

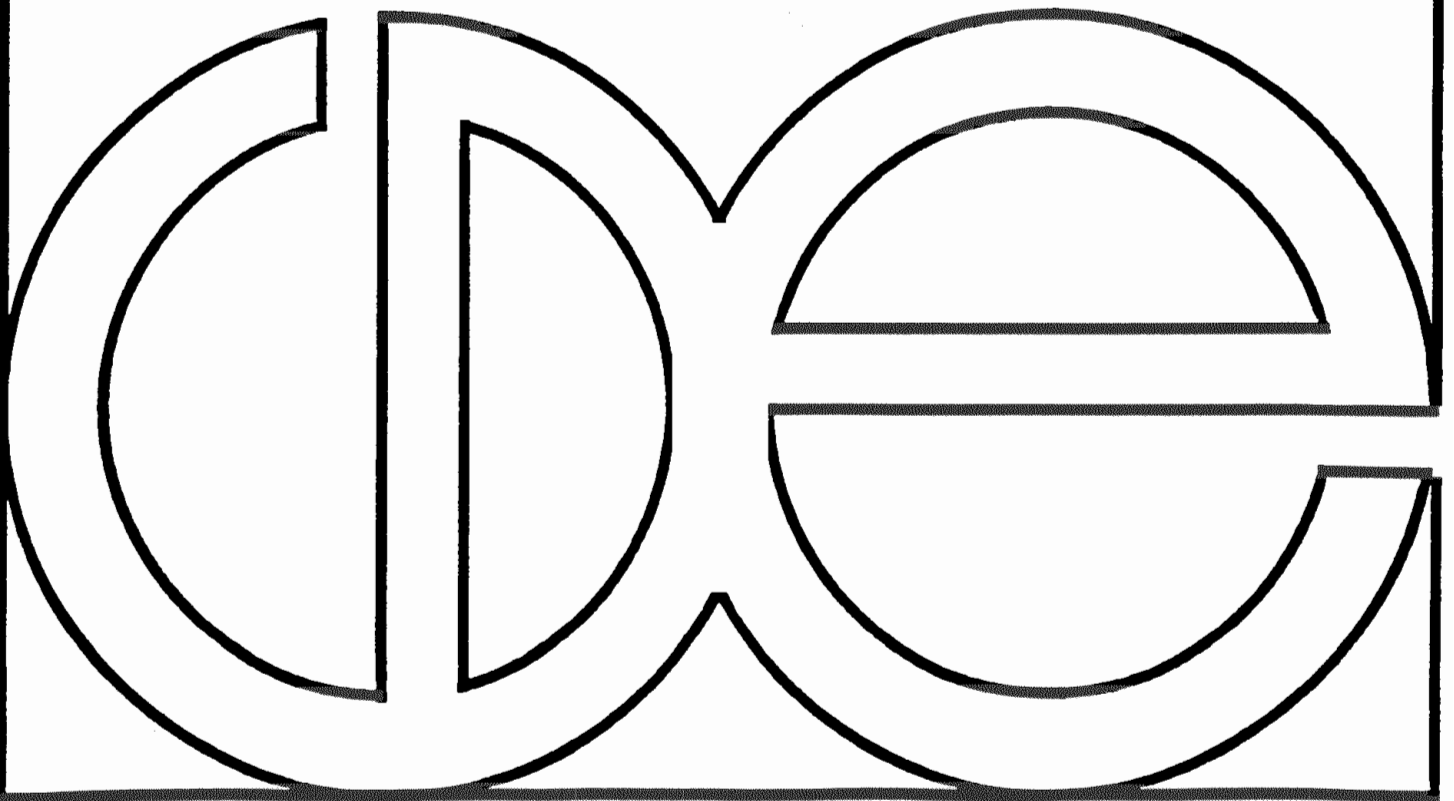
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**CHANGES IN EDUCATIONAL ATTAINMENT,  
SCHOOL ENROLLMENT, AND SKILL LEVELS**

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## CHANGES IN EDUCATIONAL ATTAINMENT, SCHOOL ENROLLMENT, AND SKILL LEVELS

### I. INTRODUCTION

Education plays many roles in American society. Schools are supposed to teach skills and knowledge as well as attitudes, values and behaviors and to ready all students to be effective workers, parents, citizens, and consumers. But schools also play a big part in determining who is economically successful and who is not. Young persons pass through school and acquire not only skills and knowledge, but also degrees and certificates that are recognized in the world of work. People vary greatly in how long they stay in school, in what they learn there, and in the credentials that they accrue. Depending in part on their school experiences, people also vary in their economic well-being once they leave school. Persons who do well in school, who successfully go through the system and acquire diplomas and degrees, are those who tend to be most attractive to employers and enjoy the greatest chances of economic success. They tend to get the best jobs when they leave school and to be protected from unemployment and downward mobility during times of economic hardship.

If schooling is a contest with winners and losers, everyone does not have an equal chance to do well in school and to leave school with the promise of lifelong economic success. Rather, the quantity and quality of schooling that persons acquire depend in large measure on the advantages or disadvantages that their parents confer throughout their childhood. Children whose parents are economically well-off, stably employed in professional or other white collar jobs, and well-educated enjoy much greater chances of success in school. Indeed, these patterns have persisted throughout the twentieth century, even as the average amount of schooling received by all persons has grown immensely. Schooling, in short, plays a key role in maintaining social

inequality from one generation to the next.

Yet it would be a mistake to view schooling merely as a corridor through which children of the poor, the middle class, and the rich pass along the way to their predestined stations in adult life. Many Americans believe, correctly, that schooling can be an avenue of social mobility, a means by which the able and hardworking sons and daughters of less well-off parents can rise above the standing of their parents. The educational system in the United States does indeed permit and, to some extent, facilitate social mobility. Thus schools play a complex and subtle role in the maintenance of inequality and the allocation of persons to positions in America's socioeconomic hierarchy. Inequalities of opportunity and inequalities of outcome persist from generation to generation and schools are important in determining who gets ahead. But the socioeconomic inequalities that children bring to schools are shuffled during the educational process, permitting some individuals and groups to transcend their social origins and some children of well-to-do parents to slide down the socioeconomic ladder.

The 1990 Census shows that during the 1980s a century-long pattern of increasing average educational attainment in the American population continued, much of it accomplished by the spread of schooling to social groups that have been traditionally disadvantaged in educational attainment, including women, persons from poor and lower class families, and members of some racial and ethnic groups. The continued spread of schooling altered but did not eliminate many longstanding patterns of educational inequality. Some inequalities were reduced but others persisted and some new forms of inequality became visible. During the 1980s traditional differences in educational attainment among racial and ethnic groups, for example, largely disappeared at the elementary and secondary school levels, but differences persisted among these groups in access to and progress through institutions of higher education. At the start of the

1980s young adult men and women were equally likely to receive at least some schooling beyond the high school level, but men continued to enjoy an advantage in actually completing college and far outstripped women in their numbers who received advanced professional degrees. By 1990 however, women surpassed men in the rate at which they continued to college, achieved parity with men in completing college, and, in many fields, showed enormous progress in reducing the gap in achieving higher professional degrees. Patterns of inequality among socioeconomic groups were stable during the 1980s, although the continued increase in rates of high school graduation shifted the importance of these inequalities away from the high school years and toward both the college and pre-school levels.

The 1980s also witnessed major changes in the ways in which educational attainment affects the economic rewards enjoyed by young adults. Throughout the decade, higher education continued to be a good investment for young persons. Indeed the gap in wages earned between persons with a college education and those with only a high school education grew wider. During the 1980s, the average wages of persons with a college degree did not change very much, but the wages of persons without a degree fell dramatically. Most severely hurt were high school dropouts, for whom opportunities for well-paying employment, already poor in 1980, diminished even further by 1990. Educational attainment, always a marker for distinguishing those with good and those with poor economic prospects, became an even more powerful discriminator during the 1980s.

Beyond the capacity that schooling plays in helping to prepare persons for adulthood and to sort persons into jobs, education is an ongoing organized activity with a life of its own. Schooling fills a vast portion of the lives of young persons and competes with work, parenthood, recreation, and public service for their time and attention. Students and their parents are also the

clients of a vast industry which employs many persons, uses a large portion of public resources, and commands the concern of politicians and administrators at the local, state, and national levels.

Educational institutions play pivotal roles in preparing each generation for adult life and in channelling persons into unequal social positions. These institutions also occupy a large fraction of the population during its childhood, adolescent, and young adult years and employ a significant fraction of the workforce. Thus, it is not surprising that almost every era of American history has been beset with public anxiety and controversy about educational issues. The past decade has been no exception. To mention just a few of the issues, the 1980s and 1990s have witnessed widespread concerns with the quality of American public school education, especially with the ability of schools to provide students with the skills to be effective workers in an increasingly competitive national economy and with the quality of personnel attracted to the teaching profession. There remain persistent concerns with the capacity of schools both to raise the achievement levels of the very best students and still serve students with weaker academic backgrounds, especially members of traditionally disadvantaged minorities. Ongoing public debates address the issues of how to allocate resources for education between public and private institutions and how schools can be equipped to respond to a changing student population created by changes in family life, by the precarious economic future facing many students, and by new waves of immigrants.

### **Issues in the Study of Educational Trends Between 1980 and 1990**

An analysis of 1980 and 1990 Census data reveals the sociodemographic context in which these issues arise. This chapter will focus on seven major issues: (1) trends and social differences in educational attainment throughout the 20th century and during the 1980s,

emphasizing how the trends toward increased educational attainment have varied between men and women and among racial and ethnic groups; (2) the effects of family background factors on educational attainment and the contribution of changes in family socioeconomic circumstances to educational trends; (3) trends and differences in school enrollment, emphasizing how enrollment has spread beyond traditional school attending ages to younger and older age groups and on the trends and determinants of nursery school and kindergarten attendance; (4) trends in academic performance of elementary and secondary school students; (5) trends in the transition from school to employment for persons with varying levels of educational attainment, emphasizing the varying experiences among racial and ethnic groups; (6) trends in the kinds of occupations open to men and women with varying educational qualifications; and (7) trends in the economic returns to schooling for young workers.

### **Race, Ethnic, and Nativity Differences in Attainment, Enrollment, and the Economic Rewards of Schooling**

Cutting across all aspects of trends in educational attainment, school enrollment, and their consequences is a concern with variation in these outcomes across race and ethnic groups and between immigrants and persons born in the United States. Schooling has traditionally been viewed as an avenue of upward mobility and economic assimilation of immigrant and disadvantaged minority groups, yet these groups vary widely in the extent to which they have been able to enjoy the benefits of schooling. Compared to majority whites, blacks have traditionally faced severe disadvantages in the quality of schools that they have attended, their level of educational attainment, and the economic rewards that they have derived from their schooling.<sup>1</sup> The educational attainment of some Hispanic groups has substantially lagged behind that of both whites and blacks, yet within levels of education, Hispanics have typically enjoyed

higher economic rewards than blacks.<sup>2</sup> Asian Americans have enjoyed unusually high levels of educational and socioeconomic success compared to whites as well as other minorities, despite persistent racial discrimination.<sup>3</sup> Both Hispanics and Asians, however, are very heterogeneous groups that differ widely in their socioeconomic success. Additionally, within and among most race and ethnic groups, there is substantial variation in educational and economic attainments of native and foreign-born groups. Although immigration often brings in the most educated and ambitious members of foreign populations, such persons often face significant handicaps relative to their native counterparts once they enter the United States.

Historical differences in educational attainment and school enrollment among racial and ethnic minorities have shrunk over time, but we know that considerable socioeconomic inequality along racial and ethnic lines has persisted. The decade, moreover, witnessed significant immigration of Hispanic and Asians groups. Thus this chapter emphasizes race and ethnic differences in educational attainment, school enrollment, and their economic consequences. For most analyses I will examine five groups: non-Hispanic whites; non-Hispanic blacks; Asian and Pacific Islanders; American Indians, Eskimos, and Aleuts; and Hispanics. Asian and Pacific Islanders will be referred to as "Asians" throughout the chapter. American Indians, Eskimos, and Aleuts will be referred to as either "Indians" or "Native Americans." Non-Hispanic blacks will be referred to as either "blacks" or "African Americans." Inasmuch as many Asians and Hispanics, unlike the other three race-ethnic groups, are foreign-born, I sometimes distinguish native and immigrant members of these groups.<sup>4</sup>

### **Census Data as a Tool for Studying Educational Issues**

The decennial census is a unique tool for the assessment of social change because it provides a very large and rich set of data for detailed analysis of social and demographic groups.



For example, the census is a uniquely reliable source of data on the educational attainments of small race or ethnic groups. For the most part, the census employs a constant set of measures for each decade, thereby avoiding the problem of confusing changes in the population with changes in the way that the population is measured. From time to time, however, the Census Bureau changes the way that a phenomenon is measured because either changes in the phenomenon itself make the old measures obsolete or users of the census change their ideas about what is important to measure.

An important change is the new measure of educational attainment in the 1990 Census. This resulted from the belief that measures of attainment used in prior censuses and many other data sources correspond poorly to widely used educational concepts, and that this problem has worsened over time. In the five censuses before 1990, educational attainment was measured in a single number--highest grade of school completed. Users of census data typically inferred whether a person completed major stages of schooling (e.g., high school graduation, college graduation, etc.) from whether he or she completed a given number of years of schooling (e.g., 12, 16, etc.). Yet this assumption works poorly for persons who attend school part-time, take accelerated or prolonged degree programs, or attend full years but only partially complete degree requirements. For example many students spend five or more years getting a college degree whereas others obtain theirs in three years. Nor is this assumption adequate for inferring whether individuals receive specific advanced degrees. To remedy this, the 1990 Census asked respondents explicitly about their academic credentials. To offset the increased detail of response categories for higher education, the 1990 schedule requests less detail at lower levels of schooling and in the measurement of school attendance. As shown in Table 1, there were three major changes between 1980 and 1990 in the census items on schooling: (1) for educational attainment

at the high school level and above, people were asked their highest *degree* obtained, rather than their number of years or grades completed; (2) people were asked their highest level of schooling *completed* in a one-part question rather than a two-part question on their highest level *attended* and whether they completed that level; and (3) people were given detailed response categories for the type of advanced degree that they may have obtained, but broader categories for attainment at the elementary and middle school level.<sup>5</sup> These changes require that one adopt a variety of strategies for assessing educational trends that enable one to distinguish actual changes in educational patterns from artifacts of change in the measurement of educational attainment. One strategy for assessing changes in the attainment patterns of young adults is to rely on estimates of the joint responses of persons in several surveys in which both the 1990 Census and the traditional educational attainment measures have been administered. Using these estimates, one can estimate the response that 1990 Census respondents would have supplied had they been given the 1980 education items, and the response that the 1980 respondents would have supplied had they been given the 1990 item. A second strategy is to use ancillary data, such as the Census Bureau's October Current Population Surveys which employ measures of schooling that are stable over time.

[Table 1]

## II. TRENDS IN EDUCATIONAL ATTAINMENT

### Trends in Trends in Educational Attainment During the 20th Century

The 1980 and 1990 Censuses provide snapshots of the population for only two years. Yet because almost everyone gets their schooling during their childhood, teens and twenties, the reported average educational attainments of the various age groups observed in each census provide a good indication of the trend in attainment across the birth cohorts represented in the

census. For example, the average attainment of persons aged 40-44 in 1990 shows the attainment experienced by persons who were born in 1946-50 (the early baby boomers) and who attended school in the late 1950s, the 1960s, and the early 1970s. To be sure, such measures are affected by the fact that persons with more schooling tend to live longer than those with less schooling and that some persons acquire more schooling at older, nontraditional ages of enrollment. Nonetheless each census provides an informative view of the "educational history" of the 20th century.

Figure 1 shows trends in percentages of persons completing selected levels of schooling by year of birth separately for men and women and for measures based on the 1980 and 1990 Censuses. A rough indication of the extent to which the population has eliminated functional illiteracy is the percentage of persons who have completed fewer than five years of formal schooling. As Figure 1a shows, about 15 percent of persons born at the turn of the century failed to complete 5th grade, a fraction that declined steadily over cohorts born during the next 40 years, reaching a level of about two percent. This fraction has held at between one and two percent of cohorts born since World War II. In pre-World War II birth cohorts, boys were somewhat more likely than girls to complete less than 5th grade, but this differential disappeared as completion of this educational milestone became nearly universal.

[Figure 1 here]

Figure 1b presents cohort trends in the percentage of persons who have completed at least a high school education.<sup>6</sup> The trend follows the S-shape that is characteristic of the spread of innovations. Between cohorts born at the turn of the century and those born in the 1960s, the rate of high school graduation grew from approximately 25 percent to greater than 80 percent. In cohorts born early in this period, women were somewhat more likely to graduate than men,

but this advantage for women disappeared for cohorts born from the 1920s onward. In recent cohorts, however, high school graduation rates for women once again exceed those of men. For both sexes, rates of graduation have declined slightly over cohorts born in the 1950s and 1960s. The erosion of graduation rates for the population as a whole may be the result of the changing makeup of successive cohorts. Over cohorts, educationally disadvantaged minority populations (especially African Americans and Hispanics) have grown relative to the white majority. Although differential population growth among race-ethnic groups is apparent in cohorts born well before the 1950s, secular increases in high school graduation rates among whites during this earlier period were more than sufficient to offset the negative effect of minority population increase on graduation rates for the whole population. Now that white rates have stabilized, however, the increase of educationally disadvantaged minorities will reduce total graduation rates until educational inequality among race-ethnic groups is further reduced.

At the college level the trend in attainment also follows an S-shaped pattern, albeit one in which the acceleration of completion rates occurs somewhat later than for the completion of high school (Figures 1c and 1d). According to 1990 Census estimates, the percentage of persons completing at least some college increased from about 15 percent for men born at the turn of the century to about 60 percent for men in the 1946-50 birth cohort, and subsided to about 50 percent for the cohort born in the late 1960s. The percentage of women completing at least some college increased from about 20 percent for cohorts born at the turn of the century to about 55 percent for cohorts born in the 1950s and 1960s. The 1980 Census estimates show a similar trend in rates of completion of some college, but within each cohort, the 1990 estimates are 5 to 10 percentage points higher.<sup>7</sup> To some extent the higher estimates for 1990 occur because a small fraction of persons continue to obtain further education during their adult years, implying that,

within cohorts, average educational attainment increases with age. It is likely, however, that an equally important cause of the difference between the 1980 and 1990 estimates of percentages completing at least some college is the change between the 1980 and 1990 Censuses in the wording of the educational attainment item. The way that educational attainment was determined in the 1990 Census induced individuals who attended technical and vocational schools after high school to report that they had attended some college without obtaining a degree. In the 1980 Census, such persons were not encouraged to count such schooling as college. Thus to some extent, the observed increase between 1980 and 1990 in the proportion of persons with at least some college is an artifact of changes in question wording. Question wording, however, does not have the same impact on our estimates of the proportions of persons who completed a college degree. As shown in Figures 1c and 1d, the percentage of persons with at least some college increases substantially between censuses, but the percentage of persons with at least four years of college increases only modestly.<sup>8</sup>

Increases in rates of college completion reflect secular changes in the socioeconomic characteristics of families, long-run technological changes in the economy, the increasingly competitive pressure to maintain one's competitive position in the workforce, and the nation's dedication to providing post-secondary education for an ever growing fraction of the population.<sup>9</sup> During the late 19th and 20th centuries in the United States each successive cohort has been born to parents who, on average, have higher levels of schooling and higher socioeconomic standing than the parents of previous cohorts.<sup>10</sup> Given the strong effects of parents' schooling and socioeconomic status on the schooling of their offspring, secular changes in the family have, over the long run, been an important source of educational growth. Changes in measured characteristics of the family, however, account for only about one-third of the growth documented

in Figure 1. In addition, the emphasis of the American economy and labor market has changed from agrarian to blue-collar industrial to white-collar service, increasing the demands for a highly educated workforce. The extent to which the economy has "needed" workers who have spent increasingly large portions of their early lives in school is, of course, debatable. Even if the educational requirements for jobs did not change, the average educational attainments of successive cohorts would have grown. Because employers often regard formal school credentials as markers for the desirability of workers, individuals are induced to acquire as much schooling as they can. Increases in educational attainment between successive birth cohorts resulted both from the efforts of individuals to compete successfully in the labor market and from large public subsidies of the cost of post-secondary schooling.

As Figures 1c and 1d show, trends in the educational attainment of women have roughly paralleled those of men, although the sexes have differed somewhat in the pace of change. Women born at the turn of the century had about the same chance as men to attend and complete college, but subsequent cohorts of women did not keep pace with their male counterparts. For both completion of any college and for college graduation, the gap between the sexes reached a maximum of about 10 percentage points for cohorts born during the Depression and subsequently shrank. Among cohorts born since the mid-1950s, women have completed at least some college at higher rates than men. There is considerable evidence that rates of college completion for women may have even surpassed those of men for cohorts born in the early 1960s. The sex difference in college attendance and completion trends reflects the different role that college has played in the lives of men and women during the 20th century. Early in this century, a college-educated, professional class was open to small numbers of men and women, albeit one in which women were primarily teachers and men occupied a more diverse set of

positions. Professional opportunities grew rapidly for men throughout the middle part of the century, but comparable occupational opportunities were not open to women, who remained primarily housewives and mothers; or, if they obtained advanced degrees were mainly confined to a small number of female dominated occupations such as teaching, library science, or nursing.<sup>11</sup> The percentage of women attending college nonetheless grew over this period, first gradually for cohorts born during the first quarter of the century and rapidly thereafter. Many of the women who received higher education did not enjoy its full benefit in the labor market. College did, however, provide them the opportunity to meet and marry men who had similar educational credentials. In many instances, therefore, women derived an economic benefit to increased education, albeit indirectly through marriage.<sup>12</sup> In more recent cohorts, in contrast, as men's and women's positions in the workforce have become somewhat more similar, women have experienced more direct economic benefits from their own education. In these cohorts, women have equalled or surpassed men in their attendance at and completion of college.

As in the case of high school graduation, levels of college attendance and completion have declined over cohorts born since 1950 to a small extent for women and a much greater extent for men. These changes are the result of two main causes. First, for men, college attendance was unusually high for cohorts born in the middle and later 1940s, the group of men who were most vulnerable to the Vietnam era military draft and could avoid the draft by obtaining a college deferment. Men who belonged to subsequent cohorts, who entered college when the manpower needs of the armed forces were lower and the draft deferment of college students was eliminated, attended college at lower rates than their earlier counterparts. Second, as for high school graduation, college attendance and completion rates for each cohort are affected by the changing racial, ethnic, and socioeconomic makeup of the population. Educational attainment for the white

majority has not changed a great deal in recent cohorts, but the proportion of each cohort made up of educationally disadvantaged minorities has grown. This has reduced average attendance and completion rates for cohorts as a whole.

### **Trends in Advanced Degrees for Men and Women**

Although trends in educational attainment provide a broad indication the population's education level, persons with the same numbers of years of schooling often vary considerably in their credentials and skills. This is particularly the case beyond the college level, where advanced specialized degrees provide people with varying qualifications in the labor market. It is, moreover, at this advanced level where changes in educational inequality between men and women over the past several decades have been particularly striking. As women have attended and completed college at increasing rates, more and more of them have been eligible to pursue advanced professional degrees. As discussed in Sections VII and VIII, higher levels of educational qualifications, combined with reduced discriminatory barriers in the labor market, have enabled highly-educated women to make progress in reducing their economic disparity with men.

The numbers of men and women eligible to go on for advanced degrees -- that is the numbers earning bachelor's degrees -- increased dramatically since 1950. In 1950 about 330,000 men and 100,000 women received bachelor's degrees. By 1980, the number of bachelor degrees awarded had grown to about 475,000 for men and 450,000 for women. As suggested by trends in rates of college completion, during the 1980s, women surpassed men in annual numbers of bachelor's degrees--in 1990 about 490,000 men and 560,000 women received bachelor's degrees. The growth in bachelor's degrees for women over this period has lead to equally impressive gains in numbers of women earning graduate and professional degrees. Figure 2 shows trends



in numbers of advanced professional degrees received by men and women during the past three or four decades in selected fields. In 1960 about 5000 men were awarded master's degrees in business (MBA's), about 25 times the number of women who received this degree. The subsequent 30 years brought about a 10-fold increase in MBA's for men, but almost a 150-fold increase for women. By 1990, about 10 men receive MBA's for every 6 received by women, but this gap dwindles year by year and shows every sign of disappearing. Similar trends can be seen for law and medicine, two of the most common and best paying professions. Whereas in 1960 men received about 45 law degrees for every law degree received by a woman, by 1990 the ratio declined to 4 to 3. In 1960 men received about 9 medical (MD) degrees for every MD awarded to a woman; by 1990 the ratio was less than 2 to 1.

