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ABSTRACT

Controversy over whether rising college costs or recent federal policies have adversely affected opportunities for postsecondary education, especially among low income and minority students, is noted. A study examined the competing claims that (1) there are enrollment increases among all students (even minorities) and (2) enrollment is far lower for low income and minority students than advantaged groups. Changes in enrollment and persistence for various types of students are described. The study saw the need for a clear analysis of trends in postsecondary education. It took the perspectives that: policy discussions about equity and opportunity must examine the progress of individual students over time; and studies of enrollment are a first step to documenting trends in postsecondary education. Two major sections look at: (1) changes in postsecondary education (immediate enrollment after high school, cumulative enrollment in each year after high school graduation, and total enrollment after 4 years); and (2) changes in persistence in postsecondary education (immediate entry into postsecondary education and entry at four time periods). Each section concludes with a brief examination of multivariate models for enrollment and persistence. It was found that the record of the 1972-82 decade was mixed. The decade had a positive overall trend in postsecondary enrollment, with large increases for all groups between 1972 and 1980. Upward trends were particularly notable for women, minorities, and students of low socioeconomic status. In contrast to this general picture, however, trends in persistence were downward for all types of students. A technical appendix is included. Figures and tables are included. (SM)

ENROLLMENT AND PERSISTENCE IN POSTSECONDARY EDUCATION: EXPANDING OPPORTUNITY OR EQUITY LOST?

by

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ENROLLMENT AND PERSISTENCE IN POSTSECONDARY EDUCATION: EXPANDING OPPORTUNITY OR EQUITY LOST?

There has been some controversy over whether rising college costs or recent federal policies have adversely affected opportunity for postsecondary education, especially among low income and minority students. Federal government spokesmen and many college officials cite statistics showing enrollment increases among all students and even among minority populations. These officials usually cite the absolute numbers of students enrolled each year, stating that the increasing numbers mean educational opportunity continues to expand. By contrast, advocates for disadvantaged groups claim that enrollment is far lower for these students than for more advantaged groups. These advocates argue that greater efforts are needed to sustain or revive the drive toward equity in higher education.

The objective of this research was to shed light on these competing claims by documenting trends in postsecondary enrollment between 1972 and 1986.[1] The National Center for Education Statistics gathered data on college-age students during that period of time, following the same students over time to track their educational progress. The availability of the 1986 follow-up data on three cohorts (the 1972, 1980, and 1982 high school graduating classes) enables us, for the first time, to compare participation rates, rather than enrollment totals, for students who graduated a decade apart.[2] By comparing these participation rates for the three cohorts, this report describes changes in enrollment and persistence for particular types of students.[3]

Previous studies of the educational experiences of recent high school graduates have discussed how those experiences varied among students with different background characteristics.[4] These studies demonstrated that there were significant differences between

[1] All rates of enrollment and attainment reported in this paper are rates as of February 1986, unless otherwise indicated. Data were obtained from the High School and Beyond surveys of 1980 high school seniors taken in 1980, 1982, 1984, and 1986. All data on postsecondary plans, secondary school grades, and postsecondary attainment were obtained from student self-report. All of the analysis for this report was performed on that portion of the cohort sample that graduated from high school.

[2] In all cases this report compares the postsecondary education only of those students who have graduated from high school.

[3] No comparisons are made of attainment rates, due to the time censoring of the 1986 survey. Since interviews were conducted during the spring semester, accurate attainment rates after four years were not obtained for these students.

[4] See Eagle et al, *A Descriptive Summary of 1980 High School Sophomores: Six Years Later; A Descriptive Summary of 1980 High School Seniors: Six Years Later; and A Descriptive Summary of 1972 High School Seniors: Fourteen Years Later.*.

men and women and among racial/ethnic groups in their rates of enrollment, persistence, and attainment in postsecondary education. In addition, these studies demonstrated a continuing relationship between socioeconomic status and educational experiences.[5] Given the systematic relationship between these student characteristics and educational experiences, this report examines not only the changes in educational experiences for the students in each cohort as a whole, but also examines separately the changes in educational patterns for males and females; for blacks, Hispanics, and whites; and for students of different socioeconomic status.[6]

This was a descriptive study, not a causal study. The perspective guiding the research was the need for a clear analysis of trends in postsecondary education. With alleged experts making contrary statements about the same set of facts, there is an urgent need to establish the facts in order for a fruitful discussion to continue.

This research took the perspective that policy discussions about equity and opportunity must examine the progress of individual students over time, not just enrollment figures for a particular calendar year. Rather than simply comparing the number of students enrolled in particular years, we must compare the proportion of students entering postsecondary education after their high school years.

Finally, this research took the perspective that studies of enrollment are only a first step to documenting trends in postsecondary education. We must compare not only the proportion enrolling but also the proportion *persisting* in postsecondary education. That is, what proportion of students not only enrolled but stayed in school long enough to receive some benefit? This paper reports the proportion of students from each cohort who remained in continuous for various periods of time.

This paper is divided into two major sections, one concerning enrollment in postsecondary education and one concerning continuation in school, or persistence. The first section examines three indicators of enrollment: immediate enrollment after high school, cumulative enrollment in each year after high school graduation, and total enrollment after four years. The second section studies persistence among immediate entrants into postsecondary education only, and at four time periods: after one year of enrollment, after two years, after three years, and after four years. Each section concludes with a brief examination of

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[5] See especially William H. Sewell and Robert M. Hauser, "Causes and Consequences of Higher Education: Models of the Status Attainment Process," in Sewell, Hauser, and Featherman, ed., *Schooling and Achievement in American Society* (N.Y.: Academic Press, 1976), pp.9-27.

[6] No comparisons are made for Native Americans or Asians as separate groups, due to their small numbers in the NLS-72 sample.

multivariate models for enrollment and persistence. The discussion of these models does not offer a causal analysis of educational progress, but notes changes in the multivariate relationships between student characteristics and educational progress between 1972 and 1982.

Changes in Postsecondary Enrollment

This section describes changes in the proportion of students from different cohorts who pursued an education beyond high school. The first indicator used is immediate entry into postsecondary education, defined as beginning postsecondary education by the October after high school graduation. This is an important indicator because those who begin their postsecondary education immediately have higher rates of attainment than those who enter later.[7] The second indicator used is cumulative enrollment in each post-high school year. In describing enrollment differences between cohorts, comparisons are made between rates of enrollment at a certain time after high school graduation. For example, enrollment in the first year is compared during the 1972-73 year for 1972 graduates, the 1980-81 year for 1980 graduates, and the 1982-83 year for 1982 graduates. The conclusion of this section summarizes enrollment trends by comparing the proportion of graduates who had entered postsecondary education within four years after their high school graduation.

