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ABSTRACT

This study describes the overall composition and characteristics of the adult labor force at present and over the next 10 years. Chapter 1 presents and discusses the size, demographic composition, and employment characteristics of the adult/labor force. Chapter 2 provides a description and analysis of the educational attainment of adult labor force, including analysis of English fluency and functional literacy of the labor force. Chapter 3 is concerned with training available to the adult labor force. Chapter 4 examines the work experience of the adult labor force for various demographic groups. Chapter 5 presents evidence on the occupational mobility of the adult labor force. Chapter 6 presents projections of the size and composition of the labor force over the next 10 years, as well as preliminary projections of educational attainment. Four major conclusions are provided in chapter 7: most adults are able to obtain employment, but a significant number of individuals, concentrated among blacks and Hispanics, face serious unemployment problems; the adult labor force is not static in nature; adult training and education are concentrated among those already doing relatively well in the labor market; and the employment situation for the adult force is likely to improve. Three topics for policy considerations are suggested. Appendixes include the methodology used to project educational attainment and a three-page bibliography. (YLB)

THE EDUCATION, TRAINING, AND WORK EXPERIENCE OF THE ADULTS LABOR FORCE FROM 1984 TO 1995

by

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This paper was prepared by Burt S. Barnow with the assistance of Louise Sheiner. Unpublished data from the Panel Study of Income Dynamics were provided by James Morgan. Several staff members of the Bureau of Labor Statistics provided unpublished tabulations from the Current Population Survey. Deborah Gerald of the National Center for Education Statistics (NCES) provided NCES projections of educational attainment. Carol Romero, Stephen Baldwin, and Sara Toye of the National Commission for Employment Policy provided many useful comments and suggestions for this report, but they are not responsible for any opinions expressed.

PREFACE

As part of a multi-year study of "Changes in the Workplace," the National Commission for Employment Policy is investigating the current and potential impact of computers and computer-based equipment on the American job market. Some of the questions in this investigation deal with the extent to which, and the ways in which, the adult work force adapts to changes in jobs.

This report examines which adult workers participate in education and training and describes the extent to which adults change occupations and the amount of work experience they have had. The study then offers some projections about how the workforce is likely to change over the next ten years, and suggests where public policies may need to be directed in order to improve employment opportunities for those most in need.

The "good news" the report offers is that most of the adult workforce is already well educated, and the educational level is projected to rise due to the greater amount of schooling among young people who will be entering the labor force over the coming years. Further, a considerable amount of privately financed adult education and training occurs every year. However, the workers undertaking adult education and training tend to be the ones already doing well in the job market. Those who are not faring well are also the least likely to obtain training. Government-sponsored training programs, such as those developed under the Job Training Partnership Act, can play a crucial role in assisting these adults.

This report is one of several dealing with the effects of computer-based equipment. The preparation of youth for entry into the labor market is the subject of a companion study on the characteristics of the youth workforce. Other reports from this project deal with how computers affect the number and types of jobs, their training requirements, and the role of computers in the education of young people. This series was designed by Carol Jusenius Romero, Sara B. Toye and Stephen E. Baldwin of the Commission staff, who are also supervising all aspects of the project.

The Commission expresses its appreciation to Dr. Barnow both for the breadth and detail of his examination and for his thoughtful development and presentation of the issues. The Commission hopes that this study will contribute to informed discussion about future directions for education and training policies.

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EXECUTIVE SUMMARY

In developing employment and training policies for the nation, it is important to understand which groups in the labor force have special problems and how well the labor force adjusts to changing demands by employers. To help deal with these issues, we examine the education, training, and work experience of the adult labor force (age 25 and over). These characteristics provide measures of the quality of the labor force, and changes in these factors provide information on the extent to which the labor force is adapting to changes in the economy.

1. INTRODUCTION

In 1983 there were an average of over 87 million adults in the labor force. The vast majority of these people, over 90 percent, were employed. There were, however, over 6.5 million adults who were unemployed; one-third of these people were out of work for over 15 weeks, and one-sixth had experienced at least 27 weeks of unemployment.

Unemployment is not spread evenly across subgroups of the population. While there is little difference between the unemployment rates of adult men and women, there are significant differences among age groups and ethnic groups. Younger adults have higher unemployment rates than older adults. Unemployment rates for blacks are about twice as high as for whites, and Hispanic unemployment rates are between those for blacks and whites.

2. EDUCATION OF THE ADULT LABOR FORCE

Education is an important factor in labor market success. In addition to providing specific skills for some occupations, education provides the general background needed for most jobs in the United States.

Nearly 20 percent of the adults in the labor force, almost 15 million people, lack a high school diploma, and almost one quarter of the labor force has at least four years of college. Adult women in the labor force are slightly less likely than men to be high school dropouts or college graduates. There are major differences in educational attainment among ethnic groups. Among whites, about 1 in 6 members of the adult labor force lacks a diploma, but nearly one third of blacks and almost half the Hispanic labor force lacks a high school diploma. Younger members of the adult labor force are better educated than older members, so educational attainment can be expected to rise in the future; while 1 in 3 men ages 55 to 64 has less than a high school education, only 1 in 8 men ages 25 to 34 lacks a diploma. Younger men are somewhat more likely than older men to have 4 or more years of college, and younger women are much more likely than older women to have 4 or more years of college.

A substantial number of adults enroll in education courses each year. In vocational education, adults account for 40 percent of the total enrollment. Slightly over half the adults enrolled in vocational education courses are women, and blacks constitute about the same share as they do of the labor force. Looking at all adult education, the most recent data available (1981) suggest that 1 in 9 adults in the labor force is enrolled each year in job-related adult education. Participation rates are much higher for individuals in white-collar jobs than blue-collar jobs.

Literacy is a difficult concept to define and measure, so there is a large range in estimates of the literacy of the labor force. While under 1 percent of the population reports itself to be illiterate, studies in the 1970's found between 13 and 30 percent of the population to be "functionally illiterate," lacking sufficient educational skills to fully participate in society. There is no standardly accepted definition of functional literacy, and some researchers believe that literacy requirements are increasing.

Individuals who do not speak English well also face barriers to labor force participation. Such individuals have lower labor force participation rates and higher unemployment rates than individuals who speak English well. Language itself may not be as important as some other barriers; the 1980 census found unemployment rates for individuals who speak no English or do not speak it well to be lower than the unemployment rate for blacks.

3. TRAINING OF THE ADULT LABOR FORCE

Data on training received by adults in the labor force are very limited and not of high quality. Public sector programs provide information about the number of participants and their characteristics, but provide only limited data on occupational areas. There is no source of regularly collected data on training in the private sector. Consequently, we know less about the training experiences of the adult labor force then we do about its education.

Apprenticeship programs combine on-the-job training with classroom instruction to prepare people for entry into the skilled trades. The Federal government does not provide funding for training apprentices, but it promotes apprenticeship and registers programs that meet minimum standards. About 50,000 individuals complete registered programs each year. Approximately 60 percent of all registered apprentices are in construction occupations. About 1 out of 5 apprentices are members of a minority group and 1 out of 15 apprentices are women.

The most significant training programs funded by the Federal government are administered under the Job Training Partnership Act (JTPA). Disadvantaged adults receive classroom and on-the-job training under Title IIA of JTPA, and dislocated workers are served under Title III. During the first nine months of operation, about 225,000 disadvantaged adults received classroom or on-the-job training in Title IIA programs; slightly more than half of these

participants were women, and about 40 percent were members of minority groups. The Title III dislocated worker programs enrolled about 100,000 individuals during the initial nine months of operations. Data are not yet available on the mix of activities, but it is widely believed that a significant share of the Title III participants receive job search assistance rather than training. About two-thirds of the Title III participants were men and three quarters were high school graduates.

A survey of the labor force found that slightly over half the labor force needed some specific skills or training to obtain their jobs. The most common sources were schooling (especially college), informal on-the-job training, and formal company training. Military training, high school vocational education, and junior colleges were each mentioned as a source of skills by 5 percent or less of the labor force. Slightly over one-third of the labor force reported taking training to improve their skills while on the current job; the most common sources of this training were informal and formal on-the-job training. As is the case with education, workers in white-collar jobs are much more likely to take training than workers in blue-collar occupations.

4. WORK EXPERIENCE AND OCCUPATIONAL MOBILITY

The high rate of labor force participation for men leads to a strong association between age and years of work experience. Because the black labor force is younger than the white labor force, black men, on average, have less work experience than white men. However, within a given age group, black and white men have similar years of work experience; black women, on the other hand, have significantly more work experience than white women the same age. There are major differences in years of work experience by sex, with men having substantially more work experience than women in the same age group. For example, virtually all men age 45 to 54 have over 15 years of work experience, but only 45 percent of women that age have over 15 years experience. Studies of labor force entry and exit have yielded similar results. Adult women have twice as many labor force entries as men, and women remain in the labor force for a shorter period. In addition, nonwhites and individuals with less than a high school education tend to have a higher than average number of labor force entries.

Overall, the adult labor force includes a large number of people who changed occupations between January 1982 and January 1983, although the percentage of the labor force that changed occupations is not large. Approximately 5.5 million adults, representing 7.5 percent of the labor force who worked in both years, changed occupations between January 1982 and January 1983. This finding is similar to those of earlier BLS studies which indicate that about 8.5 percent of the labor force changed occupations between January 1977 and January 1978 and between January 1980 and January 1981. Occupational mobility rates are higher for younger adults than older workers, and women have slightly higher mobility rates than men. A majority of the workforce changes occupations at least once after age 25.

5. PROJECTIONS OF THE LABOR FORCE THROUGH 1995

Between 1982 and 1995, approximately 25 million people are projected to be added to the adult labor force. Although this is a large number of added labor force participants, it represents annual growth of approximately 2 percent. The median age of the labor force is projected to rise by two years in this period, from 35 to 37. However, the small change in the median age does not tell the entire story, for the labor force growth is highly concentrated in the 35 to 54 age range, with declines projected for youth and for the age 54 and above categories.

The ethnic and sex composition of the labor force is projected to change significantly between 1982 and 1995. The increase in labor force participation by women is projected to continue through 1995, and women will constitute 47 percent of the labor force ages 25 to 54 in 1995 compared to 43 percent in 1982. Nearly 60 percent of the additional members of the labor force are projected to be women. Blacks and other minorities have significantly higher projected labor force growth rates than whites. The black and other share of the adult labor force is projected to grow from 13 percent in 1982 to 15 percent in 1995. Slightly over 20 percent of the adult labor force growth in this period is projected to consist of blacks and other nonwhite minorities.

The educational attainment of the adult labor force is projected to rise between 1981 and 1990, as older workers retire and are replaced by more educated workers. In 1981, 1 out of 5 adult men in the labor force lacked a high school diploma, and by 1990 the corresponding figure is projected to be 1 out of 7; the proportion of adult women in the labor force who lack a high school diploma is projected to drop by 1990 from 1 in 6 to 1 in 10.