[Figure 2 here]

Although women have made striking advances in achieving business, law, and medical credentials, the changes in other, sex-typed professions have been smaller. Whereas in 1950 virtually no women received master's degrees in engineering (M. Eng.), about 3500 did so in 1990. Nonetheless, men still receive 6 M. Eng degrees for every 1 awarded to a woman. Conversely, women still receive far more advanced degrees in education than men, as they have done since 1970. The number of master's degrees in education (M. Ed.) declined for both sexes in the 1980's, reversing a long-term trend, but the decline was proportionately greater for men than women and women now receive more than 3 M. Ed. degrees for every such degree awarded to a man.<sup>13</sup>

These trends reveal a mixed pattern of change in the educational standing of men and women during the 1980s. Both sexes sought and obtained advanced professional degrees in increasing numbers in many professional degrees. Unlike for the elementary, secondary, and

college levels where women have equalled or surpassed the educational attainment of men, men retain substantial advantages in the attainment of valuable post-baccalaureate degrees. These advantages are important because these degrees are often requirements for entering the very top jobs in industry and government and thus are the keys to many of the most stable and high paying positions in the workforce. In business, law, and medicine, as well as other fields, however, women's progress in a relatively short period of time has been revolutionary. The trends toward educational convergence for men and women at the highest levels of schooling show no sign of abating.

### **Trends in Educational Attainment in the 1980s**

To examine trends in educational attainment during the 1980s, it is necessary to examine the behaviors and statuses of young persons, many of whom are still in school. An effective method is to examine the probabilities that persons move between successive stages of schooling for those who have either made these transitions or who have dropped out of school. Because these probabilities are estimated from the educational experiences of all 7 to 24 year olds in each census, they describe the experiences of people who were born over an 18-year period. They characterize a hypothetical group of persons who had the school continuation probabilities experienced by 7 to 24 year old census respondents up to the date of the census. These probabilities are estimated as the ratio of persons who have completed a given level of schooling to persons who completed at least the previous level of schooling, leaving out persons who are enrolled at but have not yet completed the given level of schooling. Comparing the experiences of 7 to 24 year olds in the 1980 and 1990 Censuses provides an indication of recent attainment trends. As noted above, however, a problem in the analysis of trends in educational attainment between 1980 and 1990 is the change between the censuses in the way that schooling is

measured. To compare educational attainment in the two censuses, therefore, it is necessary to estimate what the 1990-basis education responses would have been for people enumerated in 1980 and what the 1980-basis responses would have been for people enumerated in 1990. Although the 1980 and 1990 Censuses do not let one see how the same person would have answered the two questions, several surveys fielded by the Census Bureau between 1980 and 1990 let one observe the joint distribution of educational attainment measures that are similar to the 1980 and 1990 Census items.<sup>14</sup>

Figure 3 shows trends in school continuation probabilities between 1980 and 1990 using the 1980 basis codes. This figure presents, for each grade of schooling, the probability that an individual will complete the subsequent grade of schooling. These estimates show that probabilities of school continuation are near unity throughout the elementary and early secondary years in both 1980 and 1990 and at rates in excess of .95 for the later stages of secondary school. Rates of dropout during high school declined slightly during the decade: at each grade of high school, the rate at which students continue from one grade to the next increased by between one and two percentage points. This increase is small because rates of high school dropout were, on a national basis, already very low at the start of the decade. That the dropout rates nonetheless declined, however, is a reflection of the same forces that have driven educational attainments throughout the century, including the rising educational attainments of parents and the dwindling employment prospects for persons who fail to complete high school.

[Figure 3 here]

At the transition from high school to college, rates of continuation increased sharply over the 1980s. The probability of progressing from 12th to 13th grade of school jumped sharply by more than .1 from 1980 to 1990. Inasmuch as only about 42 percent of high school graduates

went on to complete a year of college in 1980, this offered the potential for significant growth in school persistence over the decade. In addition, there were modest increases in probabilities of persistence in and graduation from college during the 1980s. Beyond the college level there were large increases between 1980 and 1990 in proportions of persons continuing to advanced degrees. For example, among persons who completed 16 years of schooling, the percentage who completed a 17th year increased from about 18 percent to 28 percent over the decade. To a limited degree this increase may result because increasing numbers of persons took more than four years to complete a bachelor's degree. To a large extent, however, this change, like the changes observed at the lower levels of schooling, reflects a continuation of long run trends toward increased educational attainment.

### **Race-Ethnic Differences in Educational Attainment in the 20th Century**

Average educational attainments have varied historically among major race and ethnic groups in the United States and these differences persist today. These differences reflect socioeconomic differences among these groups, ethnic and racial discrimination in schools and in the economic rewards to schooling, group differences in the timing of immigration to the United States, and group differences in values placed on formal schooling and in strategies that families use to facilitate the schooling of their offspring. The current section reviews differences among major race-ethnic groups during the 20th Century. The next section will describe changes during the past decade.

Figures 4a through 4d present trends in rates of completing selected levels of schooling for five major race-ethnic groups over cohorts born between 1900 and 1970, estimated from the 1990 Census. The attainments of native and foreign-born persons may differ greatly. On the one hand, immigrants are a selective group and may, relative to their racial or ethnic counterparts

who do not come to the United States, acquire more schooling. Indeed, many immigrants may come to this country specifically to obtain further education. On the other hand, compared to native-born members of their group, they may have lacked educational opportunities in their place of birth and have faced considerable economic and linguistic obstacles to schooling once entering the United States.<sup>15</sup> Because Asian and Pacific Islanders and Hispanics have a large portion of foreign-born members, Figures 4a through 4d distinguish native and foreign-born members of these groups.

[Figure 4 here]

All race-ethnic groups follow the trends of increasing rates of school completion observed in the population as a whole, but they differ markedly in their levels of attainment and in the rates at which their attainment levels grow. The size and pattern of change in race-ethnic differences varies with level of schooling. The higher the level of schooling, the larger the differentials that can be seen in recent birth cohorts. For completion of five years of schooling, race-ethnic differences were substantial for cohorts born at the turn of the century, favoring majority whites and the small native Asian population. For cohorts born in the 1960s, completion of fifth grade was nearly universal for all groups except foreign-born Hispanics, many of whom were not living in the United States at the time that they were teenagers. As one considers higher levels of school completion, however, the differentials among cohorts born at the turn of the century are smaller and those for recent birth cohorts are much larger. For completion of at least some college among cohorts born in the beginning of the century only whites enjoyed completion rates in excess of 15 percent. For cohorts born in the 1960s, in contrast, completion rates vary from a remarkably high 70 percent for native Asians to less than 20 percent for foreign-born Hispanics.

The trend in differences between foreign and native-born persons is strikingly different for Asians and Hispanics. Differences between native and foreign-born Asians are very large for cohorts born during the first third of the century, particularly for completion rates at elementary and secondary school. Among recent cohorts, in contrast, native and foreign-born Asians enjoy similar levels of attainment. For Hispanics, the trend is the opposite. Whereas native and immigrant Hispanics who were born early in the century experience similar rates of school completion, in more recent cohorts natives experience much higher levels of attainment. These differences in the educational histories of native and foreign-born Asians and Hispanics result from differences between the two groups in educational opportunities in their countries of origin, as well as differences in opportunities to acquire more school once living in the United States.

The school completion rates for cohorts born between approximately 1940 and 1970 have determined the educational makeup of most of the current labor force in the United States economy. Among such persons there are large race and ethnic differences in educational attainment, which are a major source of race-ethnic differences in earnings and occupational placement.<sup>16</sup> Race-ethnic differences in educational attainment, particularly as indicated by rates of completing some college and completing a college degree, remain substantial for working age adults. Within this broad age group, approximately 70 percent of Asians, 60 percent of whites, 40 percent of blacks and native Hispanics, 30 percent of American Indians, and 20 percent of foreign-born Hispanics have completed at least some post-secondary schooling. These differences imply large lifelong differences in socioeconomic welfare among these groups and large differences in the socioeconomic and educational opportunities that these groups can provide to their offspring. Despite the shrinkage of educational differences among race-ethnic groups in elementary and high school, inequalities in ultimate educational attainment are pervasive and

likely to persist for some time to come.

### **Race-Ethnic Differences in Educational Attainment in the 1980s**

To examine more recent trends in race-ethnic differences in attainment, one can again examine the school continuation probabilities for young persons, some of whom are still in school. Using the educational experiences of persons aged 7 to 24 in the 1980 and 1990 Censuses, one can estimate the probabilities of continuing between each successive level of schooling. Within each census when these probabilities are taken together, they describe the educational transitions for a hypothetical group of persons who experienced the probabilities observed at each age level in the census.

Between 1980 and 1990 all major race and ethnic groups increased their average rates of school continuation and levels of educational attainment. Whereas historic differentials among these groups compressed to some extent, these differentials nonetheless persisted at some stages of schooling. Figures 5a and 5b present probabilities of school continuation for five major race-ethnic groups for 1980 and 1990 respectively, as estimated from 1980 basis education codes for year to year transitions at the high school and college levels.<sup>17</sup> Race-ethnic differences in school continuation probabilities emerge during high school and grow much larger at the transitions into and within college. Among the five groups considered here, Asians continued to enjoy the highest probabilities of school progression at each level of schooling, followed at some distance by whites. Blacks and Hispanics experienced similar progression probabilities, which are somewhat lower than those of non-Hispanic whites. Finally, at almost all transitions, American Indians had the lowest continuation probabilities. These differentials became somewhat smaller at the secondary school level and in the transition between high school and college from 1980 to 1990, but differentials in school progression among persons who reached college persisted.

Indeed, at the transition from some college to attainment of a bachelor's degree some race-ethnic differences grew. Progression probabilities for Asians and whites, which were already much higher than the other three groups in 1980, grew substantially between 1980 and 1990, whereas the corresponding probabilities for the groups were largely unchanged. These trends follow a general historical pattern that applies to socioeconomic as well as race-ethnic differentials. That is, inequality of educational attainment moves from earlier to later stages of the schooling process as average levels of attainment increase for all groups. As schooling becomes nearly universal at the elementary and secondary levels, inequalities are eliminated, but inequalities persist or even widen at the post-secondary level.<sup>18</sup>

[Figure 5 here]

### III. FAMILY EFFECTS ON EDUCATIONAL ATTAINMENT

#### Family Effects on School Attendance and Completion

A key "engine" of secular growth in educational attainment is the trend in average family socioeconomic conditions. Children raised in families in which parents are relatively well educated, have higher family incomes, and bear smaller numbers of children go further in school than children of poorly educated, low-income, and high fertility parents. Because these inequalities have persisted, secular increases in *parental* schooling and real family income, and declines in family size have been a major source of educational growth during this century.<sup>19</sup> Despite the trends in family factors that have been conducive to growth in educational attainment, other recent social changes may have had offsetting effects. Children and teenagers raised in single-parent families tend to have lower high school graduation rates than their counterparts raised in two-parent families.<sup>20</sup> Secular increases in marital disruption and in the proportion of births that are to unmarried women tend to increase the proportion of young persons who grow



up in families that are unfavorable to educational success. In addition, low levels of growth in real incomes and stable birth rates during the late 1970s and 1980s may have eliminated some of the main sources of educational growth enjoyed by cohorts born earlier in this century. Rates of joblessness for blacks in their teens and early twenties have increased over this period, exacerbating the economic hardships of young parents. The racial, ethnic, and socioeconomic makeup of inner cities has evolved, resulting from migration of both people and jobs between south and north, rural and urban, city and suburb, and across international boundaries. During the period, there has been a national outcry about rates of dropout in inner city high schools and evidence of reduced rates of college attendance by blacks. Given these changes it is valuable to assess the effects of family factors on the chances that young persons remain in school.

*Mother's and Father's Schooling.* Highly educated parents have higher educational expectations for their offspring and provide family environments more conducive to educational attainment. Secular increases in parents' educational attainment are an important component of educational growth in offspring cohorts.<sup>21</sup> As parental education levels have increased, their variability has declined, which has tended to reduce the inequality in attainment of offspring. There is some evidence, however, that the educational attainments of mothers and fathers have become more alike in recent years because persons are increasingly likely to meet their mates in college or at work. Thus successive cohorts of children are increasingly likely to have two parents who are either both highly educated or both have lower levels of educational attainment. This trend tends to increase the combined variability of mother's and father's schooling. The increased variability of parents' schooling may tend to increase the inequality of all children's educational attainment.<sup>22</sup>

*Family Income.* The socioeconomic standing of families affects the educational

achievements of children. Prosperous families have more money to pay educational expenses and are less likely to create pressures upon their teenage members to work. In addition, children raised in such families enjoy better housing, clothing, quality of neighborhood, etc. that derive from higher incomes, and are likely to have the higher socioeconomic aspirations that higher status families transmit to their children.<sup>23</sup> Thus secular change in real family incomes may have contributed to changes in educational attainment. This study examines these effects explicitly and also investigates the extent to which trends in economic inequality in the 1980s dampened the growth of schooling.

*Family Structure and Family Size.* School attendance and completion are affected by several aspects of family life apart from the socioeconomic characteristics of parents. First, children raised in female-headed families are less likely to graduate from high school than those raised in two-parent families. Single mothers who bear children tend to be economically disadvantaged. Married mothers whose marriages break up also suffer economic hardship and their children experience the disruptive effects of divorce on their social and intellectual development.<sup>24</sup> Secular growth in the proportion of children raised in female-headed families may have dampened rates of high school graduation and other indicators of educational achievement.

Second, a child's number of siblings affects his or her educational attainment. Attendance and completion rates vary inversely with family size, presumably because children from large families face more competition for family resources than children raised in small families. These resources include not only economic benefits but also the socio-emotional benefits that parents can provide to their offspring.<sup>25</sup> Given declines in fertility since the late 1950s and the strong cross-sectional effect of number of siblings on schooling, declining family size may be an

important source of educational growth during the past three decades.

### **Trends in Family Characteristics, 1980-1990**

Trends and variations in the distributions of family characteristics may partly account for trends in levels of educational attainment as well as cross-section variation in school progression among race and ethnic groups. Because the census obtains information only about co-resident members of families and households (and not about kin who live elsewhere), these analyses are mainly restricted to young persons aged 7 to 24 years of age who were living with at least one biological or step-parent at the date of the census.<sup>26</sup>

*Nativity and Ethnicity* Racial and ethnic groups exhibit important differences in family background composition, both cross sectionally and in the factors that changed the most between 1980 and 1990. Unlike blacks, whites, and Indians, Asians and Hispanics include a substantial foreign-born population, although the nativity status of the latter two groups differs markedly. Among Asians, the proportion of young persons who were born abroad grew from approximately 50 to 60 percent of the population, whereas among Hispanics the foreign-born share of the population grew from about 25 to 30 percent. The influx of immigrants altered the ethnic makeup of these two populations. Among Asians, the shares of the population made up by Koreans, Indians, Vietnamese, and others grew from 1980 to 1990, while the relative size of the Japanese-American population became smaller. Among Hispanics, the share made up by Mexican-Americans grew at the expense of Cubans. Because these ethnic groups vary considerably in their levels of educational attainment, and immigrants typically have lower levels of schooling, these changes may have exerted downward pressure on attainment levels of Asians and Hispanics.

*Parents' Socioeconomic Standing.* Secular growth in educational attainment among past

cohorts leads to growth in the average attainments of parents. Among all race-ethnic groups except Asians, the distribution of mother's educational attainment shifted unambiguously upward. The largest increases in proportions of persons with mothers who have at least a high school degree occur for non-Hispanic blacks, Hispanics, and American Indians, groups with historically the lowest average attainment. Among Asians, a relatively large proportion of mothers have at least a bachelor's degree. This proportion increased markedly during the 1980s. At the same time, however, Asians have a relatively large proportion of mothers who have no high school education. The polarized distribution of maternal education for Asians appears to reflect the high overall average level of educational attainment in that population, combined with a large number of recent poorly educated immigrants. Overall, the trends in maternal education between 1980 and 1990 may have been an important component of educational growth over the decade.

Average parental incomes did not change greatly between 1980 and 1990, although whites and Blacks experienced modest real increases. The cross section race and ethnic differentials in parental income reflect well-established patterns of relative affluence of whites and deprivation of Indians, blacks, and Hispanics. Whereas it is unlikely that income trends can account for trends in educational attainment, income differences among race and ethnic groups are an important component of cross section race and ethnic differences in attainment.

*Family Structure and Size.* Among most race and ethnic groups, the proportion of persons living in families headed by women grew between 1980 and 1990, reflecting the well-established pattern of growth in female-headed families. Proportions of children who live only with their fathers increased too, but by small amounts in each group. Given the negative association between single parenthood and educational success of offspring, these trends may have exerted downward pressure on school continuation probabilities between 1980 and 1990, although the

quantitative importance of this component is likely to be small.

One of the biggest changes in family characteristics between 1980 and 1990 is the decline in average number of siblings. For all race and ethnic groups, the fraction of persons with three or more siblings declined between 20 and 25 percentage points. In view of the negative effect of family size on educational attainment, these declines in family size may be an important component of educational growth in the 1980s.

### **Effects of Family Background**

Schooling can be represented as a sequence of transitions that correspond to major milestones in the formal schooling process. This approach is well-suited to the qualitative measure of educational attainment in the 1990 Census and can reveal variation in the effects of family background across stages of schooling.<sup>27</sup> Moreover, this approach allows for the possibility that many people in the sample are only part way through their schooling careers. The analyses of school progression presented here focus on four transitions: completion of 9th grade, completion of a high school degree or GED given 9th grade completion, completion of some college given a high school degree or GED, and completion of a bachelor's degree given completion of some college.<sup>28</sup> Figures 6a through 6d display the net effects of family characteristics on the odds of school continuation for each of the four school transitions.

[Figure 6 here]

*Parents' Schooling.* As is well known, mother's and father's educational attainment are positively associated with the educational attainment of offspring. Parents' schooling has a strong effect for all four transitions. For example, for persons whose mothers have a high school diploma, the odds of high school graduation are more than twice the odds for those whose mothers have less schooling (Figure 6b). Among persons whose fathers or mothers have attended

at least some college, the odds of college attendance are nearly twice the odds for those whose father or mother did not attend college (Figure 6c). (The effects of mother's or father's schooling applies only to persons who were living with their mother or father respectively. Census data do not permit one to assess the effects of a parent's characteristics when the parent is absent.<sup>29</sup>) Typically, the effects of parental schooling exhibit a striking nonlinear pattern. The largest increment to the odds that offspring will make a given transition is induced by whether or not the parent made that transition. For example, the largest contrast in the odds of 9th grade completion is between those whose mothers attended some high school and those whose mothers had only grade school education; the largest contrast in odds of high school graduation is between those whose mothers were high school graduates and those whose mothers dropped out before graduation; the largest contrast in odds of college attendance is between those whose mothers attended at least some college and those whose mothers had no college; and the largest contrast in the odds of college graduation is between those whose mothers graduated from college and those whose mothers had some college but no college degree (Figures 6a - 6d). This pattern is somewhat starker for the effects of mother's than of father's schooling, but it is observable for both parents. It strongly suggests that each successive generation places an educational "floor" below which its offspring are unlikely to fall, and which provides a platform for further intergenerational growth.

*Parental Income.* In 1980 and 1990, the effect of parental income on the odds of school progression is substantial for all school transitions. Unlike for parental schooling, the income effect tends to be linear across broad income strata. The effect of income on the odds of school progression show some tendency to decline from the earlier transitions to the later ones, suggesting that income indicates more than simply a family's capacity to meet the direct expenses

of higher education. Income differences also reflect variation in the quality of schools and neighborhoods as well as other, unobserved dimensions of family socioeconomic standing that affect educational aspirations and achievement.

*Family Size and Structure.* The estimated effects on school progression of living with only one parent may be attenuated in census data because family structure is measured only at the census date, rather than at the stages of life when young persons were at risk to each school transition. Taking the estimated effects at face value, however, suggests that differences in rates of school progression between persons who live with one or both parents are limited to specific school transitions. The handicap faced by young persons living in a mother-only family is confined to the transition from high school attendance to high school graduation, whereas living in a father-only family appears substantial only for the transition from high school to college.

Offspring with relatively large numbers of siblings have lower educational attainment than those from small families because both material and socio-emotional resources are spread more thinly in large families compared to small ones. Among the school transitions considered here, the effects of sibship size are, for the most part, confined to the transitions from high school to college and from college to college graduation. For example, for persons with three or more siblings the odds of completing some college given high school graduation or of graduating from college given some college completion are only about 80 percent of the corresponding odds for those who are only children (Figure 6c).

#### **Family Effects on Educational Attainment: Summary and Conclusion**

As in past cohorts, the changing social and economic circumstances of families contribute to increases in formal schooling obtained by young persons between 1980 and 1990. Because school continuation probabilities are nearly unity at the elementary and early secondary levels,

changes in progression probabilities occurred in the late secondary and post-secondary schooling levels. Historic race and ethnic differentials in educational attainment, in which Asians and whites have averaged higher levels of schooling than blacks, Hispanics, and American Indians, persisted in the 1980s. Race and ethnic differences in progression rates in secondary school and between high school and college diminished, but differentials in transition rates between levels of post-secondary school persisted.

A major source of growth in average levels of educational attainment continues to be secular increases in average levels of educational attainment of parents. Most parents insure that their offspring achieve at least the same level of schooling that they themselves achieved. Thus, increasing average attainment levels of parents engender corresponding increases in offspring. The race and ethnic groups with below average probabilities of progression between successive stages of schooling are those with the greatest potential for future educational growth for both parents and offspring. It is likely that continued increases in parental schooling will eventually result in convergence of progression probabilities at the secondary school level by the major race and ethnic groups.

#### **IV. RECENT TRENDS IN SCHOOL ENROLLMENT**

Whereas educational attainment is a characteristic that individuals carry with them throughout their lives, school enrollment is both an activity that may engage an individual at a particular age and also a component of eventual educational attainment. School enrollment rates signify the current rate at which schooling is "produced" and "consumed" in the population. This section first briefly describes recent trends in school enrollment rates for children and young adults. Then it focusses on nursery and kindergarten where enrollment has increased significantly during the past decade. Pre-elementary school enrollment provides some indication of the extent



to which individuals either have access to explicit programs to facilitate elementary schooling, such as Head Start, or are at least exposed to an educational environment at an early age. Because school enrollment rates in the 1980 and 1990 Censuses are not comparable, the analyses reported in this section are based on the October 1979, 1980, 1989, and 1990 Current Population Surveys. To obtain enough observations for detailed analysis and to obtain measures that corresponded approximately to the census years of 1980 and 1990, the 1979 and 1980 and the 1989 and 1990 CPS's were pooled.<sup>30</sup> In contrast to the Census, the CPS does not identify Asian and Native American persons. Thus the race-ethnic groups considered are non-Hispanic whites, non-Hispanic blacks, and Hispanics.

Figure 7 shows percentages of persons enrolled in regular school in 1979-80 and 1989-90 for two-year age groups for three race-ethnic groups. During the 1980s school enrollment rates increased at the youngest and oldest ages, continuing a century-long pattern of educational growth from the middle-childhood years toward infancy and young adulthood.<sup>31</sup> This trend is particularly strong for whites. For 3-4 year old whites, enrollment increased by about 8 percentage points; at the traditional college ages, by about 10 percentage points; and, in the mid-twenties and early thirties, by between 3 and 5 percentage points. Blacks and Hispanics in their twenties experienced slightly smaller increases than those of whites, while enrollment rates were stable for those in their thirties or in the pre-school ages. Increased enrollment beyond the traditional college ages reflects both increasing rates of continuation to advanced degree programs, as well as intermittent and part-time enrollment on the way to obtaining a bachelor's degree. At the pre-school level, increased enrollment rates may be a result of increased rates of labor force participation of young mothers, although, as discussed in the next section, other social trends may have contributed to this increase as well.