Immediate Entry into Postsecondary Education

The proportion of students entering immediately into postsecondary education changed somewhat during the 1972-1982 period, with the later graduates enrolling at higher rates than the 1972 graduates. Forty-seven percent of the 1972 graduates entered a postsecondary institution immediately after high school, and the proportion of 1980 graduates who enrolled immediately was 53 percent. The apparent decline in the rate of enrollment for the 1982 graduates was not statistically significant, and this rate (50 percent) was higher than that for the 1972 graduates.[8]

As demonstrated in Figure 1, rates of postsecondary enrollment increased between 1972 and 1980 regardless of students' race/ethnicity. Enrollment rates increased for students of both

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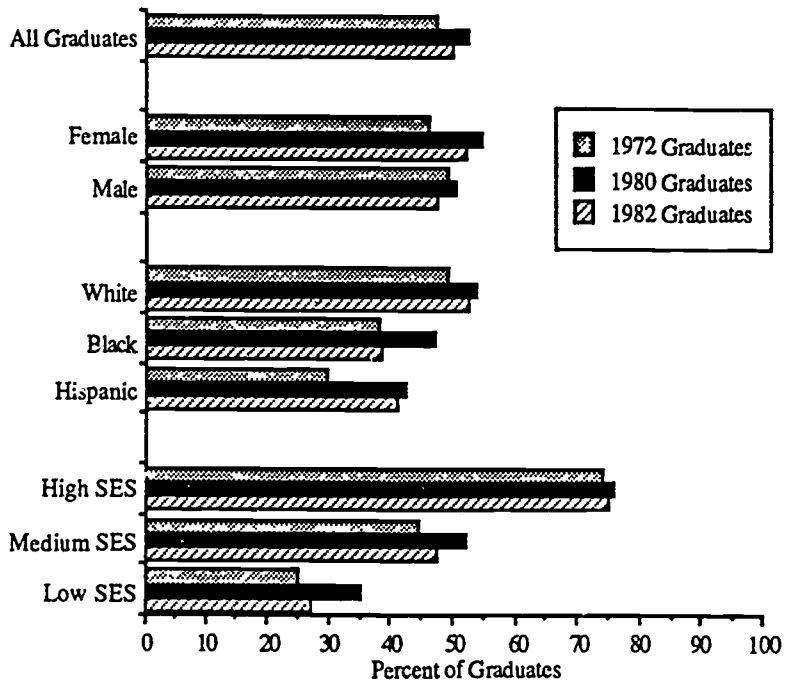
[7] See Eagle et al, *A Descriptive Summary of 1980 High School Seniors: Six Years Later;* p.16.

[8] Differences in proportions reported throughout the text were evaluated using a two-tailed t-test. Unless otherwise noted, differences reported were significant to the $p \leq .0167$ when taken singly, so that $p \leq .05$ level for each family of tests. An explanation of the procedure used is given in the technical appendix to this report.

low and medium socioeconomic status.[9] However, increases in enrollment between 1972 and 1980 were concentrated among female students rather than male students. The rate of immediate enrollment for female 1972 graduates was 46 percent, rising to 55 percent for the 1980 cohort. The increase for male graduates was not statistically significant.

Figure 1[10]
Percent of Graduates Entering Postsecondary Education Immediately after High School



Although the apparent decline in the rate of immediate enrollment for all 1982 graduates was not statistically significant, there were statistically significant declines for some student subgroups. Fewer 1982 graduatesthan 1980 graduates of medium socioeconomic status enrolled in postsecondary education, and there was also a decline in enrollment for students of low socioeconomic status.[11] Immediate enrollment for blacks declined, while the apparent

[9] The change in the rates for high SES students was not statistically significant.

[10] Exact means and standard errors for data in the figures are available from the author upon request.

[11] The change in the rates for high SES students was not statistically significant. For this analysis, students were grouped into quartiles according to their score on an index of socioeconomic status created by the National Opinion Research Center for the High School and Beyond surveys. Thus students are divided into groups with high SES (the top quartile), medium-high SES (the second quartile), medium-low SES (the third quartile), and low SES (the fourth quartile). In all of the regression models, the middle quartiles were grouped together as "medium" SES. The components of the SES index were mother's education, father's education, father's occupational status, family income, and a summary index of possessions in the household.

change in enrollment for Hispanic or white graduates was not statistically significant. When males and females were examined separately, the difference in enrollment rates between the two cohorts was not statistically significant.

The rate of enrollment for the 1982 cohort as a whole was still higher than that for the 1972 cohort as a whole: 50 percent compared to 47 percent. However, this difference was replicated only among certain subgroups. Enrollment rates increased overall for females, but there was no statistically significant difference between the 1982 enrollment of males and their 1972 enrollment. Similarly, although the 1982 enrollment rates for whites were higher than their 1972 rates, there was no statistically significant difference between the 1982 and 1972 enrollment rates for Hispanic or black students. For black graduates the proportion who enrolled in 1982 was the same as the proportion who enrolled in 1972: 38 percent.[12]

In addition to having higher rates of immediate entry into postsecondary education, later cohorts had higher rates of delayed entry as well. Six percent of the 1980 graduates and eight percent of the 1982 graduates entered during the second year, compared to three percent of the 1972 graduates. The result is that cumulative rates of enrollment were higher for the later cohorts than for 1972 high school graduates, with the differences greater after two years than in the first year after high school graduation. (See Figure 2.)

[12] For no SES group taken separately was the rate of enrollment for the 1982 cohort significantly different from the rate for the 1972 cohort.

Figure 2
Cumulative Percent of High School Graduates Enrolled in Postsecondary Education Each Year after High School

