Income and higher education

by Charles F. Manski

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The broad dimensions of the stratification by income of enrollment in college from 1970 through 1988 can be traced through the Current Population Survey (CPS), whose basic household questionnaire is supplemented each October by a school enrollment survey.[2] This article presents tabulations of these CPS data and also of data from the National Longitudinal Study of the High School Class of 1972 (NLS-72)[3] and the High School and Beyond (HSB)[4] surveys, and interprets the empirical findings.

The distribution of college enrollments by family income

Respondents to the October Current Population Survey report the current school enrollment status of household members aged 3 through 34. For each enrolled person, respondents report whether the school is public or private. For each person enrolled in college, respondents report whether the college is a two-year or four-year institution. These enrollment data are available for each of the years 1970 through 1988, with the exception of 1980.[5]

Although a more refined typology of colleges would be useful, the CPS disaggregation of colleges into public and private, two- and four-year programs reveals the basic facts about enrollment stratification.[6] The CPS is used here to examine the enrollment status of eighteen- and nineteen-year-old dependent high school graduates. The economic status of each such person is characterized by the fifth of the income distribution within which his or her family is located.[7]

The CPS sample sizes are not large enough for reliable interpretation of yearly enrollments but are adequate for interpretation of enrollments during multiple-year periods. The analysis of this paper considers the periods 1970–74, 1975–79, 1981–84, and 1985–88.

Variables and definitions used in constructing the tables

The number of dependent teens aged eighteen and nineteen who were enrolled in college (from which the percentages in Table 1 were calculated) was obtained by applying CPS-provided weights to the raw data for dependent high school graduates aged eighteen and nineteen. The CPS does not directly report a person's dependency status. In the tables, a person is defined to be dependent if he or she is neither the head of a household nor the spouse of the head and if the head of the person's household is at least thirty-nine years old. The tables restrict attention to dependent persons because the household data reported in the CPS refer to the household in which a respondent is located at the time of the interview, although college students living in dormitories are not considered to constitute separate households.[8]

A person is considered to be enrolled in college if he or she was enrolled full time or part time in a two- or four-year college. Youth enrolled in noncollegiate postsecondary schools are classified as not enrolled.

Income quintiles refer to the income distribution of the families of eighteen-year-old and nineteen-year-old dependent high school graduates. Each year's income distribution was estimated from the October CPS income responses as follows.

Respondents to the October CPS are asked to report yearly household income in current-dollar income intervals; the number of intervals and their end points have varied from year to year. To derive a complete income distribution from interval-coded data requires an assumption about how income is distributed within each interval. I assumed that income is distributed uniformly within each interval. (This assumption cannot be maintained in the highest reporting interval, which is open ended. In all cases, however, less than 20 percent of households had income in the highest interval; so no assumption about the distribution of income within the highest interval was required.)[9]

Once the income quintiles were estimated, it was necessary to assign each sampled person to the appropriate fifth. This is straightforward in those cases in which a CPS income-reporting interval lies completely within the span between two quintiles. Some intervals, however, cross quintiles. Given the assumption that income is distributed uniformly

within each reporting interval, the correct way to deal with this is to allocate persons fractionally to adjacent fifths.

For example, one of the CPS reporting intervals in 1988 was ($30,000, $34,999). This interval lies partly in the second fifth ($20,561, $32,400) and partly in the third fifth ($32,400, $44,393). Under the assumption that income is distributed uniformly within reporting intervals, the probability that a person with family income in the interval ($30,000, $34,999) has income less than $32,400 is .48. Hence, each person with income in the interval ($30,000, $34,999) was allocated with fractional weight .48 to the second income fifth and with weight .52 to the third fifth.

Based on the assumptions and definitions discussed above, Table 1 shows, for the members of each income fifth, the distribution of enrollments across the four college types. The percentage of persons not enrolled is also given. Table 2 shows, for each college type, the income distribution of enrollments.