Projections of the share of the adult labor force with at least 4 years of college show some significant changes among adults ages 25 to 34. The proportion of women with a college education is projected to drop slightly, but for men the drop is from 27 percent to 20 percent. By 1990 the female adult labor force is projected to include a greater share of college graduates than the male labor force.

6. CONCLUSIONS AND POLICY CONSIDERATIONS

Four major conclusions can be drawn from the analysis of the characteristics of the adult labor force:

- Most adults in the labor force are able to obtain employment, but a significant number of individuals, concentrated among blacks and Hispanics, face serious unemployment problems.

- The adult labor force is not static in nature; there are considerable changes in the education and training of the labor force every year.

- Adult education and training are concentrated among those who are already doing relatively well in the labor force.

- Overall, the employment situation for the adult labor force is likely to improve somewhat by 1995, but there will remain a large number of people with labor market problems.

Appropriate labor market policies depend upon the nature of the demand for labor as well as the characteristics of the labor force. This study has only addressed the supply side of the labor market, so recommendations of specific labor market policies are inappropriate here. However, the analyses presented suggest several topics for policy consideration:

- Caution should be exercised in developing general education and training initiatives for adults.

- A stronger case can be made for initiatives to improve the education and training of minorities and individuals with less than a high school education.

- Data on the education and training received by the adult labor force are very limited, and more knowledge would be useful in formulating labor market policy.

Caution is suggested in developing general policy initiatives to encourage education and training of the adult labor force for three reasons: (1) a large majority of the adult labor force is employed at any time; (2) a substantial number of adults already improve their skills for the current job or acquire skills for a new job through education, training, and informal on-the-job training; and (3) over the next 10 years the adult labor force is projected to become more experienced and better educated.

A stronger case can be made for initiatives that focus on groups in the labor force that have substantial employment problems. Blacks and Hispanics have significantly higher unemployment rates and lower educational attainment. Minority groups and individuals with less than a high school education are overrepresented in low-skill occupations where less adult education and training take place. The Job Training Partnership Act (JTPA) programs serve a small fraction of the economically disadvantaged adults in the country, and it is not yet known if these programs provide an effective approach to improving their labor market situation. Because little information is available on the education and training of the adult labor force, strong consideration should be given to taking stock of the nation's investment in the education and training of the adult labor force before new policies are developed.

CHAPTER 1

INTRODUCTION

1.1 PURPOSE OF THE STUDY

The intent of this study is to describe the overall composition and characteristics of the adult labor force (age 25 and over) at present and, to the extent possible, over the next 10 years. Projecting the future is always difficult, but to the extent we can foresee changes in the labor force and the demand for various groups and skill categories of labor, we will be in a better position to develop appropriate labor market policies. Thus, we will present projections of the labor force and its characteristics over the next 10 years, primarily those of the Bureau of Labor Statistics but also some of our own.

In describing the characteristics of the labor force, attention will be paid to the education, training, and work experience of the labor force. These features reflect the quality of the labor force. Special attention will also be paid to the adaptability of the adult labor force. Thus we will analyze the education, training, and occupational mobility of the adult labor force to see the extent to which workers are able to adjust to changing labor market conditions. As will be made clear in the following chapters, we conclude that it is incorrect to view the adult labor force as being static in nature; in any given year millions of adult Americans gain new skills through education, formal training, and informal on-the-job training.

Interest in the composition and characteristics of the adult labor force over time does not require or imply a commitment to major government interventions in the labor market. The focus of this study is to examine the extent to which the adult labor force is able to acquire new skills over time and make appropriate adjustments. Government programs may be considered necessary for population segments that face especially severe barriers to employment, but a majority of workers can and do appear to adjust very well to structural changes in the labor market.

In the remainder of this chapter, the size, demographic composition, and employment characteristics of the adult labor force are presented and discussed. Chapter 2 provides a description and analysis of the educational attainment of the adult labor force, including analysis of English fluency and functional literacy of the labor force. The third chapter describes the training experiences of the adult labor force; this chapter includes a discussion of both private sector and public sector training. Chapter 4 presents information on the work experience of the adult labor force for various demographic groups. Chapter 5 presents evidence on the occupational mobility of the adult labor force. Chapter 6 presents projections of the size and composition of the labor force over the next 10 years, as well as preliminary projections of educational attainment. Conclusions and policy considerations are presented in Chapter 7.

1.2 THE SIZE AND COMPOSITION OF THE ADULT LABOR FORCE

The labor force of the United States includes individuals with a wide range of demographic and socioeconomic characteristics. In this section,

current data are presented on the size, composition, and distribution of the adult labor force. Any summary measure of the labor force's status cannot convey all the relevant information about the nation's workers, so aspects of labor force participation such as unemployment, part-time work, and reasons for not participating in the labor force are also discussed.

Data on the labor force vary over time because of seasonal and cyclical factors as well as long-term trends. Both employers and potential workers vary their behavior over different periods of the year, so the Bureau of Labor Statistics adjusts its data to account for normal seasonal fluctuations in employment, unemployment, and labor force participation. We will use seasonally adjusted data where possible to remove the effects of seasonal fluctuations. It is considerably more difficult to isolate the cyclical component of economic data. The two most recent years for which annual data are available, 1982 and 1983, were also the years with the worst recession and highest unemployment rates (9.7 and 9.6 percent) since the Great Depression in the 1930's. There has also been an upward trend since World War II in unemployment rates, with the unemployment rate's low point after each recession at a higher level than the previous low point. We use data from 1983, the latest available year, but the reader should be aware that some aspects of the data reflect cyclical conditions during 1983.

In Table 1-1 the major dimensions of the 1983 adult labor force are presented. The adult civilian labor force included a total of 87 million individuals; the total civilian labor force included an additional 8 million teenagers 16 to 19 and 16 million young adults ages 20 to 24. The data in Table 1-1 do not include members of the armed forces, an additional 1.7 million employed men and women. Labor force participation rates are highest for adults 25 to 44, and they are under 20 percent for those over age 65. Unemployment rates vary widely with age for all demographic groups and are highest for younger adults.

Several interesting differences arise in comparing the male and female components of the adult labor force. For all age categories, men have higher participation rates than women. Men between 25 and 44 have a 95 percent participation rate, but only about 70 percent of women in that age bracket are in the labor force. Of some note is that the unemployment rate of men in each age category is higher than the unemployment rate for women in the same category. Male unemployment rates were never higher than female rates from 1947, when these data were first collected, until 1982. In March 1984, the adult male unemployment rate dropped below the female rate and has remained lower through the most current data (November 1984).[1] There are significant

[1]Based on analysis of data from 1964 through 1982, DeBoer and Seeborg (1984) have concluded that in addition to the tendency for the differential to narrow during recessions, there is also a long-term closing of the gap, primarily because of the concentration of men and women in different industries. They have projected that the female rate will drop below the male rate during the next recession and "Beyond that, it seems likely that the female rate will remain below the male rate well into the 1990's."

TABLE 1-1

EMPLOYMENT STATISTICS OF THE 1983 ADULT CIVILIAN NONINSTITUTIONAL POPULATION BY AGE, SEX, AND ETHNIC GROUP

	Civilian Labor Force (Thousands)	Participation Rate	Number Employed (Thousands)	Number Unemployed (Thousands)	Unemployment Rate
Total	87,328	63.2	80,770	6,558	7.5
25-34	31,834	81.3	28,756	3,078	9.7
35-44	23,611	81.6	21,960	1,650	7.0
45-54	16,851	76.8	15,812	1,039	6.2
55-64	11,992	54.5	11,315	677	5.6
65 and over	3,040	11.7	2,927	114	3.7
Men	50,143	77.5	46,255	3,888	7.8
25-34	18,038	94.2	16,216	1,822	10.1
35-44	13,398	95.2	12,450	947	7.1
45-54	9,746	91.2	9,133	613	6.3
55-64	7,119	69.4	6,686	433	6.1
65 and over	1,842	17.4	1,770	73	3.9
Women	37,184	50.7	34,514	2,670	7.2
25-34	13,796	69.0	12,540	1,255	9.1
35-44	10,213	68.7	9,610	703	6.9
45-54	7,105	61.9	6,678	427	6.0
55-64	4,873	41.5	4,629	244	5.0
65 and over	1,198	7.8	1,157	41	3.4
White	76,021	63.0	70,957	5,064	6.7
25-34	27,237	81.8	24,955	2,282	8.4
35-44	20,488	81.9	19,194	1,294	6.3
45-54	14,798	76.5	13,961	837	5.7
55-64	10,732	54.7	10,169	563	5.2
65 and over	2,766	11.8	2,678	88	3.2
Black	8,967	64.2	7,680	1,289	14.4
25-34	3,675	79.8	2,976	700	19.0
35-44	2,406	80.2	2,107	299	12.4
45-54	1,630	72.1	1,456	174	10.7
55-64	1,032	52.5	937	95	9.2
65 and over	224	10.5	204	21	9.2
Hispanic	61,073	NA	5,383	690	11.4
25-54	5,436	NA	4,811	625	11.5
55 and over	637	NA	572	65	10.2

Source: U.S. Department of Labor, Bureau of Labor Statistics Employment and Earnings, January 1984, pp. 158-159.

differences in the labor force characteristics of whites and members of minority groups. Overall, whites have slightly higher participation rates than blacks, but there are different patterns by sex. White men in all age categories have higher labor force participation rates than black men of the same category, but black women have higher participation rates than white women in the same age group. For example, the participation rate for white men age 25 to 54 is 95 percent, and for black men it is 88 percent; for white women age 25 to 54, the participation rate is 67 percent, but for black women it is 70 percent.[2]

The unemployment rates for minorities are much higher than the unemployment rate for whites. Adult Hispanics had an unemployment rate over 11 percent and the rate for blacks exceeded 14 percent--more than twice the rate for whites.

Not all members of the workforce are employed full time. In some cases people work part time because they wish to and in other cases because they cannot find full-time work. Most part-time workers have voluntarily chosen part-time employment. In 1983, 15 percent of employed adults worked part time, and only one-third of these workers, representing 5 percent of the total adult workforce, worked part time because they could not find full-time work. Adult men tended to work part time less than adult women, and 52 percent of the men who worked part time did so involuntarily. Slightly more than 1 in 4 adult women workers were employed part time, but almost 75 percent of the part-time adult women did not want full-time work.

To complete the picture of the labor force, we must consider individuals who would like to work but have made no specific effort to find a job. In the United States, people who have not looked for a job in the four weeks prior to being surveyed are considered to be "not in the labor force" rather than unemployed. Such individuals are referred to as "discouraged workers." Of the 22 million people age 25 to 59 who were not in the labor force in 1983, slightly over 3 million reported that they wanted a job. However, most of those who wanted a job but were not actively seeking employment cited reasons for not searching. A total of 940,000 individuals in this group could be considered discouraged workers because their reason for not seeking employment was that they thought they could not find a job. Because of the high unemployment rate in 1983, the share of discouraged workers was higher than when employment conditions are better.