[Figure 7 here]

### **Family Factors and Pre-Elementary School Enrollment**

A variety of social and economic forces affect the school enrollment of young children prior to ages of compulsory school attendance. The importance of pre-elementary education for readying children for regular school is now widely accepted, especially as a means of facilitating the achievement of groups who have been traditionally educationally disadvantaged. This has given rise to the demand on the part of many groups for increases in funding for Head Start and similar pre-school programs.<sup>32</sup> Yet while nursery school and kindergarten are enriching educational experiences for many children, for others their function may often be more custodial than educational. This suggests that children from single-parent families, families in which both parents work, and families that cannot afford individualized child care arrangements may be more likely to enroll in nursery school and kindergarten. At the same time, however, whereas pre-elementary schooling may well be a fruitful avenue for compensatory education, much of it is privately funded and hence more easily available to children from socioeconomically advantaged families.<sup>33</sup>

Figure 8 illustrates the effects of a variety of family factors on the odds that a child aged 3 to 5 attends nursery or elementary school. In this figure each effect is estimated holding other factors constant.<sup>34</sup> The odds of attending nursery school or kindergarten for children whose mothers work are about 40 percent greater than for those whose mothers do not work. Similarly, children from single-parent families headed by their mothers are about 40 percent more likely to attend pre-elementary schooling than children from two-parent families. Larger than the effects of maternal employment and family structure, however, are the effects of family size and the socioeconomic characteristics of the parents. The odds of attendance for only children are

about 75 percent higher than for children who have three or more siblings. On the one hand, in larger families older siblings may be available to substitute for nursery school care. On the other, parents with many children may be less able to afford private nursery school. Mother's educational attainment also has a strong positive effect on the odds of pre-elementary school enrollment. Children whose mothers were college graduates were almost twice as likely to attend nursery school and kindergarten as children whose mothers graduated from high school but did not attend college. That this effect is so large even among mothers who have the same employment status strongly suggests that better educated parents are more likely to value formal early childhood education. Finally, children from economically advantaged families are much more likely to attend nursery school or kindergarten. Children from families with incomes in excess of \$45,000 are about twice as likely to attend as children from families with incomes below \$30,000, suggesting that families are indeed economically constrained in their ability to send their children to pre-school. Whatever the educational benefits of pre-elementary school attendance, like the benefits of elementary, secondary, and post-secondary schooling, they are enjoyed disproportionately by children from socioeconomically advantaged backgrounds.

[Figure 8 here]

Figure 9 illustrates changes in the distributions of several family factors that affect nursery and kindergarten attendance. For the most part, the family characteristics of children aged 3-5 changed during the 1980s in similar fashion to families as a whole. The family incomes of young children grew more unequal over the decade, as indicated by the relative growth in the proportion of children from families earning more than \$45,000 and less than \$15,000.<sup>35</sup> The average education of mothers of young children increased dramatically during the 1980s, reflecting the large secular increases in college attendance and completion in the cohorts of

women who are most likely to be mothers of young children in the late 1980s. The proportion of children whose mothers work also increased sharply during the decade. Finally, the proportion of children who were raised in single-parent families also increased from 1980 to 1990.

[Figure 9 here]

When combined with the strong effects of these factors on the likelihood that children are enrolled in nursery school and kindergarten, the changing characteristics of families may account for increases in rates of attendance over the decade. Some idea of this can be obtained from Figure 10, which plots the estimated probability of attending nursery school or kindergarten in 1980 and 1990 for each race-ethnic group. For each group, the first pair of bars denotes the observed proportion of 3-5 year olds attending pre-school in 1980 and 1990. The second pair of bars denotes the expected proportion who would have attended if all the race-ethnic groups had the same distributions of the characteristics shown in Figure 9 and if these distributions had not changed over the decade. For whites, the actual rate of attendance increased between 1980 and 1990 by about eight percentage points. If the average characteristics of white children had not changed from 1980 to 1990, then their rate of attendance would have increased by only four percentage points. Thus, for white children, changes in family characteristics account for about half of the observed change in attendance rates, and changes *within* specific categories of the characteristics shown in Figure 9 account for the other half of the change in attendance. For blacks and Hispanics the actual increases in attendance are five and nine percentage points respectively. When changes in family factors are taken into account, however, all of the observed increases are eliminated, indicating that changes in family characteristics fully account for increases in nursery school and kindergarten enrollment for these groups. In other words, among whites there was a shift toward higher enrollment rates net of family background factors,

but for blacks and Hispanics there was not.

Figure 10 also illustrates how differences in the distributions of family background characteristics between race and ethnic groups account for differences in their nursery and kindergarten enrollment rates. In both 1980 and 1990, the actual enrollment rates of Hispanic children are considerably lower than those of whites. For example, in 1990, about 50 percent of Hispanic children are enrolled in contrast to about 60 percent for whites. If white and Hispanic children had the same family characteristics, however, this gap in enrollment rates would have been much smaller. The enrollment rates of white and black children were in fact very similar in both 1980 and 1990. If black children had the same distributions of family characteristics as whites, their enrollment rates would have been markedly *higher* than those of whites. Thus the rates of pre-elementary school attendance for racial and ethnic minorities would be significantly higher if they enjoyed the same favorable levels of family income and maternal schooling as whites.

[Figure 10 here]

In summary, levels of nursery school and kindergarten attendance increased markedly in the 1980s, a trend that is largely attributable to increases in mother's schooling, increases in proportions of children whose mothers who work, and increasing proportions of single-parent families. Secular increases in mother's schooling are likely to bring about further increases in pre-elementary school enrollment, although many families will continue to be unable to afford private nursery schools.

## V. RECENT TRENDS IN ACADEMIC ACHIEVEMENT

The trends discussed thus far show unambiguously a continued upswing in the quantity of schooling received by young Americans, but is increased schooling accompanied by increased

learning? How far one goes in school surely plays a big role in how well one does in the labor market. But, technological changes in the work place and an increasingly competitive international economy have put new pressures on American workers to be literate, numerate, and capable of adapting to change. In recent decades there has been a national outcry about the quality of the nation's schools and adequacy of the skills that young persons bring from schools to their jobs. In comparison with their counterparts in other industrialized nations, students in the United States do poorly on tests of mathematics and science knowledge and reasoning. The 1990-91 International Assessment of Educational Progress provided information on the performance of 9 and 13-year old students on a standardized battery of mathematics and science tests in a number of nations. For example, for 13-year olds, among the 15 nations with high rates of participation in the study, the United States ranked 14th on mathematics performance. Students from the United States averaged 55 percent correct on the test, lagging behind Korea (73 percent), the former Soviet Union (70 percent), Hungary (68 percent), France (64 percent), Canada (62 percent), and eight other competitors.<sup>36</sup> This type of result has spurred the development of numerous policies and programs designed to improve the effectiveness of students and their schools. Examples of these efforts include broadened support for Head Start programs that will improve the readiness of young children for elementary school; increased salaries for public school teachers; competency tests for teachers; and more demanding course work requirements for receiving a high school diploma. Absent carefully designed evaluation studies, it is difficult to assess whether any specific set of programs has affected the academic proficiency of students. Nationwide standardized assessments of student progress, however, have been conducted since the mid-1970s and these provide a basis for a general discussion of trends.

Table 2 shows average numbers of year-long courses taken during high school for students

who graduated in 1982 and 1990. These trends show that students are indeed taking more courses during high school, an average of about 2.5 courses per student over the four years of high school. Two aspects of these trends are heartening. First, the trend has resulted from increasing work in core academic areas -- one-third of a year of English, one-half of a year of mathematics, a full year of science, and about one-half year of history and social science. By contrast, students are taking fewer vocational courses in such areas as business, agriculture, occupational home economics, marketing, and technical courses. Second, blacks and Hispanics -- groups who are traditionally disadvantaged in their quality of schooling, academic achievement, and educational attainment -- experience a greater increase than students as a whole in total number of courses and in courses in basic academic areas.

[Table 2]

A more direct indication of the trend in academic performance is provided by students' average performances on the National Assessment of Educational Progress (NAEP). Table 3 reports changes between the early 1980s and 1990 for reading, mathematics, and science for students aged 9 and 17 years. With the exception of reading scores for 9-year-olds, the data indicate improving academic proficiency during the 1980s. Paralleling the trend in coursework, the improvement in academic performance is particularly large for black and Hispanic students. Although gaps in performance on standardized tests between these groups and white students persisted, these gaps became significantly smaller during the 1980s. Although it may be tempting to ascribe the trends in Table 3 to the changing coursework patterns shown in Table 2, it should be stressed that many social changes may have contributed. Some aspects of the family backgrounds of students -- such as, for example, the average educational attainments of their parents -- became more favorable to academic achievement during the 1980s. Tougher

coursework requirements for high school students is only one of a number of initiatives taken to improve academic performance. Early childhood education programs, for example, are much more likely to affect the achievements of 9-year-olds than an increasingly rigorous high school program.

[Table 3]

From the data presented in Table 3, it is difficult to assess the magnitude of the changes observed in the 1980s. On balance, however, these changes should be regarded as small. The possible range of test scores is between 0 and 500. The changes between the early 1980s and 1990 are, for the most part, small compared to the differences in average scores between race-ethnic groups and between age groups. These changes, moreover, have not made a major dent in the performance gaps between students in the United States and other nations, which remained large in 1990. Some idea of the size of the changes can be obtained in comparison to Scholastic Aptitude Tests (SAT), which are taken by a much more selective population -- high school students bound for selective colleges -- than the NAEP tests, but for which a longer time series is available. Average SAT verbal and mathematics scores increased steadily from World War II until the late 1960s, at which time they began a decline that lasted until about 1980. Since 1980, SAT mathematics scores have increased, returning approximately to their level as of 1974, but not yet to their level in the late 1960s. Verbal SAT scores have remained essentially unchanged throughout the 1980s. Taken together, the SAT and NAEP trends suggest that the academic proficiency of the high school population as a whole improved modestly in the 1980s.

These qualifications notwithstanding, however, the improvements in test performance by minorities during the 1980s were remarkable. That the overall trajectory is positive, moreover, suggests that students who have recently left high school are better prepared for higher education



or for demanding employment than their counterparts a decade earlier.

## **VI. THE TRANSITION FROM SCHOOL TO EMPLOYMENT**

### **The Age Profile of Employment for Young Adults**

Among men and, to an increasing extent among women, young adulthood is a time of transition from full time schooling to full time work. The timing and success of a person's transition to employment depends on his or her educational attainment in a number of important ways. First, the longer that one spends in school, on average the later that one enters the labor force. This implies that among persons of a given age who are out of school, persons who have stayed in school longer have accumulated less work experience than persons who have left school early. The advantage in work experience of leaving school early, however, dissipates as persons age inasmuch as their better educated counterparts eventually become highly experienced workers too. Second, persons who obtain more schooling are able to improve their employment chances because such persons are, on average more desirable to prospective employers. This also implies that among persons who are out of school, rates of employment will rise with age as persons who have more schooling gradually enter the labor force.<sup>37</sup> Finally, persons with varying amounts of schooling are prepared to a varying extent for the specific demands of employers. Some post-secondary school programs are occupationally oriented (for example, teaching or nursing degrees) or, at least provide specific credentials that employers seek (for example, bachelor's degrees in business or engineering). At the secondary school level such specific links are far less common than at either the post-secondary level or at the secondary level in other nations. This has given rise to calls for the implementation of apprenticeship programs similar to those in some European nations to provide vocational opportunities for non-college bound youth.<sup>38</sup> Given the complex relationship between educational attainment and the transition from school to work, it is

instructive to look at the employment and earnings of young men and women at various ages who have acquired varying amounts of schooling. These trends provide a general picture of the relationship between schooling and work and how this has changed over time.

Figures 11a through 11d present the percentages of out-of-school persons aged 16 to 35 who were employed in the week prior to the census by age, educational attainment, sex, and census year.<sup>39</sup> Such estimates provide a rough indication of the "age pattern of employment" experienced by persons with varying levels of educational attainment and work experience. Within each census, however, the way that employment varies with age may reflect not only the effect of aging on employment but also differences in employment between members of different birth cohorts.<sup>40</sup>

[Figure 11 here]

Rates of employment vary markedly among young persons with differing amounts of schooling and between men and women. Although men are more likely to work than women, this gap shrank markedly between 1980 and 1990, a change that occurred to a greater extent among more highly educated persons. Except for high school dropouts, this change occurred only because rates of employment for women increased, rather than because of a decline in employment for men. Among college-educated women in both censuses, rates of employment appear to decline with age, albeit to a lesser extent in 1990 than in 1980. To a large extent, however, this occurs because each new cohort of adult women participates in the paid labor force at a higher rate. Although it appears that women work less as they grow older, in fact they work at approximately the same rate throughout their early adult years. The 30-35 year women in Figure 11 are working at about the same rate as they did when they were in their twenties. The women in their twenties in Figure 11 will continue to work at their current rate when they are

in their thirties, and thus at a higher rate than women who are currently in their thirties. Younger women have higher employment rates than older women not because employment declines with age, but because successive cohorts of women experience secular increases in labor force participation. Within each census, women in their thirties entered the paid labor force at a time when employment opportunities for women were fewer than those faced by their younger counterparts. This cohort difference in employment opportunities at the start of women's careers may have persisted over time.<sup>41</sup>

Both the level and the timing of employment vary across educational attainment groups. Out-of-school persons with more schooling are more likely to be employed than their more poorly educated counterparts. Among men aged 30, for example, about 70 percent of high school dropouts, 80 percent of high school graduates, 90 percent of persons with some college, and over 90 percent of college graduates are employed. In addition, the transition into employment appears to be much smoother for college-educated persons than for persons with less schooling. For college-educated men, the percentage employed is almost constant across ages, suggesting that the transition to employment is smooth and direct. Among men who are high school dropouts and, to a lesser extent, high school graduates, employment varies directly with age during the teens and early twenties. More poorly educated workers have a harder time and take longer to find stable employment than their better educated counterparts. With the exception of high school dropouts, the level and age pattern of employment for young men is essentially stable between 1980 and 1990. Among dropouts, the percentage employed at most ages declined between one and five percentage points. Men without high school degrees, who have become a smaller proportion of successive birth cohorts, fared worse in 1990 than in 1980. Educational attainment at all levels of schooling continues to be a pathway to improved employment

prospects for men and women. For men, a high school diploma or better was required to avoid an increasing chance of joblessness during the 1980s.

### **Racial and Ethnic Differences in Employment**

The patterns shown thus far suggest that persons with a high school degree are disadvantaged in employment relative to college educated persons, but this disadvantage has not worsened over time. It nonetheless remains possible that there is additional variation (beyond sex and educational attainment) in the population in the success with which young persons make the transition from school to work, and that the transition from school to work has not been stable for all groups. In particular, there has been considerable concern during the 1970s and 1980s about the economic prospects for young blacks. Although high school graduation rates have risen for blacks during the past two decades, during this period young blacks have experienced unprecedentedly high rates of unemployment, suggesting that for at least some African Americans the transition from school to work may have become more difficult during the 1980s.<sup>42</sup>

Figures 12a and 12b show percentages employed by educational attainment, race-ethnicity and census year for 16-35 year old men and women respectively. Blacks and Indians had the lowest percentages employed in 1980 and experienced unfavorable changes during the 1980s compared to the other three groups. The percentage employed among young black men who were high school dropouts fell by 10 percentage points during the decade. Data not shown here indicate that the large drop in the percentage employed among black high school dropouts is not restricted to the teenage years. Rather, it occurs at virtually every age between 16 and 34. Whereas white, Asian, and Hispanic employment rates for male high school graduates were stable over the decade, they fell for blacks and Native Americans. Among women, black college

graduates are more likely to be employed than any other group, including white women, but employment rates for black women with less education grew at a much slower rate than for the white majority. Percentages employed were stable for black women who are high school graduates over this period, in contrast to the female high school graduate population as a whole, which experienced markedly increased employment rates over the decade. Among blacks with a college degree employment rates were stable during the 1980s. This stability preserved the employment gap between black men and the rest of the population. For women, however, the employment gap widened as a result of the large increase in employment for college educated women as a whole. Percentages employed for Native American women fell sharply over the decade, in contrast to the gains experienced by all other groups.

[Figure 12 here]

Using employment as a criterion, the patterns for the total population of persons who have recently left school and for blacks in this group indicate a stable transition from school to work for better educated persons and for the majority of the population, as well as a continuation of the trend toward increased employment of women. For persons with low levels of schooling and for the traditionally disadvantaged black and Native American minorities, however, this transition is becoming increasingly difficult. For these persons, the proportion holding jobs shortly after leaving school was lower in 1990 than 1980.

## VII. EDUCATION AND THE OCCUPATIONS OF YOUNG WORKERS

In addition to the employment status of young persons who have recently left school, an important indication of their economic well-being is the *kind* of job held by employed persons. Persons who are still in school are often aware of the occupational opportunities experienced by

those who were just a few years ahead of them in school. These perceptions may affect their decisions about how far to go in school, what fields to major in, and what skills and training to seek. During the 1980s, the occupational structure of the American economy underwent a variety of shifts that resulted from changes in the international economy, technological change, and continued pressures for equal access to economic opportunity for persons traditionally excluded from high paying employment. First, during this period the United States domestic economy increasingly emphasized the provision of services at the expense of manufacturing industries. Global economic competition, combined with the actions of American corporations to move production to other nations with lower-priced labor led to the decline in manufacturing employment. This trend hurt many American workers who had only a high school education and who for a generation had enjoyed relatively well paying skilled and semi-skilled positions in manufacturing. This change also meant that new cohorts of high school graduates who did not continue to college often had to settle for jobs in the service sector, jobs with poorer pay and less job security than the blue collar industrial jobs that employed their counterparts in the previous generation.<sup>43</sup>

A second transformation of employment opportunities, which became important in the 1970s and accelerated in the 1980s, was the increasing importance of computers in the organization of work. Throughout all sectors of the economy computer technology altered the way that goods were manufactured and sold and that services were delivered. This changed the content of many jobs--typically requiring the adoption of new skills by workers--created new jobs, and eliminated others. It also fueled the computer industry itself, creating new employment for those who design, manufacture, sell, and maintain electronic equipment and the requisite software. These changes created new fields of employment, typically available only to persons

with some form of post-secondary education.

A third important change in the pattern of occupational opportunities in the U.S. workforce is the gradual breakdown of barriers to lucrative employment for women. During the 1970s and 1980s women received advanced degrees in unprecedented numbers in fields traditionally dominated by men, such as business, law, and medicine. These changes have been both the cause and the consequence of more women achieving employment in these fields. Conversely, proportionately fewer women are working in more poorly paying and traditionally "female" positions. Although the segregation of occupations by sex in the U.S. workforce remained in 1990, the 1980s was a decade of substantial change.<sup>44</sup>

Table 4 illustrates these patterns by showing the top ten detailed civilian occupations for out-of-school persons aged 16-34 in 1990 as well as the ranks of these positions in 1980. The upper panel presents the top occupations for men and women who received a high school degree but no post-secondary education, and for those who received at least a college degree. It also shows those occupations that fell out of the top ten between 1980 and 1990. Although the top occupations did not change greatly between 1980 and 1990 for male high school graduates, some of the larger changes in the economy are nonetheless discernable. The disappearance from the top ten of machine operators and welders and cutters illustrates the decline in skilled and semi-skilled blue collar manufacturing employment. Taking the places of these two occupations are construction laborers, who are typically unskilled workers, and sales supervisors and proprietors. Although sales supervisors are heterogeneous, encompassing positions in both large and small establishments, their growth among high school educated workers reflects the substantial growth of service industries such as retail trade.

[Table 4]

The leading occupations for male college graduates reveal the dramatic growth of jobs relating to the provision of computers and computer services. The three new entrants to the top ten -- programmers, computer scientists, and electrical engineers -- illustrate this trend. The rising importance of supervisory positions in sales and the decline of production supervisors also reflects the growth of the service sector and the decline of manufacturing.

Trends in the occupations of women show that the benefits of reduced barriers to women's employment are largely confined to highly educated women. Among high school educated women, changes in the top ten are attributable to the same broad forces that affect men; that is, the rise of service employment (rise of sales supervisors), the decline of manufacturing (decline of assemblers), and the computerization of office work (decline of typists). The occupations of college-educated women, in contrast, show increasing representation of women in well-paying jobs traditionally dominated by men. Although many women continue to be employed in traditional occupations -- elementary teaching, nursing, and secretarial -- others are now lawyers and computer programmers, titles that make up a significant share of employment for male college graduates. Conversely, highly educated women are significantly less likely to become laboratory technicians and office clerks than they used to be, changes which signify that better opportunities are available elsewhere.

## **VIII. EDUCATION AND THE WAGES OF YOUNG WORKERS**

### **The Age-Wage Profile for Young Workers**

As illustrated in the discussion of occupational trends, schools sort and rank individuals for positions in the labor market. From the standpoint of the individual, the anticipated economic rewards are incentives for persistence in school. Employment signifies attachment to the labor force and, in principle, access to a predictable and independent means of economic support. It



does not, however, indicate the level of support that it can provide. To examine the role that schooling plays in determining economic well-being and whether this relationship has shifted over time it is valuable to examine the wages of young persons with varying amounts of schooling.

Figures 13a through 13d show the hourly wage rates of employed out-of-school young men and women in 1979 and 1989, adjusted to constant 1989 dollars.<sup>45</sup> Unlike the trend for employment which was stable or improving for all persons except male high school dropouts, the wage data indicate a substantially worsening economic condition for most young persons. Among young men who have not completed any college, the median wage dropped by one to two dollars at virtually every age between 18 and 34. The deteriorating wage prospects for young workers, moreover, were not confined to the first few years after leaving school. The real drop in wages was approximately constant from the teenage years into the thirties. The wages of young women who have not completed any college also fell between 1979 and 1989, albeit not as much as for men. Young women's wages fell between approximately 50 cents and one dollar at most ages. Taken together, these trends imply that for high school educated persons, the gap in wages between men and women shrank somewhat during the 1980s, but only because men's wages fell more than women's. Men who were high school dropouts fared even worse. They suffered the twofold hardships of a significant drop in their chances of employment combined with a large drop in the wages they earned if they became employed.

[Figure 13 here]

For out-of-school employed persons with some college, wages also fell between 1979 and 1989, albeit to a lesser extent than for high school dropouts or persons with only a high school diploma. For both men and women, the data suggest that the erosion of real wages was greater

for new entrants into the labor market than for somewhat older workers. It is not possible to tell from these data, however, whether the wages of persons in their early twenties in 1989 will grow as rapidly as the pattern shown in Figure 13c implies. The considerably depressed wages of new labor force entrants in 1989 may portend lower real wages than those earned in 1989 by persons ten years older. It is only persons who have completed at least a college degree who have been immune to the declines in real wages during the 1980s. For men who have earned a college degree, the age profile of wages is almost identical in 1979 and 1989, and for women there is evidence of a slight increase in wage rates. It is for these workers that the gap in wage rates between men and women is smallest in proportionate terms and it is only for them that whatever reduction in gender inequality in wages has occurred is the result of women's gains rather than greater losses for men.<sup>46</sup>

Taken together, the trends in wages show that the relative economic values of various levels of education have changed during the 1980s. Simple estimates of the way that the economic return to schooling has changed can be obtained by taking the ratios of median wages of persons with varying amounts of schooling in the two censuses. For the medians plotted in Figures 13a through 13d, averaged over all ages, these ratios are as follows:

	Men	Men	Women	Women		
		1979	1989	1979	1989	
High School Graduate vs. Dropout		1.27	1.28	1.24	1.26	
Some College vs. High School Graduate		1.13	1.19	1.17	1.25	
College Graduate vs. Some College		1.23	1.40	1.33	1.52	
College Graduate vs. High School Graduate		1.09	1.18	1.14	1.22	

The payoff of additional schooling to young workers increased slightly at lower levels of schooling, but sharply for college graduates during the 1980s. The value of obtaining a college degree over just some college with no degree increased from 23 to 40 percent for men and from 33 to 52 percent for women. Yet the increasing "return" to higher education over this period occurs only because higher education has protected some workers against the decline in real wages experienced by the labor force as a whole. The increased return to college results from the declining economic opportunities of those with less schooling.