Time trends in enrollments

Table 1 indicates that for each income fifth, the fraction of youth enrolled in private colleges increased modestly but steadily from the early 1970s through the late 1980s. In the period 1970–74, 7 percent of youth in the lowest fifth in

Table 1

Distribution of College Enrollment for Dependent 18- and 19-Year-Old High School Graduates, by Family Income, 1970–1988

Income Fifth and Type of College	Percentage Enrolled			
	1970–74	1975–79	1981–84	1985–88
Lowest income fifth				
Attending public 2-year college	14%	16%	14%	16%
Attending public 4-year college	20	19	16	20
Attending private 2-year college	1	2	2	2
Attending private 4-year college	6	6	6	7
Not enrolled	60	57	63	56
Second income fifth				
Attending public 2-year college	15	15	16	19
Attending public 4-year college	23	22	21	26
Attending private 2-year college	1	2	2	2
Attending private 4-year college	8	8	8	9
Not enrolled	53	53	53	45
Middle income fifth				
Attending public 2-year college	16	16	19	20
Attending public 4-year college	26	25	23	29
Attending private 2-year college	1	1	2	2
Attending private 4-year college	9	10	10	12
Not enrolled	48	47	46	38
Fourth income fifth				
Attending public 2-year college	16	15	19	19
Attending public 4-year college	29	32	30	34
Attending private 2-year college	2	1	3	2
Attending private 4-year college	12	13	13	14
Not enrolled	41	39	36	31
Highest income fifth				
Attending public 2-year college	15	13	18	17
Attending public 4-year college	35	35	36	40
Attending private 2-year college	2	1	2	2
Attending private 4-year college	19	20	20	20
Not enrolled	30	31	24	21

Source: Annual October CPS, U.S. Bureau of the Census.

Notes: Each October, 3000 or more eighteen- and nineteen-year-old dependent high school graduates appear in the CPS. Each income fifth contains roughly 20 percent of the observations. (Each need not contain exactly 20 percent of the raw observations, as our fifths are based on the weighted rather than raw samples.) Hence, the yearly samples on which Table 1 is based contain roughly 600 observations. The table aggregates over four- or five-year periods, yielding 2400 or more observations in each income fifth category. These sample sizes imply that the standard errors for the entries in Table 1 are 1.0 percent or less. The columns in this table may not add up to 100 percent, owing to rounding.

income, 10 percent in the middle fifth, and 21 percent in the highest fifth were enrolled in private colleges. In the period 1985–88, the corresponding figures were 9, 14, and 22 percent. For each income fifth, the fraction of youth enrolled in public colleges showed little if any change during the 1970s, but noteworthy changes took place in the 1980s. In the early 1980s, the poor lost and the rich gained. Enrollment by youth in the lowest income fifth dropped sharply (from 35 percent in 1975–79 to 30 percent in 1981–84), enrollment by youth in the three middle fifths remained stable or rose modestly, and enrollment by youth in the highest fifth rose sharply (from 48 percent in 1975–79 to 54 percent in 1981–84).

In the late 1980s, public college enrollments increased strongly for all income groups. Between 1981–84 and 1985–88, enrollments by youth in the lowest fifth rebounded from 30 percent to 36 percent, enrollments in the middle fifth grew from 42 percent to 49 percent, and in the highest fifth grew from 54 percent to 57 percent.

Stratification of enrollments by income

The data in Tables 1 and 2 indicate persistent patterns of stratification of college enrollments by income. In the late 1980s, 45 percent of the youth in the lowest fifth in

Table 2

Distribution of Income for Dependent 18- and 19-Year-Old High School Graduates, by College Type, 1970–1988