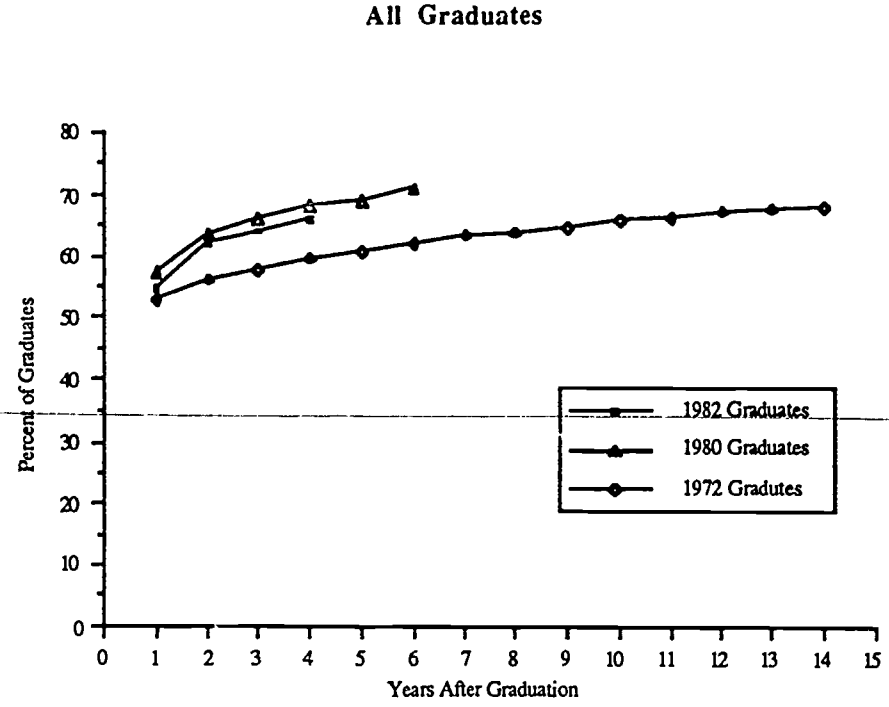
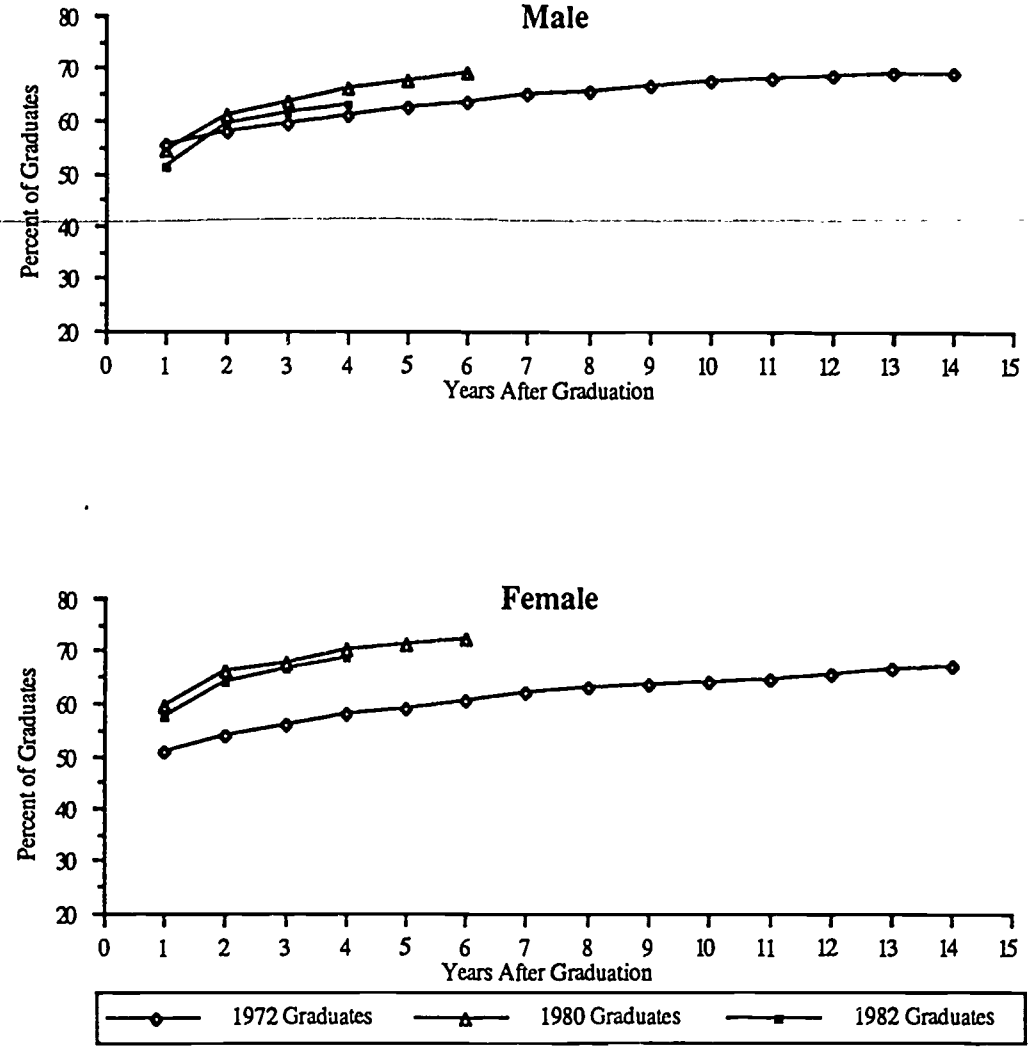


Figure 2 shows that the proportion of graduates who had been enrolled by a particular length of time after graduation was always higher for the later cohorts than for the 1972 graduates.[13] However, this degree of increase in enrollment rates was not shared equally by different types of students. For example, although enrollment for females increased between 1972 and 1980, among males the differences in the proportion of graduates from each cohort who enrolled during the first year after high school were not statistically significant. (See Figure 3.) There was no statistically significant difference in any year between the proportion of 1982 graduates and 1980 graduates who had enrolled, either for males or for females.

[13] The difference between 1972 and 1982 graduates in first year enrollment was not statistically significant, but the differences for all other years are statistically significant.

Figure 3
Cumulative Percent of High School Graduates Enrolled in Postsecondary Education Each Year after High School, by Gender

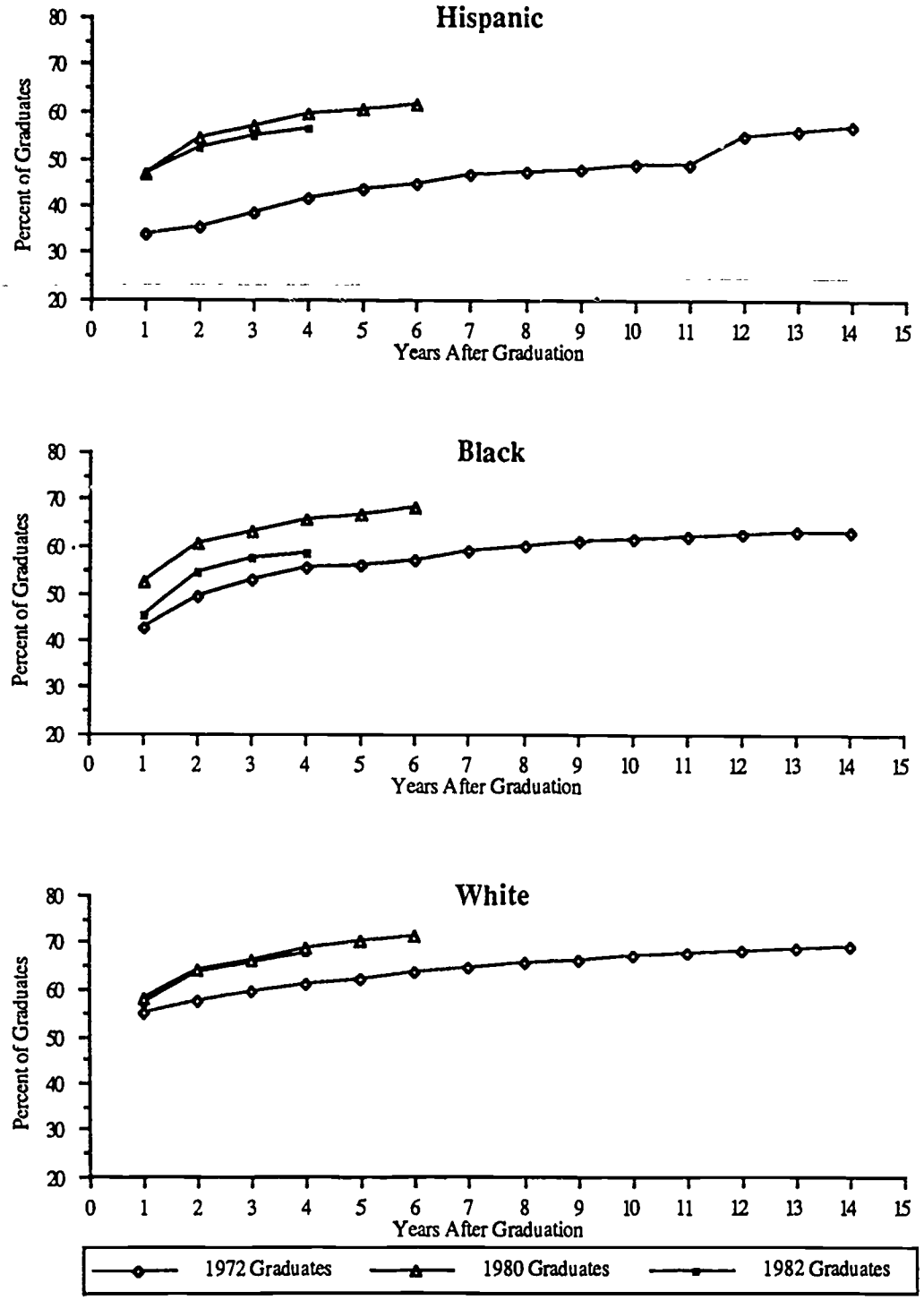


For most years after high school graduation, the proportion of white students who had enrolled in postsecondary education for some period of time was higher for the later cohorts than for the 1972 cohort.[14] (See Figure 4.)