### **Racial and Ethnic Differences in Wage Rates**

The trends in age-earnings profiles for the population as a whole mask differences among race and ethnic groups in both the levels of and trends in wage rates during the 1980s. Not only are traditionally disadvantaged minority groups less likely to be employed than the population as a whole, they typically earn less when they do work. These patterns, moreover, were reinforced during the 1980s, particularly among persons who did not go beyond high school. Table 5 shows the ratios of wage rates for each race-ethnic group relative to those of whites by educational attainment groups among employed out-of-school 16-34 year old men and women. Although some of the wage differences among race-ethnic groups is attributable to their varying average levels of educational attainment, substantial differences in earnings are observable within educationally homogenous groups. For black and Indian men at every level of educational attainment, wages were lower than for white and Asian workers in 1980 and declined further over the decade at every level of schooling. For blacks, Indians, and Hispanics, the wage rates of even college graduates declined in real terms during the 1980s. Black and Indian women's wages either grew less or fell more than those of whites and Asians. White, Asian, and Hispanic

women who are college graduates enjoyed substantial increases in their real wage rates over the decade of the 1980s. Unfortunately, similar gains were not enjoyed by blacks and Hispanics.

[Table 5 here]

Census data from 1980 and 1990 paint a bleak picture of the employment and earnings prospects for persons who have recently left school, with the exception of those who have college degrees. Although employment levels of recent school-leavers remained stable for the population as a whole, high school dropouts and traditionally disadvantaged minorities experienced erosion of their employment position in the 1980s. The *quality* of employment available to young American workers, however, eroded dramatically during this period, as indicated by the drop in real wages suffered by workers at all educational levels except college graduates. For wages as well as employment, moreover, the declines were greatest for persons with no college education and for blacks and Indians at every educational level. Thus traditionally disadvantaged minorities suffered the twin effects of poorer prospects for employment and poorer wages when they were employed.

## IX. CONCLUSION

During the 1980s the growth and distribution of educational attainment followed trends that have characterized the United States population throughout the 20th century. Successive cohorts of young persons received on average more schooling than their counterparts in previous generations. Access to formal schooling became more widespread at each level of schooling -- reducing traditional educational inequalities between men and women, among members of race and ethnic groups, and among persons from varying socioeconomic backgrounds. Nonetheless, educational opportunities and credentials remained scarce at the highest levels of the educational system. During the 1980s women finally surpassed men in the rates at which they complete

college, the culmination of a long-run trend toward the elimination of men's advantage. At the graduate level, women continued to make rapid advances in their completion of advanced and potentially highly rewarding degrees in business, law, and medicine, but each year men still receive considerably more degrees in these fields than women. During the 1970s and 1980s, however, women's progress in attaining professional credentials has been revolutionary and it appears certain that remaining disparities will all but vanish within the next decade or two.

Racial and ethnic differences in educational opportunities and attainments are a persistent feature of the American social landscape. Whereas high school graduation rates exceed 90 percent for whites and Asian Americans, only about 80 percent of blacks, Hispanics, and Native Americans complete high school. Dropout rates continued to decline in the 1980s, but racial and ethnic parity in high school completion remains a goal for the future. An important source of further educational growth for ethnic and racial minorities is the intergenerational transmission of educational status. Secular improvements in minority educational status imply that each successive generation of minority parents improves its average level of educational attainment. Inasmuch as parents typically try to ensure that their children attain at least their own educational level, this augurs well for successive generations of minority offspring. The beneficial effects of intergenerational improvement can only be offset when immigration introduces parents with lower educational attainment than those who are native-born. Immigrant Hispanics have far lower educational attainment than any major native-born race-ethnic group. Undoubtedly, the children of recent Hispanic immigrants will have higher educational attainment than their parents, but it will take several generations before their progeny will have attainments rivaling those of native groups.

During the 1980s persons acquired more education not only at the college and graduate

levels, but also in nursery school and kindergarten. This trend has been driven by secular increases in numbers of mothers of young children who work full time, by the spread of Head Start programs, and by a growing belief in the benefits of early childhood education. Although evidence for the effectiveness of Head Start programs is mixed,<sup>47</sup> the importance of early childhood programs for improving the educational prospects of disadvantaged children is part of a national consensus. At the same time, however, the children of highly educated and upper income families are also receiving early childhood schooling in increasing numbers. It remains to be seen whether pre-elementary education will reduce or widen educational inequalities over the long run.

A review of trends in students' performances on standardized tests of academic achievement during the 1980s brings some hope to those concerned about the capacity of America's schools to prepare students for higher education and an increasingly demanding world of work. Although average test scores for the nation as a whole increased modestly in the 1980s, the scores of black and Hispanic high school students increased sharply. This trend reduced, but far from eliminated traditional disparities in measured academic performance between major race-ethnic groups. It is to be hoped that these trends for blacks and Hispanics will reinforce the beneficial effects of secular improvements in parents' educational attainment on their offspring's ability to pursue higher education.

Labor market trends in the 1980s accentuated the importance of educational credentials for young workers. Average wage rates for young persons fell, but this trend differed dramatically for men with varying amounts of schooling. High school dropouts experienced the greatest drop in wages between 1980 and 1990; college educated workers experienced the least. Only those who had completed a college degree experienced a stable wage rate over the decade.

Although a college education provides no guarantee of economic security, its value increased during the 1980s, if only as buffer against downward mobility.

## FOOTNOTES

1. For example, Reynolds Farley, *Blacks and Whites: Narrowing the Gap?* (Cambridge, MA: Harvard University Press, 1984); Stanley Lieberson, *A Piece of the Pie: Blacks and White Immigrants Since 1980* (Berkeley, CA: University of California Press, 1980); Gerald David Jaynes and Robin M. Williams, Jr. (eds.), *A Common Destiny: Blacks and American Society* (Washington, D.C.: National Academy Press 1989); Robert A. Margo, *Race and Schooling in the South, 1880-1950: An Economic History* (Chicago: University of Chicago Press, 1990).

2. For example, George Borjas and Marta Tienda, *Hispanics in the U.S. Economy* (Orlando FL: Academic Press, 1985); Gary D. Sandefur and M. Tienda, *Divided Opportunities: Minorities, Poverty and Social Policy*, (New York: Plenum Press, 1988).

3. For example, Charles Hirschman and Morrison G. Wong, "The Extraordinary Educational Attainment of Asian-Americans," *Social Forces* 65(1986):1-27; Robert D. Mare and Christopher Winship, "Ethnic and Racial Patterns of Educational Attainment and School Enrollment." Pp. 173-195 in Sandefur and Tienda (1988); Yu Xie, "Social Mobility of Asian American Youth," unpublished manuscript (Ann Arbor: University of Michigan, Department of Sociology 1993).

4. This classification is mutually exclusive and covers more than 99 percent of the population. Asian and Pacific Islanders and Indians, Eskimos, and Aleuts who also identify themselves as Hispanics are classified as Asians and as Indians respectively. The terms foreign-born and immigrant are used interchangeably.

5. Studies conducted at the Census Bureau show that measures of educational attainment in the 1980 and 1990 Census are not strictly comparable. For example, a much smaller percentage of persons identify themselves as "High School Graduates" in the 1990 Census than claim to have completed exactly 12 years of schooling in the March 1990 CPS. This discrepancy appears to



result partly because the 1990 Census schedule distinguishes persons who have completed 12 grades without a diploma from those who graduated, and partly because a greater proportion of 1990 Census respondents claim that they have completed "some college but no degree" or "associate degree in college" than March 1990 CPS respondents claim that they have completed 13-15 years of schooling. Because of the broad grouping of attainment categories in the elementary and secondary years in the 1990 Census, one can no longer make these inferences about the grade in which a student is currently enrolled from questions on school enrollment status and educational attainment. Estimated school enrollment rates from the 1990 Census differ considerably from what one would expect from the 1980 Census or recent CPS data. See Robert Kominski, "Evaluation of 1980 Decennial Census Education Questions," *1980 Census Preliminary Evaluation Results Memorandum No. 104* (Washington, D.C.: U.S. Bureau of the Census, 1985); R. Kominski, "Education and Earnings: Empirical Findings from Alternative Operationalizations," *Proceedings of the Social Statistics Section, American Statistical Association* (1988):82-87; R. Kominski, "Estimating the National High School Dropout Rate," *Demography* 27(1990):303-311; R. Kominski and Paul M. Siegel, "Measuring Educational Attainment in the 1990 Census." Paper presented to the Meetings of the American Sociological Association (1987); R. Kominski and P.M. Siegel, "Measuring Educational Attainment in the Current Population Survey," unpublished manuscript (Washington, D.C.: U.S. Bureau of the Census, 1992); P.M. Siegel, "Note on the Proposed Change in the Measurement of Educational Attainment in the Current Population Survey," unpublished manuscript (Washington, D.C.: U.S. Bureau of the Census, 1991); P.M. Siegel and R. Kominski, "The Quality of Census Data on Educational Attainment." Paper presented to the Census Advisory Committee on Population Statistics, Arlington, VA (1986).

6. This is the percentage of persons who report that they have received a high school diploma.

7. The estimates are the percentages of persons completing "some college but no degree" or any post-secondary degree.

8. The estimates of the percentages of persons completing at least four years of college are based on percentages of persons completing a bachelor's or higher degree.

9. R.D. Mare, "Trends in Schooling: Demography, Performance, and Organization," *Annals of the American Academy of Political and Social Science* 453(1981a):96-122.

10. John K. Folger and Charles B. Nam, *Education of the American Population*. (A 1960 Census Monograph) (Washington, D.C.: U. S. Government Printing Office); Beverly Duncan, *Family Factors and School Dropout: 1920-1960*, Cooperative Research Project No. 2258, Office of Education (Ann Arbor: University of Michigan, 1965); B. Duncan, "Trends in Output and Distribution of Schooling," pp. 601-674 in E.B. Sheldon and W.E. Moore (eds.), *Indicators of Social Change* (New York: Russell Sage Foundation, 1968); Robert M. Hauser and David L. Featherman, "Equality of Schooling: Trends and Prospects," *Sociology of Education* 49(1976):99-120; R.D. Mare, "Social Background Composition and Educational Growth," *Demography* 16(1979):55-71.

11. Claudia Goldin, *Understanding the Gender Gap: An Economic History of American Women* (New York: Oxford University Press, 1990).

12. R.D. Mare, "Five Decades of Educational Assortative Mating," *American Sociological Review* 56(1991):15-32; C. Goldin, "The Meaning of College in the Lives of American Women: The Past One-Hundred Years," Working Paper No. 4099 (Cambridge, MA: National Bureau of Economic Research, Inc. 1992)

13. For further evidence of the dramatic increase in the number of women entering the professions, see Suzanne M. Bianchi, "The Changing Economic Roles of Men and Women," in R. Farley (ed.), *Social Diversity in the 1980s* (New York: Russell Sage Foundation, forthcoming).

14. These surveys include the 1980 Census-Content Reinterview Survey Matched file, the third wave of the 1984 panel of the Survey of Income and Program Participation, the 1986 National Content Test, and the February 1990 Current Population Survey. These surveys show that the educational attainment measures used in the Censuses of 1940 through 1980 are a poor basis for inferring whether a person achieved a high school diploma, a college degree, or a master's degree. Conversely, the 1990 measures are of limited use in determining the amount of time that a person has spent in school. See Kominski (1985); Kominski (1988); Kominski and Siegel (1987); Kominski and Siegel (1992); Siegel (1991); Siegel and Kominski (1986).

The studies with two measures of schooling provide a way of estimating the 1990 schooling code that 1980 Census respondents would have supplied had they been asked the 1990 question, and vice versa. The procedure is to (1) use one of the surveys that obtained both items to cross-classify 1980-basis highest grade of school completed by 1990-basis highest grade or degree completed; (2) from this table, estimate the conditional probabilities of each 1990-basis response given each 1980-basis response; (3) assign 1990-basis codes to 1980 Census respondents with probabilities estimated in step (2); and (4) perform the converse of steps (2) and (3) to assign 1980-basis codes to 1990 Census respondents. For example, if 73 percent of respondents who report having completed 16 years of school on the 1980-basis measures also report that their highest degree is a bachelor's, (a randomly selected) 73 percent of 1980 Census respondents who report having completed 16 years of school are assigned a bachelor's degree and the remaining 27 percent are assigned a different 1990-basis code. Most of the imputation is based on a table

reported from the February 1990 Current Population Survey, which has the largest sample size of the several Bureau studies (190,730) (see Siegel (1991):Table A). The February 1990 CPS included the 1990 Census educational attainment question and the CPS schooling item which is similar but not identical to the 1980 Census item. In particular, (1) the CPS top codes educational attainment at six or more years of post-secondary school, whereas the 1980 Census top codes attainment at eight or more years of post-secondary school; and (2) whereas the 1980 Census distinguishes among persons with no school completed, with nursery school, and with kindergarten, the CPS combines these three groups. To impute the 1990-basis education codes for 1980 respondents who had six, seven, or eight or more years of post-secondary schooling, a cross classification of the 1990 and 1980 items from the 1986 National Content Test was used (Kominski and Siegel (1987):Tables 4 and 5). Here again the conditional probabilities of attaining each 1990-basis schooling level given a 1980-basis response were estimated and used to impute probabilistically a 1990 code to 1980 Census respondents. The converse procedure was used to impute 1980 codes to 1990 respondents. This method assumes a homogeneous relationship between 1980 and 1990 measures across socio-demographic groups. Group differences in attainment patterns may result in heterogeneity in this relationship. For example, trends in attainment may cause age groups to vary in the extent to which they are at risk to various types of mismatch between 1980 and 1990 concepts (see Siegel and Kominski (1986)). Unfortunately, none of the microdata from census studies with dual coding of educational attainment are in the public domain and thus one must rely on tabulations that appear in Census Bureau working papers.

15. Important factors affecting the educational attainments of foreign-born persons are their age of immigration and whether they enter the United States before or after completing their

schooling.

16. See, for example, Borjas and Tienda (1985); Sandefur and Tienda (1988).

17. Survival probabilities for transitions before high school are not reported because there are only trivial differences among race-ethnic groups at this level. Survival probabilities for transitions beyond the Bachelor's degree are not reported because samples are too small to be reliable for some race-ethnic groups and it is difficult to construct comparable measures of school continuation from the 1980 and 1990 Censuses at this level of schooling.

18. Robert D. Mare, "Change and Stability in Educational Stratification," *American Sociological Review* 46(1981b):72-87; Michael Hout, Adrian Raftery, and Eleanor O. Bell, "Making the Grade: Educational Stratification in the United States, 1925-1989," in Y. Shavit and H.P. Blossfeld (eds.), *Persistent Inequality: Changing Educational Attainment in Thirteen Countries* (Boulder, CO: Westview Press, 1993).

19. See, for example, Hauser and Featherman (1976):99-120; Mare (1979).

20. Irwin Garfinkel and Sara McLanahan, *Single Mothers and Their Children: A New American Dilemma*, (Washington, D.C.: The Urban Institute, 1986); S. McLanahan, "Family Structure and the Reproduction of Poverty," *American Journal of Sociology* 90(1985):873-901.

21. See, for example, Hauser and Featherman (1976):99-120; Mare (1979).

22. Hauser and Featherman (1976):99-120; Mare (1991).

23. W.H. Sewell and R.M. Hauser, *Education, Occupation, and Earnings*, (New York: Academic Press, 1975).

24. Garfinkel and McLanahan (1986); McLanahan (1985).

25. Judith Blake, *Family Size and Achievement*, (Berkeley: University of California Press, 1989); R.M. Hauser and W.H. Sewell, "Birth Order and Educational Attainment in Full Sibships," *American Educational Research Journal* 22(1985):1-24; R.D. Mare and M.D. Chen, "Further

Evidence on Number of Siblings and Educational Stratification," *American Sociological Review* 51(1986):403-412.

26. In both 1980 and 1990 more than 95 percent of persons lived with at least one parent until age 18, at which point the percentage drops precipitously. By age 21, approximately 60 percent of persons left the home of their parents. From the middle teens onward, rates of school enrollment differ markedly between persons living with and away from their parents. Despite the large proportion of young persons who do not live with parents and the gap in enrollment rates between persons living with and away from their parents, the analysis of educational attainment for young persons who live with parents is informative about the attainments of all young persons. *Rates of school progression* estimated from persons living with parents at the census date are similar to those for persons living away from parents. This suggests that the *timing* of educational attainment differs between these two groups, but the level of attainment is similar. See R.D. Mare, "Family Effects on Educational Attainment among Race and Ethnic Groups in the United States, 1980-1990," paper presented to the Meetings of the Population Association of America, Cincinnati, OH (1993).

27. R.D. Mare, "Social Background and School Continuation Decisions," *Journal of the American Statistical Association* 75(1980):205-305.

28. The odds of making each school transition are predicted using logistic regression models. Preliminary analyses of the 1980 and 1990 PUMS data showed that there are no systematic changes in the effects of family characteristics on school continuation between 1980 and 1990, although for several race and ethnic groups and for one or two transitions there is some evidence of an increasing effect of family income between 1980 and 1990. Thus, the results reported in this section are based on additive models for the effects of family characteristics, race-ethnic

group membership, and time on school progression.

29. Figures 6a-6d are based on logistic regression models in which persons who were not living with their father were given a separate code for "father absent" in place of a code for their father's schooling. The "father absent" code, however, is equivalent to the code such persons receive for their family structure. Likewise, persons who were not living with their mother are coded as "mother absent," which is equivalent to their code on family structure.

30. The analyses reported in this section rely on a uniform series of reformatted microdata files for the October CPS prepared by Robert M. Hauser and his associates. See Robert M. Hauser, Linda Jordan, and James A. Dixon, *Current Population Survey, October Person-Household Files, 1968-90* [machine readable data files], (Center for Demography and Ecology, Department of Sociology, University of Wisconsin-Madison, 1993); and Robert M. Hauser and Taissa S. Hauser, *Current Population Survey, October Person-Household Files, 1968-1990: Cumulative Codebook*, (Center for Demography and Ecology, Department of Sociology, University of Wisconsin-Madison, 1993).

31. Duncan (1968).

32. United States General Accounting Office, Office of the Comptroller General, "Education Issues," Transition Series Report No. GAO/OCG-93-18TR (1992).

33. In October 1990 about 65 percent of nursery school students attended private schools. About 15 percent of kindergarten students attended private schools. See U.S. Bureau of the Census, Current Population Reports, Series P-20, No 460, *School Enrollment--Social and Economic Characteristics of Students: October 1990*, (Washington, D.C.: U.S. Government Printing Office, 1992:29).

34. The model is a logistic regression model for the log odds of enrollment in nursery school

or kindergarten. In addition to the factors shown in Figure 8, the model included a dummy variable for year (1979-80 vs. 1989-90), a four-category variable for race-ethnicity (white, black, Hispanic, other), and interactions between year and race-ethnicity. The small number of children in the 3-5 age group who were attending elementary school were excluded from the analysis.

35. Incomes are adjusted to constant 1989 dollars.

36. U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics 1993* (Washington, D.C.: U.S. Government Printing Office, p. 415, 1993).

37. Robert D. Mare, Christopher Winship, and Warren N. Kubitschek, "The Transition from Youth to Adult: Understanding the Age Pattern of Employment," *American Journal of Sociology* 89(1984):326-358.

38. United States General Accounting Office (1992).

39. Persons who serve in the armed forces are classified as employed in Figures 11 and 12.

40. For a detailed analysis of the transition from school to work using panel data, see Peter E. Tiemeyer, "Racial Differences in the Transition from School to Stable Employment Among Young Men," unpublished Ph.D. Dissertation (Madison, WI: University of Wisconsin, Department of Sociology, 1993).

41. See Bianchi (forthcoming) for further discussion of the distinction between cohort and age patterns of women's labor force participation.

42. Richard B. Freeman and Harry J. Holzer (eds.), *The Black Youth Employment Crisis*, (Chicago: University of Chicago Press, 1986); R.D. Mare and C. Winship, "The Paradox of Lessening Racial Inequality and Joblessness among Black Youth: Enrollment, Enlistment, and Employment, 1964-1981" *American Sociological Review* 49(1984):39-55.

43. For further discussion of these trends, see Frank Levy, "Incomes and Income Inequality Since 1970" in R. Farley (ed.), *Social and Economic Trends in the 1980s* (New York: Russell



Sage Foundation, forthcoming), and John Kasarda, "Industrial Restructuring and the Consequences of Changing Job Locations" in R. Farley (ed.), *Social and Economic Trends in the 1980s* (New York: Russell Sage Foundation, forthcoming).

44. For further discussion of trends in occupational sex segregation, see Bianchi (forthcoming) and James R. Wetzel, "Labor Force Participation, Unemployment, and Earnings," in R. Farley (ed.), *Social and Economic Trends in the 1980s* (New York: Russell Sage Foundation, forthcoming).

45. These data derive from the Public Use Microdata Samples of 1980 and 1990. The wage rate is estimated as the ratio of wage and salary income in 1989 to the product of weeks worked in 1989 and hours worked per week worked in 1989.

46. For further discussion and interpretation of these wage trends see Bianchi (forthcoming), Wetzel (forthcoming), and Levy (forthcoming).

47. For a recent review and analysis, see Janet Currie and Duncan Thomas, "Does Head Start Make a Difference?" NBER Working Paper No. 4406. (Cambridge, MA: National Bureau of Economic Research, 1993).

Table 1. School Enrollment and Educational Attainment Items in 1980 and 1990 Censuses

1980

8. Since February 1, 1980, has this person attended regular school or college at any time? Fill one circle. Count nursery school, kindergarten, elementary school, and schooling which leads to a high school diploma or college degree.

- No, has not attended since February 1
- Yes, public school, public college
- Yes, private, church-related
- Yes, private, not church-related

9. What is the highest grade (or year) of regular school this person has ever attended?

Fill one circle.

If now attending school, mark grade person is in. If high school was finished by equivalency test (GED), mark "12."

Highest grade attended:

Nursery School

Kindergarten

Elementary through High School (grade or year)

1	2	3	4	5	6	7	8	9	10	11	12
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

College (academic year)

1	2	3	4	5	6	7	8 or more
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Never attended school -- Skip question 10

10. Did this person finish the highest grade (or year) attended?

Fill one circle.

- Now attending this grade (or year)
- Finished this grade (or year)
- Did not finish this grade (or year)

1990

11. At any time since February 1, 1990, has this person attended regular school or college? Include only nursery school, kindergarten, elementary school, and schooling which leads to a high school diploma or a college degree.

- No, has not attended since February 1
- Yes, public school, public college
- Yes, private school, private college

12. How much school has this person COMPLETED? Fill ONE circle for the highest level COMPLETED or degree RECEIVED. If currently enrolled, mark the level of previous grade attended or highest degree received.

- No school completed
- Nursery school
- Kindergarten
- 1st, 2nd, 3rd, or 4th grade
- 5th, 6th, 7th or 8th grade
- 9th grade
- 10th grade
- 11th grade
- 12th grade, NO DIPLOMA
- HIGH SCHOOL GRADUATE - high school DIPLOMA or the equivalent (For example: GED)
- Some college but no degree
- Associate degree in college - Occupational program
- Associate degree in college - Academic program
- Bachelor's degree (For example: BA, AB, BS)
- Master's degree (For example: MA, MS, MEng, MEd, MSW, MBA)
- Professional school degree (For example: MD, DDS, DVM, LLB, JD)
- Doctorate degree  
(For example: PhD, EdD)

Table 2. Trends in Numbers of Courses Completed in High School by Race-Ethnic Group, Subject Matter, and Graduating Class

	All Courses			English		
	1982	1990	Change	1982	1990	Change
Total	21.2	23.6	2.4	3.8	4.1	0.3
White	21.4	23.6	2.2	3.8	4.0	0.2
Black	20.5	23.4	2.9	3.9	4.2	0.3
Hispanic	20.8	23.9	3.1	3.8	4.4	0.6

	Mathematics			Science & Computer Science		
	1982	1990	Change	1982	1990	Change
Total	2.5	3.1	0.6	2.3	3.3	1.0
White	2.6	3.1	0.5	2.4	3.3	0.9
Black	2.4	3.1	0.7	2.1	3.3	1.2
Hispanic	2.2	3.1	0.9	1.9	3.0	1.1

	History & Social Science			Vocational Education		
	1982	1990	Change	1982	1990	Change
Total	3.1	3.5	0.4	4.0	3.2	-0.8
White	3.2	3.6	0.4	3.9	3.3	-0.6
Black	3.0	3.4	0.4	4.2	3.5	-0.7
Hispanic	2.9	3.5	0.6	4.6	3.2	-1.4

Source: National Assessment of Educational Progress, Reported in National Center for Education Statistics, *Digest of Education Statistics 1993*.