Type of College and Income Fifth	Percentage Enrolled			
	1970–74	1975–79	1981–84	1985–88
Attending public 2-year college				
In lowest fifth	19%	21%	17%	17%
In second fifth	19	20	19	20
In middle fifth	21	21	22	22
In fourth fifth	22	20	22	21
In highest fifth	19	17	21	19
Attending public 4-year college				
In lowest fifth	15	14	12	13
In second fifth	17	17	17	17
In middle fifth	20	19	18	19
In fourth fifth	22	24	24	23
In highest fifth	26	26	29	27
Attending private 2-year college				
In lowest fifth	15	24	17	19
In second fifth	19	22	19	18
In middle fifth	19	21	22	21
In fourth fifth	22	19	23	22
In highest fifth	26	14	20	21
Attending private 4-year college				
In lowest fifth	11	11	10	11
In second fifth	15	15	14	14
In middle fifth	17	18	18	19
In fourth fifth	22	22	23	23
In highest fifth	35	34	36	33
Not in college				
In lowest fifth	26	25	28	29
In second fifth	23	23	24	24
In middle fifth	21	21	21	20
In fourth fifth	18	17	16	16
In highest fifth	13	14	11	11

Source: Annual October CPS, U.S. Bureau of the Census.

Note: The sample size for each school type is proportional to the enrollment in the type; hence the standard errors for the entries in Table 2 vary as well, roughly as follows: public 2-year colleges (2.3 percent or less); public 4-year colleges (1.8 percent or less); private 2-year colleges (7.0 percent or less); private 4-year colleges (2.9 percent or less).

income, 62 percent of those in the middle fifth, and 79 percent in the highest fifth were enrolled in some college (Table 1). Figure 1 shows that not only do more members of the top fifth attend college, but also that the gap in attendance between the poorest and richest widened between the late 1970s and the late 1980s. Of youth not enrolled in college in the late 1980s, 29 percent were from the lowest fifth in income, 20 percent were from the middle fifth, and 11 percent were from the highest fifth (Table 2).

Interestingly, the distribution of enrollments in two-year institutions is close to equal across income groups. In the late 1980s, 16 percent of the youth in the lowest fifth in income, 20 percent of those in the middle fifth, and 17 percent in the highest fifth were enrolled in two-year public colleges. In every income fifth, 2 percent of the youth were enrolled in two-year private colleges (Table 1).

The inequality in enrollments occurs only in the four-year institutions. In the late 1980s, 20 percent of the youth in the lowest fifth in income, 29 percent of those in the middle fifth, and 40 percent in the highest fifth were enrolled in four-year public colleges. At the same time, 7 percent of the youth in the lowest income fifth, 12 percent of those in the middle fifth, and 20 percent in the highest fifth were enrolled in four-year private colleges (Table 1).

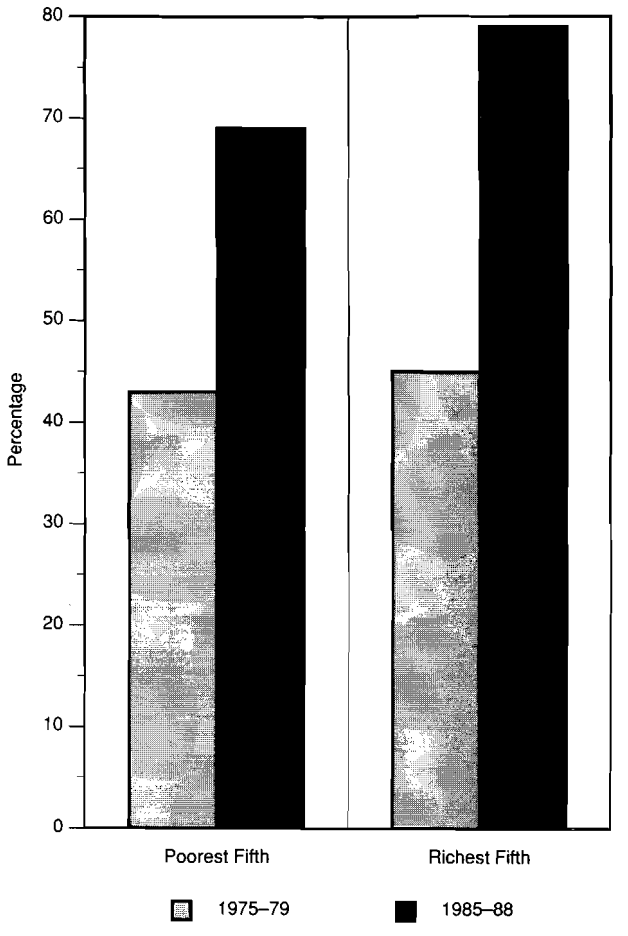

Figure 1. Percentage of Poorest Fifth and Richest Fifth of 18- and 19-Year-Old High School Graduates Who Attended College in 1975–79 and 1985–88.