The brief summary of the adult labor force presented here indicates that even in 1983, a year with extremely high unemployment by historical standards, a large proportion of the labor force was able to obtain employment. Younger adults and minorities had more serious employment problems than prime-age adults and men. There were, however, 6.6 million adults unemployed, on average, during 1983, and for many of these adults unemployment was a serious problem. Approximately one-third of the unemployed population in 1983 was

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[2]Detailed labor force statistics by age, race, and sex for 1983 can be found in Employment and Earnings, January 1984.

searching for work for 15 weeks or more, and one in six were unemployed for 27 weeks or more.[3] In an earlier study, Lerman, Barnow, and Moss (1978) estimated that the one-quarter of the unemployed individuals with the most unemployment account for three-quarters of the nation's unemployment; for the individuals with long periods of unemployment, the labor market is not functioning well.

1.3 THE LABOR FORCE STATUS OF THE DISABLED

Detailed information on the labor force status of individuals with disabilities is not published on a regular basis, but a 1978 survey provides a perspective on the problem.[4] The survey found that 17 percent of the population and 10 percent of the labor force between the ages of 18 and 64 classified themselves as disabled. Disabilities were classified into three categories of severity: severely disabled (unable to work altogether or unable to work regularly), occupationally disabled (able to work regularly, but not at the same work as before the onset of disability or unable to work full time), and secondary work limitation (able to work regularly and full time at the same occupation, but with limitations in the kind or amount of work that can be performed). Approximately half of the disabled population is severely disabled, 20 percent have occupational disabilities, and 30 percent have secondary limitations.

As would be expected, labor force participation among the severely disabled is very limited--under 14 percent of the severely disabled population was in the labor force. Individuals with occupational disabilities or secondary disabilities have participation rates that are almost as high as the rate for the general population. The participation rate is slightly higher for the group with occupational disabilities than for the group with secondary limitations, which is somewhat surprising because occupational disabilities are more limiting.

1.4 SUMMARY

When considered in aggregate, most adults in the United States who wish to work are able to obtain employment. Even in 1983, a year with extremely high unemployment by historical standards, over 90 percent of the adult labor force was employed. There were, however, over 6.5 million adults unemployed, and over one-third of those experiencing unemployment sought work for over 15 weeks and one in six unemployed adults suffered over 27 weeks of unemployment. One study estimated that in a year of relatively low unemployment, approximately one-quarter of the unemployed experience about three-quarters of the total weeks of unemployment during the year. For the individuals experiencing long spells of unemployment, the labor market is not functioning well.

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[3]See Employment and Earnings, January 1984. p. 205.

[4]See U.S. Department of Health and Human Services (1982).

Unemployment is not spread evenly across subgroups of the population. While there is little difference between the unemployment rates of adult men and women, there are significant differences among age groups and ethnic groups. Younger adults have higher unemployment rates than older adults. Unemployment rates for blacks are about twice as high as for whites, and Hispanic unemployment rates are between those for blacks and whites.

CHAPTER 2

THE EDUCATIONAL ATTAINMENT OF THE ADULT LABOR FORCE

2.1 INTRODUCTION

This chapter reviews the data on the educational attainment of the adult labor force, including the distribution of educational attainment of the labor force by sex, ethnic group, and age. In addition, the significant rise in the level of attainment in recent years, particularly with regard to high school completion, is discussed. However, educational attainment, as measured by years of schooling completed, does not provide a complete picture of the educational status of the labor force, and we will also address a number of special concerns about the education of the adult labor force.

Vocational education in the United States is offered at the secondary and post-secondary levels to provide students with entry-level preparation for certain occupations. However, not all students who take vocational education do so with the intention of pursuing a career in the field or fields studied -- high school students taking typing courses is a good example. In addition, there are no standardized definitions of what constitutes career preparation in the various vocational fields, so it is difficult to interpret national data on vocational education. It is also sometimes difficult to distinguish between vocational education and training, a subject covered in the next chapter of this report. For instance, clerical occupations may be prepared for in vocational education classes or through training programs. Published information on vocational education is reviewed, but the reader should keep in mind the problems cited above.

Although we frequently think of education as taking place early in one's life, a great deal of adult education takes place each year. Not all adult education is oriented toward receiving a diploma, college degree, or career improvement; much of it is taken for recreation, and some adult education might be better classified as training. We will attempt to sort out the data to get a picture of the relevant adult education that takes place in the United States.

The chapter concludes by addressing two subjects of special interest today -- literacy of the population and language barriers to employment. As noted above, there is a great deal of concern about the quality of education today, especially regarding the number of individuals who might be classified as illiterate or "functionally illiterate." Such individuals may have a difficult time qualifying for jobs, so the size of this population is of special concern. Similarly, individuals with difficulties in English may also face significant barriers to employment.

2.2 THE SIZE AND DISTRIBUTION OF EDUCATIONAL ATTAINMENT

In March 1983, the adult labor force age 25-64 consisted of about 84 million people. Of this total, as shown in Table 2-1, nearly 15 million (18 percent) had less than a high school education; 33 million (40 percent) had a

TABLE 2-1

SIZE AND DISTRIBUTION OF THE MARCH 1983 ADULT LABOR FORCE AGE 25-64 BY SEX, ETHNIC GROUP, AND EDUCATION
(Number in Thousands)

	Men	Women	White	Black	Hispanic Origin	Total
Size of Labor Force	47,903	35,712	72,750	8,592	4,378	83,615
Less than 4 yrs. h.s.	9,303	5,556	11,976	2,525	1,989	14,857
4 yrs. h.s. only	17,404	15,993	29,301	3,459	1,378	33,397
1 to 3 yrs. college	8,459	6,702	13,304	1,483	578	15,159
4 or more yrs. college	12,738	7,462	18,171	1,127	434	20,201
Percentage by Category						
Less than 4 yrs. h.s.	19.4	15.6	16.5	29.4	45.4	17.8
4 yrs. h.s. only	36.3	44.8	40.3	40.3	31.5	39.9
1 to 3 yrs. college	17.7	18.8	18.3	17.3	13.2	18.1
4 or more years college	26.6	20.9	25.0	13.1	9.9	24.2
Labor Force Part. Rate	88.9	61.8	75.1	73.2	70.0	74.9
Less than 4 yrs. h.s.	77.9	43.8	60.9	58.4	61.7	60.3
4 yrs. h.s. only	90.5	62.5	74.1	78.1	76.6	74.5
1 to 3 yrs. college	91.7	68.6	79.4	84.5	80.2	79.8
4 or more years college	94.6	76.5	86.9	91.6	83.6	87.0

Source: Young and Hayghe (1984).

high school diploma but no additional education; 15 million (18 percent) had one to three years of college; and 20 million (24 percent) had four or more years of college.

As Table 2-1 demonstrates, the educational attainment of the labor force differs significantly by sex and ethnic group. A greater percentage of men than women in the adult labor force have less than a high school education (19 percent for men compared to 16 percent for women). Women in the adult labor force are more likely to have a high school diploma than men (45 percent compared to 36 percent), and women are slightly more likely to have one to three years of college (19 percent compared to 18 percent). However, men are more likely than women to have attended college for four or more years (27 percent compared to 21 percent). Thus, men are more represented at both the high and low ends of the educational attainment distribution.

When the distribution of the educational attainment of the labor force is examined by ethnic group, a clear pattern emerges: whites are much more concentrated in the category of 4 or more years of college than blacks or Hispanics and much less concentrated in the category of less than 4 years of high school; for the two middle categories, the percentages of blacks and whites are fairly close, but Hispanics have significantly lower concentrations in these categories. While approximately 17 percent of the adult white labor force has less than a high school education, about 29 percent of the black population and 45 percent of the Hispanic population have less than a high school education. Because English is not the first language of many Hispanics, the lower level of educational attainment is likely to be a greater barrier for them than for blacks.[1]

The third section of Table 2-1 presents labor force participation rates by education, sex, and ethnic group. Within each ethnic or sex category, increased education is associated with higher labor force participation rates.[2]

Table 2-2 presents the educational distribution of the adult labor force by sex and age for 1981, the latest year for which the Bureau of Labor Statistics has published such information. The table shows a pattern of increased levels of educational attainment for the younger members of the

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[1]It should be noted that Hispanic workers tend to suffer less unemployment and earn almost as much as blacks in spite of their lower levels of educational attainment. In 1982, median weekly earnings of Hispanics was $242 per week, and for blacks the comparable figure was $247. In June 1983, the unemployment rate for blacks in the labor force was 20.6 percent and the unemployment rate for Hispanics was 14.0 percent (Source: U.S. Department of Commerce. Statistical Abstract of the United States 1984 104th ed. pp. 406 and 434).

[2]This finding is consistent with the economic theory of human capital, because of the higher wage rates paid to more educated people. For all demographic groups examined, the greatest increase in participation is for high school graduates over those with less than a high school education.

TABLE 2-2

PERCENT DISTRIBUTION OF THE 1981 ADULT LABOR FORCE AGE 25-64 BY SEX, AGE, AND EDUCATION

	25-34 Years	35-44 Years	45-54 Years	55-64 Years	25-64 Years
Men					
Percentage by Category					
Less than 4 yrs. h.s.	13.4	19.9	29.2	33.3	21.5
4 yrs. h.s. only	37.8	36.7	35.2	34.6	36.5
1 to 3 yrs. college	22.3	16.4	13.4	12.9	17.4
4 or more years college	26.5	27.0	22.2	19.2	24.6
Women					
Percentage by Category					
Less than 4 yrs. h.s.	10.5	16.7	23.0	28.6	17.4
4 yrs. h.s. only	43.6	47.0	49.2	46.7	46.1
1 to 3 yrs. college	22.2	17.3	13.8	13.9	17.9
4 or more years college	23.8	18.9	14.0	10.8	18.6

Source: Young (1982).

adult labor force compared to the older members of the labor force. For example, a little more than 33 percent of the 55- to 64-year-old men had less than a high school education in 1981 compared with about 13 percent of the men age 25 to 34; as would be expected, the pattern is similar for women. The percentage of the labor force with only a high school education does not vary a great deal by age. Over time the percentage of younger workers with a college education has increased while the proportion receiving only a high school education has remained almost constant. In 1981, the proportion of men with at least one year of college was about 31 percent for men 55 to 54 years old and 49 percent for those age 25 to 34.

Although the percentage of the population receiving a high school education has remained almost constant, it is not clear whether the quality of that education has remained unchanged. One measure of students' education is their scores on the Scholastic Aptitude Test (SAT). Between 1970 and 1981, the average verbal SAT score of college-bound seniors declined 7.8 percent, and the average math score, 4.7 percent.[3]

The educational attainment of the labor force has changed dramatically in recent years. Part of this change is due to adult education, but most of change results from older workers being replaced by more highly educated youth entering the labor force. Between 1970 and 1981 the proportion of the adult male labor force age 25 to 64 with less than a high school education dropped from 38 percent to 22 percent. During this same period, the share with at least one year of college increased from about 28 percent percent to 42 percent.[4]

Other notable changes in educational attainment have also taken place over the last decade. For instance, women are now partaking in education to a much greater extent than a decade ago. In 1970, only 43 percent of bachelors degrees were received by women, whereas in 1980, this percentage had reached 49 percent. Similarly, the percentage of advanced degrees (masters, first-professional, doctorate) going to women increased from 32 percent in 1970 to 44 percent in 1980.[5]

Another change that has occurred in recent years is the increasing popularity of the General Educational Development (GED) Test as a means of obtaining a high school credential. In 1972, only a little more than 7 percent of all high school degrees awarded were GEDs; by 1980, that number had increased to almost 13 percent.[6]

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[3]U.S. Department of Commerce, Statistical Abstract of the United States, 103 edition, p. 157.