Table 4. Most Common Occupations of High School and College Graduates Aged 16-34 by Sex, Year, and Rank.

	Men		Women	
	1980	1990	1980	1990
High School Graduates				
Truck Drivers	1	1	1	1
Carpenters	4	2	3	2
Auto Mechanics	5	3	5	3
Janitors and Cleaners	8	4	6	4
Supervisors & Proprietors, Sales	12	5	2	5
Laborers, exc. Construction	3	6	20	6
Construction Laborers	11	7	4	7
Managers & Administrators, NEC	2	8	10	8
Cooks	9	9	15	9
Assemblers	7	10	17	10
(Machine Operators, NEC)	6	13	7	17
(Welders & Cutters)	10	12	8	13
			9	12
College Graduates				
Managers & Administrators, NEC	1	1	1	1
Accountants & Auditors	2	2	2	2
Supervisors & Proprietors, Sales	9	3	7	3
Lawyers	5	4	4	4
Sales Reps., Mining, Mfg, & Wholesale	4	5	5	5
Computer Programmers	13	6	12	6
Electrical & Electronic Engineers	11	7	6	7
Physicians	7	8	16	8
Computer Systems Analysts & Scientists	23	9	20	9
Teachers, Elementary School	3	10	10	10
(Teachers, Secondary School)	6	18	3	11
(Managers, Marketing, Advertising & Public Relations)	8	12	8	23
(Supervisors, Production Occupations)	10	>25	9	>25

Table 3. Trends in Academic Proficiency Scores by Age, Race-Ethnic Group and Subject Matter

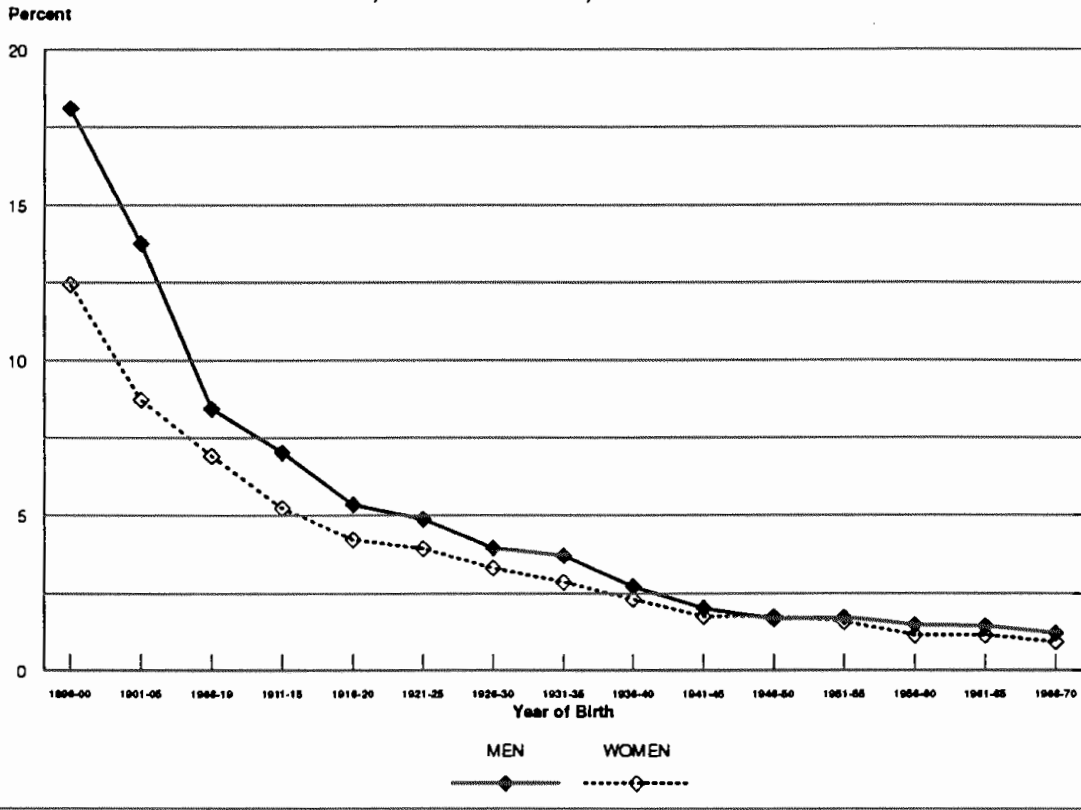
	Age 9			Age 17		
	Reading					
	1979-80	1989-90	Change	1979-80	1989-90	Change
Total	215	209	-6	285	290	5
White	221	217	-4	293	297	4
Black	189	182	-7	243	267	24
Hispanic	190	189	-1	261	275	14
	Mathematics					
	1981-82	1989-90	Change	1981-82	1989-90	Change
Total	219	230	11	299	305	6
White	224	235	11	304	310	6
Black	195	208	13	272	289	17
Hispanic	204	214	10	277	284	7
	Science					
	1981-82	1989-90	Change	1981-82	1989-90	Change
Total	221	229	8	283	290	7
White	229	238	9	293	301	8
Black	187	196	9	235	253	18
Hispanic	189	206	17	249	262	13

Source: National Assessment of Educational Progress, Reported in National Center for Education Statistics, *Digest of Education Statistics 1993*.

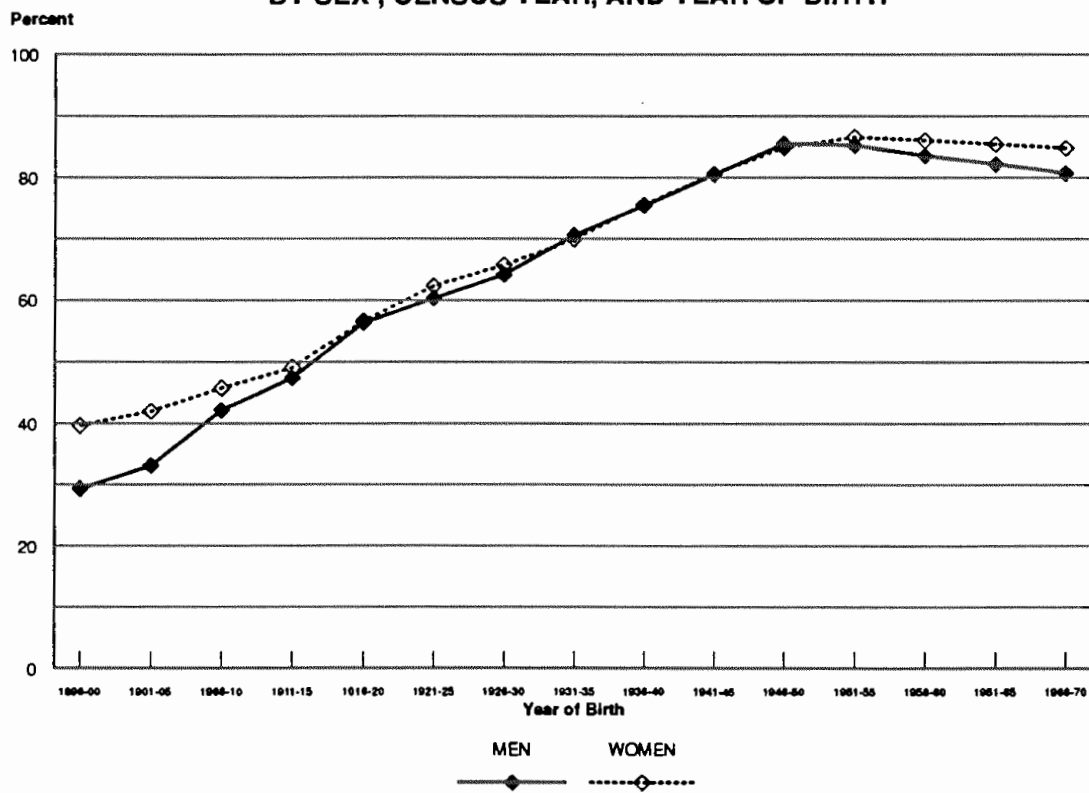
Table 5. Earnings of Race-Ethnic Groups Relative to Whites by Educational Attainment and Year

	H.S. Dropouts		H.S. Grads		Some College		College Grads	
	1980	1990	1980	1990	1980	1990	1980	1990
Men								
Black	.83	.82	.79	.76	.87	.90	.91	.83
Asian	.93	.97	.87	.93	.83	1.04	1.05	1.02
Indian	.84	.86	.82	.83	.88	.84	.97	.85
Hispanic	.92	.84	.91	.86	.95	.92	.94	.87
Women								
Black	1.01	.96	1.00	.88	.96	.94	1.04	.92
Asian	1.13	1.16	1.01	1.05	1.02	1.08	.95	1.05
Indian	.93	.95	.89	.86	.95	.82	.94	.86
Hispanic	1.04	.99	.96	.98	.96	1.02	.97	.99

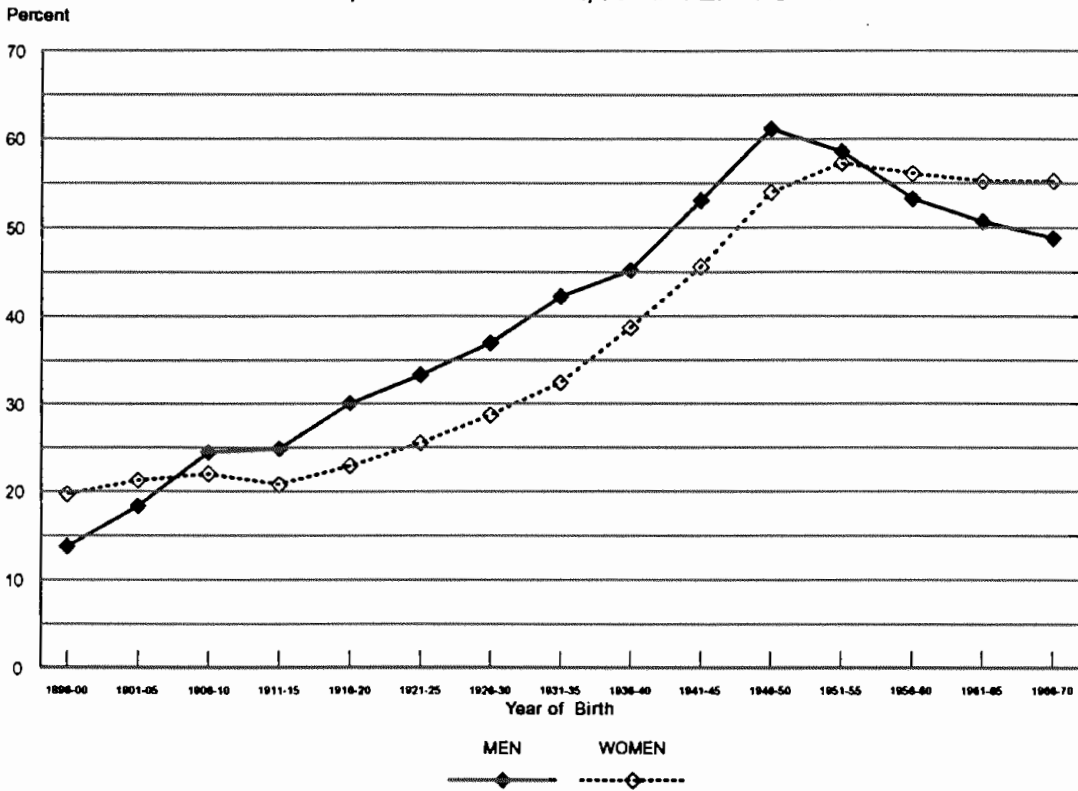
**FIGURE 1a. PERCENT OF PERSONS COMPLETING LESS THAN 5 YEARS OF SCHOOL BY SEX, CENSUS YEAR, AND YEAR OF BIRTH**



**FIGURE 1b. PERCENT OF PERSONS COMPLETING AT LEAST 12 YEARS OF SCHOOL BY SEX, CENSUS YEAR, AND YEAR OF BIRTH**



**FIGURE 1c. PERCENT OF PERSONS COMPLETING AT LEAST SOME COLLEGE BY SEX , CENSUS YEAR, AND YEAR OF BIRTH**



**FIGURE 1d. PERCENT OF PERSONS COMPLETING AT LEAST A BACHELOR'S DEGREE BY SEX , CENSUS YEAR, AND YEAR OF BIRTH**

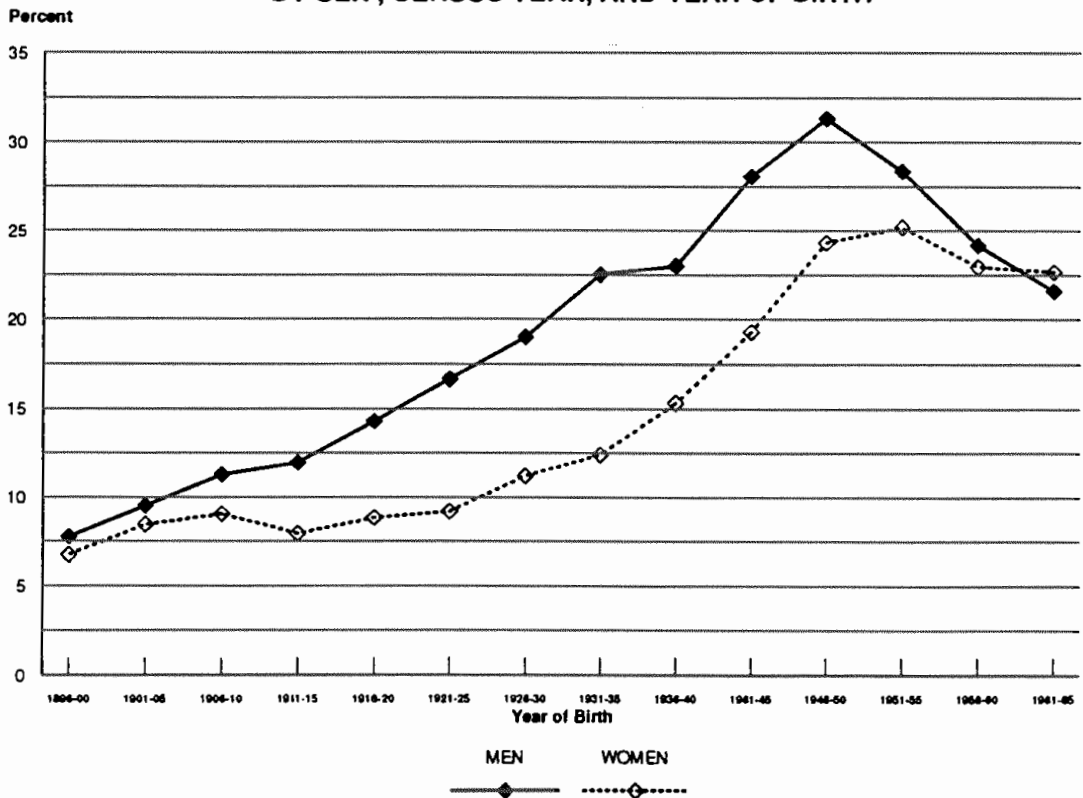
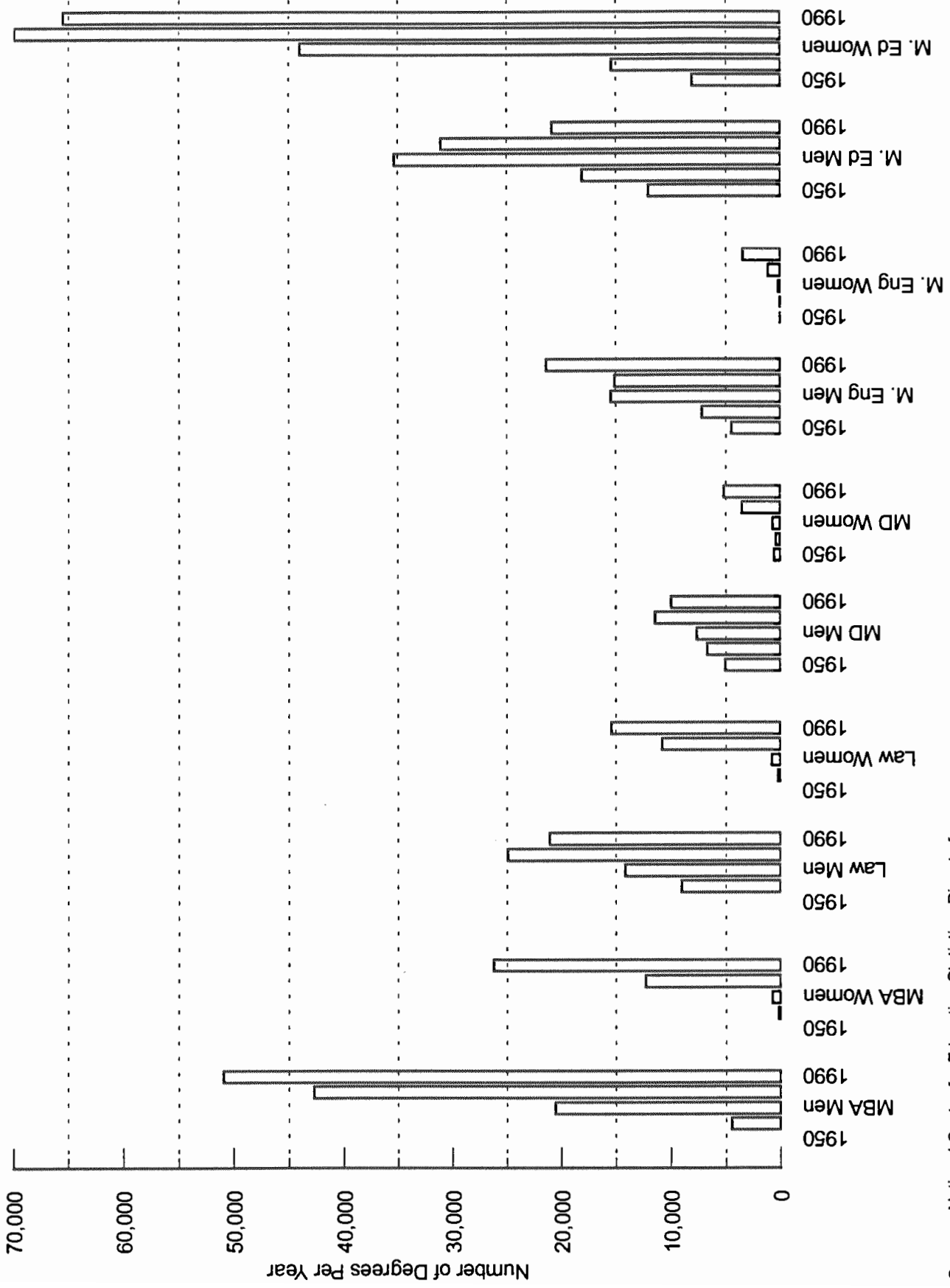


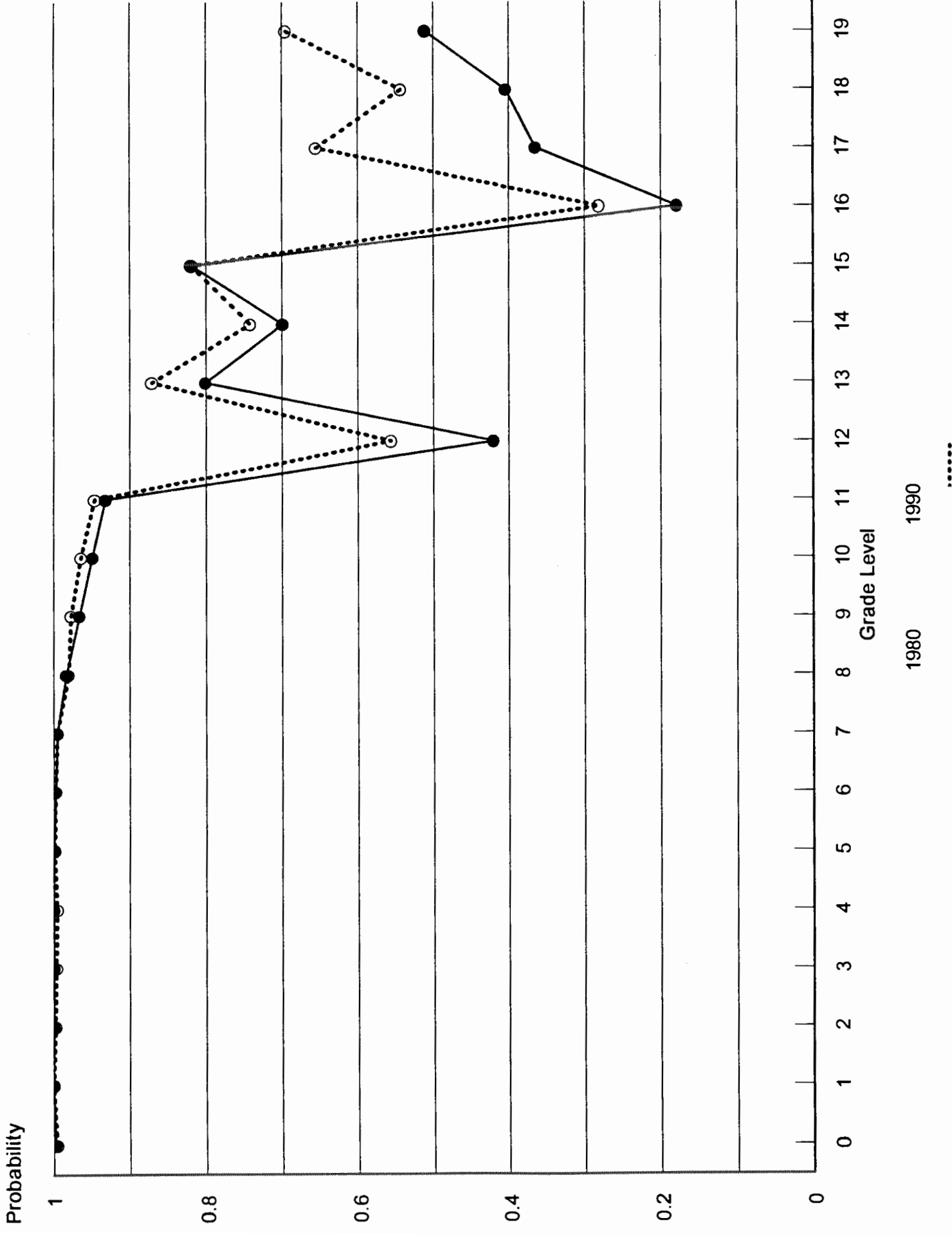


FIGURE 2. DEGREES RECEIVED BY SEX, YEAR, AND FIELD, 1950-1990

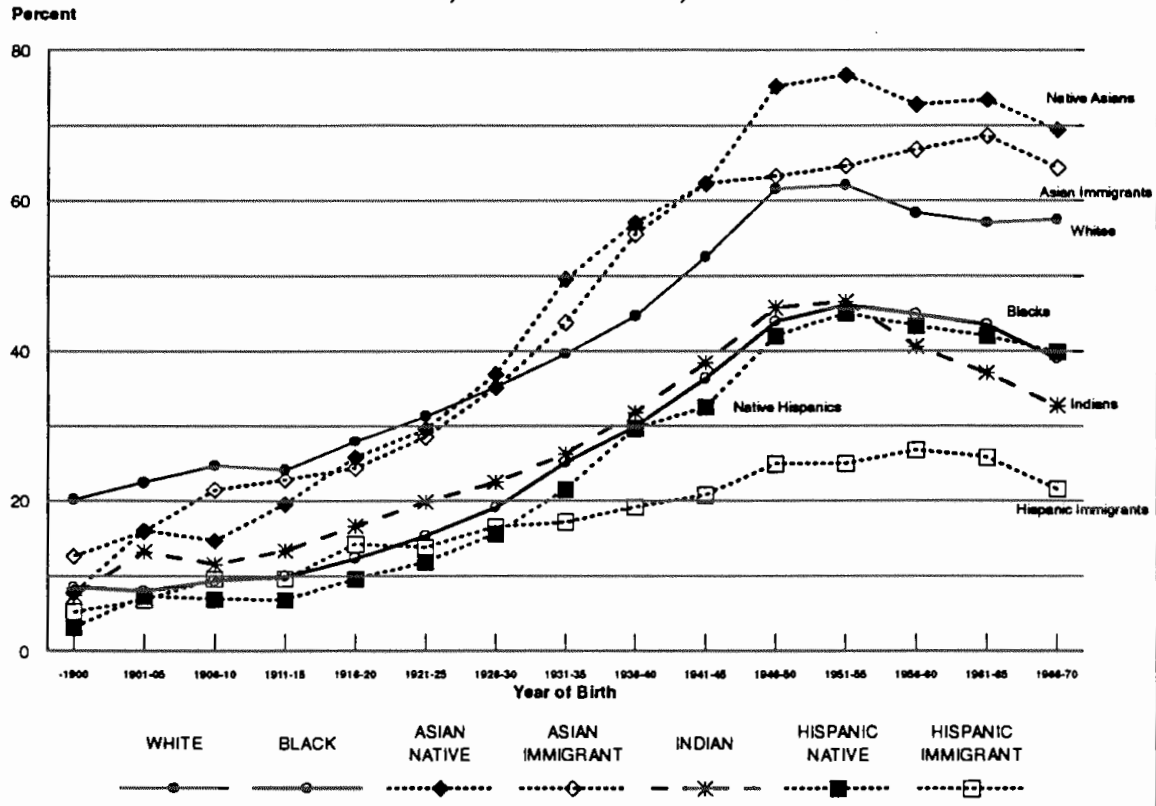


Source: National Center for Education Statistics, Digest of Education Statistics, Washington, D.C., U.S. Government Printing Office.

