10]See, for example, Astin et al., *Minorities in American Higher Education* (San Francisco: Jossey-Bass, 1988), and D.J. Jones and B.C. Watson, *"High Risk" Students in Higher Education,* ASHE-ERIC Higher Education Reports (Washington, DC: 1990). It should be noted that Asian American/Pacific Islander undergraduates as a group have the highest persistence and attainment rates compared with other racial–ethnic groups. However, variation according to national origin is likely.

[11]Astin et al., 180–181.

[12]Ibid., and Jones and Watson, 10.

[13]It should be noted that students may enter community colleges without intending to attain a degree, but simply to improve skills or enhance career opportunities. Furthermore, other factors related to enrolling in a community college instead of a 4-year college may be indirectly related to lower degree attainment, such as a lack of financial resources.

4-year college or university enhances their persistence. These studies have also emphasized the important role of financial factors in the persistence of minority students. For instance, working full time while attending school tends to reduce minority students' persistence to a bachelor's degree, while the receipt of financial aid in the form of grants or scholarships positively influences persistence.[14] Finally, researchers have found that students who live away from home while attending college are more likely to persist than those who live at home with their parents. This was found to be especially true for black, non-Hispanic and Hispanic students.[15]

Purpose and Data Sources

The purpose of this report is to provide additional information concerning minority student participation in postsecondary education based on data from the National Postsecondary Student Aid Study (NPSAS:90) and its longitudinal component, Beginning Postsecondary Students (BPS:90/92). The NPSAS data were used to examine in detail the types of institutions undergraduates attended; their degree program and educational aspirations; their reasons for choosing the postsecondary institutions they attended; and the primary means of financing their education. In addition, NPSAS is large enough to provide estimates of specific Asian/Pacific Islander and Hispanic subgroups. Thus, data for these subgroups are presented separately.

A longitudinal cohort of NPSAS:93 undergraduates who were enrolled in postsecondary education for the first time in 1989–90 were followed up in 1992 (BPS:90/92). For these students, attainment rates for some sub-baccalaureate awards and interim persistence rates for students in bachelor's degree programs were available as of spring 1992. For students who did not interrupt their education, this would be the second term of their third academic year. Some students, however, were not continuously enrolled; they had interrupted their education and subsequently returned. In the case of students pursuing a bachelor's degree, the percentage of students who interrupted and reenrolled is presented.

Minority Students Included in the Analysis

In education survey research, non-white racial–ethnic groups are often compared in the aggregate with white, non-Hispanic students because the sample sizes of minority subgroups are too small to produce reliable estimates. Thus, these analyses fail to illuminate differences not only among different minority groups but also within aggregated ethnic groups, such as Hispanics and Asians/Pacific Islanders. The size of the NPSAS survey (about 40,000 undergraduates) is large enough to provide at least an overall snapshot of these main groups, as well as the specific Asian/Pacific Islander and Hispanic subgroups. In the survey, Asian/Pacific Islander and Hispanic students were asked for

[14]See also, U.S. Department of Education, National Center for Education Statistics, *Undergraduates Who Work While Enrolled in Postsecondary Education* (Washington, DC: 1994).
[15]Astin, et. al., 183.

their specific subgroup identity.[16] However, those who chose not to identify themselves, those belonging to groups too small to be disaggregated, or students of mixed identity were categorized as "other/non-specified" (figure 6). These "other" groups were largest among both Hispanic and Asian/Pacific Islander subgroups, illustrating the diversity of their origins.

Throughout the remainder of this report, minority student groups are identified as follows. The specific terms and definitions for each minority group were designated by the Office of Management and Budget Statistical Policy directive (No. 15, May 12, 1977).

American Indian or 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. For accuracy and consistency with previously published data, the term *American Indian/Alaskan Native* is used to identify these students, recognizing that the term *Native American* is sometimes preferred. American Indian/Alaskan Native students are a particularly small group of undergraduates. Because of their small sample size, some estimates of participation and all estimates of persistence in postsecondary education could not be reported.[17]

Asian or Pacific Islander. A person having origins in any of the Pacific Islander original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or Pacific Islands. This includes peoples from China, Japan, Korea, the Philippine Islands, Samoa, India, and Vietnam. In addition, the NPSAS data provide estimates for subgroups including Asian Indian, Chinese, Japanese, Korean, Pacific Islander (Filipino, Hawaiian, Samoan, and Guamanian), and Vietnamese. A group called "other" includes those from other origins and those who did not specify their ethnic group. Like the American Indian/Alaskan Native undergraduate population, each of these Asian subgroups is very small, and some estimates could not be reported. In addition, some differences in estimates between subgroups may appear large, but they are often not statistically significant. Only differences that are statistically significant are discussed in this report.

Black, non-Hispanic. A person having origins in any of the black racial groups of Africa, not of Hispanic origin. While the terms *African American, Black American*, or *Person of Color* are often preferred, to preserve consistency with previously published education data and for accuracy, the term *black, non-Hispanic* is used in this report.

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[16]In the survey, students were first asked their race (white, black, American Indian/Alaskan Native, Asian/Pacific Islander, or other); If they indicated "other," they were then asked if they were of Spanish/Hispanic origin. Those who indicated Spanish/Hispanic origin were asked to identify themselves as Mexican/Mexican-American/Chicano; Cuban; Puerto Rican; or to specify their origin if they were other than these three groups. Similarly, American Indians/Alaskan Natives were asked to specify their tribe, and Asians were asked if they were Chinese, Filipino, Hawaiian, Japanese, Korean, Vietnamese, Asian Indian, Samoan, or Guamanian, or to specify their subgroup if they were not one of these ethnicities. However, students were not given the specific definitions of each group.

[17]Estimates based on samples of fewer than 30 students cannot be reported.

Hispanic. A person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race. Again, to preserve data reporting consistency, the term *Hispanic* is used in this report, with the recognition that *Latino* as a generic term for all people of Latin American/Spanish origin may be preferred. The NPSAS data also provide estimates for subgroups including Mexican American, Puerto Rican, and Cuban American students. A group called "other" includes those of other Hispanic origins and those who did not specify their ethnic group.

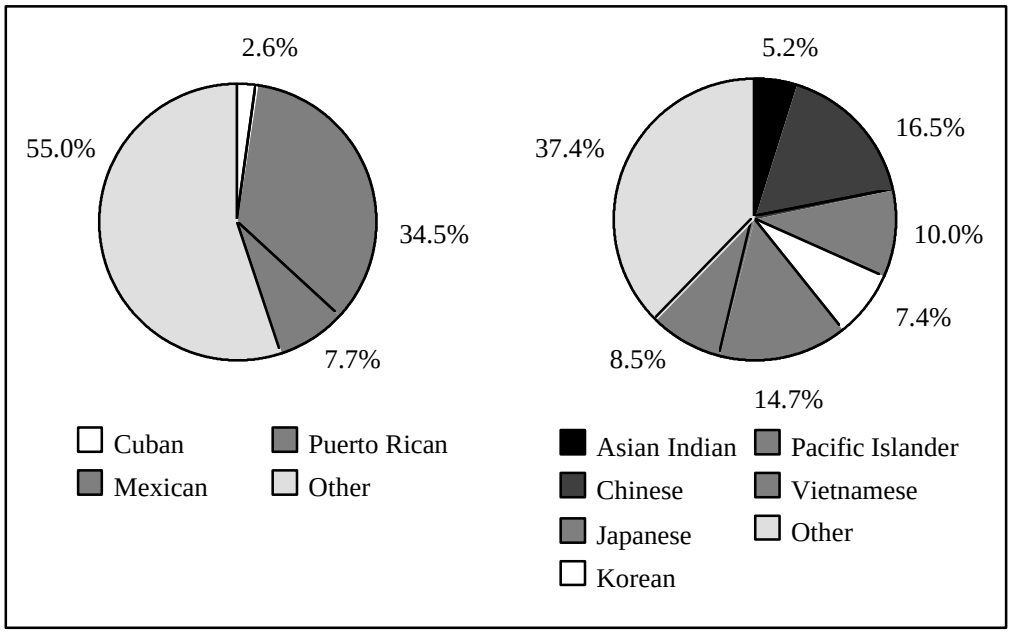
White, non-Hispanic. For comparisons with minority groups, estimates for white, non-Hispanic undergraduates are also presented. These are students with origins in any of the original peoples of Europe, North Africa, or the Middle East (except those of Hispanic origin).

Citizenship

The results presented in the remainder of this report include all noncitizens, who account for about 5 percent of undergraduates. The non-citizens are primarily Asian/ Pacific Islander (39 percent) and Hispanic (17 percent). However, most of these noncitizens are permanent residents or are eligible for financial aid as individuals in the country for "other than a temporary purpose," including refugees, persons granted asylum, and so on. (See *The Federal Student Financial Aid Handbook* for a more detailed description of these students).[18] Therefore, given their relatively permanent status in this country, all noncitizens were included in the analysis. Thus, there are some instances where minority groups are referred to as American (such as Mexican American), which may include a small percentage of noncitizens.

[18]Approximately 3 percent of Hispanic undergraduates and 12 percent of Asians/Pacific Islanders are neither permanent residents nor eligible for financial aid. For further information, see U.S. Department of Education, National Center for Education Statistics, *Financing Undergraduate Education: 1990* (Washington, DC: 1993).

Figure 6—Percentage distribution of Hispanic and Asian students, by their ethnic identity: 1989–90



NOTE: Percentages may not sum to 100 due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Survey (NPSAS:90), Data Analysis System.

Postsecondary Experiences of Minority Undergraduates: 1989–90

In the last 20 years, the proportion of so-called nontraditional students in postsecondary education has increased dramatically.[19] This is especially true for older students who for various reasons delayed their entry into college or other postsecondary education programs.[20] Students who delay their postsecondary education are more at risk of not completing a credential than those who have followed a more traditional educational path.[21] Given this association between delayed entry and attainment, it may not be surprising that Asian/Pacific Islander undergraduates, who have higher college completion rates than other students, tended to be younger (thus, less likely to have delayed their college entry), while black, non-Hispanic and American Indian/Alaskan Native students tended to be older (table 2). About two-thirds of Asian/Pacific Islander students (63 percent), compared with about one-half of black, non-Hispanic students (52 percent) were 23 or younger. By contrast, 36 percent of American Indian/Alaskan Natives and 28 percent of black, non-Hispanic students were age 30 or older, compared with 18 percent of Asian/Pacific Islander students.

Many members of minority groups, especially Vietnamese and Puerto Ricans, are economically disadvantaged. In 1989–90, undergraduates in all racial–ethnic minority groups were less well off financially than were their white, non-Hispanic peers (table 3). Approximately one-third or more of minority students (30 percent of American Indians/ Alaskan Natives, 35 percent of Asians/Pacific Islanders, 39 percent of Hispanics, and 41 percent of black, non-Hispanic students) were in the lowest family income quartile, compared with about one-fifth of white, non-Hispanic students.[22]

In addition, the income distribution within Hispanic and Asian subgroups varied. For example, Cuban Americans (8 percent of all Hispanics) were substantially more affluent than other Hispanic groups: about 37 percent were in the highest income quartile, compared with about 16 percent of either Mexican Americans or Puerto Ricans. When Asian/Pacific Islander ethnic groups were disaggregated, Vietnamese students were found to be among the poorest enrolled, with about two-thirds (68 percent) having incomes at or below the 25th percentile.

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[19]D.J. Jones and B.C. Watson, *"High Risk" Students in Higher Education,* ASHE-ERIC Higher Education Reports (Washington, DC: 1990).