[4]These data are from Young (1982).

[5]These data are computed from information provided in NCES, Projections of Education Statistics to 1990-1991, Volume 1, p. 70.

[6]NCES, Projections, Volume 1, page 69.

Finally, there has been a marked change in the age distribution of college students. More older people, especially women, have been enrolling in institutions of higher education. In 1970, only about 7 percent of all female college students were over 30; by 1980, the number had increased to 25 percent. The change for males is also significant, if less dramatic: in 1970, approximately 14 percent of all male college student were over 30, whereas in 1980, 18 percent were over 30.[7]

It is not a simple matter to determine if the educational attainment mix of the labor force is "the right one." Some analysts have argued that the supply of college graduates has exceeded the demand, leading to depressed labor market conditions for new graduates.[8]

2.3 VOCATIONAL EDUCATION OF THE LABOR FORCE

Vocational education is oriented toward developing skills in nonacademic fields which can be useful in employment or in the home. Courses in vocational education are offered both at the secondary and post-secondary levels and in a variety of settings; secondary vocational education is provided in comprehensive high schools that are not primarily vocationally oriented, vocational high schools that specialize in vocational education but also provide academic courses, and area vocational centers that provide only vocational courses, with the students attending other schools for their academic courses. At the postsecondary level, vocational education is offered at 4-year colleges and universities, 2-year junior colleges, and at a variety of noncollegiate postsecondary schools that do not grant degrees but provide training in one or more vocational fields.[9]

Federal data on vocational education have several problems: Each State defines vocational education independently, and there are problems of double counting enrollments;[10] definitions have not been applied uniformly in all

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[7]NCES, Projections, Volume 1, page 36.

[8]Freeman (1976) presents evidence that in the 1970s the inflation-adjusted starting salaries of college graduates declined below the starting salaries in 1960. Freeman's analysis leads him to conclude that the job market for college graduates would improve in the 1980's, but not lead to the high relative salaries of the 1960's. He also estimates college enrollments and starting salaries through 1990.

[9]See National Center for Education Statistics, The Condition of Vocational Education. 1980, pp. 4-5 for descriptions of all types of noncollegiate postsecondary institutions. These schools include vocational/technical schools, technical institutes, business/commercial schools, cosmetology/barber schools, flight schools, trade schools, art/design schools, hospital schools, and allied health schools.

[10]See National Center for Education Statistics. The Condition of Education. 1983, p. 131. The major source of historical data on vocational education, the Vocational Education Data System (VEDS) has been suspended recently because of problems in data quality.

states;[11] and surveys frequently include vocational education at the postsecondary level in college degree programs.[12]

Table 2-3 presents data on enrollments in vocational programs at the postsecondary level. Although a majority of college students in vocational programs (60 percent) were in the 16 to 24 age bracket, 791,000 people (40 percent) were adults age 25 and over. Two-thirds of those over age 24 were in the 25 to 34 age category, but people of all ages were enrolled in such programs. Women accounted for 58 percent of these students, and blacks and other minorities accounted for 16 percent of the enrollment.

Many of these students worked while completing their education. Nearly one-third of these students worked full time, and 29 percent worked part time; another 29 percent were not in the labor force, and 9 percent were unemployed.

2.4 ADULT EDUCATION OF THE LABOR FORCE

The 1981 Participation in Adult Education (PAE) Survey estimated that approximately 21 million people over age 17 participated in adult education courses in the 12 months before the survey.[13] Of this total, nearly 18 million were in the labor force, and 14 million were in the adult labor force (age 25 and above). Thus, approximately 17 percent of the adult labor force took adult education courses in 1981, with more women than men participating.

Participation in adult education varied significantly by occupation: 23 percent of white-collar workers participated versus 11 percent of blue-collar workers. Participation was highest among health workers (43 percent), physicians and dentists (39 percent), and teachers in primary and secondary schools (37 percent). White-collar workers in managerial, sales, and clerical occupations had somewhat lower participation rates (17 to 20 percent). Farm workers participated the least in adult education (7 percent), and the only blue-collar groups with more than 10 percent participating were craft workers and service workers, both having about 13 percent participation.

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[11]Not all vocational education is intended to provide entry level occupational skills; such courses are called "exploratory" while career-oriented courses are called "occupational."

[12]Data from a survey of the Federal Job Training Partnership Act indicated that about one-quarter of the participants, who are almost all economically disadvantaged, had more than a high school education; it is likely that many of these individuals had vocational education rather than college.

[13]Every three years the U.S. Department of Education adds a supplement to the May Current Population Survey entitled "Participation in Adult Education," (PAE). Some of the responses might be better classified as training; thus, the finding by Goldstein (1982) that only one-third of all participants were counted in the 1978 survey largely reflects his objective of including training as well as adult education.

TABLE 2-3

DISTRIBUTION OF PERSONS ENROLLED IN COLLEGE AND WORKING TOWARD A VOCATIONAL CERTIFICATE, ASSOCIATE OCCUPATIONAL DEGREE, OR OTHER AWARD BASED ON OCCUPATIONAL CURRICULUM, BY SEX, AGE GROUP, RACE, AND LABOR FORCE STATUS: OCTOBER 1982

Characteristics	Number in Thousands	Percentage Distribution			Female as Percent of Total
		Total	Male	Female	
Age group, total	2,006	100.0	100.0	100.0	57.6
16 to 24 years old	1,215	60.0	61.0	60.3	57.6
25 to 34 years old	525	26.2	28.4	24.6	54.3
35 to 44 years old	187	9.3	7.3	10.8	54.3
45 to 54 years old	64	3.2	3.0	3.4	(*)
55 years old and over	13	0.7	0.2	1.0	(*)
Race, Total	2,006	100.0	100.0	100.0	57.6
White	1,686	84.1	86.3	82.5	56.8
Black	250	12.5	9.2	14.8	68.8
Other	69	3.4	4.5	2.7	(*)
Labor force status, total	2,006	100.0	100.0	100.0	57.6
Not in labor force	590	29.4	23.1	34.0	67.0
Employed full-time	640	31.9	39.7	26.3	47.6
Employed part-time	589	29.3	27.0	31.1	61.3
Unemployed	186	9.3	10.2	8.6	53.5

* Base less than 75,000.

Source: National Center for Education Statistics. The Condition of Education, 1984 Edition, p. 124.

Adult education courses were provided in a variety of settings. A majority of the courses, 54 percent, were provided in a school setting, most commonly at a 4-year or 2-year college. Non-school settings included business places, government offices, and community agencies; nearly one-quarter of the courses were provided by employers. Employers were indicated as the source of financial support for adult education in one-third of the cases, more frequently for men (41 percent) than women (26 percent).

It is clear that a significant share of the adult labor force participates in job-related adult education each year. Most of this education is provided to individuals in white-collar jobs, and a positive correlation exists between skill level and participation in adult education. About 80 percent of the job-related adult education taken by members of the labor force was to improve or advance in the current job. Adult education does not appear, however, to be a major source of occupational mobility among adults, as only 550,000 courses were taken with the intention of entering a new occupation and some of these courses were taken by people outside the labor force. Not all adult education is job related; about one-third of the adult education taken by members of the labor force was for other reasons. Finally, it is likely that some of the adult education consisted of brief courses on specific subjects.

2.5 LITERACY AND EDUCATIONAL ACHIEVEMENT

Although the general level of education has been increasing, there is cause for concern about the nearly 15 million members of the labor force who lack a high school education. The U.S. Department of Education (1984) makes the point as follows:

> The increasing technical nature of most jobs and the complexity of knowledge lead many educational practitioners to conclude that high school completion, or the reading skill of a 12th grade student is a basic necessity in the United States of the 1980's.

Although nearly 12 million of the 15 million adults in the labor force who lack a high school education are white, the situation is especially severe for blacks are Hispanics: 29 percent of blacks and nearly half of the Hispanic adult labor force (45 percent) lack a high school education.

Unfortunately, standard definitions of educational quality and literacy do not exist. In this section we will briefly review some of the literature on this subject, but the lack of clear definitions presents major difficulties in assessing the severity of educational deficiencies of the United States labor force.

Data from the Census studies of 1959 and 1979 are presented in Table 2-4.[14] According to the Census measure, only 0.5 percent of the population

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[14]The U.S. Bureau of the Census periodically collects data on illiteracy by asking a sample of respondents, "Can you read and write a simple message in any language?" Although this series dates back to 1870, it is of limited value because one does not know what constitutes a simple message, and illiterate individuals may not answer the question truthfully. See Fisher (1978, p. 29) for a critique of the Census studies and presentation of additional data.

TABLE 2-4

ILLITERACY OF THE POPULATION 14 YEARS OLD AND OVER, BY RACE AND AGE

	Total		White		Black	
	1959	1979	1959	1979	1959	1979
Total, 14 yrs and over	2.2	0.5	1.6	0.4	7.5	1.6
14-24 years	0.6	0.2	0.5	0.2	1.2	0.2
25-44 years	1.2	0.3	0.8	0.2	5.1	0.5
45-64 years	2.6	0.7	1.8	0.5	11.3	2.6
65 years and over	6.5	1.4	5.1	0.8	25.5	6.8

Source: U.S. Department of Commerce, Bureau of the Census. Statistical Abstract of the United States 1982-1983.

reported itself to be illiterate in 1979 compared to 1.0 percent in 1969 and 2.2 percent in 1959. The rate of illiteracy for blacks was at least 4 times the rate for whites in all 3 years.[15]

The U.S. Department of Education notes that "just being able to read and write may not be enough to function even minimally in today's society."[16] The Department of Education also notes that they do not present measures of the learning levels of the adult population "because recent data are lacking on adult educational performance,"[17] so they rely upon educational attainment, 12 years or 8 years, as proxies for literacy. The remainder of this section is based primarily on Fisher's analysis (1978) of three studies of functional illiteracy.[18]

Before presenting specific findings, there are several problems in assessing functional literacy that should be considered. First, as Fisher (1978, p.4) points out, "there are no commonly accepted criteria for literacy. Each study developed its own criteria ..." Basic literacy, in terms of reading and writing skills, is more amenable to the development of specific criteria than "functional literacy." Basic literacy can be defined in terms of mastering a certain vocabulary and reading level, but defining the skills needed to function in society is much more difficult and subjective. To the extent that individuals can find and retain employment, they could be said to be functioning properly. At the other extreme, virtually no one has all the skills required to function in society, and much of the service industry exists to provide services we cannot provide ourselves, for example, accountants who prepare income tax returns. Selecting the precise level where a person becomes "functional" must be somewhat subjective, and it is not surprising that estimates of functional literacy vary widely.