The differences between Hispanic graduates of different cohorts matched those for whites, except that Hispanics showed greater increases in enrollment between the 1972 and 1980 cohorts. However, the pattern of cumulative enrollment for black graduates was quite different than that for whites and Hispanics. For blacks, there was an increase in enrollment from the 1972 cohort to the 1980 cohort, followed by a significant decline in enrollment levels between the 1980 and the 1982 cohorts. By the end of four years, the rates of cumulative enrollment were 55 percent for black 1972 graduates, 66 percent for black 1980 graduates, and 58 percent for black 1982 graduates. The 58 percent cumulative enrollment rate for black 1982 graduates was not significantly different from that reached by black 1980 graduates after two years (60 percent). Despite the increased rates of enrollment for the 1980 cohort compared to the 1972 cohort, the decline in enrollment rates between the 1980 and 1982 cohorts meant that in no year was the cumulative enrollment rate for black 1982 graduates significantly different from that for black 1972 graduates.

[14] The differences between cohorts in first year enrollment were not statistically significant. In no year was the difference between the cumulative percentage of the 1982 and 1980 white graduates enrolled in postsecondary education statistically significant.

Figure 4
Cumulative Percent of High School Graduates Enrolled in Postsecondary Education Each Year after High School, by Race/Ethnicity



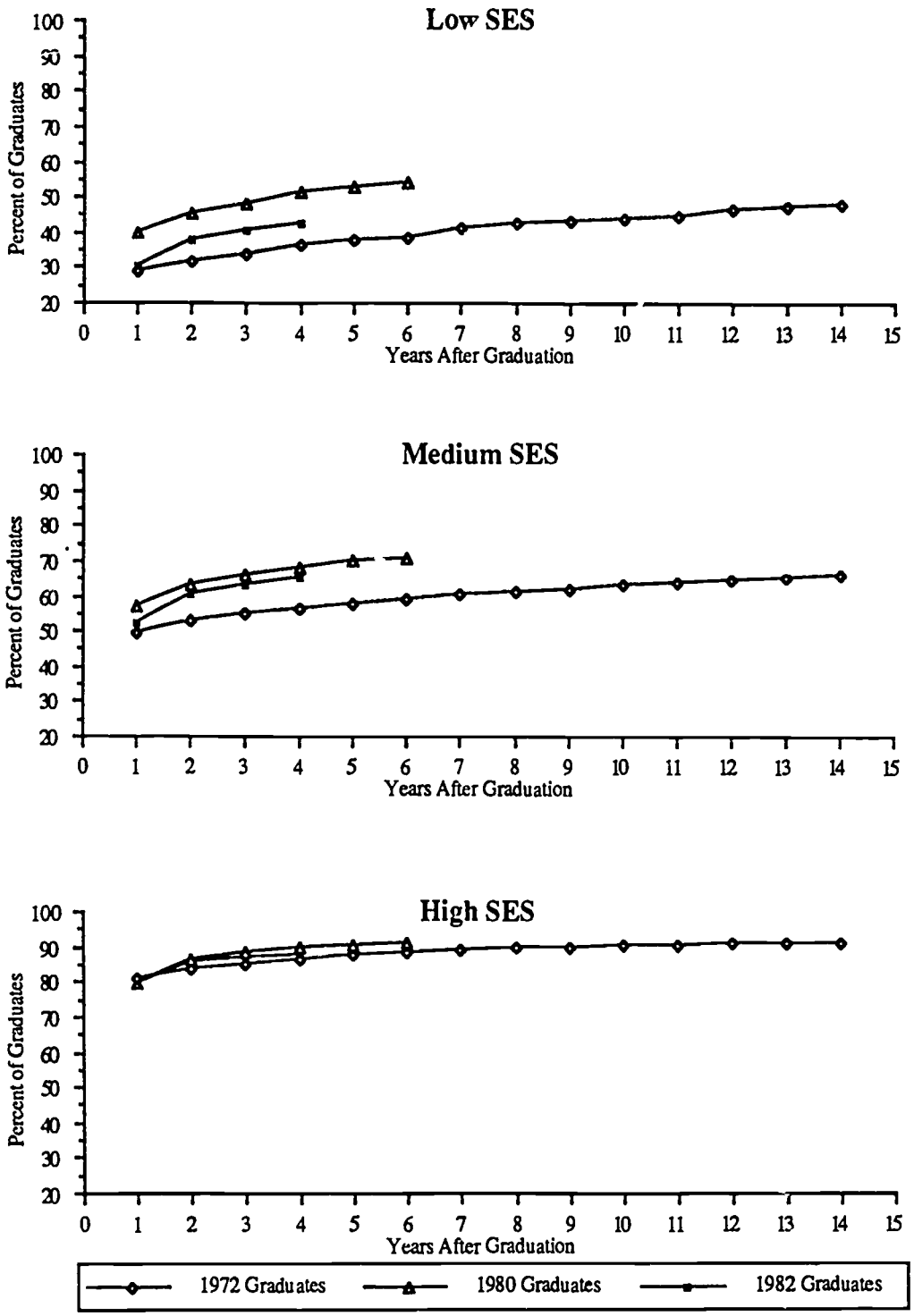
In general, the proportion of high SES students who had enrolled in postsecondary education by a certain time was no different for one cohort than for another. (See Figure 5.) High SES students enrolled at high rates in each year and in each cohort, and the differences between any two cohorts were not statistically significant.[15]

Among medium SES students, the 1980 graduates had higher cumulative enrollment rates than did the 1972 graduates. The rate of enrollment for the 1982 graduates was higher than that for the 1972 graduates, except that the difference in the first year was not statistically significant. After four years, 65 percent of the 1982 graduates and 56 percent of the 1972 graduates had enrolled in postsecondary education.

For students of low socioeconomic status, as for those of medium status, enrollment increased from the 1972 cohort to the 1980 cohort. However, there was also a significant decline in enrollment between the 1980 class and the 1982 class for students with low socioeconomic status. After three years, the cumulative enrollment rate for 1982 graduates with low socioeconomic status had finally equalled that for 1980 graduates with low socioeconomic status in their first year after high school: 40 percent. Despite the decline in cumulative enrollment rates for low SES students between the 1980 and 1982 cohorts, the 1982 cohort enrolled at higher rates overall than did the 1972 cohort.

[15] The one exception to this is that the cumulative enrollment rates for the 1980 seniors were significantly higher than those for the 1972 seniors after three years and after four years. No other pairwise comparison of high SES students was significant in any year, however.