Source: Table 1.

The data indicate that, while enrollments are stratified in both public and private four-year colleges, they are more stratified in the private four-year colleges. In the late 1980s, the chance that a high school graduate from the highest fifth in income would enroll in a public four-year college was double that of a youth from the lowest income fifth (40 percent to 20 percent), but the chance that a high school graduate from the highest income fifth would enroll in a private four-year college was triple that of a youth from the lowest income fifth (20 percent to 7 percent) (Table 1). Viewed another way, public four-year colleges drew 27 percent of their enrollment from the highest fifth in income and 13 percent from the lowest fifth, while private four-year colleges drew 33 percent of their enrollment from the highest fifth and 11 percent from the lowest fifth (Table 2).

Family income and graduation from college

Roughly half of all youth who enroll in college do not persist to a bachelor's degree. It is therefore important to ask whether the income stratification patterns found among eighteen- and nineteen-year-old enrollees are indicative of stratification among college graduates. The CPS cannot be used to answer this question but the National Longitudinal Study of the High School Class of 1972 and the High School and Beyond surveys can, at least for the high school classes of 1972 and 1980.

Respondents to NLS-72 were first interviewed in the spring of 1972, when they were high school seniors, and were followed through October 1979.[10] Thus, the NLS-72 data can be used to learn the stratification by income of bachelor's degree recipiency seven years after high school graduation. Respondents to HSB were first interviewed in the spring of 1980, when they were high school seniors, and were followed through early 1986. Thus, the HSB data can be used to learn the stratification of degree recipiency five-and-a-half years after high school graduation.[11] Table 3 shows the NLS-72 and HSB enrollment and graduation distributions. (Although the NLS-72, HSB, and CPS sampling frames and variable definitions differ in significant respects, the data sources show enrollment patterns that are broadly similar and match well in most details.)[12]

Table 3 provides data on the stratification by income of bachelor's degree recipiency. Because the NLS-72 and HSB patterns are so similar, only the more recent HSB data will be discussed here. By early 1986, only 12 percent of the 1980 high school seniors with family income in the lowest fifth had received a bachelor's degree; of these, 9 percent were from public four-year colleges and 3 percent were from private colleges. In the middle fifth, 24 percent

Table 3

Distribution of Bachelor's Degrees for High School Classes of 1972 and 1980, by Family Income

Income Fifth and Type of Degree	Class 1972	Class 1980
Lowest fifth in income		
Public college	8%	9%
Private college	3	3
No degree	89	89
Second fifth in income		
Public college	12	10
Private college	5	4
No degree	83	86
Middle fifth in income		
Public college	15	16
Private college	6	8
No degree	79	76
Fourth fifth in income		
Public college	20	19
Private college	8	11
No degree	72	71
Highest fifth in income		
Public college	24	22
Private college	13	17
No degree	62	61

Sources: For class of 1972, NLS-72 data for October 1979. For class of 1980, HSB data for February 1986.

Note: The columns may not add up to 100 percent, owing to rounding.

had degrees, 16 percent from public colleges and 8 percent from private ones. In the highest fifth, 39 percent had degrees, 22 percent from public colleges and 17 percent from private ones. Thus, compared with a youth in the lowest fifth in income, a youth in the highest fifth had two-and-a-half times the chance of receiving a bachelor's degree from a public college (22 percent to 9 percent) and almost six times the chance of receiving a degree from a private college (17 percent to 3 percent). Figure 2 compares college enrollment rates in the period 1975–84 with college graduation rates of the high school class of 1980. It can be seen that the recipiency of a bachelor's degree is more stratified by income than is college enrollment.