[20]U.S. Department of Education, National Center for Education Statistics, *A Profile of Older Students in Postsecondary Education* (Washington, DC: 1995).

[21]U.S. Department of Education, National Center for Education Statistics, *High School and Beyond, 1992 Descriptive Summary of 1980 High School Sophomores* (Washington, DC: 1995).

[22]The income quartiles are based on the NPSAS undergraduate income distribution, not the general population.

Table 2—Percentage distribution of undergraduates according to their age by race–ethnicity: 1989–90

	Age as of 12/31/89		
	23 or younger	24–29	30 or older
Total	57.6	16.7	25.5
Race–ethnicity			
American Indian/Alaskan Native	52.7	11.5	35.6
Asian/Pacific Islander	63.1	18.5	18.3
Black, non-Hispanic	51.9	20.2	27.8
Hispanic	59.5	19.4	21.0
White, non-Hispanic	57.9	15.9	26.1
Racial–ethnic subgroup Asian			
Asian Indian	71.0	12.7	16.2
Chinese	60.8	22.1	17.0
Japanese	60.9	19.3	19.6
Korean	83.6	12.2	4.0
Pacific Islander	55.1	19.7	25.0
Vietnamese	74.9	12.7	12.3
Other or non-specified	59.8	19.6	20.4
Racial–ethnic subgroup Hispanic			
Cuban	61.2	26.3	12.3
Mexican	60.4	17.7	21.8
Puerto Rican	60.4	17.6	21.9
Other or nonspecified	58.7	20.5	20.7

NOTE: Percentages may not sum to 100 due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Undergraduate Data Analysis System.

Table 3—Percentage distribution of undergraduates according to their family income percentile rankings by race–ethnicity: 1989–90

	Total family income, 1988 percentile rank		
	25th or lower	26th–75th	76th or higher
Total	24.9	49.9	25.0
Race–ethnicity			
American Indian/Alaskan Native	30.2	52.8	16.9
Asian/Pacific Islander	34.5	42.4	23.0
Black, non-Hispanic	40.5	47.5	11.9
Hispanic	39.2	46.8	13.9
White, non-Hispanic	20.6	51.0	28.2
Racial–ethnic subgroup Asian			
Asian Indian	33.4	34.8	31.6
Chinese	37.0	35.0	27.9
Japanese	19.8	43.4	36.6
Korean	24.8	47.4	27.7
Pacific Islander	20.0	54.9	25.0
Vietnamese	68.3	24.4	7.2
Other or nonspecified	37.3	44.7	17.8
Racial–ethnic subgroup Hispanic			
Cuban	17.3	45.6	37.0
Mexican	32.3	51.1	16.4
Puerto Rican	42.9	40.4	16.6
Other or nonspecified	44.2	45.0	10.7

NOTE: Percentages may not sum to 100 due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Undergraduate Data Analysis System.

In 1989–90, men and women enrolled in postsecondary education at different rates, and there was also variation in the gender distribution among racial–ethnic groups. For example, 55 percent of all undergraduates and two-thirds of black, non-Hispanic students were female (table 4). To a lesser extent, Hispanic students were also more likely to be female (53 compared with 47 percent). On the other hand, there was no significant difference in the proportion of males and females enrolled for either Asians/Pacific Islanders or American Indians/Alaskan Natives.[23]

[23]While it appears as though more males than females were enrolled for these two groups, the difference is not statistically significant.

Table 4—Percentage distribution of undergraduates by gender and race–ethnicity: 1989–90

	Male	Female
Total	44.6	55.4
Race–ethnicity		
American Indian/Alaskan Native	52.0	47.9
Asian/Pacific Islander	51.9	48.0
Black, non-Hispanic	36.7	63.3
Hispanic	46.9	53.0
White, non-Hispanic	44.8	55.1
Racial–ethnic subgroup Asian		
Asian Indian	53.8	46.1
Chinese	50.4	49.6
Japanese	41.3	58.6
Korean	52.3	47.7
Pacific Islander	54.0	45.9
Vietnamese	58.7	41.2
Other or nonspecified	52.7	47.2
Racial–ethnic subgroup Hispanic		
Cuban	61.5	38.4
Mexican	46.8	53.1
Puerto Rican	44.0	55.9
Other or nonspecified	46.6	53.3

NOTE: Percentages may not sum to 100 due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Undergraduate Data Analysis System.

Minority Students' Enrollment and Educational Goals

One of the more striking differences among minority groups with respect to their enrollment in 1989–90 was the tendency of black, non-Hispanic and Hispanic students to attend private, for-profit institutions (table 5). About 20 percent of black, non-Hispanic students and 15 percent of Hispanic students were enrolled in such institutions, compared with 5 percent of Asians/Pacific Islanders and 6 percent of white, non-Hispanic students. Private, for-profit institutions typically offer programs of short duration leading to a vocational certificate in fields such as cosmetology; administrative and secretarial programs; health-related programs such as physician assistant and practical nursing; and trade and industry programs leading to such jobs as mechanics and repairers.

Table 5—Percentage distribution of undergraduate enrollment according to control of institution, by race–ethnicity: 1989–90

	Public	Private, not-for-profit	Private, for-profit
Total	75.6	15.7	8.5
Race–ethnicity			
American Indian/Alaskan Native	78.3	10.3	11.2
Asian/Pacific Islander	81.2	13.4	5.3
Black, non-Hispanic	68.1	12.0	19.8
Hispanic	68.1	16.5	15.3
White, non-Hispanic	77.1	16.4	6.4
Racial–ethnic subgroup Asian			
Asian Indian	76.3	21.3	2.3
Chinese	82.6	14.4	2.9
Japanese	88.7	9.6	1.5
Korean	77.4	20.6	1.9
Pacific Islander	86.1	8.9	4.8
Vietnamese	86.5	11.8	1.6
Other or nonspecified	76.8	13.6	9.5
Racial–ethnic subgroup Hispanic			
Cuban	77.7	16.1	6.1
Mexican	85.7	5.5	8.7
Puerto Rican	55.2	30.5	14.2
Other or nonspecified	58.4	21.5	20.0

NOTE: Percentages may not sum to 100 due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Undergraduate Data Analysis System.

In contrast, black, non-Hispanic; Hispanic; and American Indian/Alaskan Native students were less likely to be enrolled in 4-year colleges or universities than were white, non-Hispanic students (table 6). In addition, black, non-Hispanic and Hispanic students who did attend colleges and universities were less likely than Asian/Pacific Islander students to be in fields with greater economic returns, such as science and engineering (table 7).

Among Hispanic ethnic groups, there were also differences in the types of institutions students attended (table 6). For example, two-thirds of Mexican Americans were enrolled in 2-year institutions (most of which are public community colleges), whereas the majority of Puerto Ricans (65 percent) were enrolled in 4-year colleges or universities. Cuban American students, on the other hand, were more evenly distributed in their enrollment at 2-year and 4-year institutions (49 and 48 percent, respectively).

Table 6—Percentage distribution of undergraduate enrollment according to highest level of institutional offering, and by race–ethnicity: 1989–90

	Less-than-2-year	2-year	4-year
Total	7.5	45.5	46.9
Race–ethnicity			
American Indian/Alaskan Native	9.3	57.2	33.3
Asian/Pacific Islander	4.1	49.2	46.5
Black, non-Hispanic	17.0	45.1	37.8
Hispanic	15.2	47.3	37.3
White, non-Hispanic	5.5	45.0	49.3
Racial–ethnic subgroup Asian			
Asian Indian	1.3	39.0	59.6
Chinese	1.8	44.3	53.7
Japanese	0.6	51.5	47.7
Korean	1.4	38.4	60.1
Pacific Islander	3.0	61.4	35.4
Vietnamese	1.3	53.9	44.7
Other or nonspecified	8.1	48.5	43.3
Racial–ethnic subgroup Hispanic			
Cuban	2.5	49.1	48.2
Mexican	7.4	65.5	26.9
Puerto Rican	10.8	23.8	65.3
Other or nonspecified	21.4	39.0	39.4

NOTE: Percentages may not sum to 100 due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Undergraduate Data Analysis System.

Despite their concentration in sub-baccalaureate institutions, black, non-Hispanic and Hispanic students were just as likely as white, non-Hispanic students to aspire to a bachelor's degree or to an advanced degree as their ultimate educational goal (table 8). The same was true for American Indians/Alaskan Natives, 24 percent or whom were enrolled in a baccalaureate program in 1989–90, compared with 40 percent of either Asian/Pacific Islander or white, non-Hispanic students. But when asked what their ultimate educational aspirations were, 37 percent of American Indians/Alaskan Natives reported a bachelor's degree, and 47 percent reported an advanced degree. These aspirations were no different from those of white, non-Hispanic undergraduates.

Table 7—Percentage distribution of undergraduates' major field of study by race–ethnicity: 1989–90

	Humanities social science	Math/ science/ engineering/ computing	Education	Business manage-ment	Health	Vocational/ technical	Other technical prof.
Total	21.5	16.6	6.9	23.7	8.6	6.4	15.9
Race–ethnicity							
American Indian/Alaskan Native	20.4	17.4	8.6	20.1	8.8	7.0	17.5
Asian/Pacific Islander	20.6	29.4	2.4	24.2	6.9	5.0	11.1
Black, non-Hispanic	14.2	14.6	4.1	28.4	8.9	7.7	21.9
Hispanic	17.8	18.4	6.2	25.9	6.3	8.5	16.7
White, non-Hispanic	23.0	15.9	7.7	22.8	9.0	6.0	15.2
Racial–ethnic subgroup Asian							
Asian Indian	11.3	44.0	3.0	12.8	12.8	9.6	6.2
Chinese	19.5	42.7	0.8	20.3	4.1	1.0	11.3
Japanese	33.4	13.0	4.0	26.6	5.0	3.4	14.3
Korean	29.8	35.7	0.5	15.6	5.2	0.2	12.8
Pacific Islander	19.7	20.9	4.4	23.6	16.4	9.2	5.5
Vietnamese	16.9	36.5	1.8	31.6	5.4	1.0	6.5
Other or nonspecified	18.5	25.8	2.4	26.9	5.0	7.0	14.0
Racial–ethnic subgroup Hispanic							
Cuban	38.3	15.9	1.0	24.5	5.8	1.1	13.0
Mexican	16.3	18.0	9.4	23.5	7.1	10.9	14.4
Puerto Rican	18.2	21.3	5.4	25.0	7.9	6.3	15.6
Other or nonspecified	17.7	18.3	4.7	27.4	5.7	7.7	18.2

NOTE: Percentages may not sum to 100 due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Undergraduate Data Analysis System.

Table 8—Percentage distribution of undergraduates according to their current degree objectives and their ultimate educational aspirations, by race–ethnicity: 1980–90

	1989–90 degree objective		Educational aspirations		
	Less than bachelor's	Bachelor's degree	Less than bachelor's	Bachelor's degree	Advanced degree
Total	61.8	38.2	15.1	32.6	52.2
Race–ethnicity					
American Indian/Alaskan Native	75.8	24.1	15.7	37.3	46.9
Asian/Pacific Islander	60.5	39.5	9.7	31.7	58.5
Black, non-Hispanic	69.6	30.4	16.2	29.9	53.7
Hispanic	68.8	31.3	18.0	31.8	50.0
White, non-Hispanic	59.9	40.1	15.0	33.0	51.9
Racial–ethnic subgroup Asian					
Asian Indian	62.8	37.2	4.2	16.2	79.4
Chinese	51.1	48.9	8.7	25.1	66.0
Japanese	61.1	38.9	10.2	35.8	53.9
Korean	49.0	51.0	0.4	23.7	75.7
Pacific Islander	68.8	31.2	13.9	43.5	42.5
Vietnamese	50.4	49.6	12.1	34.2	53.5
Other or nonspecified	62.7	37.3	11.3	32.5	56.1
Racial–ethnic subgroup Hispanic					
Cuban	59.2	40.8	7.5	11.4	81.0
Mexican	76.8	23.3	20.7	36.6	42.5
Puerto Rican	45.4	54.6	11.1	28.9	59.8
Other or nonspecified	67.5	32.5	17.6	28.0	54.3

NOTE: Percentages may not sum to 100 due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Undergraduate Data Analysis System.