Figure 5
Cumulative Percent of High School Graduates Enrolled in Postsecondary Education Each Year after High School, by Socioeconomic Status



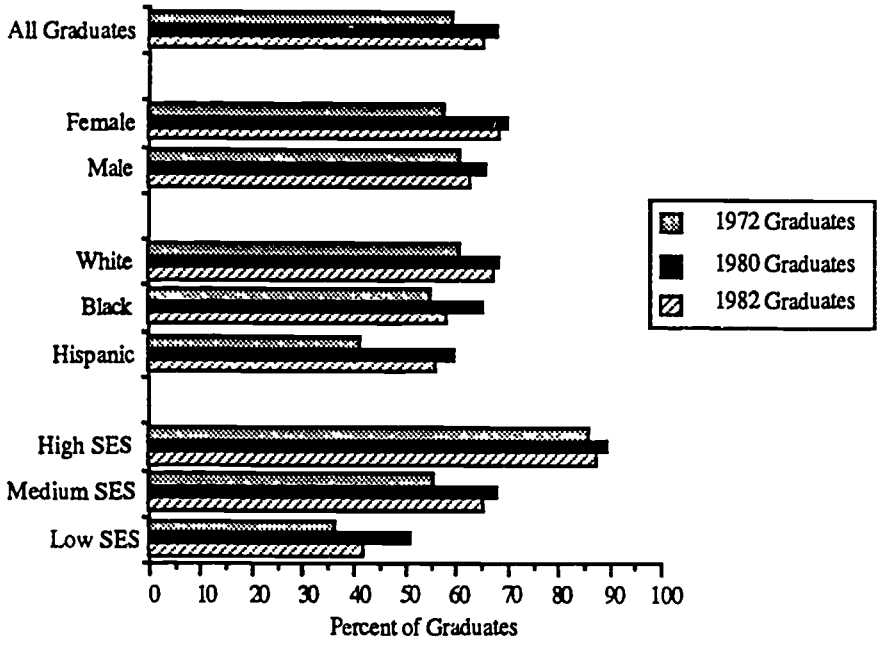
Postsecondary Enrollment after Four Years

Figure 6 summarizes enrollment trends by showing the percent of students who experienced some form of postsecondary education within four years of high school graduation.[16] Relationships between most student characteristics and enrollment in postsecondary education were the same for each cohort: students with higher socioeconomic status were more likely to have enrolled in postsecondary education than students with lower socioeconomic status, and white students had higher enrollment rates than Hispanic or black students. Only for students of different gender did the comparative enrollment rates change. Females of the 1972 cohort enrolled at close to the same rates as did males (58 percent for females and 61 percent for males), but in later cohorts females enrolled at significantly higher rates than men (70 percent compared to 66 percent in 1980 and 68 percent compared to 63 percent in 1982).

Figure 6 also summarizes the general upward trend in enrollment between the 1972 and 1980 cohorts and the subsequent decline in enrollment for certain types of students. All types of students had higher enrollment rates in the 1980 than the 1972 cohort, regardless of gender, race/ethnicity, or socioeconomic status. For students of low socioeconomic status and for black students, rates of enrollment for 1982 graduates were significantly lower than for 1980 graduates. Although 1982 graduates did not enroll at higher rates than 1980 graduates, the proportion enrolling was still higher than for 1972 graduates among students who were female, white, Hispanic, medium SES, or low SES. For students who were male, black, or high SES, enrollment for 1982 graduates was not significantly different than that for 1972 graduates.

[16] For 1982 graduates, the percentage is actually for those who had experienced any postsecondary education by February of 1986, the time of the survey.

Figure 6
Percent of High School Graduates Who Had Enrolled in Postsecondary Education within Four Years of High School Graduation



Multivariate Analysis of Enrollment in Postsecondary Education

The above analysis demonstrated that overall levels of enrollment increased for most types of students between 1972 and 1980, followed by a leveling off between 1980 and 1982. Exceptions to this trend were observed for blacks, who experienced enrollment declines after 1980, and for males, whose enrollment rates did not change significantly during this decade. The causes of these different trends are difficult to unravel, and this paper is confined to the task of describing changes in educational experiences over time rather than determining the underlying causes for those changes. However, the multivariate analysis of enrollment rates permits us to see if there has been any change between 1972 and 1982 in the relationship between gender, race, or socioeconomic status and enrollment when these and other student characteristics are taken into account.

Table 1 below shows the results when variables for gender, race, socioeconomic status, high school grades and ability were regressed on a dichotomous variable for enrollment.[17]

[17] These results were obtained using a linear probability model, not a probit or logit model. All regression coefficients in this report are unstandardized. For information on how the standard errors of the coefficients were

These variables taken together accounted for slightly over 20 percent of the variance in college enrollment rates for the three graduating classes studied.[18]

Regression analysis of enrollment rates shows that the underlying relationship between student characteristics and enrollment rates has changed little between 1972 and 1982, despite the fact that rates of enrollment themselves changed during the time period. The major exception to this was that females from the 1972 class were less likely to enroll and females from the 1980 and 1982 classes more likely to enroll, even when the other factors were taken into account. The probability that blacks of similar gender, grades, ability, and socioeconomic status would enroll in postsecondary education declined somewhat after 1972, while the probability of Hispanic enrollment increased slightly.

adjusted for the complex sampling design, see the technical appendix to this report. Student ability was measured by combining scores from standardized tests given during the senior year of high school. For more information on these tests, see *National Longitudinal Study: Base Year (1972) through Fourth Follow-up (1979) Data File Users Manual*, Volume 1-3. (Ricobono, John, et al, Center for Education Research and Evaluation, Research Triangle, Research Triangle Park, N.C. 2709, 1981).

[18] The adjusted R-squared was .25 for the 1972 graduating class, .21 for the 1980 graduating class, and .24 for the 1982 graduating class.

Table 1
Regression Results for Enrollment in Postsecondary Education

1972 Graduates Enrolled 1972	Parameter Estimate	Standard Error	T-statistic
Intercept	0.59	0.001	
Female	-0.06	0.001	-56.53
Black	0.23	0.002	109.64
Asian	0.07	0.008	8.01
Native American	0.10	0.006	17.84
Hispanic	0.09	0.003	30.98
Low Ability	-0.23	0.001	-156.59
High Ability	0.14	0.001	104.75
Low SES	-0.14	0.001	-104.48
High SES	0.20	0.001	154.88
Low HS Grades	-0.16	0.001	-112.32
High HS Grades	0.09	0.001	67.67
1980 Graduates Enrolled 1980	**Parameter Estimate**	**Standard Error**	**T-statistic**
Intercept	0.63	0.001	
Female	0.03	0.001	40.09
Black	0.17	0.001	125.98
Asian	0.17	0.003	52.20
Native American	0.01	0.004	2.61
Hispanic	0.13	0.002	70.35
Low Ability	-0.20	0.001	-189.37
High Ability	0.14	0.001	140.63
Low SES	-0.13	0.001	-129.12
High SES	0.15	0.001	157.78
Low HS Grades	-0.16	0.001	-139.39
High HS Grades	0.09	0.001	91.46
1982 Graduates Enrolled 1982	**Parameter Estimate**	**Standard Error**	**T-statistic**
Intercept	0.62	0.001	
Female	0.05	0.001	81.41
Black	0.15	0.001	141.87
Asian	0.17	0.003	64.19
Native American	0.01	0.003	4.12
Hispanic	0.08	0.001	61.47
Low Ability	-0.20	0.001	-221.73
High Ability	0.18	0.001	209.50
Low SES	-0.17	0.001	-197.89
High SES	0.15	0.001	186.16
Low HS Grades	-0.16	0.001	-201.83
High HS Grades	0.07	0.001	72.67