A related problem is developing appropriate instruments and scoring techniques for determining functional literacy. Many studies of functional literacy use forms, such as applications for credit cards, and then base the determination of functional literacy on the percent of items answered correctly. While the use of actual forms that people encounter on the job or

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[15]It is likely that some of the reported decline in iliteracy between 1959 and 1979 is due to reporting errors. The reported rate in 1959 for people 25-44 was 1.2 percent. In 1979 these individuals were 45-64 and their reported illiteracy rate was 0.7 percent.

[16]See U.S. Department of Education The Condition of Education, 1984 Edition, p. 129.

[17] Ibid.

[18]A study by Fisher (1978), which was supported by the Department of Education, reviews what he considers to be the surveys that "provide the best information currently available for assessing the notion that the schools are graduating large numbers of functional illiterates and that they are becoming less effective vis-a-vis the teaching of literacy."

in personal life makes these instruments relevant, the researcher may not have selected the best mix of questions, and it is difficult to see what level of performance should be judged to be the threshold for functional literacy.

Because the requirements to function in society can change over time, some analysts believe that measures of functional literacy must be modified over time. Northcutt et al., (1975, p. 2) state:

> A person is functionally competent only to the extent that he or she can meet the requirements which are extant at a given point in time. If the requirements change and the individual does not adapt by either acquiring more or different knowledge and skills, then the person becomes less competent. Functional competence is a dynamic process, rather than a static state.

Thus, it is difficult to compare different studies done at the same time, and it might be impossible to draw conclusions about the level of functional literacy in different years even if the same instrument is used.

A summary of the findings from the review of the literature on functional illiteracy by Fisher (1978) is presented in Table 2-5. The three studies cited all took place between 1970 and 1975. Findings of functional illiteracy range from 13 percent in the 1970 Harris Survey to approximately 25 percent in the 1973 Adult Functional Reading Survey.[19] In all studies reviewed by Fisher, illiteracy rates are higher for older individuals and those with less education. It is possible that the higher rate of functional illiteracy for older people is somewhat due to loss of skills acquired earlier, but a more likely explanation is that older individuals have, on average, less education. Fisher believes that the studies overstate functional illiteracy to some extent because of the high rates found for high school graduates (13 percent in the Adult Performance Level Project, for example) and among people employed as professionals and managers (14 percent in the Adult Functional Reading Study). There are a number of possible explanations for the high reported functional illiteracy in these groups, such as classification errors in education or occupation, so it is difficult to say how the findings should be adjusted.

Because of the great difficulty in defining and measuring functional illiteracy, and the fact that the measures probably need to be changed frequently, it is difficult to apply the concept of functional illiteracy to a study of the labor market. In some cases employers have adjusted to low skill levels of available workers by substituting capital for labor. For example, in many fast-food restaurants, cash registers compute the prices of items, the appropriate tax, and the change to be received by the customer; rather than requiring skills in addition, subtraction, and multiplication, the employee only needs to know how to count.

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[19]An overall average rate of illiteracy for the Adult Functional Reading Study was not provided by Fisher (1978).

TABLE 2-5

SUMMARY OF STUDIES OF FUNCTIONAL ILLITERACY

Study	Year	Sample	Findings
Louis Harris & Assoc.	1970	1,985 people over age 15	13% in "marginal survival" category or lower
Adult Performance Level Project	1975	7,500 people over age 17	19% classified as "adults who function with difficulty"
Adult Functional Reading Study	1973	7,500 people over age 15	28% of 16-19, 23% of 20-29, 26% of 30-59, and 39% of these 60 and over classified as "illiterate"

Source: Fisher (1978).

2.6 LANGUAGE AS A BARRIER TO EMPLOYMENT

A significant share of the United States population faces special barriers to employment because of language problems. When the 1980 census was taken, over 14 million individuals, representing about 6 percent of the population, reported that they were foreign born and many of these people did not speak English before coming to the United States. In addition, many immigrants speak their native language in the home, so their children do not have as much exposure to English as other children.

Table 2-6 shows the characteristics of the labor force according to the language spoken at home.[20] The first column of the table shows that although the vast majority of the population age 16 and over speak English at home, 19 million people speak another language in the home -- 8.5 million speak Spanish and 10.3 million speak another language.[21] Of those who speak another language in the home, nearly half of those who speak Spanish and 61 percent of those who speak a different language responded that they speak English well.

Among the population that speaks a language other than English in the home, those who speak English well or very well have employment outcomes that are close to the population as a whole. For those whose language at home is Spanish and who speak English well or very well, the labor force participation rate is higher than for the total population. For those who speak a language other than Spanish at home but speak English well or very well, the participation rates are 5 to 10 points lower. In terms of unemployment rates, those who speak Spanish in the home and speak English well or very well have slightly higher unemployment rates than the population as a whole, 8.6 percent

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[20]The Bureau of the Census asked a sample of respondents if they or other members of the household spoke a language other than English at home. If the respondent used another language at home, he or she was asked whether the ability to speak English could best be classified as "very well," "well," "not well," or "not at all." Some findings from this survey are presented in Table 2-6. One possible problem with these data is that there are an unknown number of illegal immigrants in the United States, sometimes estimated as high as 6 million, and these immigrants may be undercounted in the census.

[21]Although the Census data combine all who speak Spanish in the home, Hispanics in the United States should not be viewed as a single group. About 60 percent of Hispanics in the United States are Mexican-American, 14 percent are Puerto Rican, 12 percent are "other Spanish," 8 percent are Central and South Americans, and 7 percent are Cubans. These groups had significantly different employment experiences, with Cubans having the most positive outcomes and Puerto Ricans having the most negative employment outcomes.

TABLE 2-6

LABOR FORCE CHARACTERISTICS OF POPULATION
AGE 16 AND OVER BY LANGUAGE SPOKEN AT HOME IN 1980

	Population (thousands)	Partici-pation Rates	Employed (thousands)	Unemployment Rate
Persons in Households Speak Only English	165,614	63.1	96,727	6.5
Speak Spanish at Home				
Ability to Speak English				
Very well	4,104	67.9	2,538	7.8
Well	2,080	64.0	1,210	8.6
Not well	1,430	60.2	772	10.1
Not at all	840	48.5	354	13.0
Speak Another Language at Home				
Ability to Speak English				
Very well	6,285	58.3	3,429	5.4
Well	2,660	52.1	1,288	6.4
Not well	1,067	47.6	462	8.8
Not at all	249	35.1	77	11.3

Source: U.S. Department of Commerce, 1980 Census of Population, Vol. 1 Characteristics of the Population; Chapter D, Detailed Population Characteristics; Part 1 United States Summary; Section A, United States. Table 258 pp. 1-18 and 1-19.

and 7.8 percent compared to 6.5 percent for the population as a whole.[22] However, among those who speak a language other than Spanish in the home and speak English well or very well, the unemployment rate is slightly lower than for the entire U.S. population. The employment-population ratios for those who speak a language other than English in the home and speak English well or very well are close to the ratio for the population as a whole; only those who speak a language other than Spanish in the home and speak English well have a significantly lower employment-population ratio (.48 compared to .58 for the population as a whole).[23]

It is among members of the population who do not speak English at all or do not speak it well that employment problems are significant. For these individuals, the labor force participation rates range from 35 percent to 60 percent, and the unemployment rates range from almost 9 percent to 13.0 percent. However, to put these figures in perspective, the unemployment rate for blacks in 1980 was 13.2 percent, which is higher than the unemployment rate for any of the groups with language barriers.

One cannot help but conclude that language does not appear to be as strong a barrier to labor market participation in the United States as might be expected. We have shown that most people in the United States who speak a language other than English in the home and also speak English well or very well do almost as well as the population as a whole in terms of labor force participation, employment, and unemployment. For those who do not speak English well, there is somewhat poorer performance in the labor market, but the performance is not worse than for blacks. Perhaps the most surprising finding is that almost 40 percent of those who speak no English are employed compared to 58 percent of the total population. However, difficulty with English may be a barrier to upward job mobility.

2.7 SUMMARY

Nearly 20 percent of the adults in the labor force, almost 15 million people, lack a high school diploma, and almost one-quarter of the labor force has at least four years of college. Adult women in the labor force are slightly less likely than men to be high school dropouts or college graduates. There are major differences in educational attainment among ethnic and racial groups. Among whites, about 1 in 6 members of the adult labor force lacks a diploma, but nearly one third of blacks and almost half the Hispanic labor force lacks a high school diploma. Younger members of the adult labor force are better educated than older members, so educational

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[22]For a detailed review of the employment situation of Hispanics, see National Commission for Employment Policy. Hispanics and Jobs: Barriers to Progress. (1982). The NCEP report concludes that difficulty with English is the major source of labor market barriers for Hispanics followed by low educational attainment.

[23]The employment-population ratios are calculated from Table 2-6 by dividing the third column, number employed, by the first column, population.

attainment can be expected to rise in the future; while 1 in 3 men ages 55 to 64 has less than a high school education, only 1 in 8 men ages 25 to 34 lacks a diploma. Younger men are somewhat more likely than older men to have 4 or more years of college, and younger women are much more likely than older women to have 4 or more years of college.

A substantial number of adults enroll in education courses each year. In vocational education, adults account for 40 percent of the total enrollment. Slightly over half the adults enrolled in vocational education courses are women, and blacks constitute about the same share as they do of the labor force. Looking at all adult education, the most recent data available (1981) suggest that 1 in 9 adults in the labor force is enrolled each year in job-related adult education. Participation rates are much higher for individuals in white-collar jobs than blue-collar jobs.

Literacy is a difficult concept to define and measure, so there is a large range in estimates of the literacy of the labor force. While under 1 percent of the population reported itself to be illiterate in a survey, studies in the 1970's found between 13 and 30 percent of the population to be "functionally illiterate," lacking sufficient educational skills to fully participate in society. There is no standardly accepted definition of functional literacy, and some researchers believe that the requirements are increasing.

Individuals who do not speak English well also face barriers to labor force participation. Such individuals have lower labor force participation rates and higher unemployment rates than individuals who speak English well. Language itself may not be as important as some other barriers, and the 1980 census found unemployment rates for individuals who speak no English or did not speak it well to be lower than the rate of blacks.

CHAPTER 3

TRAINING OF THE ADULT LABOR FORCE

3.1 INTRODUCTION

Few jobs in the United States today are suitable for completely unskilled workers. In some cases, all that is required is basic literacy in reading and mathematics, and for individuals in these jobs the nation's elementary and high schools provide the skills needed to perform the work. Many jobs require skills beyond basic literacy, and there are many ways in which such skills can be acquired -- vocational education programs at the secondary or post-secondary level, technical institutes and junior colleges, four-year colleges and universities, government training programs, apprenticeship programs, correspondence courses, and formal and informal training on the job. In this chapter we address the subject of training that workers receive to perform their jobs.

Describing the training received by the labor force is difficult because of conceptual problems in defining and measuring training and because of a lack of good sources of data on the training received by the labor force. As we shall describe in more detail below, estimates of the training received by the labor force vary widely in a given year; there are no statistics for training attainment comparable to those published by the Federal government for educational attainment.