Conclusions

American colleges remain substantially stratified by income. The consequences of income stratification are known only in part. Ample empirical evidence relates college graduation to later labor market outcomes. In fact, recent studies indicate that the income return to attending college increased during the 1980s.[13] This evidence, combined with that presented here, indicates a continuing problem of intergenerational immobility: youth from low-income families tend not to graduate from college, and then have low incomes themselves.

There is little empirical evidence relating the type of college one attends to labor market outcomes. In particular, we do not know whether, controlling for ability, students who graduate from private colleges earn higher incomes

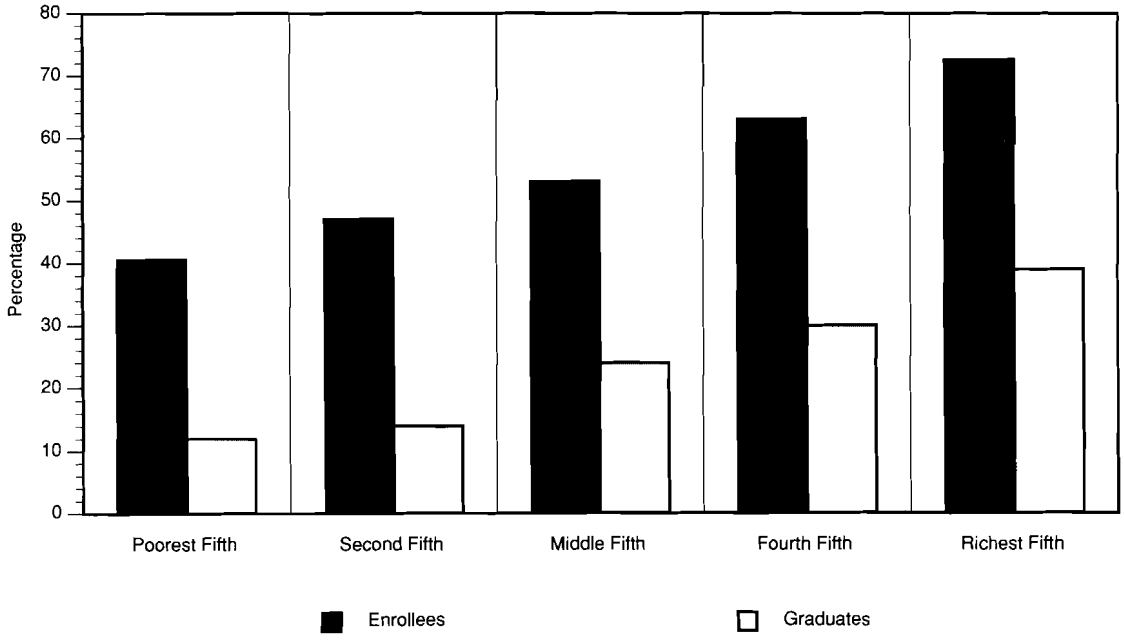

Figure 2. College Enrollment vs. Graduation, by Income Fifth.

Source: Average college enrollment rates, 1975–84, are from Table 1. Graduation rates for the HSB class of 1980 are from Table 3.

than those who graduate from public colleges. In the absence of this information, we cannot say whether the more pronounced income stratification of private college enrollments should be a matter of public concern. ■

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[1] The author wishes to thank the Democratic Study Center for partial support of this work and Scott Lilly for helpful comments. This article is drawn from a DSC report, "Parental Income and College Opportunity," August 26, 1992.

[2] The annual October Current Population Survey is carried out by the U.S. Bureau of the Census. The School Enrollment Supplement to the October CPS provides data on school enrollment for households in the survey. The schooling data and household background data for these persons have been combined into a single unified file by Robert M. Hauser and Taissa Hauser ("Uniform October CPS Person-Household File, 1968–1988," Department of Sociology, University of Wisconsin–Madison, 1991). I am grateful to Robert Hauser for making this material available to me.

[3] The National Longitudinal Study of the High School Class of 1972 is a longitudinal survey of individuals who were twelfth graders in 1972. It is conducted by the National Center for Education Statistics (NCES). For details on the NLS-72 design, see J. Riccobono, L. Henderson, G. Burkheimer, C. Place, and J. Levinsohn, *National Longitudinal Study: Data File Users' Manual* (Washington, D.C.: NCES, U.S. Department of Education, 1981).