Changes in Persistence in Postsecondary Education

The data on enrollment presented in the previous section provide a picture of participation in postsecondary education for each cohort. In focusing on participation, these data do not differentiate among students who enrolled only briefly in postsecondary education and those who were enrolled for an extended period of time. In an effort to determine whether students are receiving more or less postsecondary education during the 1980s as compared to the 1970s, this section examines the proportion of 1972, 1980, and 1982 graduates who "persisted" in postsecondary education for various lengths of time.[19]

Persisting refers to attending continuously during the academic months of each year, as well as during the preceding year. As a result, and as shown in Figure 7, the proportion of students in continuous attendance declined significantly each year for each graduating class. That is, the proportion lasting through two years is lower than that lasting through one year, while the proportion lasting through three years is lower still.

All three cohorts showed the same pattern of declining persistence over time, but the three cohorts varied in their rates of persistence two or more years.[20] The proportion of immediate entrants who persisted through two years was significantly lower among each successive cohort. Rates of persistence through three years were quite similar for the 1980 graduates and the 1972 graduates, but the proportion of 1982 graduates was lower than for either of these cohorts.

Comparing rates of persistence through four full years of postsecondary education indicates that persistence declined between the 1972 and 1980 cohorts but did not change between the 1980 and 1982 cohorts. Forty-seven percent of the 1972 graduates attended four years continuously, compared to 29 percent of the 1980 graduates and 27 percent of the 1982 graduates. The proportion persisting through four years from the 1982 cohort was significantly lower than the proportion from the 1972 cohort.

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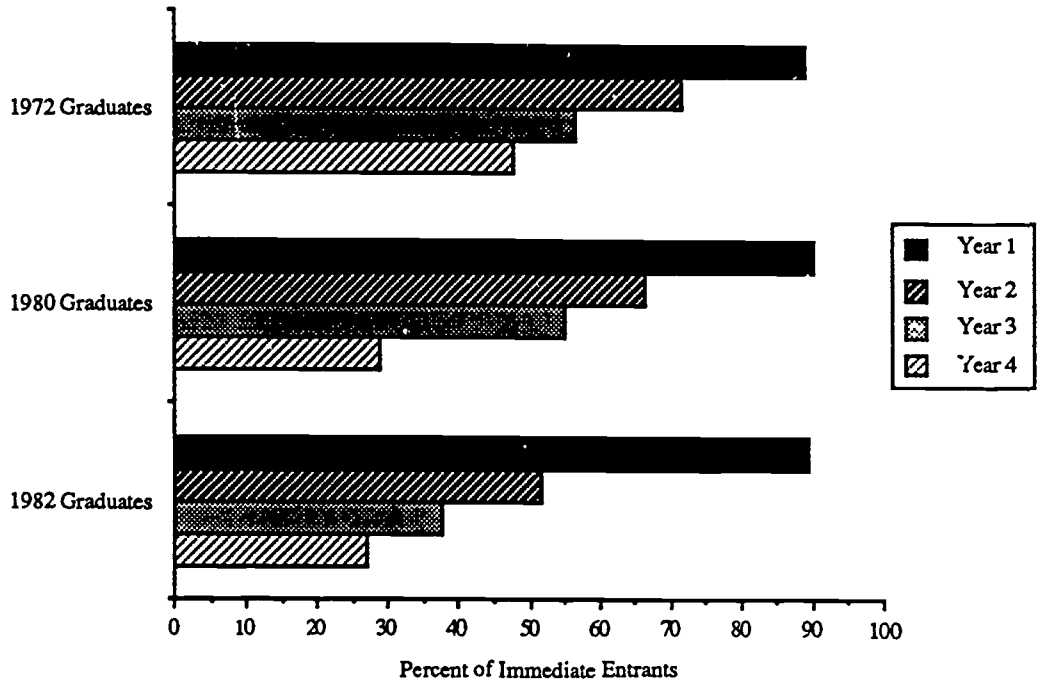
[19] In order to preserve comparability between cohorts, postsecondary persistence is presented here only for those students who enrolled immediately after high school. By using immediate entrants as the base for the percentage persisting, comparisons of these percentages can be made that are not confounded by differences in the proportion entering postsecondary education.

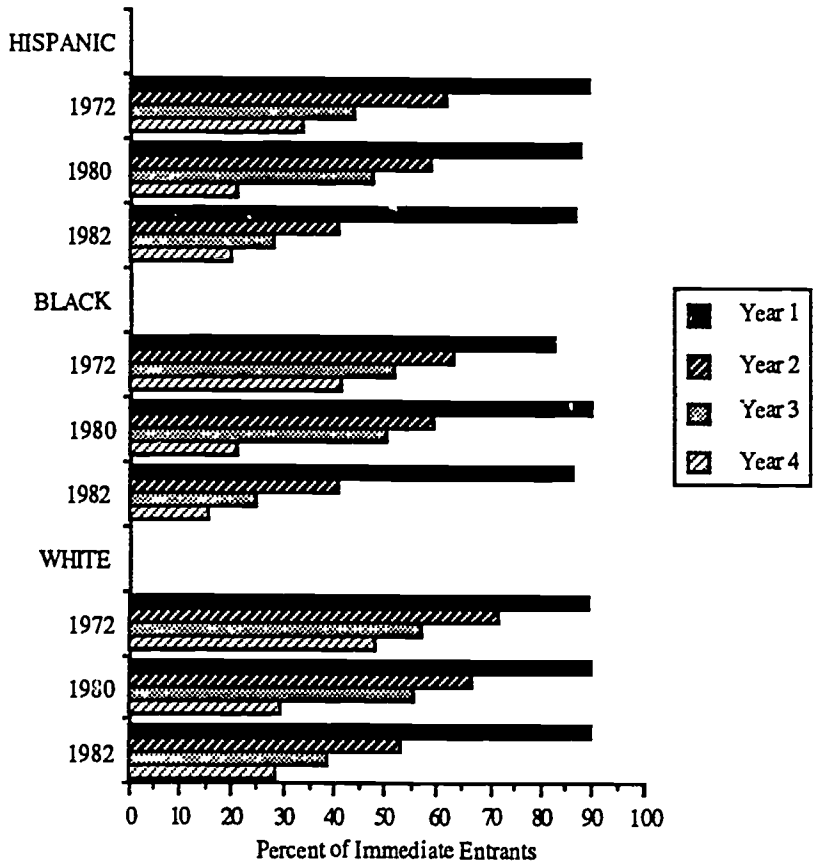
[20] There was no significant difference among cohorts in the percent of immediate entrants who persisted through one year of postsecondary education.