No clear distinction exists between the terms education and training. Education is often associated with the acquisition of general skills such as reading, writing, and arithmetic, while training is more often associated with the acquisition of skills for jobs. This distinction is not sharp, however; most vocational education programs provide students with specific job skills, and some training programs provide students with educational skills and sometimes lead to high school diplomas or equivalency certificates (GEDs).

The units of training are much more difficult to define than the units of education. Although there may be significant quality differences between the high school education of two individuals, there is general agreement on what constitutes an eighth-grade education, a high school diploma, or a college degree. Even at a more disaggregated level, most people would know what a three-credit college course in biology or a one-year high school algebra course mean. Training programs, on the other hand, can last for a few hours, such as a course on how to operate a simple machine, or they can last four or more years, as is frequently the case in apprenticeships.

Although education is usually considered valuable for its own sake, training is usually related to a specific job or occupation. A training program may provide all the skills needed for an entire occupational career (e.g., barbers and hair stylists) while other training may be useful for one

year or less (e.g., training provided to government workers on preparing budget documents); thus, its value may depreciate over time.[1]

As will be described in more detail below, many workers acquire skills informally on their jobs. This method of skill acquisition is often referred to as "on-the-job training" (OJT), but the Federal government uses this term to refer to formal contractual arrangements where employers are subsidized for the costs of bringing unskilled workers up to the normal skill levels.[2]

A final problem in attempting to measure the training that takes place in the United States is that the data are poor. Private sector firms do not necessarily keep good records of the individuals they train, and it is unlikely that the records of individual firms would be consistent. As Goldstein (1980, p. 22) notes:

> How much and what kind of training goes on, who gives it, where it is given, who gets it, how much it costs, and what good it does have not been measured adequately in the United States.

Most of the data that do exist are from surveys covering a single year, so it is difficult to determine the extent to which training is provided to the same workers or different workers over time.

Data on many Federal government training programs also have problems. The U.S. Department of Labor stopped collecting data on the occupational fields of apprentices in 1979, and the fields of training for participants under the Comprehensive Employment and Training Program (CETA) were published for only seven broad categories.

For all the reasons cited above, it is impossible to develop good estimates of the stock of training attained by the U.S. labor force. Thus,

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[1]The concept of training as an investment in "human capital" is clearly relevant. Just as physical capital varies in terms of its useful life, so does training. Moreover, many training courses also have a salvage value like physical capital. For example, a training course on how to operate a particular word processing machine may have value beyond the time when the machine is no longer used or when the person trained changes careers. If the person is assigned to a new machine, it is likely that less training will be required if he or she was trained on a different machine than if he or she had no such training. In some instances, the training may help reduce training for a new occupation; for example, computer programming may be helpful in training to be a systems analyst.

[2]Although Mincer (1962) and others have attempted to estimate how much informal OJT takes place in the economy, we will emphasize formal training in this study; it is worth noting, however, that the rough estimate by Stromsdorfer (1975) of the amount of informal training that occurs each year is in the same range as many of the estimates of formal training ($46 billion in 1975).

this chapter does not include tables parallel to those on educational attainment. This chapter is organized as follows. First, we review the efforts to estimate the annual level of training in the United States. We then discuss those government training programs that are overseen by the government -- both apprenticeship and the Job Training Partnership Act (JTPA). Finally, we review data on the sources of training in the United States.

3.2 ESTIMATES OF ANNUAL TRAINING OF THE LABOR FORCE

Over the past 10 years, several researchers have tried to estimate how much employee training occurs on an annual basis. Problems in estimation arise because training may be sponsored by the government, by the employer, or the individual, and it may take place on the job, in a school, or in a special training institution. No single data source captures all such training, and much of the training is overlooked because of inconsistent and poor recordkeeping by employers and recall problems by workers. When several data sources are combined, there is frequently a risk of double counting the training provided. Finally, there is the problem of whether training should be considered separately from education, and if so, how. The existing studies of training of the labor force can easily be criticized for their shortcomings, but it is not possible to adjust for these problems and correct the estimates. In this section we will therefore present some of the most frequently cited estimates; the reader is referred to Carnevale and Goldstein (1983) and Adams et al. (1982) for critiques of the existing studies.

A 1977 study estimated education and training sponsored by industry in 1975.[3] The study's key findings were that 3.7 million workers, representing 11 percent of employees in large firms, took part in in-house courses provided by employers during working hours, and an additional 700,000 workers, representing 2 percent of the workforce in large firms, were enrolled in company courses provided outside of working hours. Based on other data, the study also concluded that 1.3 million employees in large firms took part in tuition-aid programs. Larger firms tended to spend more per employee on training than smaller firms, and financial and insurance companies provided more training than firms in other industries.

A commonly cited estimate of employer-provided training was developed by Robert Craig of the American Society of Training and Development. Craig estimated that about 50 percent of the workforce (50 million workers) receive such training each year at an annual cost of $30 to $40 billion. Carnevale and

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[3]Lusterman (1977) restricted his sample to firms with 500 or more employees, so it is not likely to be representative of all firms. In addition, Lusterman notes that the response rate was only 22 percent overall and 11 percent among firms with 500 to 999 employees. Although Lusterman attempted to correct for the differential response rates by firm size, the low response rate calls into question whether or not his findings are unbiased.

Goldstein (1983) review several other studies of employee training.[4] One study simply assumes that all firms provide as much training as the American Telephone and Telegraph Company and concludes that $100 billion was spent on employee training in 1975.[5] Carnevale and Goldstein also report the findings from an unpublished study by Goldstein in 1981 in which he estimated that industry and government provided about 17.6 million courses to 11.1 million workers. In another study, Goldstein (1982) estimated that in 1978 the total number of individuals who participated in education or training courses was 41 million. Goldstein's 1978 estimate includes all types of education and training, not just job-related or employer-provided training.

It is clear that little is known even about the most basic aspects of employee training in the United States. Even if we had precise estimates of the number of participants in training provided by employers and the expenditures for this training, we would need a great deal more information before we would understand the nature of the training provided.

3.3. GOVERNMENT TRAINING PROGRAMS

The Federal government's involvement in training includes activities in promoting and registering apprenticeship programs and providing the funding for training and other employment-related activities for selected groups in the population. In this section we discuss the apprenticeship system in the United States and training provided under the Job Training Partnership Act (JTPA), the two largest areas of Federal activity.

3.3.1 Apprenticeship

Apprenticeship is one of the oldest methods available for learning a skilled trade or craft. In apprenticeship programs, individuals learn the skills necessary to be journeypersons through a combination of training on the job and classroom instruction. To assure that the apprentices learn all aspects of the occupation, many programs rotate apprentices through various jobs. Classroom instruction is usually set at 144 hours per year, and the instruction is frequently offered through junior colleges and technical institutes. Apprenticeship programs most commonly last 3 or 4 years, but some programs are 1 year long and others require 5 years. Apprenticeship programs are either joint programs operated by unions and employers or nonjoint programs operated solely by employers. The majority of registered

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[4]Carnevale and Goldstein (1983, p. 36) conclude, "It should be apparent that none of the above estimates is definitive, and that they are all put together from scraps of information with heavy dollops of ingenuity and bold assumptions."

[5]Lusterman (1977, p. 14) found that firms with over 10,000 employees spent an average of $77.60 per employee, and firms with 500 to 999 employees spent an average of $26.90 per employee in 1975. Among firms with fewer than 500 employees, training expenditures are likely to be considerably lower because many small firms lack the resources to provide training. Thus, the $100 billion estimate is probably vastly overstated.

apprentices are union members and the majority of the registered apprenticeship programs are operated solely by employers, although these tend to be smaller than the joint programs.

Although no Federal funding is provided for apprenticeship training, the National Apprenticeship Act of 1937, often referred to as the Fitzgerald Act, was established to promote apprenticeship training. Under the Fitzgerald Act, the Federal Government established the Bureau of Apprenticeship and Training (BAT), which is responsible for setting standards for programs to be registered with BAT. An apprentice who completes a registered program has a credential that shows potential employers that his/her training has met certain standards. An employer whose program is registered and who performs work for the Federal Government can pay apprentices a lower wage rate than that of the journeyperson. Many employers, however, prefer not to register their apprenticeship programs, and no data on unregistered programs are available.[6]

The latest period for which information on registered apprenticeship programs is available is fiscal year 1984, October 1, 1983, through September 30, 1984. At the beginning of this period, there were 253,000 registered apprentices and at the end there were 233,000. During the one-year period, 69,000 new apprentices were added, 42,000 apprentices dropped out of their programs, and 49,000 apprentices completed their programs. As of September 30, 1984, almost 7 percent of the apprentices were women and nearly 19 percent were minority group members. The total number of registered programs at the end of the fiscal year was 48,000, of which 34,000 were in industries other than construction; there was a net loss of 2,000 apprenticeship programs during the fiscal year.

Table 3-1 summarizes the occupational data on apprentices for 1979, the latest year for which the Department of Labor published such information. Construction occupations, accounting for 59 percent of the total, had the greatest share of apprenticeships. Production occupations accounted for 17 percent of the total, and mechanics and repairers accounted for 13 percent. Minorities were more than 40 percent of the apprentices among cement masons and plasterers and under 10 percent among optical workers and tool and dyemakers. Women were under 20 percent in all occupations except compositors (20 percent) and barbers and beauticians (63 percent).[7]

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[6]It has been estimated that about 50 percent of all apprenticeship programs are unregistered (Department of Labor, 1984) and that almost 40 percent of the apprentices at any time are in unregistered programs (Goldstein, 1982). Neither source provides documentation on how or where they obtained their estimates. Because there are no standards for unregistered programs, the unregistered programs may not be as rigorous as registered programs.

[7]The 1979 figures on apprenticeship enrollment by sex and minority status are taken from U.S. Department of Labor Bulletin 81-22, 1981. BAT does not publish data on the age of apprentices, but many apprenticeship programs have an upper age limit of 30 for enrollment.

TABLE 3-1

OCCUPATIONAL DISTRIBUTION OF REGISTERED APPRENTICES AS OF DECEMBER 31, 1979

Trade	Number
Technologists and technicians, except health	804
Service occupations	6,148
Mechanics and repairers	40,900
Construction occupations	191,926
Production occupations	53,374
Transportation and material moving occupations	6,539
Miscellaneous trades, not classified above	24,175
Total	323,062

Source: Bureau of Labor Statistics, U.S. Department of Labor. Occupational Projections and Training Data 1984 Edition, p. 102.

3.3.2 Training Under the Job Training Partnership Act (JTPA)

Since the early 1960s, the Federal government has sponsored training for selected segments of the population. Unlike apprenticeship, these training programs receive Federal funding and generally require participants to meet income or unemployment eligibility criteria. The bulk of training services are provided currently under the Job Training Partnership Act (JTPA).[8]

JTPA, which became effective in October 1983, provides training for economically disadvantaged adults and youth to improve their employment and earnings and reduce their receipt of public assistance.[9] Programs supported under JTPA include training of economically disadvantaged youth and adults in Title IIA, a summer jobs program for economically disadvantaged youth in Title IIB, a training program for dislocated workers in Title III, and a series of national programs in Title IV.[10] The programs under Title IIA and Title III are the major programs providing training to adults, so attention here will be restricted to these programs.