[4] The High School and Beyond survey began with tenth and twelfth graders in 1980. Like NLS-72, this survey is conducted by the NCES. For details on the HSB design, see P. Sebring, B. Campbell, M. Glusberg, B. Spencer, M. Singleton, and M. Turner, *High School and Beyond 1980 Senior Cohort Third Follow-up (1986) Data File Users' Manual* (Chicago: National Opinion Research Center, University of Chicago, 1987).

[5] Prior to 1970, respondents were not asked to distinguish two-year from four-year colleges. In 1980, the Bureau of the Census did not release data on whether schools were publicly or privately controlled.

[6] The various college types differ substantially in their costs of enrollment. In fall 1986, the "adjusted net cost" of attendance per student was $7124 in private four-year institutions, $3498 in public four-year institutions, and $2049 in public two-year institutions. Adjusted net cost was defined as cost (tuitions, fees, room and board, books and supplies, and transportation costs) minus grants minus 40 percent of loans (Congressional Budget Office, *Student Aid and the Cost of Post Secondary Education* [Washington, D.C.: CBO, 1991]).

[7] Because the CPS reporting unit is the household, the available income data do not necessarily describe the economic status of the family in which a person grew up. On the other hand, the CPS data do permit one to determine with little ambiguity those persons who are dependent members of their family's households. I restrict attention to eighteen- and nineteen-year-olds because the great majority of these persons are still dependents.

[8] The U.S. Census Bureau, in its Series P-20 Current Population Reports, presents October CPS figures for the number of eighteen- and nineteen-year-old persons who are high school graduates and who are enrolled in college. The figures used here range from 80 to 90 percent as large as those given in Series P-20. One reason for the reduction in size is my restriction of attention to dependent youth. A second reason is that I use data only on those persons for whom actual income and other survey responses are available. The Census Bureau practice of allocating respondents with missing responses to response categories is not followed here.

[9] The estimated income quintiles for each year were, in current dollar terms:

	Income Quintile				
Year		20%	40%	60%	80%
1970	$0	$6,808	$9,684	$12,774	$18,036
1971	0	6,875	9,955	13,311	19,644
1972	0	7,260	10,907	14,092	21,033
1973	0	8,342	12,183	15,750	22,576
1974	0	8,821	12,937	16,868	23,208
1975	0	9,683	13,743	18,136	23,910
1976	0	9,800	14,636	19,648	27,162
1977	0	10,835	15,883	21,094	32,456
1978	0	11,491	17,368	22,972	36,439
1979	0	12,458	19,479	25,229	40,519
1980	0	13,307	20,306	28,300	42,345
1981	0	13,916	21,875	31,889	45,013
1982	0	14,183	23,474	32,000	44,199
1983	0	14,210	23,834	33,080	46,283
1984	0	15,813	25,714	35,060	48,939
1985	0	16,861	26,789	36,734	50,364
1986	0	17,151	28,563	39,606	56,603
1987	0	17,500	30,242	41,294	60,911
1988	0	20,561	32,400	44,393	63,387

[10] A subsample of respondents were later interviewed in 1986. These data are not used here.

[11] The HSB survey also interviewed youth who were high school sophomores in spring 1980 and followed them into 1986. But this time span is not sufficiently long for these persons to complete a four-year college program; hence data from the sophomore cohort are not reported here.

[12] In each of the NLS-72 and HSB surveys, a sample of high schools was drawn and a sample of students were interviewed in each high school. The enrollment, degree, and family income data are student self-reports. For the sake of comparability with the CPS data, the same income quintiles are used. The NLS-72 and HSB data do show some different enrollment patterns in high school from those in the CPS.

[13] See, for example, K. Murphy and F. Welch, "Wage Premiums for College Graduates: Recent Growth and Possible Explanations," *Educational Researcher*, 18, 4 (1989), 17–26.