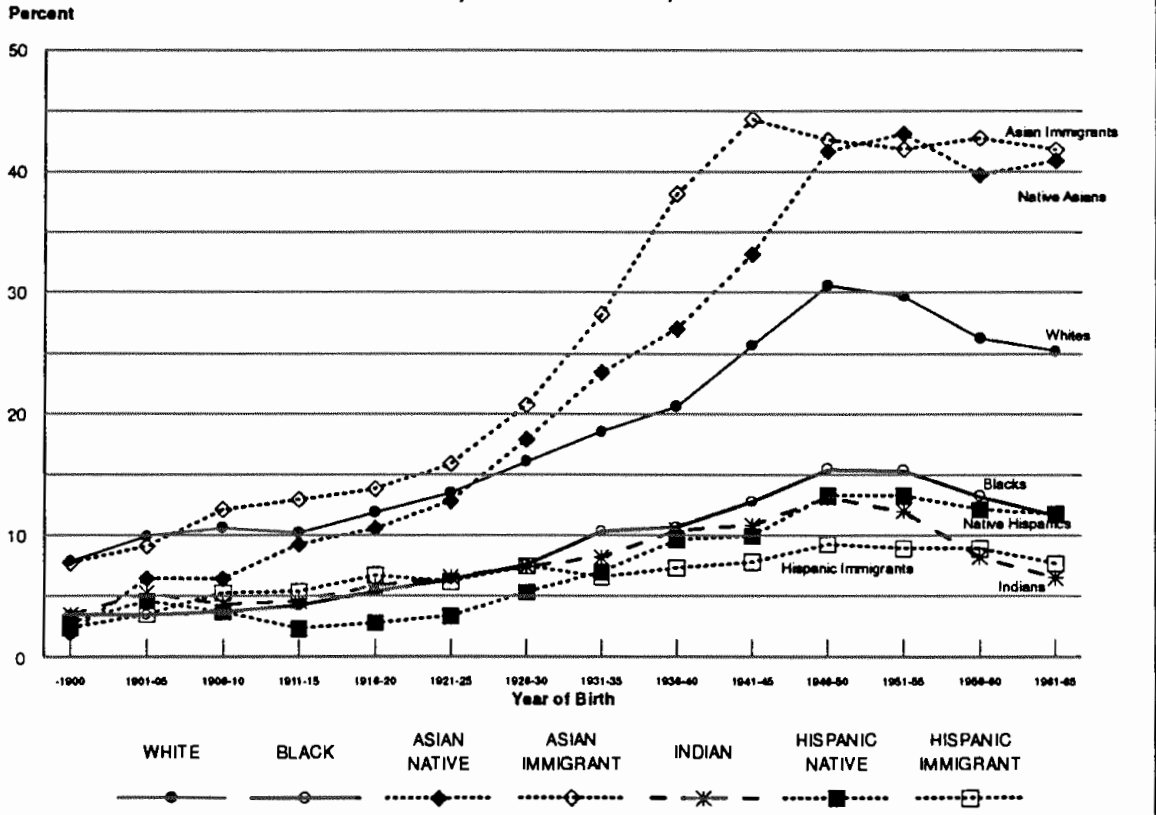
FIGURE 3. SCHOOL CONTINUATION PROBABILITIES, 1980 AND 1990



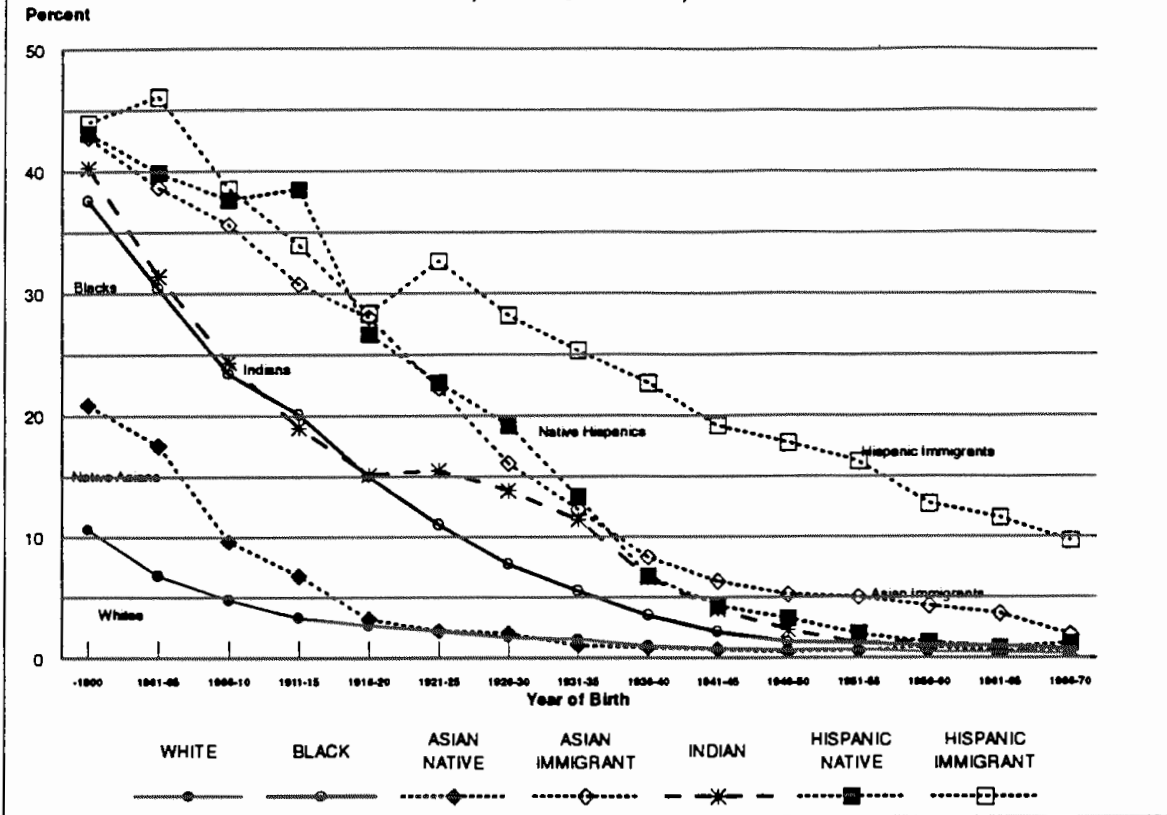
**FIGURE 4c. PERCENT OF PERSONS COMPLETING AT LEAST SOME COLLEGE BY RACE-ETHNICITY, CENSUS YEAR, AND YEAR OF BIRTH**



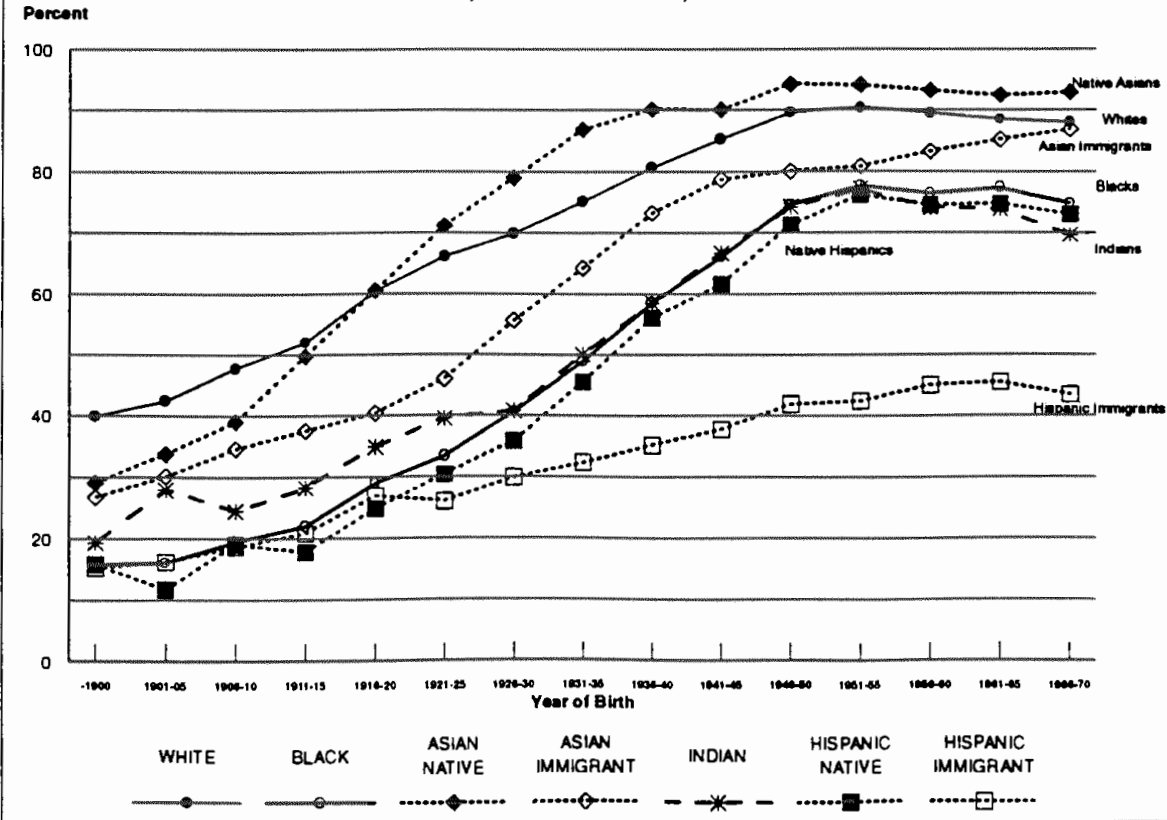
**FIGURE 4d . PERCENT OF PERSONS COMPLETING AT LEAST A BACHELOR'S DEGREE BY RACE-ETHNICITY, CENSUS YEAR, AND YEAR OF BIRTH**



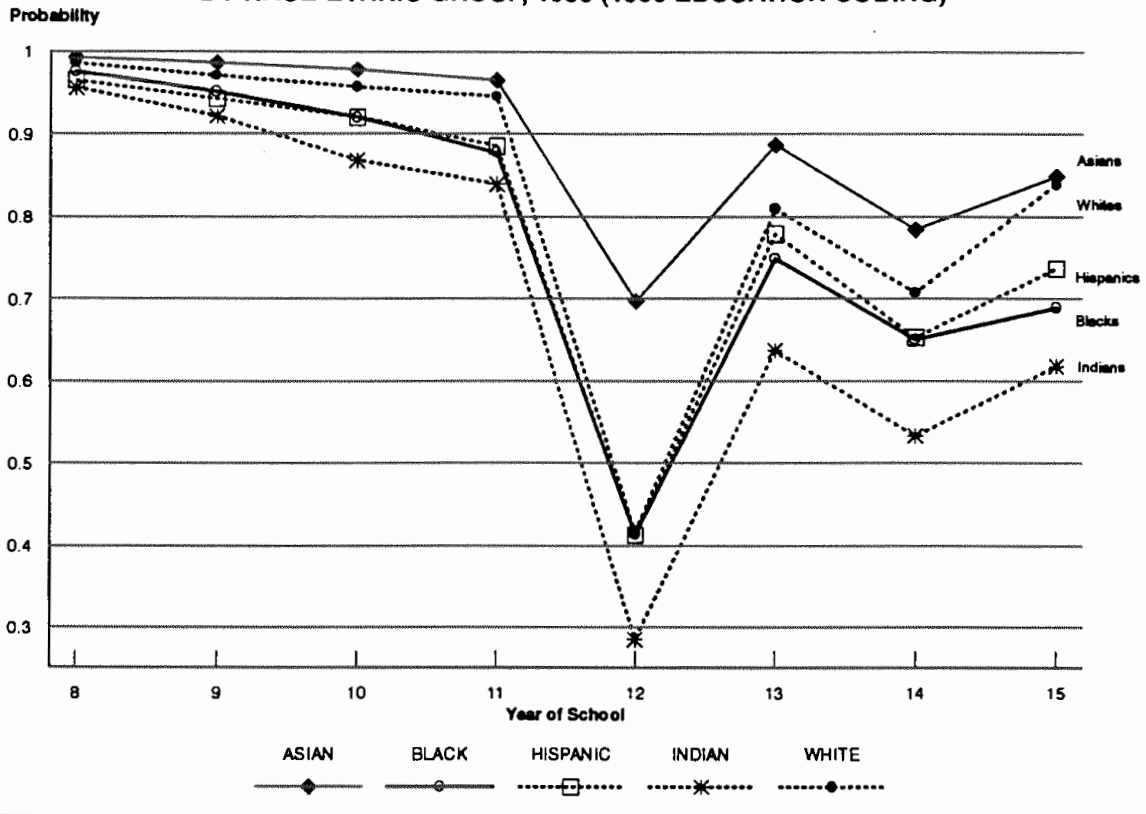
**FIGURE 4a. PERCENT OF PERSONS COMPLETING LESS THAN 5 YEARS OF SCHOOL BY RACE-ETHNICITY, CENSUS YEAR, AND YEAR OF BIRTH**



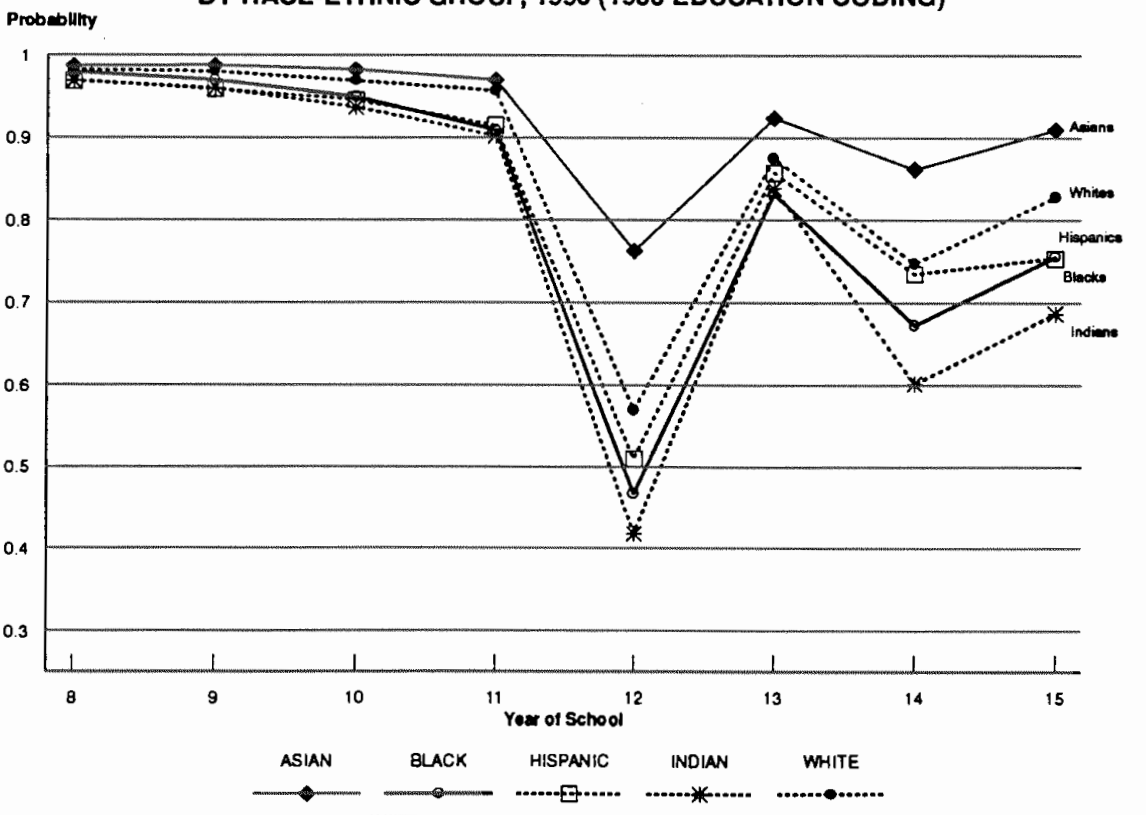
**FIGURE 4b. PERCENT OF PERSONS COMPLETING AT LEAST 12 YEARS OF SCHOOL BY RACE-ETHNICITY, CENSUS YEAR, AND YEAR OF BIRTH**



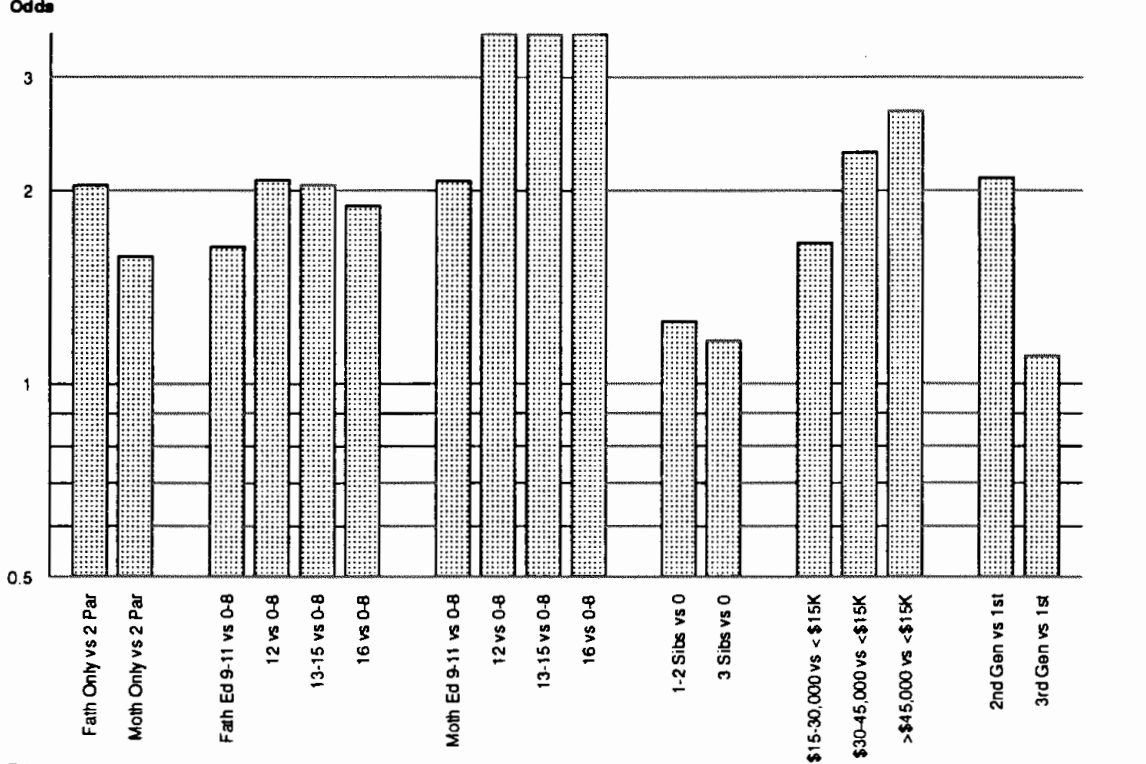
**FIGURE 5a. SCHOOL CONTINUATION PROBABILITIES IN HIGH SCHOOL AND COLLEGE BY RACE-ETHNIC GROUP, 1980 (1980 EDUCATION CODING)**



**FIGURE 5b. SCHOOL CONTINUATION PROBABILITIES IN HIGH SCHOOL AND COLLEGE BY RACE-ETHNIC GROUP, 1990 (1980 EDUCATION CODING)**



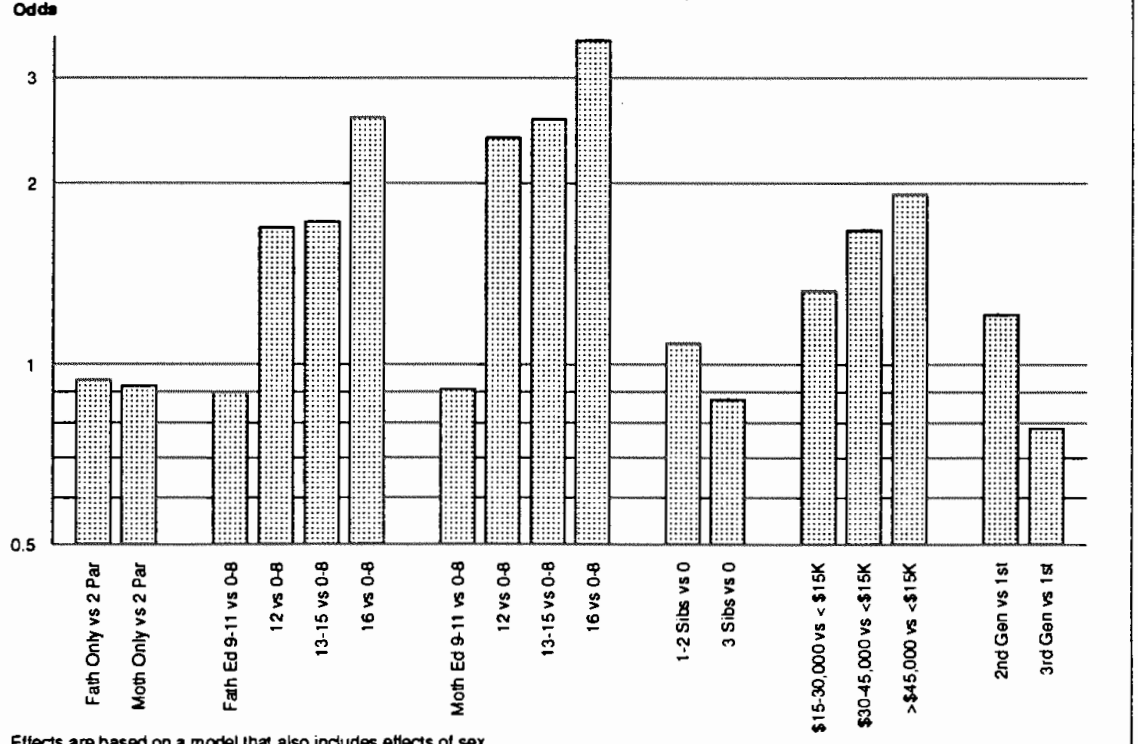
**FIGURE 6a. EFFECTS OF SOCIAL BACKGROUND ON ODDS OF COMPLETING SOME HIGH SCHOOL**



Effects are based on a model that also includes effects of sex, race, and ethnicity