Attendance at Historically Black Colleges and Universities

Historically black colleges and institutions were first established in the 1800s to counter the practice of prohibiting the education of black persons.[24] Their earliest appearance was before the Civil War when almost all black persons were still slaves. However, it was only after the Civil War and in the late 1800s that modest gains were made in educational opportunities for minorities. During this time, Congress passed the Second Morrill Act, which established a dual system of higher education—one for whites and one for non-whites. All schools were run by white administrators until 1927, when Mordecai Johnson was named Howard University's first black president. At that time, there were 77 HBCUs with about 14,000 students enrolled. Today there are 105 such institutions enrolling approximately 258,000 students. Most HBCUs (about 90 percent) are 4-year colleges, and about half are private, not-for-profit institutions.[25]

[24]For a comprehensive overview of HBCUs and enrollment changes in recent years see: U.S. Department of Education, National Center for Education Statistics, *Historically Black Colleges and Universities: 1976-1990,* (Washington, DC: 1992).
[25]Ibid., 4.

Between 1986 and 1990, enrollment in HBCUs increased 15 percent, and according to the Integrated Postsecondary Education Data System (IPEDS) survey of higher education institutions, about 17 percent of black, non-Hispanic students attended HBCUs in the fall of 1990.[26] While the overwhelming majority of students attending HBCUs were black, non-Hispanic, about one-fourth came from other racial–ethnic groups. Among the NPSAS:90 undergraduates attending HBCUs, for example, about 75 percent were black, non-Hispanic; 15 percent white, non-Hispanic; 7 percent Hispanic; and less than 3 percent each were either Asian/Pacific Islander or American Indian/Alaskan Native (table 9).

Table 9—Percentage of undergraduates enrolled in historically black colleges or universities (HCBU) and the percentage distribution of students, by race–ethnicity: 1989–90

	Attend HBCU		
	All undergraduates	Undergraduates in public or private, not-for-profit institutions in fall of 1990	Percent racial–ethnic distribution attending HBCUs
Total	1.4	1.5	100.0
Race–ethnicity			
American Indian/ Alaskan Native	2.2	2.8	1.2
Asian/Pacific Islander	0.7	0.6	2.7
Black, non-Hispanic	11.7	14.1	74.7
Hispanic	1.1	1.4	6.5
White, non-Hispanic	0.2	0.2	14.9

NOTE: Percentages may not sum to 100 due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Undergraduate Data Analysis System.

Students attending HBCUs reported somewhat higher educational aspirations than those attending non-HBCUs. For example, among undergraduates enrolled in 4-year colleges and universities, 77 percent of those attending HBCUs reported their educational goal as an advanced degree, compared with 71 percent of students attending non-HBCUs (table 10).

[26]Ibid., 6. Note that the NPSAS:90 survey is based on full-year enrollment and includes students in for-profit trade schools, leading one to expect that the overall proportion of black, non-Hispanic students in the NPSAS sample who are enrolled in HBCUs would be somewhat lower than that in IPEDS. This was in fact the case; about 12 percent of all black, non-Hispanic students enrolled in postsecondary education were enrolled in HBCUs. However, if NPSAS:90 is limited to the fall sample of public and private, not-for-profit institutions, the percentage of black, non-Hispanic students is about 14 percent.

Table 10—Percentage distribution of undergraduates enrolled in 4-year institutions according to their educational aspirations, by their enrollment in historically black colleges and universities (HBCU): 1989–90

	Less than bachelor's degree	Bachelor's degree	Advanced degree
Total	2.3	27.0	70.6
Attend HBCU	2.5	20.4	77.1
Attend non-HBCU	2.3	27.2	70.6

NOTE: Percentages may not sum to 100 due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Undergraduate Data Analysis System.

Reasons Students Reported for Choosing Their Institution

Regardless of racial–ethnic group, almost all undergraduates (two-thirds or more) cited academic reasons (e.g., institution's overall reputation, its reputation for placing graduates, and its having the desired courses) as important factors in choosing their institution. Differences among racial–ethnic groups did emerge, however, in the proportion of students citing financially-related reasons for choosing their institutions (table 11). For example, black, non-Hispanic; Hispanic; and Asian/Pacific Islander undergraduates were all more likely to cite the opportunity for obtaining a job at school as an important reason for their choice (34 to 38 percent) than were white, non-Hispanic students (26 percent). While a majority of students reported that being able to work and attend school was an important reason for their choice, Asians/Pacific Islanders were less likely than black, non-Hispanic or Hispanic students to do so (65 percent compared with 75 percent and 78 percent, respectively). This is consistent with the finding that Asian/Pacific Islander students are less likely to work while attending school than other racial–ethnic groups.[27]

Corresponding in part to their lower incomes, black, non-Hispanic students were the most likely to report that obtaining financial aid was an important reason for their choice of institution (57 percent compared with 42 percent of Hispanics, 41 percent of American Indians/Alaskan Natives, 38 percent of Asians/Pacific Islanders, and 33 percent of white, non-Hispanics). Among Hispanic ethnic groups, a greater proportion of Puerto Ricans cited the possibility of obtaining financial aid as an important reason for their choice of institution than did either Mexican or Cuban American students (64 percent compared with 40 percent and 32 percent, respectively). The difference between Puerto Rican and Mexican American students may be due to Puerto Ricans' greater likelihood of attending higher cost 4-year institutions, whereas Mexican Americans were more likely to be enrolled in 2-year institutions.

[27]U.S. Department of Education, National Center for Education Statistics, *Undergraduates Who Work While Enrolled in Postsecondary Education* (Washington, DC: 1994).

Table 11—Percentage of undergraduates who reported various reasons for choosing their postsecondary institution as somewhat or very important, by race–ethnicity: 1989–90

	Good reputation placing graduates	Good reputation of school	Offered courses wanted	Better chance getting job at school	Can attend school & work	Can graduate in shorter time	Got financial aid needed	Can live at home	Friends attended
Total	65.9	83.2	91.9	28.4	71.1	56.7	35.8	62.1	22.1
Race–ethnicity									
American Indian/ Alaskan Native	67.1	89.6	91.1	35.8	77.1	53.3	41.4	63.5	21.7
Asian/Pacific Islander	67.7	79.8	88.8	37.4	65.1	60.8	37.7	65.1	32.8
Black, non-Hispanic	69.3	82.8	93.3	38.3	75.4	64.1	56.6	66.9	18.8
Hispanic	70.4	82.2	91.6	34.1	77.7	62.5	42.3	73.1	24.4
White, non-Hispanic	65.0	83.4	91.9	26.1	70.3	55.1	32.8	60.3	21.6
Racial–ethnic subgroup Asian									
Asian Indian	68.8	80.0	81.9	25.6	49.5	47.2	34.4	65.7	23.0
Chinese	67.8	78.4	93.7	38.7	52.4	57.7	36.1	60.3	31.3
Japanese	58.0	71.6	87.6	27.3	52.3	49.3	14.0	64.3	33.1
Korean	70.6	86.0	82.6	41.0	65.4	61.7	38.7	51.3	26.2
Pacific Islander	67.1	83.7	91.1	34.7	82.5	68.6	36.9	82.7	38.4
Vietnamese	72.6	78.6	92.5	63.3	76.4	65.6	66.2	64.3	34.5
Other or nonspecified	69.6	80.6	85.6	33.4	69.2	65.3	40.2	61.1	34.6
Racial–ethnic subgroup Hispanic									
Cuban	62.6	76.0	83.3	35.5	64.2	47.3	32.1	69.3	15.4
Mexican	67.8	79.8	91.4	33.0	81.0	63.6	40.4	73.3	27.6
Puerto Rican	80.4	85.4	94.5	38.5	67.8	62.3	63.7	75.8	21.8
Other or nonspecified	71.7	85.4	91.8	34.0	77.7	62.8	39.4	72.5	21.6

NOTE: Percentages may not sum to 100 due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Undergraduate Data Analysis System.

Finishing their postsecondary education in a short amount of time was especially important to Hispanic and black, non-Hispanic students, which is consistent with their higher attendance at less-than-2-year institutions: about two-thirds of black, non-Hispanic and Hispanic students as reported this an important factor in choosing their school, as compared with 55 percent of white, non-Hispanic students.

Finally, the importance of living at home while attending school, the reason for which may be financial and/or cultural, distinguished Hispanics from Asians/Pacific Islanders and white, non-Hispanic students: about three-fourths (73 percent) of Hispanics cited this as an important reason for their school choice, as compared with 65 percent of Asians/Pacific Islanders and 60 percent of white, non-Hispanic students.[28] Asian/Pacific Islander students, on the other hand, were much more likely to cite having friends who

[28]The percentage of Hispanic students is not significantly different from that of black, non-Hispanic students (67 percent).

attend the same institution as an important factor for their school choice, compared with Hispanic; black, non-Hispanic; or white, non-Hispanic students (33 percent compared with 19 to 24 percent).

Financial Aid

The receipt of financial aid is determined by family income, school costs, and whether or not a student is financially dependent on his or her parents. Thus, differences in the receipt and amounts of aid among racial ethnic groups are due to differences in these determinants of financial aid. (Differences in loan aid may also depend on students' willingness to borrow.) However, given their overall lower incomes, the receipt of financial aid may disproportionately affect minority students' access to and persistence in postsecondary education when compared with their white, non-Hispanic counterparts who have greater financial resources.[29]

Consistent with their lower incomes, black, non-Hispanic students were more likely to get financial aid than any other racial–ethnic group, with the exception of American Indians/Alaskan Natives: about 60 percent of black, non-Hispanic undergraduates, compared with 50 percent, 36 percent, and 40 percent of Hispanic; Asian/Pacific Islander; and white, non-Hispanic students, respectively (table 12).[30] Hispanics were, in turn, more likely to get aid than were either Asian/Pacific Islander or white, non-Hispanic students.

Similar differences were seen for both grant and loan aid receipt: a greater percentage of black, non-Hispanic students received grants (53 percent) than did Hispanics (44 percent), Asians/Pacific Islanders (31 percent), or white, non-Hispanic students (33 percent). Likewise, nearly one-third (29 percent) of black, non-Hispanic students received loans, compared with 19 percent of Hispanics, 14 percent of Asians/Pacific Islanders, and 18 percent of white, non-Hispanic students.

Differences in the receipt of aid were also noted among Asian and Hispanic subgroups, which for the most part corresponded to the different income levels of these students. For example, about 40 percent of all Asian/Pacific Islander students received aid; however, Vietnamese students were more likely to receive financial aid (58 percent) than many other Asian ethnic groups including Japanese, Chinese, and Pacific Islander students.

Among Hispanic subgroups, Puerto Ricans were nearly twice as likely to receive aid (63 percent) than were Mexican Americans (34 percent), even though these two ethnic groups differed little in their distribution among income levels (see table 9). The difference

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[29]A forthcoming NCES report, (*How Low-Income Students Finance Their Education),* examines in detail the relationship between financial aid and the postsecondary education experiences of low-income students.