Figure 7
Percent of Immediate Entrants Persisting in Postsecondary Education for Various Lengths of Time



The patterns of persistence in postsecondary education were quite similar for males and females, but persistence for two or more years among whites exhibited a different trend than it did among Hispanics and blacks. For whites, the proportion of immediate entrants persisting through two years declined with each cohort. For Hispanics and blacks, the proportion of immediate entrants persisting after two years did not change significantly between the 1972 and 1980 cohorts, but then declined between the 1980 and 1982 cohorts.

Figure 9
Percent of Immediate Entrants Persisting in Postsecondary Education Each Year after High School, by Race/Ethnicity



Persistence through four years declined between the 1972 and the 1980 cohorts for all students, regardless of race/ethnicity. For Hispanics, 33 percent of the 1972 cohort persisted through four years, compared to 21 percent of the 1980 cohort. For blacks, 41 percent of the 1972 cohort persisted through three years, compared to 21 percent of the 1980 cohort. For whites, 48 percent of the 1972 cohort persisted through three years, compared to 30 percent of the 1980 cohort. For blacks, the decline continued between the 1980 and 1982 cohorts: 15 percent of the 1982 cohort persisted through four years compared to 21 percent of the 1980 cohort. For Hispanics and whites there was no significant decline in persistence through four years between the 1980 and 1982 cohorts.

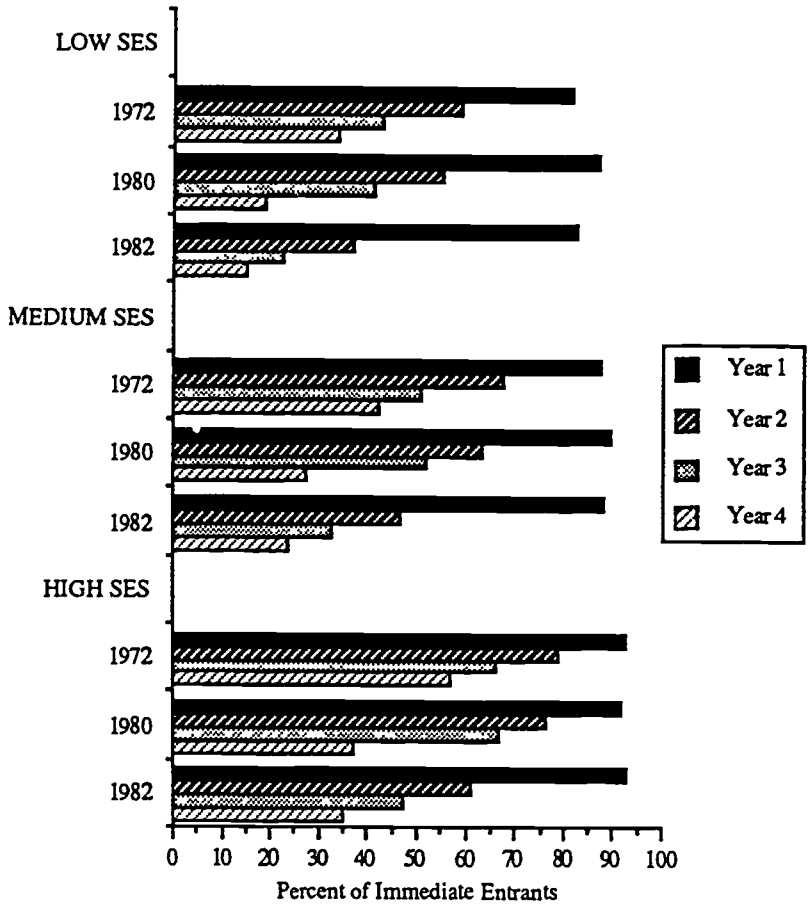
After the first year, the proportion of immediate entrants persisting each year was significantly lower among the 1982 cohort than among the 1972 cohort for all three

racial/ethnic groups. Thus the overall trend in persistence was down for students who entered postsecondary education immediately after high school, regardless of race/ethnicity.

Regardless of socioeconomic status, persistence rates through two or three years of postsecondary education did not decline significantly between the 1972 and the 1980 cohorts. However, for all SES groups there was a decline in these rates between the 1980 and the 1982 cohorts, producing an overall decline in the proportion persisting through two years and through three years.

The rate of persistence through four continuous years of enrollment declined significantly between the 1972 and 1980 cohorts for all students, regardless of socioeconomic status: to 37 percent from 57 percent for high SES students, to 27 percent from 42 percent for medium SES students, and to 19 percent from 34 percent for low SES students. The apparent declines in persistence through four years between 1980 and 1982 were not statistically significant, but there was a significant difference between these rates of persistence for 1982 graduates and 1972 graduates of similar socioeconomic status.

Figure 10
Percent of Immediate Entrants Persisting in Postsecondary Education Each Year after High School, by Socioeconomic Status



Multivariate Analysis of Persistence in Postsecondary Education

The above analysis demonstrated that levels of persistence through more than one year decreased for most types of students between 1972 and 1982. Declines in persistence characterized all students over the period, regardless of student characteristics. Table 2 below shows that, despite an overall decline in the level of persistence in postsecondary education, neither the total nor the relative influence of various student characteristics on persistence changed much over time.

Table 2
Regression Results for Persistence in Postsecondary Education

1972 Graduates: Immediate Entrants	Parameter Estimate	Standard Error	T-statistic
Intercept	2.41	0.005	
Female	-0.23	0.005	-46.20
Black	0.36	0.011	32.53
Asian	-0.05	0.038	-1.21
Native American	0.66	0.022	29.98
Hispanic	0.13	0.016	8.35
Low Ability	-0.41	0.010	-40.93
High Ability	0.28	0.006	50.34
Low SES	-0.35	0.008	-42.20
High SES	0.32	0.005	60.12
Low HS Grades	-0.58	0.009	-62.03
High HS Grades	0.38	0.006	69.27
1980 Graduates: Immediate Entrants	**Parameter Estimate**	**Standard Error**	**T-statistic**
Intercept	2.09	0.004	
Female	-0.11	0.003	-32.06
Black	0.26	0.006	42.82
Asian	0.59	0.012	50.61
Native American	-0.21	0.022	-9.32
Hispanic	0.19	0.008	22.96
Low Ability	-0.37	0.006	-61.75
High Ability	0.34	0.004	88.51
Low SES	-0.21	0.005	-41.27
High SES	0.31	0.004	83.17
Low HS Grades	-0.35	0.007	-53.47
High HS Grades	0.46	0.004	123.49
1982 Graduates: Immediate Entrants	**Parameter Estimate**	**Standard Error**	**T-statistic**
Intercept	1.56	0.003	
Female	-0.04	0.002	-15.22
Black	0.10	0.004	23.18
Asian	0.20	0.008	25.36
Native American	-0.06	0.015	-4.22
Hispanic	0.06	0.005	10.92
Low Ability	-0.27	0.005	-60.06
High Ability	0.32	0.003	122.68
Low SES	-0.15	0.004	-39.20
High SES	0.24	0.002	98.61
Low HS Grades	-0.30	0.003	-87.25
High HS Grades	0.24	0.003	89.42

In this analysis, the same variables were regressed on a five-category variable for persistence as were used in the analysis of enrollment.[21] Variables for gender, race, socioeconomic status, high school grades, and ability together account for on around eleven percent of the variance in college enrollment rates for the three graduating classes studied.[22] There was no change in direction of any of the significant coefficients for any of these variables.