Source: 1980 and 1990 Census

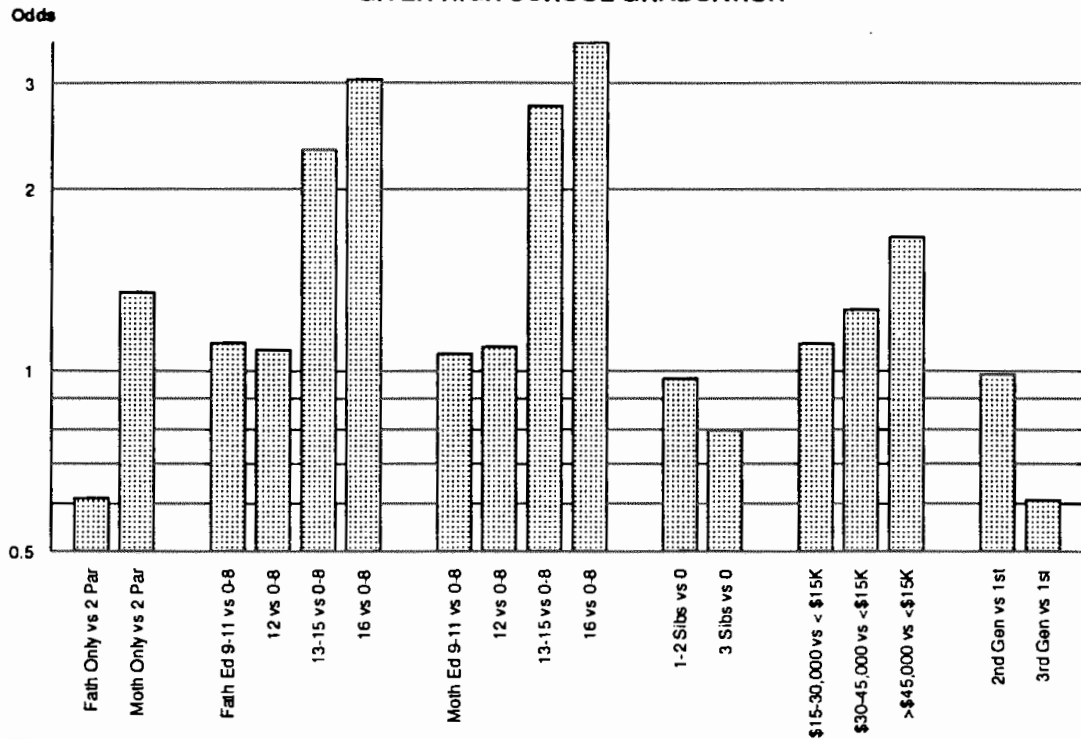
**FIGURE 6b. EFFECTS OF SOCIAL BACKGROUND ON ODDS OF HIGH SCHOOL GRADUATION GIVEN 9TH GRADE COMPLETION, 1980 AND 1990**



Effects are based on a model that also includes effects of sex, race, and ethnicity

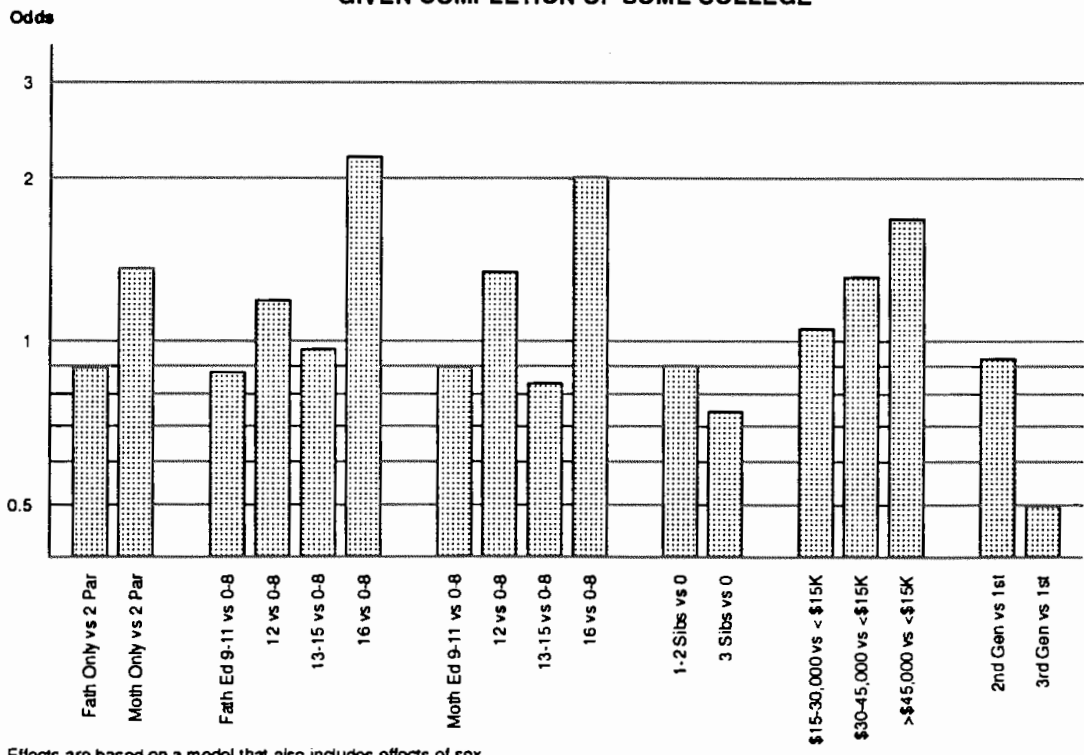
Source: 1980 and 1990 Census

**FIGURE 6c. EFFECTS OF SOCIAL BACKGROUND ON ODDS OF COMPLETING SOME COLLEGE GIVEN HIGH SCHOOL GRADUATION**



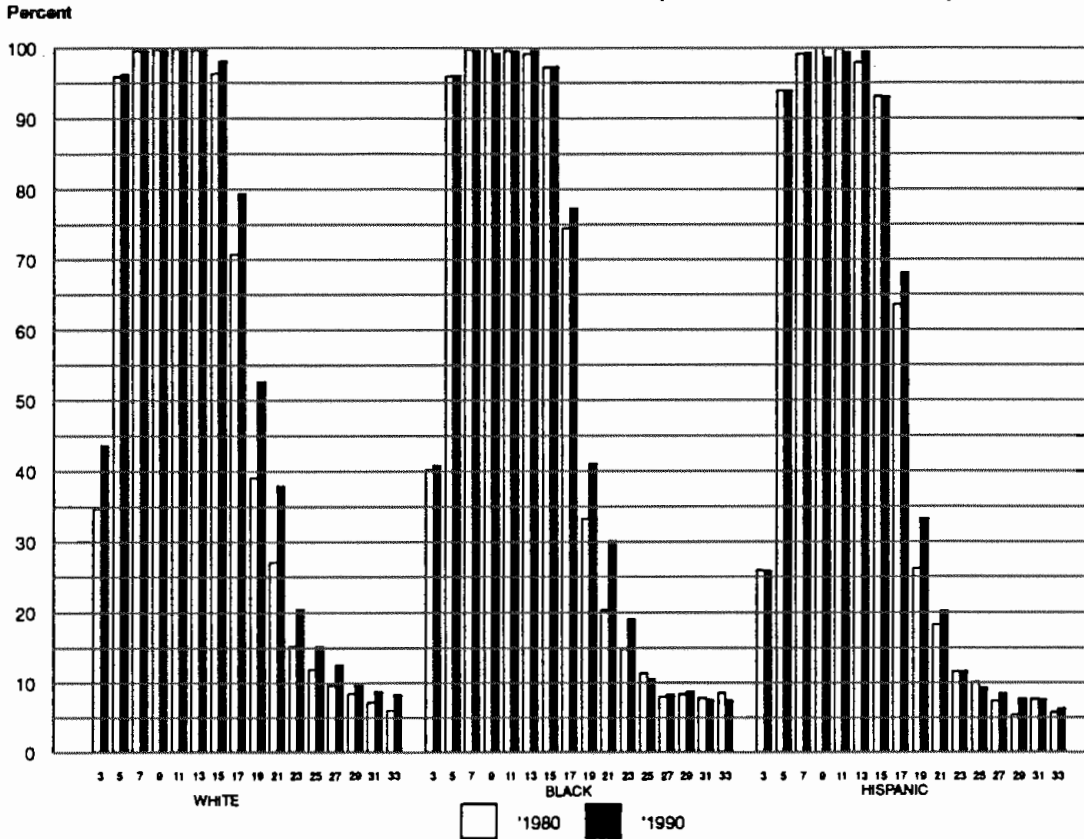
Effects are based on a model that also includes effects of sex, race, and ethnicity  
 Source: 1980 and 1990 Census

**FIGURE 6d. EFFECTS OF SOCIAL BACKGROUND ON ODDS OF COMPLETING A COLLEGE DEGREE GIVEN COMPLETION OF SOME COLLEGE**

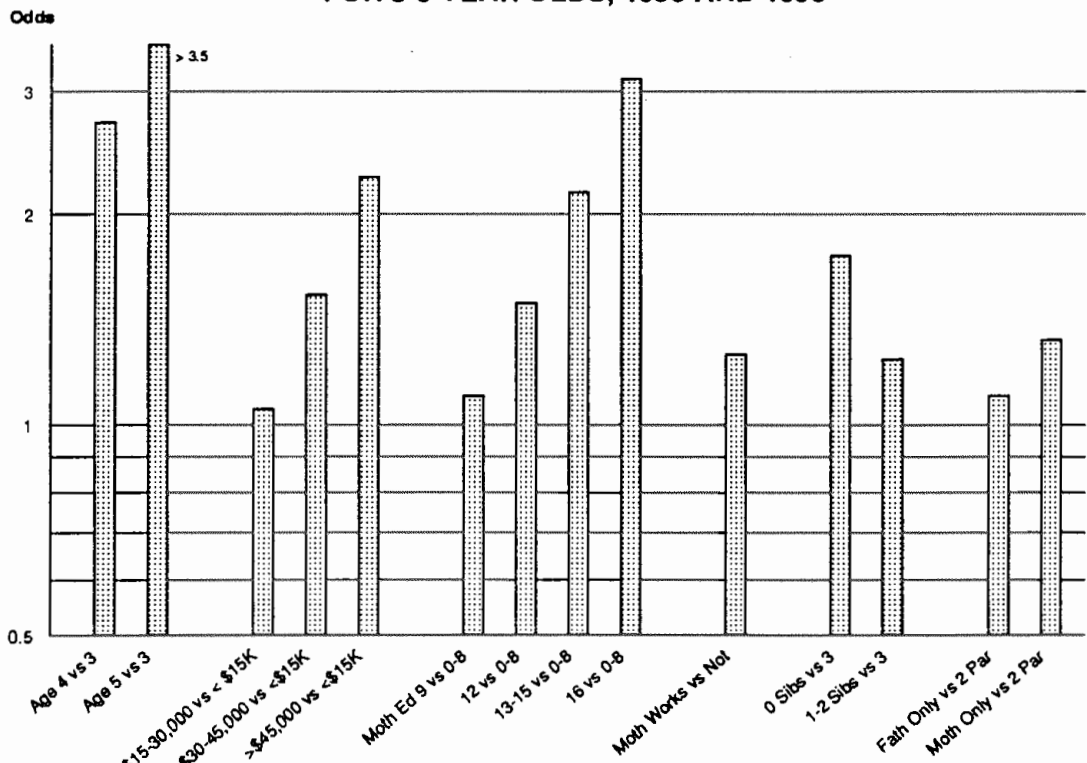


Effects are based on a model that also includes effects of sex, race, and ethnicity  
 Source: 1980 and 1990 Census

**FIGURE 7. PERCENT ENROLLED BY AGE, RACE-ETHNICITY, AND YEAR**



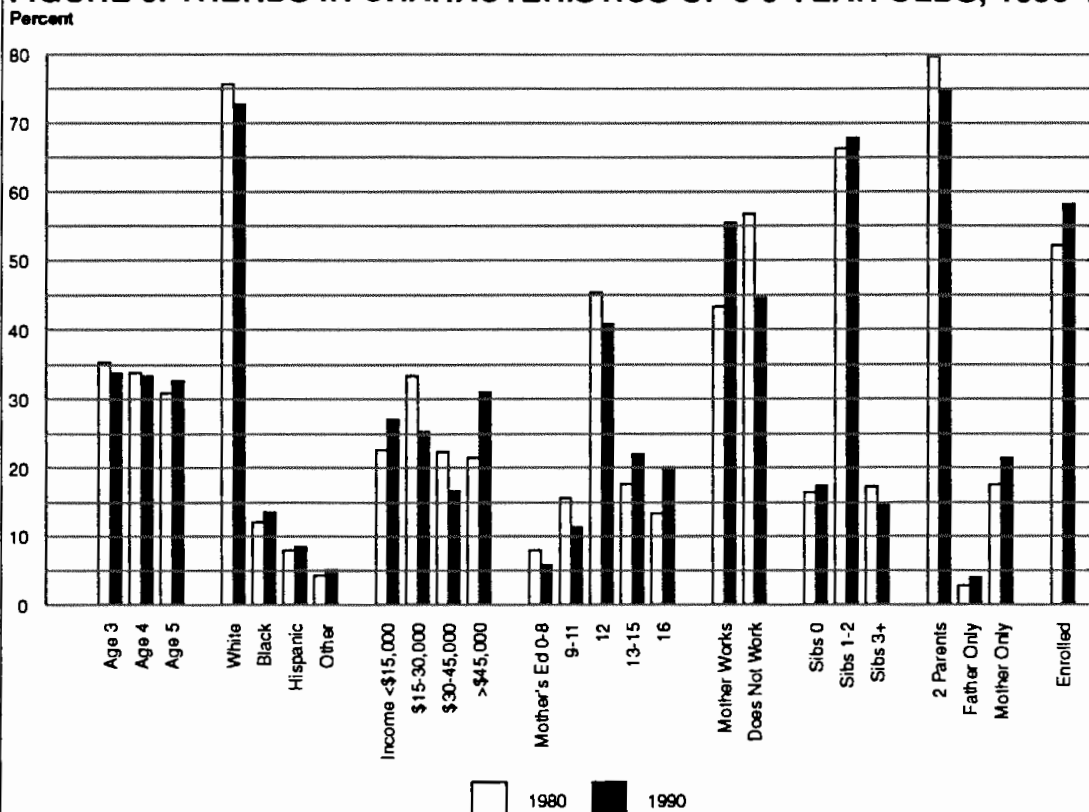
**FIGURE 8. EFFECTS OF SELECTED FAMILY FACTORS ON ODDS OF ENROLLMENT FOR 3-5 YEAR OLDS, 1980 AND 1990**



Source: October 1979, 1980, 1989, and 1990 Current Population Survey

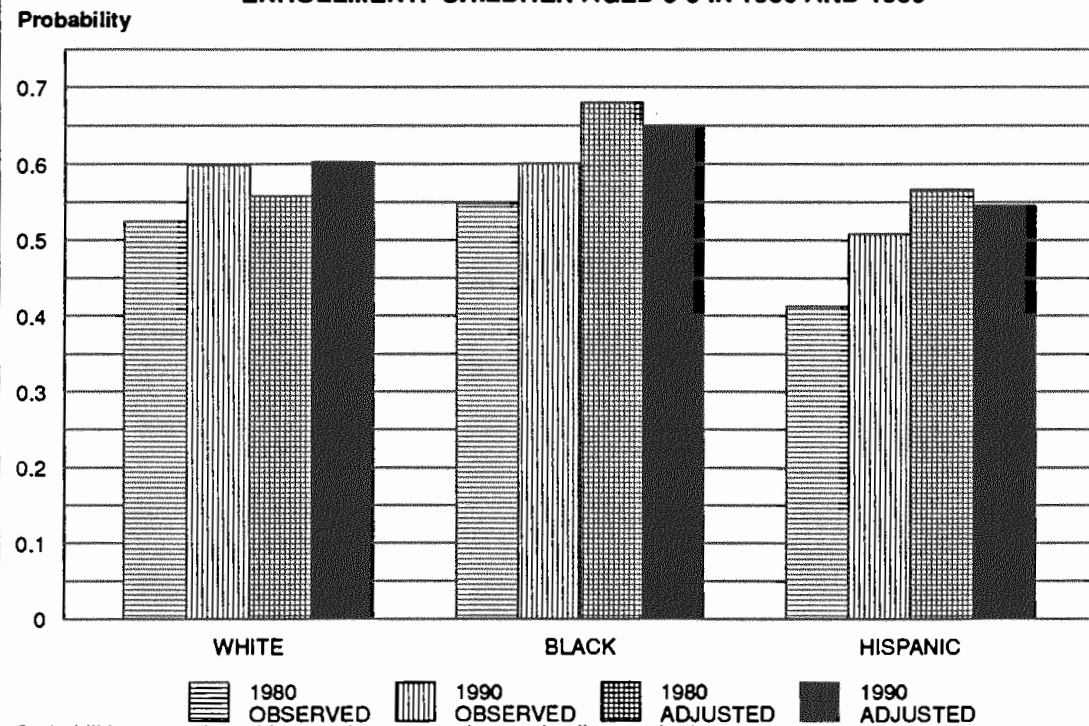


**FIGURE 9. TRENDS IN CHARACTERISTICS OF 3-5 YEAR OLDS, 1980-1990**



Source: October 1979, 1980, 1989, and 1990 Current Population Survey

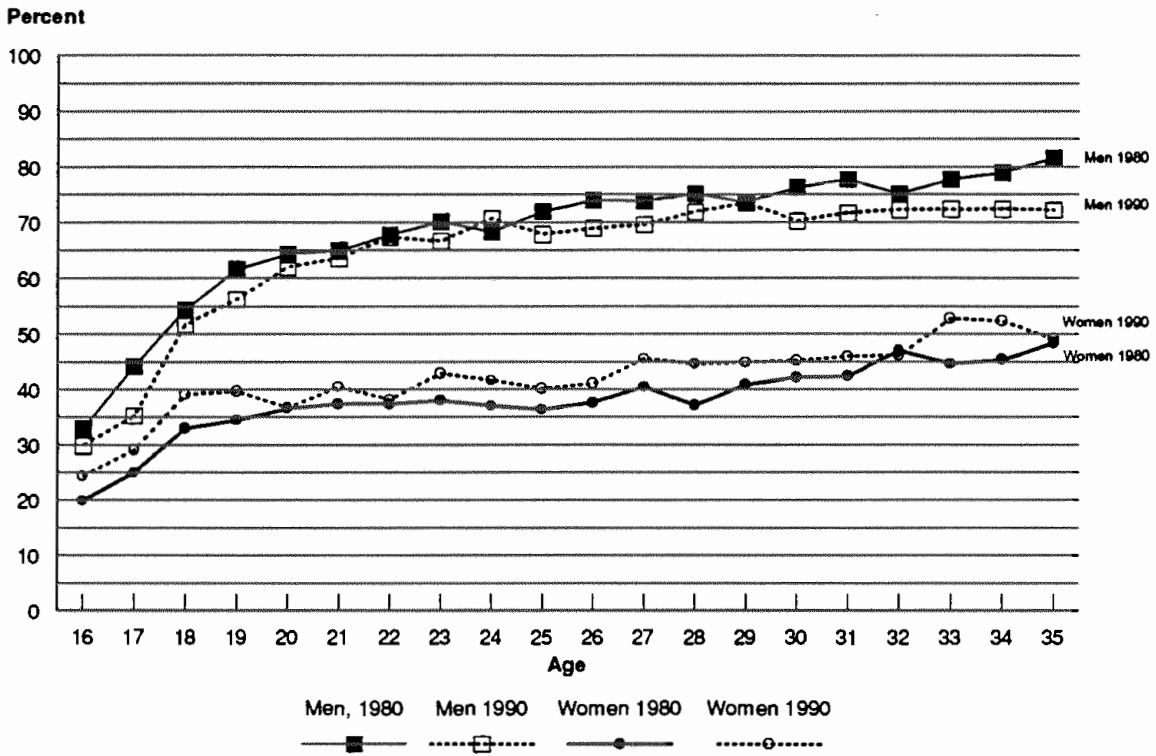
**FIGURE 10. OBSERVED AND ADJUSTED PROBABILITIES OF NURSERY OR KINDERGARTEN ENROLLMENT: CHILDREN AGED 3-5 IN 1980 AND 1990**



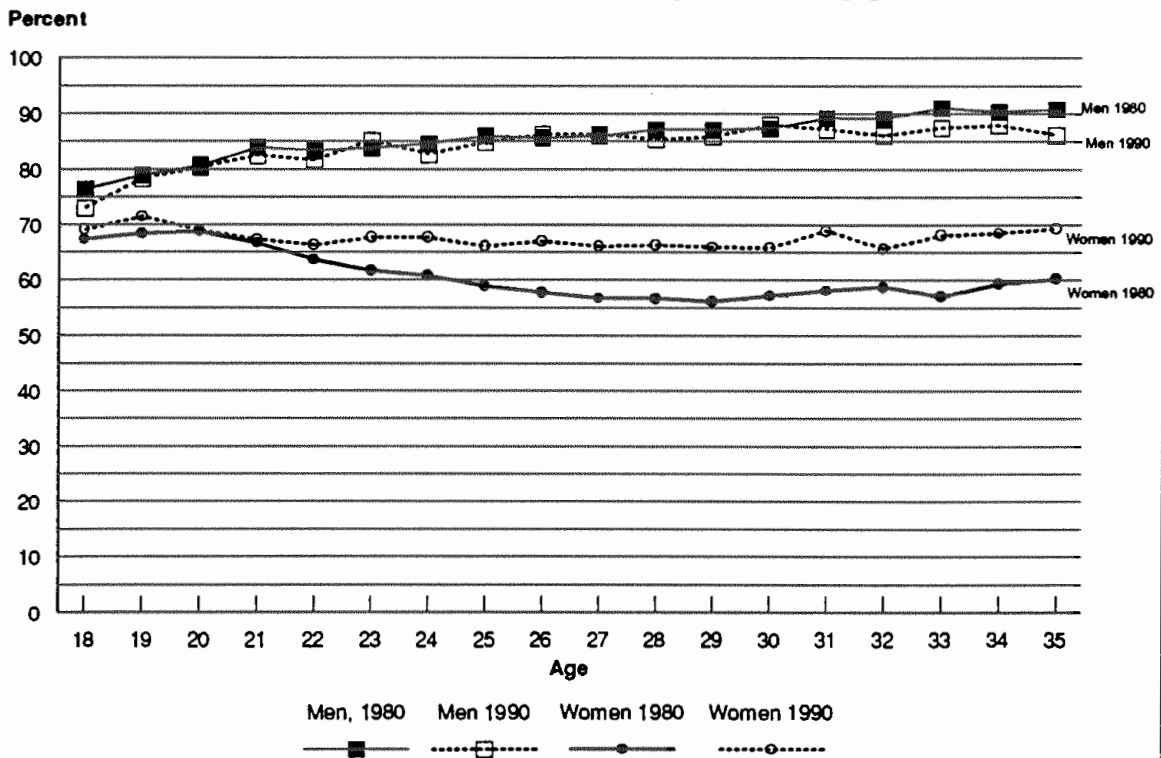
Probabilities are adjusted for age, income, mother's schooling, mother's mother's employment, number of siblings, and family structure.