[30]About one-half of American Indians/Alaskan Natives received aid, which was not statistically different from any other group.

in aid receipt is probably due to Puerto Ricans' propensity to be enrolled in higher cost 4-year institutions, compared with Mexican Americans' likelihood to be enrolled in community colleges.

Table 12—Percentage of undergraduates receiving financial aid and the amounts received, by race–ethnicity: 1989–90

	Any aid received	Grant aid received	Loan aid received	Total aid amount	Total grant amount	Total loan amount
Total	42.8	36.2	18.7	$3,605	$2,257	$2,799
Race–ethnicity						
American Indian/Alaskan Native	50.9	45.6	15.3	3,827	2,495	3,189
Asian/Pacific Islander	35.7	31.0	14.0	4,381	2,952	2,968
Black, non-Hispanic	60.2	53.0	28.9	3,787	2,419	2,698
Hispanic	49.8	43.8	19.0	3,466	2,332	2,818
White, non-Hispanic	40.0	33.3	17.7	3,541	2,168	2,807
Racial–ethnic subgroup Asian						
Asian Indian	42.6	37.5	12.5	3,837	2,852	3,149
Chinese	30.8	27.1	10.1	4,376	3,191	3,065
Japanese	12.2	9.9	4.1	3,447	2,213	—
Korean	43.1	36.4	24.3	5,949	4,043	2,880
Pacific Islander	24.4	21.0	10.0	3,662	2,185	3,200
Vietnamese	58.0	57.1	21.8	4,806	3,308	2,339
Other or nonspecific	41.2	34.3	16.4	4,240	2,761	3,145
Racial–ethnic subgroup Hispanic						
Cuban	46.3	42.0	11.6	2,996	2,327	—
Mexican	34.1	28.7	16.2	3,705	2,122	2,984
Puerto Rican	62.6	58.9	22.3	3,527	2,445	2,551
Other or nonspecific	58.1	51.3	20.6	3,388	2,388	2,786

—Sample size too small for reliable estimate.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Undergraduate Data Analysis System.

Persistence Among 1989–90 Minority Students

For students who first began their postsecondary education in 1989–90, nearly one-half (45 percent) reported that their current degree objective was a bachelor's degree, while 27 percent were seeking an associate's degree. Approximately 15 percent had relatively short-term educational objectives and reported pursuing a vocational certificate.[31] Since the length of time required to complete these three programs is so different (for example, a vocational certificate is often earned in less than one year), the persistence rates for these three groups are presented separately.

Consistent with historical trends, persistence rates for students pursuing a bachelor's degree tended to be higher for Asian/Pacific Islander students than for Hispanic and black, non-Hispanic students (figure 7).[32] For example, 69 percent of Asian/Pacific Islander students were continuously enrolled through the spring of 1992, compared with 46 percent of Hispanic students and 50 percent of black, non-Hispanic students.[33] On the other hand, persistence for white, non-Hispanic students (58 percent) was not significantly different from any other group.

Despite the fact that an associate's degree is traditionally viewed as a 2-year program, among undergraduates pursuing an associate's degree, only about 12 percent of beginning postsecondary students seeking such a degree had actually completed it after nearly 3 years. This result reflects the tendency of these students to attend community colleges on a part-time basis (figure 8).[34] For students who completed their degree, the differences in completion rates among Hispanic; black, non-Hispanic; and white, non-Hispanic students were not statistically significant: 17 percent, 8 percent, and 13 percent, respectively. (The sample of Asian/Pacific Islander students was not large enough for a reliable estimate.) However, because of the extent of part-time enrollment in these programs, many students were still enrolled at the end of their third year. This was particularly true for Hispanic students who were less likely than black, non-Hispanic students to have left school with no credential (28 percent compared with 53 percent) and to have never reenrolled.

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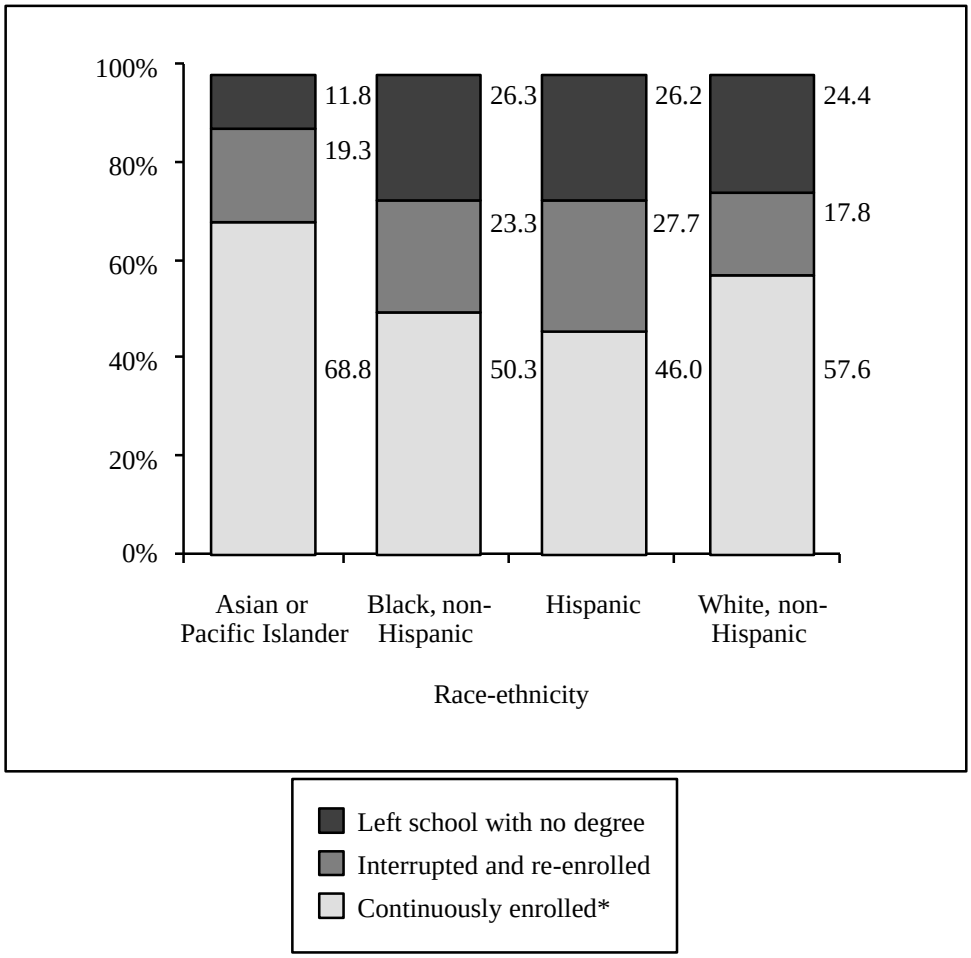
[31]These estimates were from the NCES BPS:90/92 Data Analysis System. Undergraduate degree goal is based on students' response to the question: "Toward which degree or other award are the courses you are taking leading?" It was therefore possible for students to be working toward a degree that the institution did not offer. (For example, a student could be attending a community college and pursuing a bachelor's degree.) Thus, this variable differs from "undergraduate program," a variable representing the current program in which the student is enrolled that is reported by the institution.

[32]The sample size of American Indians/Alaskan Natives was not large enough to provide reliable estimates and is not included in this discussion.

[33]The difference between Asians/Pacific Islanders and black, non-Hispanic students is significant at $p \leq 0.1$.

[34]U.S. Department of Education, National Center for Education Statistics, *Descriptive Summary of 1989- 90 Beginning Postsecondary Students: Two Years Later* (Washington, DC: 1994).

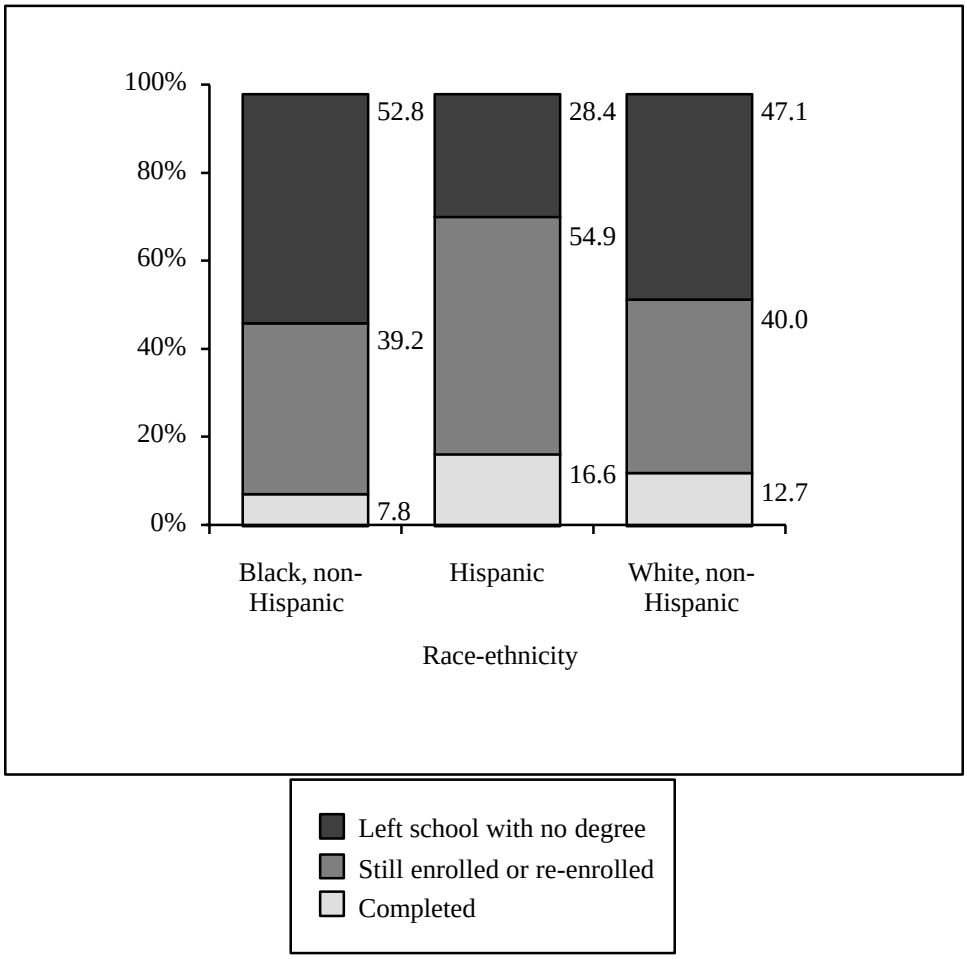
Figure 7—Percentage of 1989–90 beginning postsecondary students who reported a bachelor's degree as their current degree objective, by their persistence status as of Spring 1992, by race–ethnicity



*Includes a small percentage (1.5%) who reported completing the degree.

NOTE: Percentages may not sum to 100 due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 Beginning Postsecondary Student Survey, first follow-up (1992).

Figure 8—Percentage of 1989–90 beginning postsecondary students who reported an associate's degree as their current degree objective, by their persistence status as of spring 1992, by race–ethnicity



NOTE: Percentages may not sum to 100 due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 Beginning Postsecondary Student Survey, first follow-up (1992).

As might be expected, given the shorter time needed to complete a certificate, students seeking a certificate were more likely to complete one by spring 1992 than those pursuing an associate's degree (figure 9). About 44 percent of black, non-Hispanic students and 32 percent of Hispanic students seeking a certificate had completed. While differences in completion and attrition among racial–ethnic groups were not statistically significant, the sample for this group of students was very small, and it would be difficult to detect differences that are actually present in the population.