Under JTPA, eligibility in the Title IIA program is restricted to the economically disadvantaged.[11] Allowable program activities include classroom

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[8]Recipients of Aid to Families with Department Children (AFDC) are required to participate in the Work Incentive Program (WIN) if they are "job ready" and do not have very young children. In the past, WIN programs frequently included some vocational training, but budget cuts and program redirection in recent years have eliminated most of the training. In states designated as WIN Demonstration States, training is sometimes provided. Also, in States that have Community Work Experience Projects (CWEP), commonly called workfare, welfare recipients are sometimes provided with training rather than work experience. Workers who lose their jobs due to imports may receive support for training under the Trade Adjustment Assistance (TAA) program.

[9]The major predecessors to JTPA were the Manpower Development and Training Act of 1962 (MDTA), which originally provided training to individuals who lost their jobs due to automation but later focused on the economically disadvantaged, and the Comprehensive Employment and Training Act of 1973 (CETA), which provided training and subsidized employment (public service employment and work experience) to the economically disadvantaged and cyclically unemployed workers. For descriptions of earlier training programs, see Perry et al., and the annual Employment and Training Report of the President.

[10]National programs supported under Title IV include the Job Corps, the Indian and Native American Program; the Migrant and Seasonal Farmworker Program; a veterans employment program; the Research, Development, and Evaluation Program; and the Pilot and Demonstration Program.

[11]Title IIA programs are operated by local units of government called service delivery areas (SDA's) in conjunction with private industry councils (PIC's), which include a majority of members from the private sector. SDA's are permitted to serve up to 10 percent nondisadvantaged individuals with other employment barriers.

training (both vocational and educational), on-the-job training, job search assistance, transition services, and work experience. In JTPA programs, the term "on-the-job training" (OJT) refers to a contractual arrangement with employers where the employer receives a subsidy for the cost of training a JTPA participant while he or she is working on the job; such training may be formal or informal. The most common form of subsidy in OJT is 50 percent of the salary for the first 6 months of employment.

The Title III program for dislocated workers is a state-level retraining program for workers who are laid off in declining industries, lose their jobs because of a plant closing, or are long-term unemployed. States are required to match Federal funds, but the amount the State must contribute is reduced if the State's unemployment rate is above the national average. The Title III program is more flexible than Title IIA in terms of eligibility requirements and allowable activities. Funding for the Title IIA program was $1,886 million in fiscal year 1984, and the Title III program included $223 million in Federal funds.[12]

Data from the Job Training Longitudinal Survey (JTLS) estimate that 585,000 individuals enrolled in JTPA during the first 9 months of operation.[13] Of this total, 355,000 were over age 21. Not all adults enrolled in JTPA received training, however -- 75,000 received job search assistance, 10,400 received work experience, and 30,900 received other services -- leaving 239,100 enrolled in classroom or on-the-job (OJT) training. Thus, slightly over 40 percent of all enrollees in Title IIA of JTPA were adults receiving training. Some of the adults enrolled in classroom training may have been receiving basic education rather than vocational training. The most recent data available from CETA, from fiscal year 1979, indicate that 38 percent of those enrolled in classroom training were not trained in any occupational area. If this proportion is the same in JTPA, only about 30

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[12]Unlike most Federal programs which operate on a fiscal year basis of October 1 through September 30, JTPA operates on a program year running from July 1 through June 30. The 1984 fiscal year appropriation provides funding for July 1, 1984, through June 30, 1985.

[13]The Job Training Longitudinal Survey (JTLS) gathers data on a sample of 6,000 enrollees and 3,000 terminees per quarter from Title IIA and Title III programs in a sample of 194 SDA's through local SDA records. Administrative JTPA data are contained in the JTPA Annual Status Report (JASR), which sums the data provided by SDAs on a limited number of data items. Data reported here for Title IIA are taken from the JTLS because of the greater level of detail provided. Since JTLS Title III data are not yet available, the JASR has been used for Title III information; data from the two sources are always within 10 percent on major items. For a comparison of JTLS and JASR data, see U.S. Department of Labor "Summary of JTLS Data for JTPA Title IIA: Enrollments and Terminations During the Transition Year" Appendix B, 1984.

percent of the enrollees in Title IIA are adults age 22 and over enrolled in vocational training.[14]

Characteristics of adult enrollees in JTPA Title IIA training are presented in Table 3-2. Women make up 60 percent of the enrollees in classroom training but only 40 percent of the enrollees in OJT. There are significant numbers of minority group members in the program, especially in classroom training where blacks constitute 32 percent of the enrollees and Hispanics 10 percent; in OJT, blacks are 20 percent of the enrollees and Hispanics 7 percent. The programs serve young adults in large measure, with half the adult classroom training enrollees and two-thirds of the OJT enrollees falling in the 22 to 29 age category. Only 6 percent of the classroom training enrollees and 7 percent of the OJT enrollees are not economically disadvantaged. At application half of the classroom training enrollees and 36 percent of the OJT enrollees received public assistance in the form of AFDC, general assistance, refugee assistance, and/or food stamps.

The most striking aspect of the data in Table 3-2 is the high level of educational attainment of the enrollees. Over half the enrollees had a high school education, and another quarter of the enrollees had some education past high school. This is unexpected when we consider that over 90 percent of the enrollees were economically disadvantaged and half received public assistance. For JTPA participants, a high school education or more was clearly not a guarantee of labor market success.

Data on the occupational areas in which CETA participants received training are presented in Table 3-3.[15] For men in classroom training, crafts occupations were the most prevalent, with 44 percent of the participants, and operatives came in second with 29 percent of the participants. Women in classroom training were concentrated in clerical (55 percent) and service (21 percent) occupations. In OJT, the distributions were somewhat different. Approximately one-third of the men in OJT were in craft training and another third were trained to be operatives. Women in OJT were most concentrated in the clerical area, 36 percent, and in operative occupations, 31 percent.

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[14]Several factors should be kept in mind in reviewing the figures in the text. First, JTPA is intended to emphasize services to youth; the law requires 40 percent of the funds to be spent on youth. Second, the CETA data cited are for all age groups, and it is likely that education was more frequently provided to youth. Finally, some of the individuals not reporting an occupational area may have simply not responded properly to the questions asked. However, it is clear that fewer than half of the enrollees in JTPA were adults age 25 and over enrolled in vocational training. Data on enrollment in occupational areas in CETA training are from Westat (1984) Table 9.

[15]The most recent published data are for fiscal year 1979. Data on occupational areas are not yet available for JTPA.

TABLE 3-2

PERCENT DISTRIBUTION OF JTPA TITLE IIA ENROLLEES
OCTOBER 1983 THROUGH JUNE 1984
AGE 22 AND OVER BY SELECTED CHARACTERISTICS

Selected Characteristics	Classroom Training	On-the-Job Training
Total Enrollees	146,800	92,300
Sex		
Male	40%	59%
Female	60	41
Minority Status		
White (excluding Hispanic)	52	68
Black (excluding Hispanic)	32	20
Hispanic	10	7
Other	5	4
Age at Enrollment		
22-29	50	53
30-44	40	37
45-54	7	8
55 and older	3	3
Economically Disadvantaged		
No	6	7
Yes	94	93
Receiving Public Assistance at Application		
No	50	64
Yes	50	36
Education Status		
School dropout	21	25
Student (high school or less)	1	1
High school graduate (not past high school)	54	53
Past high school education	24	23

Source: U.S. Department of Labor. "Summary of JTLS Data for JTPA Title IIA Enrollments and Terminations During the Transition Year." 1984. Table A-2.

TABLE 3-3

PERCENT DISTRIBUTION OF CETA PARTICIPANTS IN VOCATIONAL TRAINING BY SEX AND OCCUPATIONAL AREA OF TRAINING FOR FY79 ENROLLEES

Occupational Area	Classroom Training			OJT		
	Total	Male	Female	Total	Male	Female
Total	100	100	100	100	100	100
Professional and Technical	9	9	9	5	5	5
Clerical	37	9	55	17	5	36
Crafts	21	44	6	23	34	4
Operatives	15	29	7	32	32	31
Nonfarm Labor	1	2	-	8	11	3
Service	16	7	21	9	6	14
Other	2	2	2	7	7	7

Source: Westat, Inc. CLMS Follow-up Report No. 12: Post Program Experiences, with Pre/Post Comparisons, for Terminees Who Entered CETA During FY 1979. 1984, Table 9.

Of those who completed Title IIA training in JTPA during the initial program year, the entered employment rate for those over age 21 was 57 percent for those in classroom training and 80 percent for those over age 21 who were in OJT. The Department of Labor does not yet have data on whether the employment obtained was related to the field of training.

It should be kept in mind that JTPA Title IIA programs serve only a very small proportion of those eligible. One study estimated that on an annualized basis under 2 percent of the eligible population participated in the programs during the transition year.[16] While not all eligible people would like to participate, the JTPA programs clearly serve a very small fraction of the eligible population at current funding levels.

The JTPA Annual Status Report (JASR) indicates that 96,100 participants enrolled in Title III during the transition year.[17] Of these, 53 percent also terminated during the 9-month period. Nearly all the terminees, 95 percent, were age 22 or over. A majority of the terminees were male (68 percent), and most of the terminees were high school graduates (78 percent). Of those who terminated, 72 percent were reported as having entered employment.

3.4 SOURCES OF TRAINING FOR WORKERS TO QUALIFY FOR JOBS AND IMPROVE THEIR PERFORMANCE

Although the estimates are not precise, there is evidence that more than 25 percent of the population over age 17 participates in an adult education or training program in any given year. Not all, however, take such courses to obtain jobs or improve job-related skill. Some take courses for recreation or self-improvement, some because they cannot find jobs in their field of training, and some seek better opportunities in an unrelated occupation.

Table 3-4 shows the sources of skill acquisition for workers in 12 broad occupational categories.[18] (Note that respondents were asked to provide all

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[16]See Hunt, Allan H. and Kalman Rupp.

[17]For Title III of JTPA, only JASR administrative data are available at present, so very little detail can be presented. No data are available at present on what percent of the Title III participants received training, but many observers believe a high proportion of Title III participants have received job search assistance rather than training.

[18]The Employment and Training Administration supported a special supplement to the January 1983 Current Population Survey on how workers obtained the skills required for their occupations and the extent to which workers obtained training to improve job performance. It should be kept in mind that the survey focuses on the entire workforce age 16 and over, rather than just adults age 25 and over, and that it does not address training for past or future jobs.