The multivariate relationships of these characteristics with persistence in school did not change much over time, despite the fact that rates of persistence themselves were declining. Regression analysis of enrollment rates shows that the underlying relationship between persistence and student characteristics has changed little between 1972 and 1982, despite the fact that rates of enrollment themselves changed during the time period. Assuming similar race, high school grades, ability, and socioeconomic status; females from all three cohorts were less likely to enroll than were males, but the difference declined with each successive cohort until it was statistically insignificant for the 1982 cohort. The persistence rates for blacks of similar gender, high school grades, ability, and socioeconomic status were positive in all years, but declined somewhat after 1972 until the coefficient was statistically insignificant for the 1982 cohort. The relationships between high school grades, socioeconomic status, and ability with persistence in postsecondary education were positive for all three cohorts, but the impact of each declined with each successive cohort.

Summary

The record of the 1972-82 decade was mixed in terms of extending the advantages of postsecondary education. The overall trend in postsecondary enrollment was positive, with large increases for all groups between 1972 and 1980. Upward trends were particularly notable for women, minorities, and students of low socioeconomic status. With the leveling off of enrollment after 1980, the extension of access to postsecondary education for all groups did not continue into the 1980s and in fact declined for some students. Although enrollment rates for 1982 graduates were still higher than for 1972 graduates among women, Hispanics, and low SES students, rates for low SES students from the 1982 class had declined

[21] The dependent variable in this model takes on a value from zero to four, corresponding to the number of years the student was enrolled continuously in postsecondary education.

[22] The adjusted R-squared was .11 for the 1972 graduating class, .12 for the 1980 graduating class, and .11 for the 1982 graduating class.

significantly relative to their rates in the 1980 class. During the same time, enrollment rates for black high school graduates had actually declined enough to erase previous gains.

In contrast to the general picture of increasing access to postsecondary education during the 1972-82 decade, trends in persistence were downward for all types of students. If access is to have any meaning, it must be followed by persistence in school sufficient to attain some type of degree or extended training. For all types of students except Hispanics, the proportion persisting through even two years of postsecondary education was significantly lower from the 1982 cohort than from the 1980 or the 1972 cohort. Without this length of persistence, the range of vocational certificates that can be earned is somewhat limited and the probability of attaining an associate's degree is very low. Persistence through four years, essential to attainment of a bachelor's degree, declined throughout this decade for all types of students.

This research did not attempt to determine why these changes in enrollment and persistence occurred between 1972 and 1982. However, the results reported here demonstrate that an explanation is needed for the declining persistence in postsecondary education observed for all students throughout the decade and for the declines in enrollment rates for some students after 1980.

TECHNICAL APPENDIX

Data Sources

The High School and Beyond Study has produced a longitudinal data base with a nationally representative sample of over 58,000 1980 high school sophomores and seniors. As part of the long-term National Center for Education Statistics data collection program, the National Education Longitudinal Studies, HS&B provides the most contemporary information available on these students. Both the 1980 senior and sophomore samples were surveyed in 1980, 1982, 1984, and 1986. The 11,227 HS&B seniors and the 13,481 HS&B sophomores used as the basis for this report are those who participated in the third follow-up survey in 1986.

The National Longitudinal Study has produced a longitudinal data base with a nationally representative sample of over 22,000 1972 high school seniors. As part of the long-term National Center for Education Statistics data collection program known as the National Education Longitudinal Studies, NLS-72 provides the most contemporary information available on these students. The 1972 senior sample was surveyed in 1972, 1973, 1974, 1976, 1979, and 1986. The 12,841 NLS-72 seniors used as the basis for this report are those who participated in the fifth follow-up survey in 1986.

The survey samples for both HS&B and NLS-72 were designed to include sufficient students of particular interest in policy questions by over-sampling of schools with high minority populations, alternative public schools, and private schools with high-achieving students. Follow-up surveys retained students in these groups at higher rates than other students.

In addition to the survey data, the Postsecondary Education Transcript Study was conducted in 1984 for the 1972 high school seniors. This study collected transcripts from academic and vocational postsecondary institutions that respondents reported attending between 1972 and 1979. Data from these transcripts were merged with information reported in the Fifth Follow-up Survey on postsecondary education after 1979 to provide the information on educational enrollment and attainment used in this report.

Methodology

In order to facilitate comparison across graduating classes and among student subgroups, this analysis was limited to high school graduates. Data on student progress between their graduation date and 1986 were combined to create longitudinal variables describing student enrollment, persistence, and attainment. These variables categorize students according to their time of entry into postsecondary education, the length of their attendance, and their achievement.

A special program for cross-tabulation tables was used to calculate the proportion of graduates from each cohort and for each category who enrolled in postsecondary education each year after high school and who enrolled immediately after high school (without any delay); who attended school for one, two, three, and four years continuously, thus persisting in postsecondary education for specified periods of time; and who attained various types of degrees within four and six after high school graduation. This tabulation program was run

with a special weight created to compensate for non-response to the various follow-up surveys. To calculate the standard errors for the complex sample design employed, the program used a Taylor Series approximation.

Once the many data points and standard errors were calculated, analysis proceeded through Student's t-tests on pairwise comparisons of the proportion of students in each cohort who exhibited the behaviors listed above. Gains or declines in enrollment were identified between the 1972 and 1980 cohorts, between the 1980 and 1982 cohorts, and for the 1972 cohort compared to the 1982 cohort. These pairwise comparisons were made again within each student subgroup studied, so that gains or declines in enrollment could be identified for males, females, Hispanics, and so on.

In order to reduce the probability of Type I error in a set of multiple comparisons, the author of this report calculated Bonferroni intervals based on families of **Student's t** tests. Families of tests were defined as pairwise tests comparing an outcome for two or more related categories of students. For example, a comparison of enrollment for males and females comprises a family of tests, with only one comparison (males v. females). Comparisons of enrollment rates for black, Hispanic, and white students comprise another family of tests, with three comparisons possible (black v. white, black v. Hispanic, and white v. Hispanic).

The width of a Bonferroni interval depends upon the number of comparisons actually made within a family. When only one pairwise comparison is made, the Bonferroni interval is the same as the confidence interval obtained from a **Student's t** test. The more comparisons that are made, the narrower the Bonferroni interval and thus the greater the **t** statistic needed for each difference to guarantee a significance level $\leq .05$ for all of the comparisons taken together.[23]

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 $p \leq .05$.[24]

Finally, multivariate analysis was conducted using an ordinary least squares regression procedure. The standard errors reported for each cohort were calculated by multiplying the standard error obtained through ordinary least squares by the average design effect for educational analysis obtained for that cohort by taking the ratio of the standard error obtained through ordinary least squares and that obtained through balanced repeated replications. The average design effect for the 1972 cohort was 1.44; the average effect for the 1980 graduates was 1.38; the average design effect for the 1982 graduates was 1.36.

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[23] For a discussion of family-wise error rates, see Alan J. Klockars and Gilbert Sax, *Multiple Comparisons*, Beverly Hills, CA: Sage Publications, 1986, p.17.

[24] 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 insure that $p \leq .05/k$ for a particular family size and degrees of freedom, see Oliver Jean Dunn, "Multiple Comparisons Among Means," *Journal of the American Statistical Association*, 56: 52-64.