Controlling for Factors Related to Persistence

Since racial–ethnic groups differ with respect to a number of background characteristics as well as their postsecondary experiences in general, it is instructive to try to control for some of these factors to see if the differences in persistence rates initially observed among racial–ethnic groups change.[35] Therefore, we estimated the joint effect of a number of variables using a linear regression model.[36] The regression coefficients were subsequently used to adjust the estimate for the proportion of students pursuing a bachelor's degree who were continuously enrolled through spring 1992.

The independent variables initially included in the model were race–ethnicity (with white, non-Hispanic students serving as the comparison group); gender; income (family income if the student is dependent and student income if the student is independent); age; marital status; parents' highest education; single parent status; type of high school credential (diploma, GED, none); intensity of attendance (full-time for a full-year or less); the number of hours worked while enrolled; the amount of financial aid received; whether students entered postsecondary education immediately after high school graduation;[37] the type of postsecondary institution initially attended; and the extent of the students' involvement in their first year of academic life. Unfortunately, due to the postsecondary focus of the BPS survey with the exception of the type of high school credential (GED versus diploma), variables related to early academic preparation and high school curricula, which have been shown to be strongly associated with postsecondary persistence and attainment, were not available for inclusion in the model.

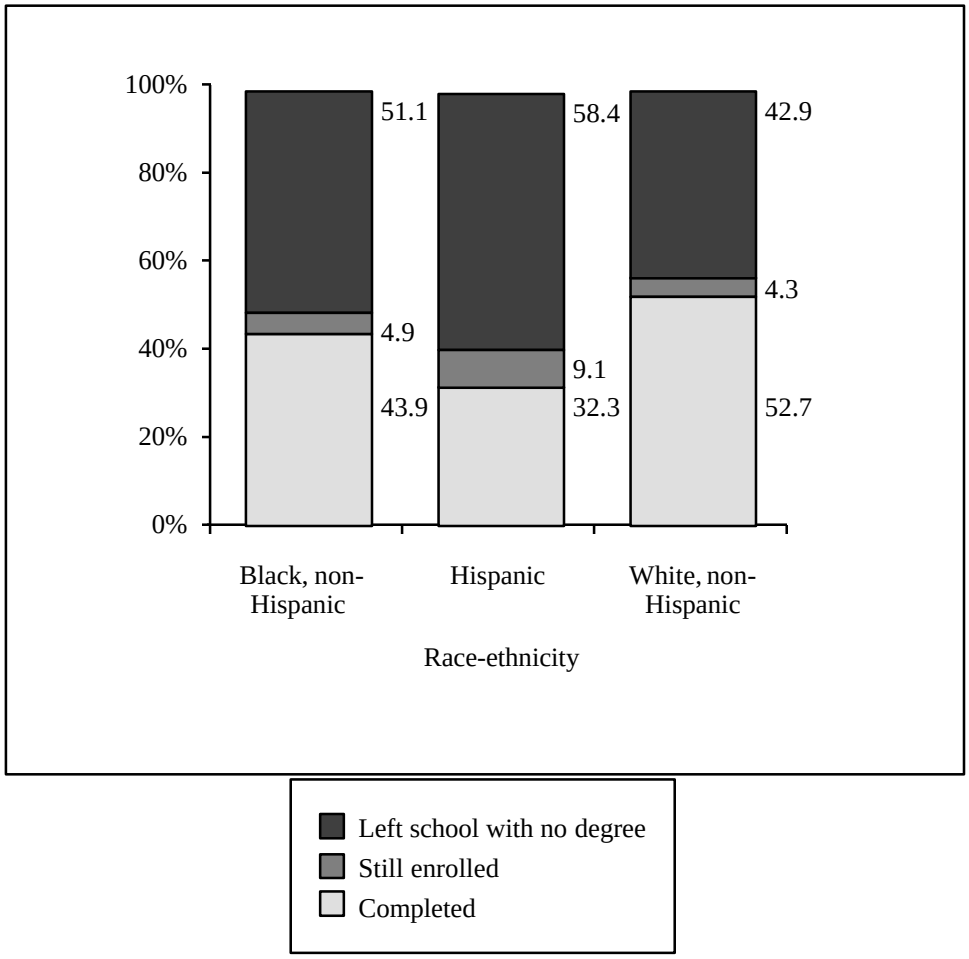
The adjusted proportions of students pursuing a bachelor's degree who were continuously enrolled through spring 1992 are shown in table 13. Once all the variables were held constant, four factors were no longer significantly related to persistence: age (under 24 or older), single parent status, high school credential type, and immediate entry

[35]Given the substantial limitations imposed by the small sample sizes of minority groups in the BPS survey, we could not control for these factors in a simple tabular analysis.

[36]An exploratory analysis that included a number of independent variables (identified in subsequent paragraphs) was initially conducted. Variables that were not significant were removed from the model, and the resulting regression coefficients for variables that significant were used to adjust the original estimates.

[37]"Immediately after high school graduation" means within 1 year of high school graduation.

Figure 9—Percentage of 1989–90 beginning postsecondary students who reported a vocational certificate as their current educational objective, by their persistence status as of Spring 1992, by race–ethnicity



NOTE: Percentages may not sum to 100 due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 Beginning Postsecondary Student Survey, first follow-up (1992).

into postsecondary education. These were subsequently removed from the model. While these four variables have been shown to be individually associated with reduced persistence and attainment rates, students with these attributes (i.e., students who are older, single parents, those who delayed entry into postsecondary education, and recipients of GED credentials) are also more likely to attend community colleges rather than 4-year institutions and to attend on a part-time basis.[38] Therefore, when these related variables were included in the model, the age-related factors were no longer significant.

There were a number of variables related to students' educational activities that were positively associated with continuous enrollment toward a bachelor's degree when all other variables were held constant. For example, if students attended full time during their entire first year in college, they were more likely to persist than were students attending less time. Students who worked part time while they were enrolled in their first year fared better than those who worked full time as did students who reported more active involvement in their academic life when compared with those who reported never participating in academic activities outside of class.

The amount of financial aid received in 1989–90 also made a difference in persistence, with students receiving $5,000 or more persisting at higher rates than those who received less. On the other hand, there was no difference in persistence rates for students who initially enrolled in a private, not-for-profit 4-year institution compared with those enrolled in public 4-year institutions.

Family background characteristics such as income and parents' education were related to persistence in expected ways: students from high income families persisted better than those from middle income families and students whose parents were college graduates persisted better than did students whose parents had no more than a high school education.

Finally, the demographic variables that made a difference in persistence were gender, with female students more likely to persist than males, and marital status, with unmarried students being more likely to persist than married students.

After controlling for all the variables that were associated with persistence, the relationship among racial–ethnic groups with respect to their persistence rates changed to some degree. For example, compared with white, non-Hispanic students, Asian/Pacific Islander students pursuing a bachelor's degree were more likely to be continuously enrolled through spring 1992, while black, non-Hispanic students were less likely to be so. Persistence for Hispanic students, on the other hand, did not differ significantly from that of white, non-Hispanic students. Moreover, the adjusted persistence rate for Hispanic students showed a substantial increase (46 percent to 55 percent for those who were continuously enrolled). Two possible explanations for this increase may be that Hispanic

[38]See U.S. Department of Education, National Center for Education Statistics, *High School and Beyond, 1992 Descriptive Summary of 1980 High School Sophomores* (Washington, DC, 1995), and *Profile of Older Undergraduates in Postsecondary Education* (Washington, DC: 1995)

students pursuing a bachelor's degree are much more likely to initially enroll in a 2-year institution (45 percent compared with 19 percent of white, non-Hispanic students), and that they are less likely to be enrolled full time for a full year (40 percent compared with 64 percent of white, non-Hispanic students).[39] When these factors, which are known to negatively influence persistence to a bachelor's degree, were controlled for the persistence rate for Hispanic students increased.

Table 13—Percentage of 1989–90 beginning postsecondary students pursuing a bachelor's degree who were continuously enrolled through spring 1992, and the adjusted percentage taking into account the covariation of variables listed in the table[1]

	Unadjusted means[2]	Adjusted means[3]	WLS coefficient[4]	Standard error[5]
Total	56.8		0.541	
Racial–ethnic				
Black, non-Hispanic	50.3	48.3	-0.087	0.036 *
Hispanic	46.0	55.0	-0.020	0.042
Asian/Pacific Islander	68.8	70.5	0.135	0.043**
American Indian/ Alaskan Native	—	—	—	—
White, non-Hispanic	57.6	57.0		
Persistence status AY: 89–90				
Not full-time, full-year	41.9	46.9	-0.163	0.022 **
Full-time, full-year	66.0	63.2		
Hours worked/week when enrolled AY: 89–90				
Not working	56.7	55.0	0.034	0.021
1–19 hours	65.6	60.6	0.089	0.021 **
20–34 hours	57.7	59.3	0.076	0.022 **
35 or more hours	47.5	51.7		
Family income percentile rank 1988				
1–25th percentile	53.5	53.7	0.000	0.022
75th–100th percentile	63.9	64.6	0.109	0.022 **
26th–74th percentile	53.9	53.7		
Gender				
Female	60.5	60.0	0.064	0.015 **
Male	53.0	53.6		
Average involvement AY: 89–90				
Once	51.9	54.8	0.061	0.032
Sometimes	60.8	58.2	0.095	0.025 **
Often	67.0	61.6	0.129	0.030 **
Never	36.3	48.7		

[39]These are estimates from the NCES BPS:90/92 Data Analysis System.

Table 13—Percentage of 1989–90 beginning postsecondary students pursuing a bachelor's degree who were continuously enrolled through spring 1992, and the adjusted percentage taking into account the covariation of variables listed in the table[1]—Continued

	Unadjusted means[2]	Adjusted means[3]	WLS coefficient[4]	Standard error[5]
Type of institution AY: 89–90				
Public, less-than-4-year	42.3	54.2	-0.050	0.032
Private, not-for-profit less-than-4-year	32.7	36.6	-0.226	0.058**
Private, not-for-profit 4-year	64.2	55.5	-0.037	0.028
Private, for-profit	19.6	30.6	-0.286	0.179
Public, 4-year	59.6	59.2		
Marital status AY: 89–90				
Married	24.2	37.0	-0.208	0.044 **
Divorced/separated/widowed	26.3	43.7	-0.141	0.073
Never married	58.5	57.8		
Parent's highest education level				
Some PSE	55.4	55.4	0.015	0.020
Bachelor's degree or more	63.0	59.6	0.057	0.022**
High school or less	49.2	53.9		
Total financial aid AY: 89–90				
No aid	52.2	53.0	-0.141	0.030**
Less than $1,000	57.1	60.1	-0.070	0.033*
$1,000–$2,999	58.0	58.0	-0.091	0.027**
$3,000–$4,999	56.2	55.6	-0.115	0.024**
$5,000 or more	69.5	67.1		

[1]Last group in each category is the reference group for comparison (blank entries).
[2]Estimates from NCES BPS:90/92 Data Analysis System.
[3]Proportions adjusted for differences in the proportion continuously enrolled that were associated with differences in other variables in the table (see appendix B for details).
[4]Weighted least squares regression coefficient.
[5]Standard error of regression coefficient adjusted for design effect (see appendix B for details).
* $p < .05$.
** $p < .01$.

—Sample size too small for reliable estimate.

NOTE: Age, high school degree (GED), single parent status, and delayed entry status were redundant variables (no significant differences) and were removed to produce the reduced model.