Source: October 1979, 1980, 1989, and 1990 Current Population Survey

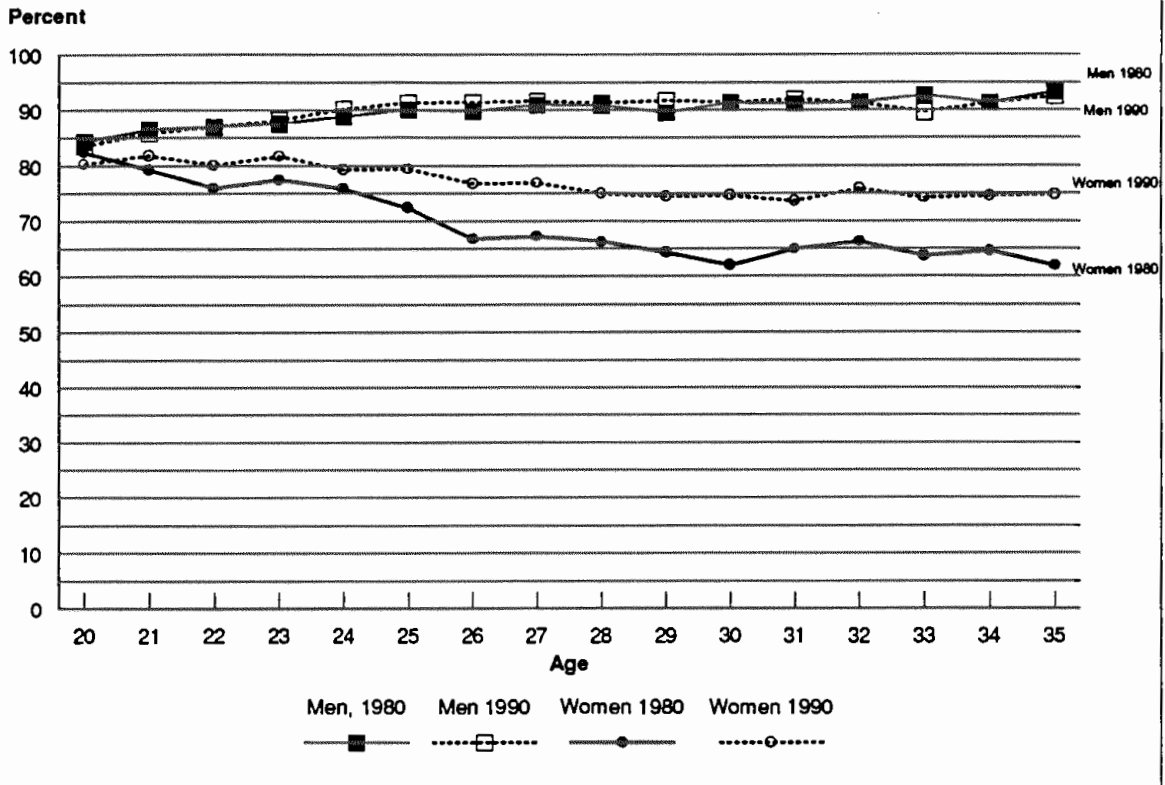
**FIGURE 11a. PERCENT EMPLOYED AMONG OUT OF SCHOOL PERSONS WITH <12 YEARS OF SCHOOL**



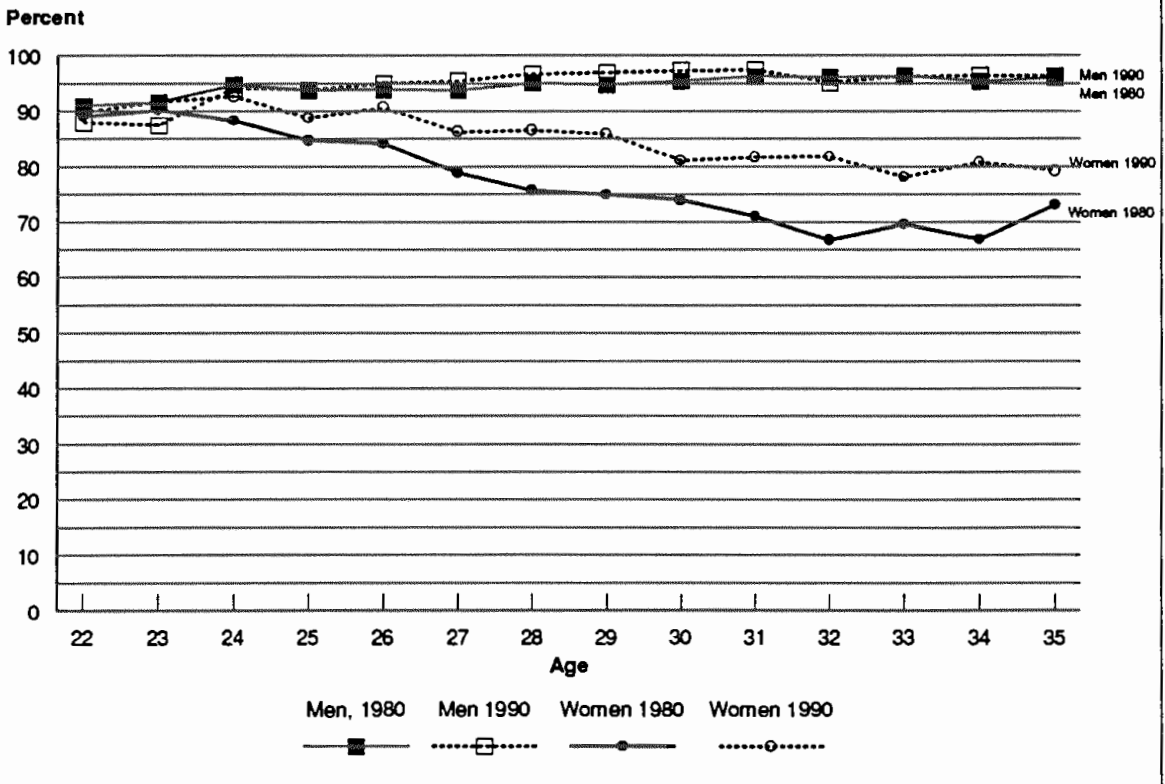
**FIGURE 11b. PERCENT EMPLOYED AMONG OUT OF SCHOOL PERSONS WITH 12 YEARS OF SCHOOL**



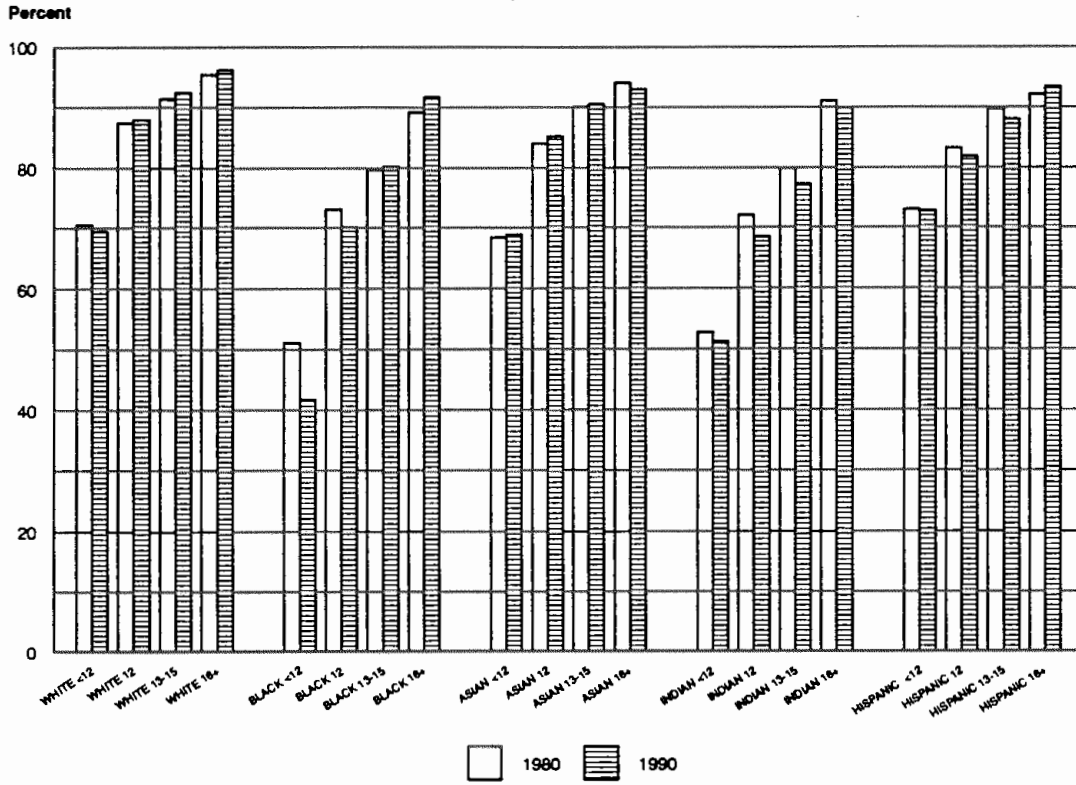
**FIGURE 11c. PERCENT EMPLOYED AMONG OUT OF SCHOOL PERSONS WITH SOME COLLEGE BUT NO DEGREE**



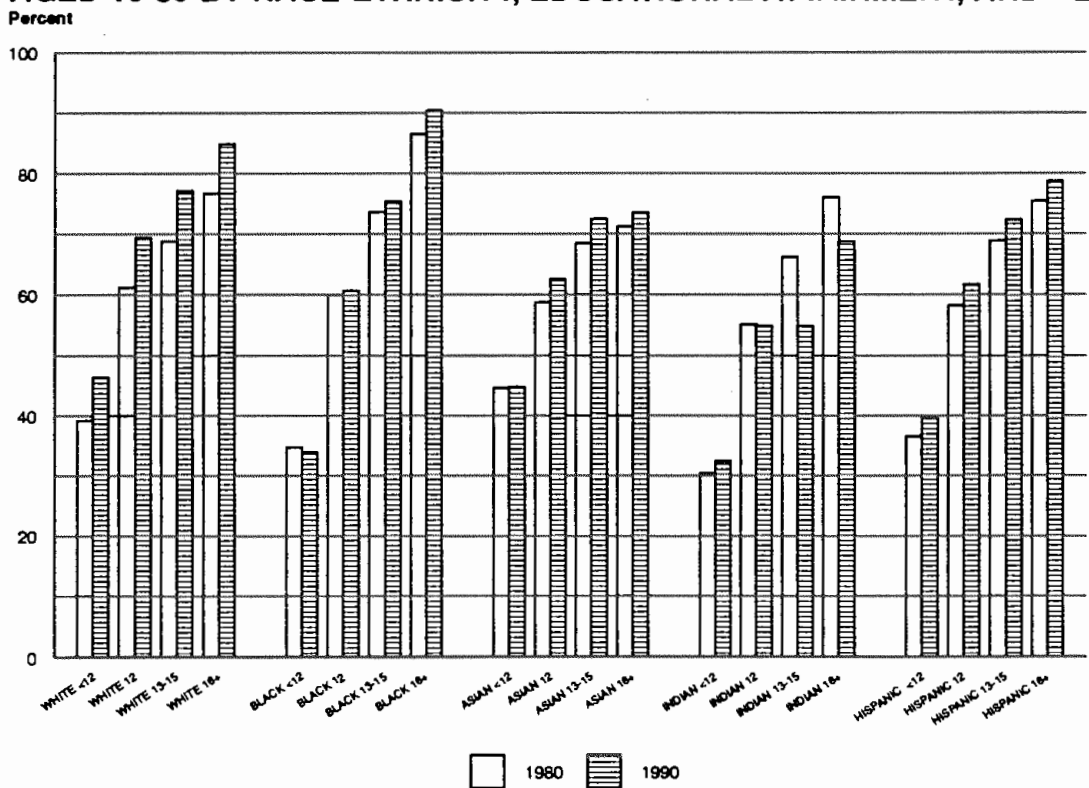
**FIGURE 11d. PERCENT EMPLOYED AMONG OUT OF SCHOOL PERSONS WITH AT LEAST A BACHELOR'S DEGREE**



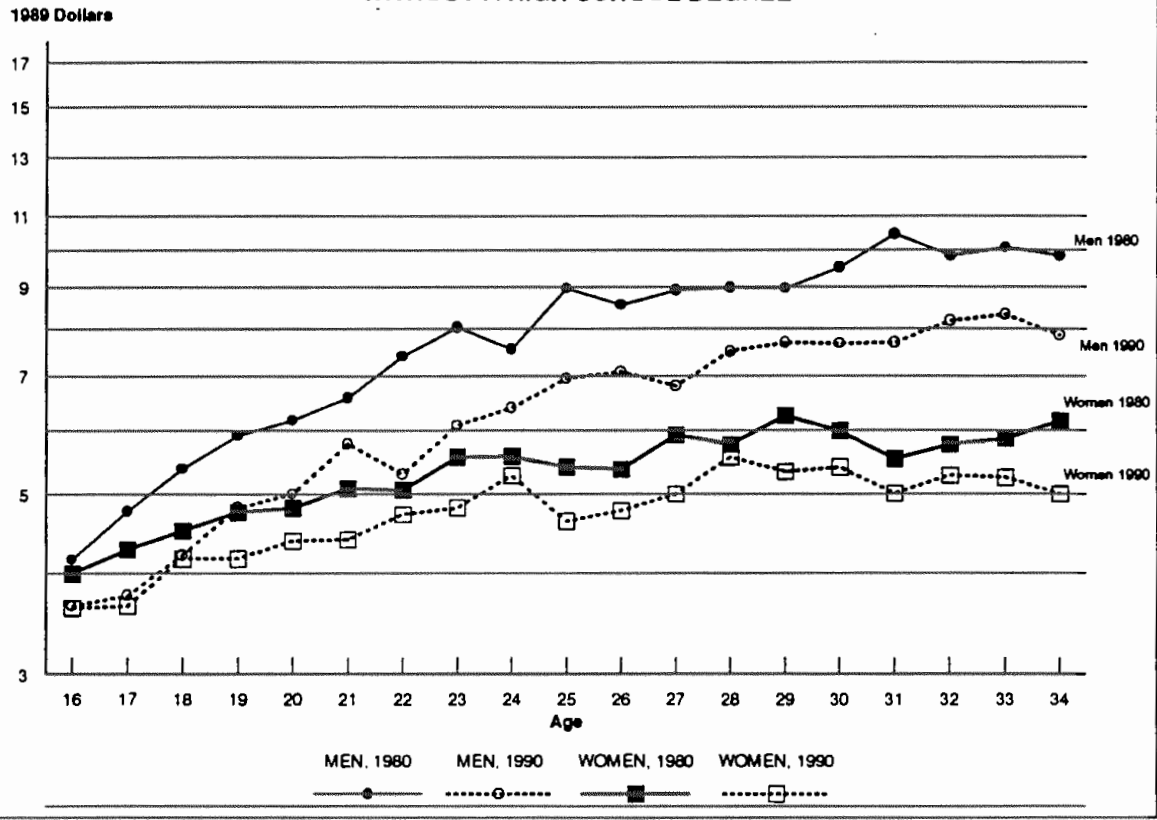
**FIGURE 12a. PERCENT EMPLOYED AMONG OUT OF SCHOOL MEN AGED 16-35 BY RACE-ETHNICITY, EDUCATIONAL ATTAINMENT, AND YEAR**



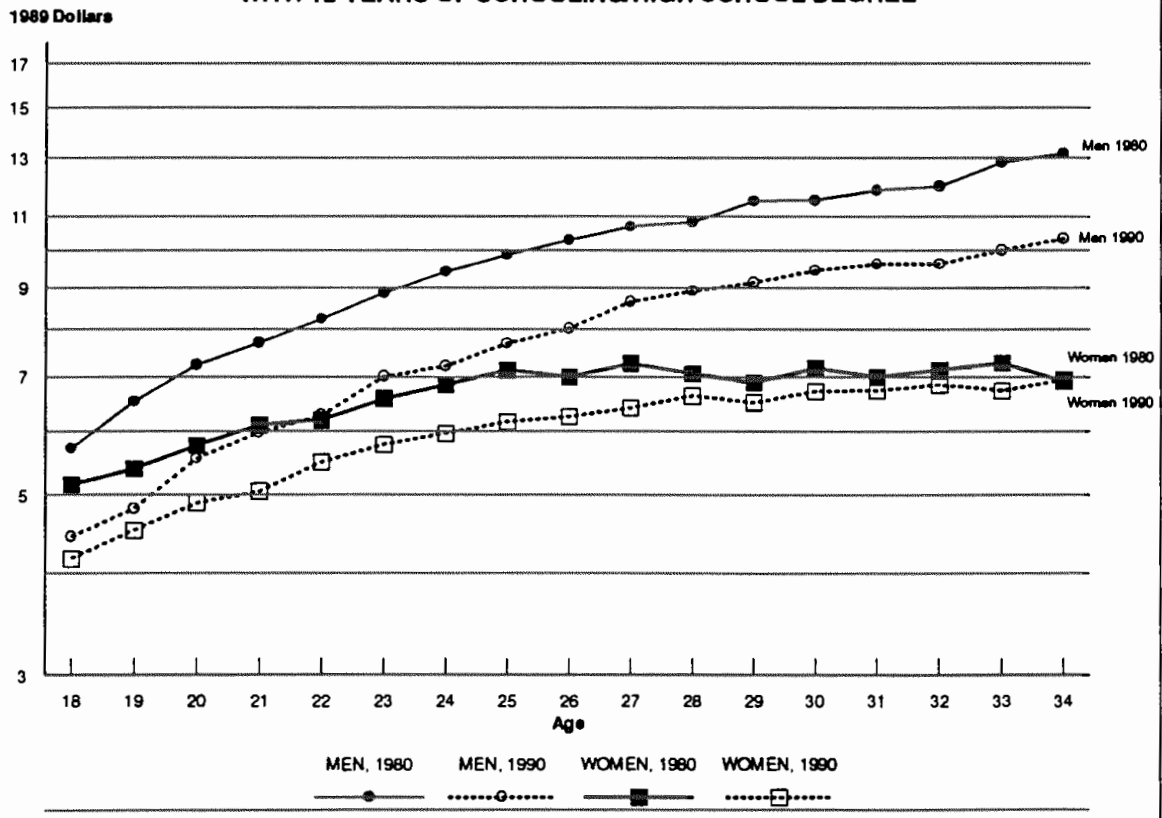
**FIGURE 12b. PERCENT EMPLOYED AMONG OUT OF SCHOOL WOMEN AGED 16-35 BY RACE-ETHNICITY, EDUCATIONAL ATTAINMENT, AND YEAR**



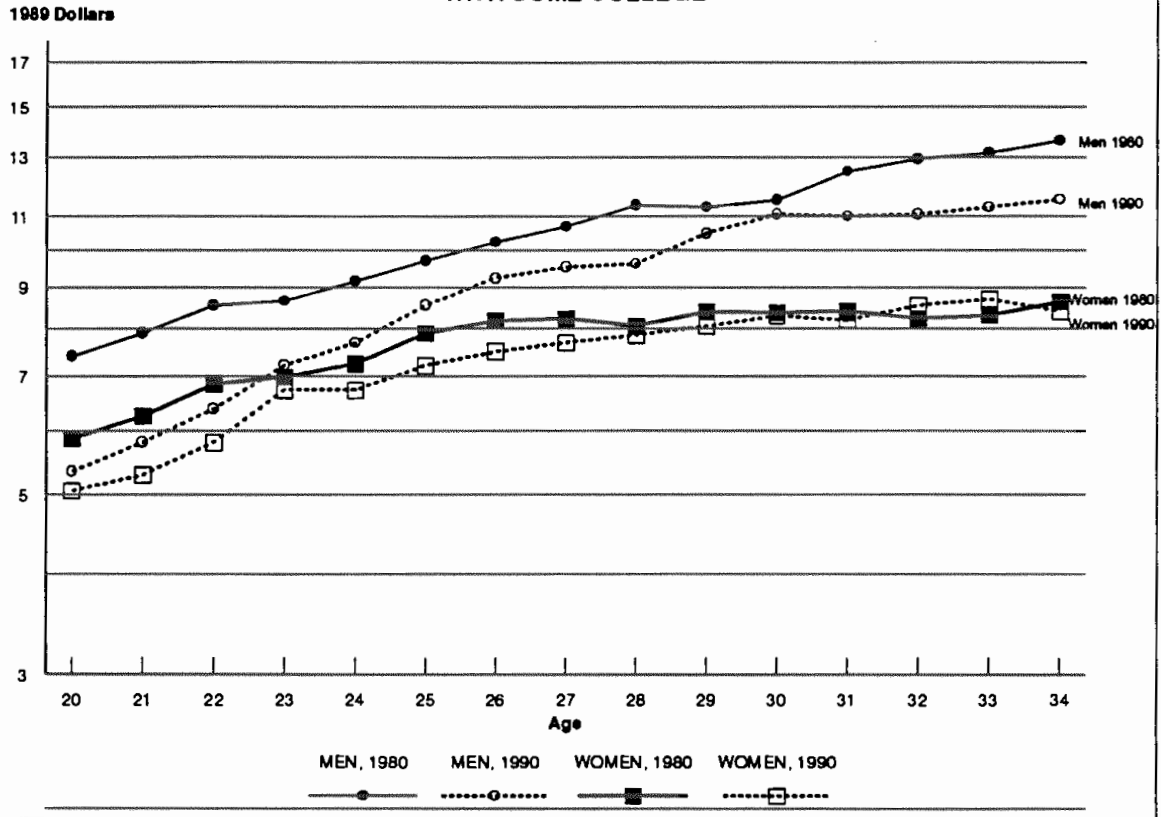
**FIGURE 13a. ESTIMATED MEDIAN HOURLY WAGE FOR OUT OF SCHOOL EMPLOYED PERSONS WITHOUT A HIGH SCHOOL DEGREE**



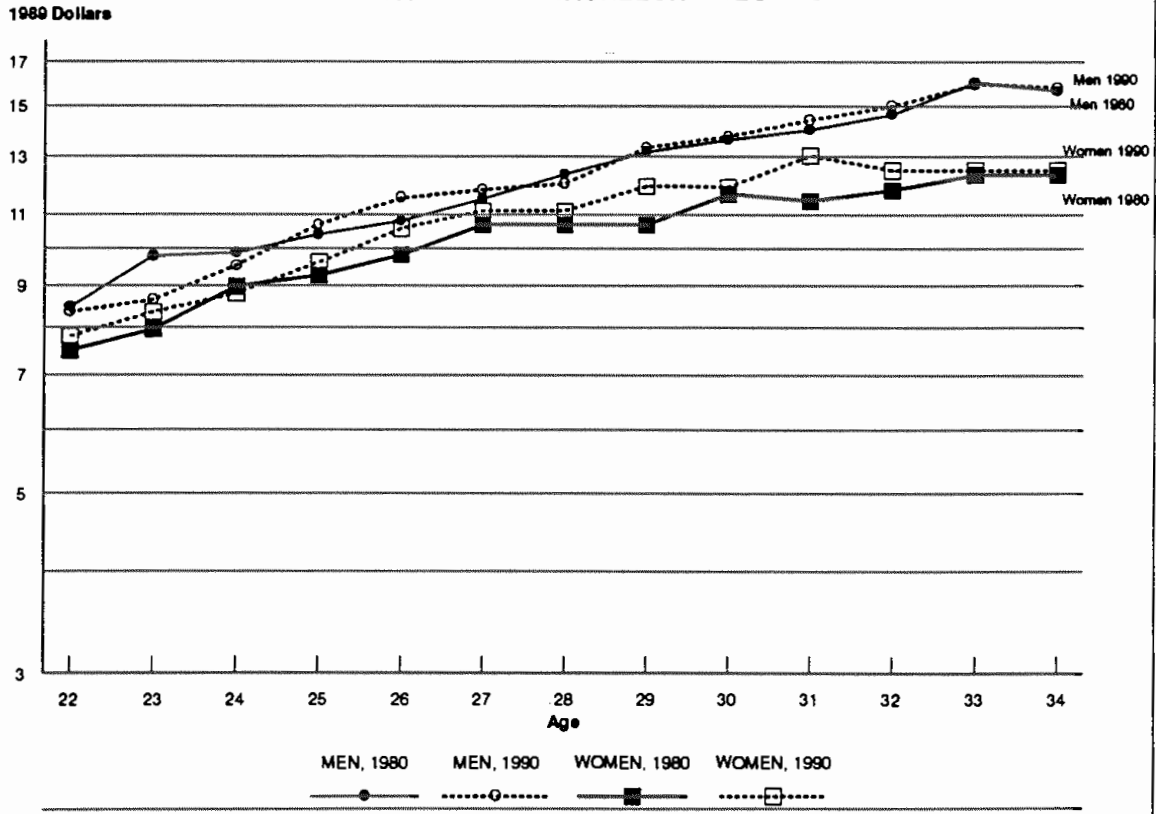
**FIGURE 13b. ESTIMATED MEDIAN HOURLY WAGE FOR OUT OF SCHOOL EMPLOYED PERSONS WITH 12 YEARS OF SCHOOLING/HIGH SCHOOL DEGREE**



**FIGURE 13c. ESTIMATED MEDIAN HOURLY WAGE FOR OUT OF SCHOOL EMPLOYED PERSONS WITH SOME COLLEGE**



**FIGURE 13d. ESTIMATED MEDIAN HOURLY WAGE FOR OUT OF SCHOOL EMPLOYED PERSONS WITH AT LEAST A BACHELOR'S DEGREE**



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