Recent Changes in Persistence

In order to determine whether or not 3-year persistence rates for beginning undergraduates had changed over time, we compared the BPS persistence rates with those of the 1980 High School and Beyond (HS&B) sophomore cohort for the same period of time. For comparability between the two samples, the comparison was limited to undergraduates who initially entered a 4-year college or university immediately following

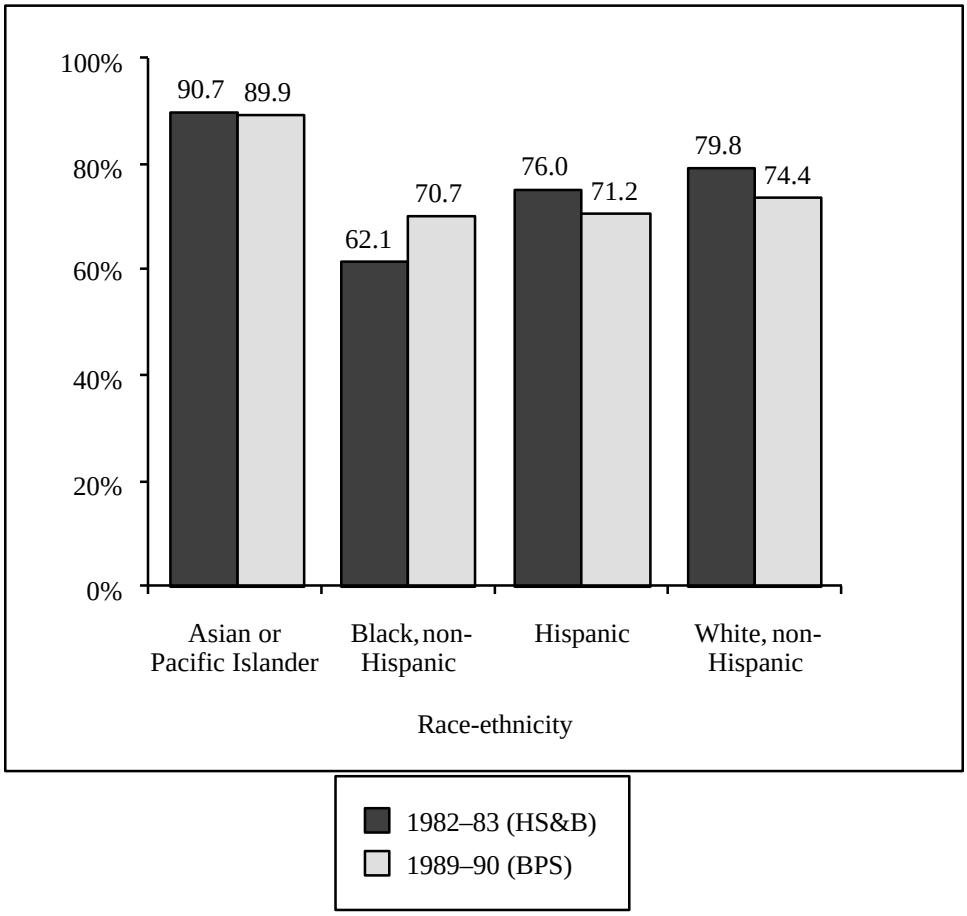
their high school graduation ("immediate entrants"). HS&B students would have started their college education in the fall of 1982–83, while BPS students began their education in the fall of 1989–90. All students enrolled during the month of May in the third year after their initial enrollment were considered persisters. This included students who may have left school and subsequently reenrolled before the month of May in either 1985 or 1992.

Overall, for undergraduates who entered a 4-year institution immediately after their high school graduation, persistence over 3 years appeared to decline somewhat between students entering in 1982–83 and those entering in 1989–90 (78 percent compared with 75 percent).[40] However, this was primarily due to a decline in white, non-Hispanic students' persistence rates (figure 10). Even though it appears that persistence may have improved for black, non-Hispanic students (62 percent compared with 71 percent) and declined for Hispanic students (76 percent compared with 71 percent), the difference between the BPS and HS&B cohorts was not significant for either group.[41] Thus, at this time it is difficult to draw conclusions about changes in persistence between these two cohorts especially with regard to minority students. As BPS students progress further in their educational programs and more data become available, degree attainment comparisons between BPS and HS&B will be possible.

[40]NCES BPS:90/92 Data Analysis System.

[41]This is in part due to the small sample sizes in this subgroup for both cohorts.

Figure 10—Percentage of 1982–83 and 1989–90 beginning postsecondary students who initially enrolled in a 4-year institution the fall after their high school graduation, who were still enrolled in May three years later (May 1985 or May 1992)



NOTE: Students who interrupted their education and re-enrolled are included if they were enrolled in May of their third year.
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 Beginning Postsecondary Student Survey, first follow-up (1992), and High School and Beyond Student Survey (1982).

Appendix A

Glossary

This glossary describes the variables used in this analysis in the order that they appear in the report. The variables were taken directly from the NCES NPSAS:90 undergraduate and BPS:90/92 Data Analysis Systems, NCES software applications that generate tables from the NPSAS:90 and BPS:90/92 data. A description of the DAS software can be found in appendix B. The labels in parentheses correspond to the names of the variables in the DAS.

Student Background Characteristics

Race–ethnicity (RACE)

The following definitions of racial–ethnic groups correspond to OMB classifications (Policy directive No. 15, May 12, 1977). The survey participants were not given specific definitions but were asked to identify themselves; first according to race (American Indian/Alaskan Native, Asian/Pacific Islander, black, white); then whether or not they were of Hispanic origin; and for those who were Hispanic, whether they were Mexican/Mexican American/ Chicano, Cuban, or Puerto Rican. Similarly, American Indian/Alaskan Natives were asked their tribal affiliation and Asian/Pacific Islanders were asked their specific ethnic group (Chinese, Filipino, Hawaiian, Japanese, Korean, Vietnamese, Asian Indian, Samoan, or Guamanian).

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 American, 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).

Citizenship (CITZNSHP)

Citizen	Student was a U.S. citizen.
Eligible non-citiz.	Student was a not a citizen of the United States but satisfied the requirements to be eligible for financial aid. An example of an eligible noncitizen would be a person with permanent residence status.
Other	Student was a not a citizen of the United States and was not eligible for federal financial aid. An example would be a student who had been granted temporary residence in the United States (e.g., on a student visa).

Gender of student (GENDER)

Male

Female

Age as of 12/31/89 (AGE)

This is a continuous variable that was aggregated to the following categories:

23 years old or younger	Student was 23 years old or younger as of 12/31/89.
24–29 years old	Student was between 24 and 29 years old as of 12/31/89.
30 years old or older	Student was 30 years old or older as of 12/31/89.

Income percentile (FAMINCPR)

Income percentile ranks are calculated separately for dependent and independent students. For dependent students, the percentile rank is based on family income (DEPINC); for independents, it is based on the independent students' income (INDEPINC).

Lower 25th percentile	Income falls at or below the lowest quartile of undergraduates' income distribution.
26th to 75th	Income falls between the 25th and 75th percentile of

percentile	undergraduates' income distribution.
Upper 25th percentile	Income falls at or above the 75th percentile of undergraduates' income distribution.

Institutional and Educational Characteristics

Control of institution (CONTROL)

Public	A postsecondary education institution operated by publicly elected or appointed officials in which the program and activities are under the control of these officials and which is supported primarily by public funds.
Private, not-for-profit	A postsecondary 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 institution that is privately owned and operated as a profit-making enterprise. Includes career colleges and proprietary institutions.

Level of institution (TYPE)

Highest award offered at an institution.

Less-than-2-year	Institution where all of the programs are less than 2 years in duration. The institution must offer a minimum of one program of at least 3 months in duration that results in a terminal certificate or license or is creditable toward a formal 2-year or higher award.
2- to 3-year	Institution that confers at least a 2-year formal award (certificate or associate's degree) or offers a 2- or 3-year program that partially fulfills requirements for a baccalaureate or higher degree at a 4-year institution. The institution does not award a baccalaureate. These would include most community or junior colleges. Note: In this report, 2- to 3-year institutions were referred to as "2-year."
4-year non-doctoral-granting	Institution or subsidiary element that confers at least a baccalaureate degree in one or more programs, but does not award higher than a master's degree.

4-year doctoral-granting	Institution that confers a doctoral or first professional degree in one or more programs. Note: In this report, non-doctoral and doctoral institutions were aggregated to a classification called “4-year.”

Historically black college or university (HBCU)

Colleges and universities identified as HBCU were obtained from the Integrated Postsecondary Education Data Systems (IPEDS) institutional characteristics file and merged with the NPSAS:90 data. Students who were enrolled in an HBCUs were subsequently identified. Since most HBCUs are 4-year public or private, not-for-profit institutions, comparisons between students in HBCUs and non-HBCUs were limited to these types of institutions.

Undergraduate degree program (PROGTYP)

Type of program undergraduate was enrolled in during the 1989–90 academic year reported by the institution, aggregated in this report to “less than bachelor’s degree” and “bachelor’s degree.”

Associate’s degree	Student pursuing an associate’s degree.
Bachelor’s degree	Student pursuing a Bachelor of Arts or Bachelor of Science degree.
Undergraduate’s certificate	Student pursuing a certificate or formal award other than an associate’s or bachelor’s degree.
Other undergraduate	Student is not enrolled in any of the above programs.

Major field of study (MAJORS3)

Humanities	English, liberal arts, philosophy, theology, art, music, visual and performing arts.
Social/behavioral science	Psychology, economics, political science, other social science.
Life sciences	Biology.
Physical sciences	Physical science, physical sciences technology.
Mathematics	Mathematics.

Computer/information technology	Computer science, computer technology.
Engineering	Engineering, engineering technology.
Education	Elementary/secondary education, other education.
Business management	Accounting, finance, secretarial, business, marketing.
Health	Nursing RN, practical nursing, pre-med, other medical.
Vocational/ technical	Mechanic technology, protective service, skilled crafts, transportation, construction.
Other technical/ professional	Agriculture, architecture, journalism, communications, cosmetology, health technology, home economics, pre-law, paralegal, court reporting, social work.

Aspiration, degree planned (EXEDCOL)

The highest level of education that the student expected to complete. Master's and Ph.D./professional degrees were aggregated to "advanced degree."

Less than a bachelor's degree	Student expected to attend a trade school or some college, but not to earn a bachelor's degree.
Bachelor's degree	Student expected to earn a bachelor's degree.
Master's degree	Student expected to earn a master's degree.
Ph.D./professional	Student expected to earn a doctoral or first-professional degree.

Note: It has been found from NCES longitudinal surveys that students' aspirations tend to be much higher than the degree they actually attain.

Reasons for selecting the institution (PLACEMT; GD_REP; COURSOFF; SCHNWRK; BETTRJOB; SHORTER; FINAID; LIVEHOME; FRIENDAT)

Students were asked to indicate whether certain reasons were "very important," "somewhat important," or "not important" to them in deciding upon the school they attended in fall 1989. Table 11 reports the percentages of students who reported the following reasons were "somewhat or very important."

The school had a good reputation for placing its graduates.
The school had a good reputation.
The school offered the course of study the student wanted.
The student had a better chance of getting a job at school.
The student could work while attending the school.
The student could finish the course in a short period of time.
The student obtained the financial aid needed at the school.
The student could live at home.
The student had friends who attended the same school.

Received financial aid (TOTAID)

Student received financial assistance during the period July 1989 to June 1990 in the form of grants, loans, or work from sources other than family or self to help finance student's education. Students receiving aid were identified by the TOTAID variable having a positive value.

Grants (TOTGRT)

Total grants received between July 1989 and June 1990. Grants are a type of student financial aid that does not require repayment or employment. At the undergraduate level it is usually (but not always) awarded on the basis of need, possibly combined with some skills or characteristics the student possesses. Grants are more frequently awarded on a merit basis at the graduate level. Grants include scholarships and fellowships. The percentage of students with grants is the percentage with positive amounts recorded for this variable. The average amount received is the average for all students who received grants.

Total loan amount (TOTLOAN)

Total loans received between July 1989 and June 1990. This includes all loans through federal, state, or institutional programs except PLUS loans (which are made to parents). Loans are a type of student financial aid that advances funds and that are evidenced by a promissory note requiring the recipient to repay the specified amounts under prescribed

conditions. The percentage of students with loans is the percentage with positive amounts recorded for this variable. The average amount received is the average for all students who received loans.

Beginning Postsecondary Students' (BPS) Persistence

This analysis is based on data collected from a nationally representative sample of first-time beginning students in postsecondary education in academic year 1989–90. Students were surveyed in 1990 and again in the spring of 1992. The National Postsecondary Student Aid Study of 1990 (NPSAS:90) provided the base year data for the Beginning Postsecondary Students Longitudinal Survey which re-interviewed these students in the spring of 1992.

Degree goal (DEGGOAL)

Degree intention was determined from the response to the question, "Toward which degree or other award are the courses you are taking leading?" It was therefore possible for students to be working toward a degree that the institution did not offer (for example, a student could be attending a community college and working toward a bachelor's degree).

None	Student was not in formal degree program.
Vocational cert. or license	Student reported a vocational certificate or license as current degree goal.
Associate's degree	Student reported an associate's degree as current degree goal.
Bachelor's degree	Student reported a bachelor's degree as current degree goal.
Other	Student was not pursuing any of the above goals.

Bachelor's degree persistence (BARESULT)

Refers to students whose degree goal was a bachelor's degree. Because students would not normally complete a baccalaureate within the survey period, the variable emphasizes continuity of enrollment. Students are classified as follows:

Continuously enrolled	Student had no interruption in enrollment of more than 4 consecutive months.
Reenrolled following interrupted enrollment	Student had an interruption in enrollment of more than 4 consecutive months and reenrolled.

Left without reenrollment and without credential	Student left school without attaining an award and did not reenroll during survey period.

Enrollment is defined as continuous if enrollment is never interrupted for more than four consecutive months. Reenrollment for associate's and bachelor's degree are those who had reenrolled at least once by the time of the spring 1992 follow-up survey. It is important to note that reenrollment does not necessarily imply current (spring 1992) enrollment. Students who reenrolled may have experienced subsequent interruptions in enrollment. A very small percentage (about 1.5 percent) of students identified as continuously enrolled reported completing their degree.

Associate's degree persistence (AARESULT)

Refers to students whose degree goal was an associate's degree. The measure emphasizes both degree completion and continuity of enrollment. Enrollment is defined as continuous if enrollment is never interrupted for more than four consecutive months. Reenrollment for associate's and bachelor's degree are those who had reenrolled at least once by the time of the spring 1992 follow-up survey. It is important to note that reenrollment does not necessarily imply current (spring 1992) enrollment. Students are classified as follows:

Completed	Student reported attaining associate's degree.
Continuously enrolled	Student still enrolled and did not interrupt enrollment for more than 4 consecutive months.
Reenrolled following interrupted enrollment	Student interrupted enrollment for a period lasting longer than 4 consecutive months and reenrolled.
Left without reenrollment and without credential	Student left school without and attaining an award and did not reenroll during survey period.

Because of the small sample sizes of minority students, the continuously enrolled and reenrolled categories were aggregated.

Vocational certificate or license (ANYCERT)

Refers to students whose degree goal was a vocational certificate or license. Because these programs are typically of short duration, the measures emphasize degree completion. Students are classified as follows:

Completed, less than 9 months	Student completed certificate or license in less than 9 months.
Completed, 9	Student completed certificate or license in 9 months or more.

or more months	
Still enrolled	Student was enrolled at time of survey.
Left without credential	Student left school without attaining certificate and did not during survey period.

Because of the small sample sizes of minority students, the two "completed" categories were aggregated.

Additional BPS Variables Included in Multivariate Analysis

Enrollment status (ATTNST3)

This variable represents students' enrollment (reported by the student) over the entire academic year (9 months).

Full-time, full-year	This category includes students who were enrolled full time for 9 months.
Part-time and/or part-year	Includes students who were not enrolled full time for at least nine months. Thus it includes students enrolled full time for one term and part time for an entire year, and students enrolled full or part time for one term and not enrolled for a second term.

Parent education (PAREDUC)

The highest level of education completed by the student's parents (mother's or father's education, whichever was highest).

High school or less	High school diploma, GED, or less than a high school diploma.
Postsecondary, but less than a bachelor's	Trade school, 2 years of college or more (but not a bachelor's degree).
Bachelor's or higher	Bachelor's degree, master's degree, doctoral degree, or professional degree.

Average number of hours worked per week while enrolled in 1989–90 (EMWKHR3)

Did not work	Student did not report working during enrollment.

1–19 hours/week	Student reported working part time, fewer than 20 hours/week.
20–34 hours/week	Student reported working part time, from 20 to 34 hours/week.
35 or more hours/week	Student reported working full time, 35 or more hours/week while enrolled.

Marital status in 1990 (MARITAL)

Never married	Student had not married as of the 1989–90 academic year.
Married	Student was married as of the 1989–90 academic year.
Divorced/separated/ widowed	Student was divorced, separated, or widowed as of the 1989–90 academic year.

Time of entry into postsecondary education (STUDTYPE)

Traditional	Entered within one year of high school graduation.
Non-traditional	Entered one year or more following high school graduation.

The degree of academic and social involvement at NPSAS institution (INVOLVE)

This index is based on the student's reported frequency (never, once, sometimes, often) of the following activities:

Contact with faculty outside of class.
Meetings with an advisor concerning academic plans.
Discussion of academic matters with faculty outside class.
Participation in study groups outside class.
Participation in cultural activities with friends from school.
Participation in school clubs.
Participation in intramural and intercollegiate activities.
Student never participated in activities.

The responses were coded from 1 to 4 for each activity and the mean response was calculated and coded as follows:

Never	Mean value less than 1.75
Once	Mean value of 1.75 to less than 2.5

Sometimes	Mean value of 2.5 to less than 3.75
Often	Mean value of 3.75 or higher

Comparison of Persistence between HS&B Sophomore and BPS Cohorts

For comparability between the two cohorts, the comparison was limited to undergraduates who entered a 4-year college or university immediately after high school graduation (within one year after graduating for BPS and the fall following high school graduation for HS&B).

Student was an immediate entrant into PSE

BPS variable: STUDTYPE	Traditional entry into postsecondary education Students who entered within one year of their high school graduation.
HS&B variable: PSE8209	Enrollment status (full- or part-time) in September 1982.

Student entered a 4-year institution

BPS variable: SCHL8990	Level of institution AY 1989–90. Limited to students enrolled in 4 year institutions.
HS&B variable: PSESTART	Type of start in postsecondary education. Limited to students enrolled full- or part-time in 4-year institutions.

Student was enrolled as of May in the third year (includes continuous and non-continuous enrollment)

BPS variable: PERSIST2	Enrollment persistence and attainment by May 1992. Student was continuously or non-continuously enrolled as of May 1992. This variable was used instead of other BPS persistence variables (e.g., BARESULT) because it was not associated with a specific degree goal and it indicated a specific date of enrollment, regardless of whether student interrupted enrollment or not. Thus, it was the most comparable to the HS&B persistence variables.
HS&B variable: PSE8505	Enrollment status (full- or part-time) as of May 1985.

Appendix B

Technical Notes and Methodology

The 1989–90 NPSAS and the 1990–92 Beginning Postsecondary Student Surveys

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, 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.

The 1990–92 Beginning Postsecondary Students Longitudinal Study (BPS:90/92) followed students identified as first-time beginning (FTB) students in the academic year 1989–90 from the NPSAS:90 sample. A follow-up was conducted 2 years after the NPSAS:90 survey that obtained information concerning enrollment, program completion, education financing, employment, and family formation; expectations for graduate school; participation in additional education (provided by an employer or other non-postsecondary provider); family income and expenditure; goals and aspirations; and civic participation. The data derived from this survey permit a variety of analyses concerning postsecondary persistence and completion, entry into the work force, and civic participation.

NPSAS:90 included a stratified sample of approximately 69,000 eligible students (about 47,000 of whom were undergraduates) from about 1,100 institutions. Students were included in the sample if they attended a NPSAS-eligible institution; were enrolled between July 1, 1989 and June 30, 1990; 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.

For each of the students included in the NPSAS sample, there were up to three sources of data. First, institution registration and financial aid records were extracted. Second, a Computer Assisted Telephone Interview (CATI) designed for each student was conducted. Finally, a CATI designed for the parents or guardians of a subsample of students was conducted. Data from these three sources were synthesized into a single system with an overall response rate of about 89 percent. For example, the variable age was determined by first checking student responses. If a student did not provide this information, age was taken from the institutional record abstract.

For more information on the NPSAS survey, consult *Methodology Report for the 1990 National Postsecondary Student Aid Study* (Longitudinal Studies Branch, Postsecondary Education Statistics Division, Washington, D.C.: U.S. Department of Education, National Center for Education Statistics, NCES 92-080, June 1992).

NPSAS:90 yielded an initial set of 11,700 BPS students, which contained 10,566 students who had been selected as undergraduate students, and 1,134 students who were later identified as graduate or first-professional students as discussed above. The BPS:90/92 sample consisted of 10,624 members for whom response and eligibility status were defined. Sample-based adjustment cell weighting was used to compensate for BPS nonresponse and ineligibility. The weighted percent responding at this phase of data collection (i.e., the estimated percent of the population represented by the sample of students for whom eligibility could be determined using the BPS procedures) was 85.8 percent. Both the weighted and unweighted percentages of respondents among the sample students known to be eligible for BPS were 99.7 percent. Therefore, the weighted and unweighted BPS response rates (products of the above response rates for eligibility determination and BPS interviewing) were 85.5 percent and 85.2 percent, respectively.

For more information on the BPS:90/92 survey, consult the *Beginning Postsecondary Students Longitudinal Study First Follow-up (BPS:90/92) Final Technical Report*, Postsecondary Longitudinal Studies Branch, Postsecondary Education Statistics Division, National Center for Education Statistics, U.S. Department of Education, 555 New Jersey Avenue NW, Washington, DC 20208-5652.

The High School and Beyond Fourth Followup

The High School and Beyond (HS&B) sophomore cohort was used to determine changes in persistence between students beginning their college education in 1983–84 with the BPS cohort who began their education in 1989–90. The HS&B fourth followup, conducted in the spring of 1992, focused exclusively on the sophomore class and had two components: a respondent survey of 14,825 members of the 1980 sophomore cohort, and a transcript study based on the 9,064 sophomore members who reported postsecondary education attendance. The goals of the fourth followup were to obtain information on issues of access to and choice of undergraduate and graduate educational institutions, persistence in attaining educational goals and progress through the curriculum, rates of degree attainment and of other educational outcomes, and labor market outcomes in relation to educational attainment and labor market experiences. For more information on the HS&B fourth followup, consult *The High School and Beyond Fourth Followup Methodology Report*, Postsecondary Longitudinal Studies Branch, Postsecondary Education Statistics Division, National Center for Education Statistics, U.S. Department of Education, 555 New Jersey Avenue NW, Washington, DC 20208-5652 1994.

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 non sampling errors. Sampling errors may occur because observations are made only on samples of students, not on entire populations. Non-sampling errors occur not only in sample surveys but also in complete censuses of entire populations.

Non-sampling 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 estimating missing data.

Data Analysis System

The estimates presented in this report were produced primarily from the NPSAS:90 undergraduate and BPS:90/92 Data Analysis Systems (DAS). The HS&B fourth followup DAS was used to make comparisons between the HS&B and BPS persistence rates. The DAS software makes it possible for users to specify and generate their own tables from postsecondary data sets. With the DAS, users can recreate or expand upon the tables presented in this report. In addition to the table estimates, the DAS calculates proper standard errors[42] and weighted sample sizes for these estimates. For example, tables B1a, B1b, B2a, B2b, and B2c present the standard errors that correspond to selected tables 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. Also, 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 adjustment procedure.)

[42]The NPSAS sample is not a simple random sample and, therefore, simple random sample techniques for estimating sampling error cannot be applied to these data. The DAS takes into account the complexity of the sampling procedures and calculates standard errors appropriate for such samples. The method for computing sampling errors used by the DAS involves approximating the estimator by the linear terms of a Taylor series expansion. The procedure is typically referred to as the Taylor series method.

Table B1a—Standard errors for table 5: percentage distribution of undergraduate enrollment, by control of institution, and by race–ethnicity: 1989–90

	Public	Private not-for-profit	Private for-profit
Total	1.02	0.72	0.66
Race–ethnicity			
American Indian/Alaskan Native	3.43	1.93	2.76
Asian/Pacific Islander	1.70	1.32	0.87
Black, non-Hispanic	2.99	1.47	2.58
Hispanic	3.19	2.52	2.32
White, non-Hispanic	1.06	0.85	0.55
Racial–ethnic subgroup Asian			
Asian Indian	3.91	3.55	1.40
Chinese	2.65	2.28	0.85
Japanese	2.41	2.14	0.92
Korean	3.72	3.50	0.92
Pacific Islander	2.52	1.73	1.59
Vietnamese	4.59	4.54	0.63
Other or nonspecified	2.35	1.48	1.70
Racial–ethnic subgroup Hispanic			
Cuban	4.49	3.56	2.02
Mexican	2.44	1.37	1.85
Puerto Rican	5.22	4.61	3.04
Other or nonspecified	3.97	3.53	3.34

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Undergraduate Data Analysis System.

Table B1b—Standard errors for table 6: percentage distribution of undergraduate enrollment, by level of institution, and by race–ethnicity: 1989–90

	Less-than-2-year	2-year	4-year
Total	0.64	1.61	1.60
Race–ethnicity			
American Indian/Alaskan Native	2.56	5.00	4.31
Asian/Pacific Islander	0.74	3.54	3.40
Black, non-Hispanic	2.41	3.87	3.30
Hispanic	2.48	3.67	3.30
White, non-Hispanic	0.56	1.77	1.77
Racial–ethnic subgroup Asian			
Asian Indian	0.82	7.73	7.61
Chinese	0.63	6.96	6.81
Japanese	0.47	7.17	7.14
Korean	0.85	7.37	7.28
Pacific Islander	1.17	5.51	5.26
Vietnamese	0.52	7.36	7.26
Other or nonspecified	1.56	3.88	3.53
Racial–ethnic subgroup Hispanic			
Cuban	1.37	8.38	8.18
Mexican	1.79	4.80	4.40
Puerto Rican	2.83	4.78	5.12
Other or nonspecified	3.53	3.79	3.71

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Undergraduate Data Analysis System.

Table B2a—Standard errors for figure 7, percentage of 1989–90 beginning post-secondary students who reported a bachelor's degree as their current degree objective, by their persistence status as of spring 1992, by race–ethnicity

	Completed	Continuously enrolled or re-enrolled	Left school with no degree
Total	1.38	1.10	1.17
Race–ethnicity			
American Indian/Alaskan Native	—	—	—
Asian/Pacific Islander	6.62	6.13	4.19
Black, non-Hispanic	3.93	3.66	3.22
Hispanic	5.50	5.58	5.19
White, non-Hispanic	1.51	1.17	1.3

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Beginning Postsecondary Student Survey (BPS:90/92), Data Analysis System.

Table B2b—Standard errors for figure 8, percentage of 1989–90 beginning postsecondary students who reported an associate's degree as their current degree objective, by their persistence status as of spring 1992, by race–ethnicity

	Completed	Continuously enrolled or re-enrolled	Left school with no degree
Total	1.26	2.11	2.07
Race–ethnicity			
American Indian/Alaskan Native	—	—	—
Asian/Pacific Islander	—	—	—
Black, non-Hispanic	3.27	6.47	6.07
Hispanic	5.64	8.59	7.94
White, non-Hispanic	1.43	2.22	2.20

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Beginning Postsecondary Student Survey (BPS:90/92), Data Analysis System.

Table B2c—Standard errors for figure 9, percentage of 1989–90 beginning postsecondary students who reported a vocational certificate as their current educational objective, by their persistence status as of spring 1992, by race–ethnicity

	Completed	Still enrolled	Left school with no certificate
Total	2.59	1.30	2.62
Race–ethnicity			
American Indian/Alaskan Native	—	—	—
Asian/Pacific Islander	—	—	—
Black, non-Hispanic	6.24	2.21	5.92
Hispanic	7.28	7.94	9.12
White, non-Hispanic	2.94	1.24	2.96

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Beginning Postsecondary Student Survey (BPS:90/92), Data Analysis System.

For more information about the 1990 NCES Data Analysis Systems, contact:

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Statistical Procedures

The descriptive comparisons were tested in this report using Student's *t* statistics. Comparisons based on the estimates of the proportions include the estimates of 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 between each pair of means or proportions and comparing these with published tables of significance levels for two-tailed hypothesis testing.

The 1989–90 NPSAS survey, while representative and statistically accurate, was not a simple random sample. Instead, the survey sample was selected using a more complex three-step procedure with stratified samples and differential probabilities of selection at each level. First, postsecondary institutions were initially selected within geographical strata. Once institutions were organized by zip code and state, they were further stratified by control (i.e., public; private, not-for-profit; or private, for-profit) and offering (less-than-2-year, 2- to 3-year, 4-year non doctoral-granting, and 4-year doctoral-granting). Sampling rates for students enrolled at different institutions and levels (undergraduate or other) varied, resulting in better data for policy purposes, but at a cost to statistical efficiency.

Student's *t* values may be computed for comparisons using these tables' estimates with the following formula:

$$t = \frac{P_1 - P_2}{\sqrt{(se_1^2 + se_2^2)}}$$

where P_1 and P_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 percent distribution in this report, across a row in a table, a covariance term was added to the denominator of the *t*-test formula).

There are hazards in reporting statistical tests for each comparison. First, the test may make comparisons based on large *t* statistics 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 is 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 when *k* comparisons were made within a family of possible tests, the significance level of the comparisons would sum to $p \leq .05$.[43]

For example, in a comparison of the percentages of males and females who enrolled in postsecondary education only one comparison is possible (males v. females). In this family, $k=1$, and the comparison can be evaluated with a Student's *t* test. 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 .005. The formula for calculating family size (k) is as follows: $k = j * (j - 1)/2$, 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, black, Hispanic, and white), so $k = 5*(5-1)/2=10$.

Adjustments 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 for those who persist in postsecondary education by race–ethnicity, it is impossible to know to what extent the observed variation is due to race–ethnicity and to what extent it is due to differences in other factors such as income, attendance status, and type of institution attended. However, if a table were produced showing race–ethnicity within attendance status, within income group, within institution type, the cell sizes would be too small to identify the patterns. For those cases where the

[43]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 *Journal of the American Statistical Association* 56: 52–64.

sample size becomes too small to support controlling for another level of variation, one must use other methods to take such variation into account.

Adjusted values for subgroup populations were obtained by regressing the dependent variable on a set of descriptive variables such as, family income, race–ethnicity, etc. The adjusted values were determined only for those independent variables that remained were in the model. That is, the model was 'reduced' by removing variables whose variance was accounted for by other variables. Once the model was reduced, substituting ones or zeros for the subgroup variable(s) and the mean proportions for the other variables results in an estimate of the adjusted proportion for some specified subgroup holding all other variables constant. For example, consider the case in which two variables, family income and race–ethnicity, are used to describe continuous enrollment in a bachelors degree program. The variables family income and race–ethnicity are recoded into two dummy variables representing family income and four dummy variables representing race–ethnicity:

Family Income:

	I_1	I_2
Low Income	1	0
High Income	0	1
Middle Income	0	0

and;

Race–ethnicity:

	R_1	R_2	R_3	R_4
American Indian/Alaskan Native	1	0	0	0
Asian/Pacific Islander	0	1	0	0
Black, non-Hispanic	0	0	1	0
Hispanic	0	0	0	1
White, non-Hispanic	0	0	0	0

Equation 1.1 is then estimated from the correlation matrix output from the DAS:

$$\hat{Y} = a + b_1I_1 + b_2I_2 + b_3R_1 + b_4R_2 + b_5R_3 + b_6R_4 \qquad (1.1)$$

To estimate the adjusted mean for any subgroup evaluation 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,

say we had a case where Y=persistence was being described by I_1 through R_4 (coded as shown above), and suppose the means for I_1 through R_4 are:

Variable	X
I_1	0.255
I_2	0.244
R_1	0.008
R_2	0.040
R_3	0.097
R_4	0.073

Estimating 1.1 above from the correlation matrix and the regression results in:

$$\hat{Y} = 0.542+(0.015)I_1+(0.101)I_2+(-0.092)R_1+(0.116)R_2+(-0.061)R_3+(-0.107)R_4$$

To estimate the adjusted value for blacks, one substitutes the appropriate values for the intercept and each dummy variable.

Variable	Value	b
a	0.542	
I_1	0.255	0.015
I_2	0.244	0.101
R_1	0	-0.092
R_2	0	0.116
R_3	1	-0.061
R_4	0	-0.107

This results in:

$$\hat{Y} = 0.542+(0.255)(0.015)+(0.244)(0.101)+(-0.092)(0)+(0.116)(0)+(-0.061)(1)+(-0.107)(0)$$

$$\hat{Y} = 0.5095$$

In this case the adjusted mean for black students is 0.5095 and represents the expected persistence rate for black students pursuing a bachelor's degree who were continuously enrolled and who look like the average student across all the other variables (in this example, income).

It is relatively straightforward to produce a multivariate model using NPSAS:90 or BPS:90/92 data, since one of the output options of the DAS is a correlation matrix, computed using pair-wise missing values.[44] This matrix can be used by most commercial regression packages as input for producing weighted least-square estimates of the parameters. That was the general approach used for this report, with two additional adjustments described below to reduce the effect of redundant parameters and to incorporate the design effect for statistical testing.

Since many of the independent variables are interrelated (as previously discussed in the report), the presence of some variables in the model is redundant. That is, the variance explained by them will have been accounted for by other variables in the model. Accordingly, variables without explanatory power were removed, resulting in a reduced regression model. The reduced model was then used to produce the parameter estimates shown in the above formula. For example, the variable age is highly related to financial dependency status since one of the definitions of financial independence is being over the age of 24. Therefore, the variable age may account for the variation observed for dependency status when both variables are present in the model. In this case, the dependency status variable would be removed from the model.

Most commercial regression packages compute parameter standard errors on the assumption of simple random sampling. For the data used in this report, this assumption is incorrect. A better approximation of their standard errors is to multiply each standard error by the DEFT of the dependent variable,[45] where 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 is available with the correlation matrix.

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

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