TABLE 3-4
SOURCES OF TRAINING NEEDED BY WORKERS TO QUALIFY FOR THEIR CURRENT JOBS, BY MAJOR OCCUPATIONAL GROUP

Sources of training needed by workers to qualify for their current jobs, by major occupational group

Occupational group	Sources of training needed for obtaining current job											
		School										
				Post-high school vocational education								
	Any source of training	Any school	High school vocational education	Private	Public	Junior college or technical institute	College, 4 years or more	Formal company[1]	Informal OJT[2]	Armed Forces	Correspondence courses	Friends and others
Total, age 16 and over												
Number (in thousands)	53,890	28,075	4,692	2,098	1,586	4,965	16,078	9,418	27,004	1,902	777	3,205
Percent of total employment	55	29	5	2	2	5	17	10	28	2	1	3
Executive, administrative, and managerial occupations												
Number (in thousands)	7,738	4,674	333	169	134	581	3,638	1,346	4,242	314	140	341
Percent of occupational employment	71	43	3	2	1	5	34	12	39	3	1	3
Professional specialty occupations												
Number (in thousands)	11,797	10,397	208	367	213	906	8,961	1,184	2,767	281	118	331
Percent of occupational employment	93	82	2	3	2	7	70	9	22	2	1	3
Technicians and related support occupations												
Number (in thousands)	2,579	1,759	149	168	185	600	744	422	962	152	54	47
Percent of occupational employment	85	58	5	5	6	20	24	14	32	5	2	2
Sales occupations												
Number (in thousands)	4,867	1,643	185	163	90	356	941	1,315	3,148	90	113	330
Percent of occupational employment	43	15	2	1	1	3	8	12	28	1	1	3
Administrative support occupations, including clerical												
Number (in thousands)	9,157	5,262	2,659	506	367	1,282	976	1,198	4,945	136	101	198
Percent of occupational employment	57	33	16	3	2	8	6	7	31	1	1	1
Private household occupations												
Number (in thousands)	81	15	9	2	0	0	4	10	36	0	0	45
Percent of occupational employment	8	2	1	0	0	0	0	1	4	0	0	5
Service workers, except private household												
Number (in thousands)	4,397	1,604	207	442	195	461	316	1,104	2,233	141	23	216
Percent of occupational employment	36	13	2	4	2	4	3	9	18	1	0	2
Farming, forestry, and fishing occupations												
Number (in thousands)	862	259	75	15	16	58	128	41	507	7	5	335
Percent of occupational employment	28	8	2	0	1	2	4	1	16	0	0	11
Precision production, craft, and repair occupations												
Number (in thousands)	7,603	1,817	606	193	280	568	282	1,945	4,710	599	188	939
Percent of occupational employment	65	16	5	2	2	5	2	17	40	5	2	8
Machine operators, assemblers, and inspectors												
Number (in thousands)	2,742	479	196	45	79	115	69	476	1,957	81	22	186
Percent of occupational employment	37	6	3	1	1	2	1	6	26	1	0	3
Transportation and material moving occupations												
Number (in thousands)	1,462	97	34	23	10	18	10	311	1,028	80	7	185
Percent of occupational employment	36	2	1	1	0	0	0	8	26	2	0	5
Handlers, equipment cleaners, helpers, and laborers												
Number (in thousands)	605	69	30	6	16	21	7	68	468	20	7	54
Percent of occupational employment	16	2	1	0	0	1	0	2	13	1	0	1

[1]A formal company training program such as apprenticeship training or other type of training having an instructor and a planned program.

[2]Informal training from a friend or relative or other experience not related to work.

NOTE: All items are nonadditive, many workers reported more than one source of training.

Source: Carey and Eck (1984).

sources of training, so the columns cannot be added.) Overall, 55 percent of the workers, representing nearly 54 million individuals, responded that they needed some form of skills or training to obtain their jobs. The most common ways of obtaining skills were through school (29 percent) and informal on-the-job training (28 percent). College programs of 4 or more years provided qualifying skills for 17 percent of the workforce, and 10 percent received formal, company-sponsored training. High school vocational education, postsecondary vocational education, and junior colleges and technical institutes were listed as sources by 5 percent or less of the workforce. Somewhat surprisingly, training received in the armed forces was listed as a source by only 2 percent of the workforce.

As would be expected, the percentage of workers who required training and the sources of training varied considerably among occupational groups. Executive, professional, and technical workers reported the greatest need for training to obtain their jobs. Among executive, administrative, and managerial workers, 71 percent responded that they required specific skills for their jobs. A greater percentage of these workers obtained their skills from informal on-the-job training (39 percent) than from college (34 percent). Among professional specialty workers, 93 percent required specific skills to obtain their jobs, with college the most cited source (70 percent) and informal OJT the second most-cited source (22 percent). Technical workers required specific skills in 85 percent of the cases, but only 24 percent of the technical workers received their skills from a four-year college; many technical workers received their skills from junior colleges and technical institutes (20 percent), postsecondary vocational education (11 percent), and informal OJT (32 percent).

Sales occupations include a wide variety of positions ranging from retail sales, where little skill is required, to very technical jobs such as computer sales, where a great deal of skill is required. Overall, 43 percent of sales workers reported that they required specific skills to obtain their jobs, with informal OJT (28 percent) cited most frequently as the training source. Similarly, more than half (57 percent) of the workers in administrative support positions, which include clerical workers, required specific skills for their jobs. For these workers, informal OJT (31 percent) and high school vocational education (16 percent) were the most-cited sources. Private household workers were less likely than workers in any other occupational group to require specific skills for their jobs, with only 8 percent responding that specific skills were needed.

Skill requirements varied considerably among the blue-collar occupations, from 65 percent for workers in precision production to 16 percent for those in the category handlers, equipment cleaners, helpers, and laborers; in the semi-skilled occupational group the figure was approximately 36 percent. Informal OJT was the most frequently cited source of skills for blue-collar jobs, with schooling and formal training playing lesser roles.

Some sources of training are heavily associated with certain occupational groups whereas others are more evenly cited. For example, 78 percent of those who cited four-year colleges as a source of their qualifying skills worked in executive or professional occupations, and 57 percent of those who cited high

school vocational education as a source worked in administrative support positions. On the other hand, informal OJT was the most common source of skill acquisition in all occupational groups and was distributed relatively evenly across occupations.

The Bureau of Labor Statistics (BLS) also surveyed respondents about training on their current jobs. For the workforce as a whole, 35 percent, representing 33,900,000 workers, responded that they had taken training to improve their skills while on their present job.[19] Informal OJT was the most common means of acquiring additional skills in the job, with 14 percent using this source. Formal company training was the second most common source, with 11 percent of workers participating. Schooling was less common as a source of improving skills on the job than as a source of acquiring qualifying skills; only 12 percent of the workforce used schooling to add skills, but 29 percent used schooling to obtain qualifying skills. Most of the schooling was at four-year colleges and universities (6 percent) or junior colleges and technical institutes (3 percent), with only 2 percent at private and public postsecondary vocational education schools.

The patterns within the 12 occupational groups are similar to those within the workforce as a whole. In almost all occupational groups the percentage of workers who received training to increase skills is less than the percentage who needed skills to qualify for their jobs. For most of the occupational groups, informal and formal training are the most common sources of acquiring additional skills, with four-year colleges and universities a distant third. Occupational groups that had a high percentage of workers needing specific skills to qualify also tended to have a high percentage of workers obtaining additional training; for example, professional specialty occupations had the highest proportion of workers who needed specific skills to qualify for their job (93 percent) and the highest proportion of workers who took additional training (61 percent); private household occupations had the lowest rates in both categories.

The BLS survey shows that the American workforce receives a great deal of training to qualify for jobs and that a great number of workers take actions to increase their skills. In interpreting these figures, it should be kept in mind that we are presenting workers' perceptions, and their perceptions might differ from those of employers. Moreover, the questions asked on the BLS survey differ from the Survey of Participation in Adult Education, so it is not surprising that the figures differ. Of major interest from the BLS study is the high proportion of workers who gained the skills needed to qualify for

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[19]Because the data in this section include youths age 16 to 24, these data understate the amount of training taken by adult workers to improve their skills while working. As reported by Sehgal (1984), 56.4 percent of the workers age 16 to 24 have one year or less job tenure with their current employer. Thus, young workers have less opportunity to invest in training, and employers might be less likely to train young workers, especially teenagers, because of their high rates of job mobility.

their jobs from their employers: BLS estimates that over 27 million American workers obtained qualifying skills through informal training while on the job, and over 9 million workers obtained qualifying skills through formal company training. Thus, over one quarter of the workforce gained their skills through their employers. It is therefore likely that much of the change in the occupational composition of the labor force can be accommodated through existing sources.

3.5 SUMMARY

Data on training received by adults in the labor force is very limited and not of high quality. Public sector programs provide information about the number of participants and their characteristics, but limited data on occupational areas. There is no source of regularly collected data on training in the private sector. Consequently, we know less about the training experiences of the adult labor force then we do about their education.

Apprenticeship programs combine on-the-job training with classroom instruction to train people for entry into the skilled trades. The Federal government does not provide funding for training apprentices, but it promotes apprenticeship and registers programs that meet minimum standards. About 50,000 individuals complete registered programs each year. Approximately 60 percent of all registered apprentices are in construction occupations. About 1 out of 5 apprentices are members of a minority group and 1 out of 15 apprentices are women.

The most significant training programs funded by the Federal government are administered under the Job Training Partnership Act (JTPA). Disadvantaged adults receive classroom and on-the-job training under Title IIA of JTPA, and dislocated workers are served under Title III. During the first nine months of operation, about 225,000 disadvantaged adults received classroom or on-the-job training in Title IIA programs; slightly more than half of these participants were women, and about 40 percent were members of minority groups. The Title III dislocated worker program enrolled about 100,000 individuals during the initial nine months of operations. Data are not yet available on the mix of Title III activities, but it is widely believed that a significant share of the participants receive job search assistance rather than training. About two-thirds of the Title III participants were men and three-quarters were high school graduates.

A survey of the labor force found that slightly over half the labor force needed some specific skills or training to obtain their jobs. The most common sources were schooling (especially college), informal on-the-job training, and formal company training. Military training, high school vocational education, and junior colleges were each mentioned as a source of skills by 5 percent or less of the labor force. Slightly over one-third of the labor force reported taking training to improve their skills while on the current job; the most common sources of this training were informal and formal on-the-job training.

CHAPTER 4

WORK EXPERIENCE OF THE ADULT LABOR FORCE

4.1 WORK EXPERIENCE BY DEMOGRAPHIC GROUP

As noted in the previous chapter, informal on-the-job training (OJT) is a major source of skill acquisition for the American workforce, with 28 percent of the workforce indicating that informal OJT was used to acquire skills needed to perform their current jobs, and 14 percent reporting that informal OJT was used to improve skills on their current job. In this chapter, we examine the work experience of the adult labor force by using two different approaches. First, we present and analyze data on the distribution of the labor force according to years of work experience, provided by the Panel Study of Income Dynamics.[1] We then present and analyze the Bureau of Labor Statistics' (BLS) projections of the expected number of years of future work by the population.

The distributions of work experience for white and black men are presented in Tables 4-1 and 4-2. As can be seen by examining the row percentages, the black male labor force is somewhat younger than the white male labor force, so one would expect to find less work experience among black men: 61 percent of the adult black male labor force has 15 or fewer years of work experience, whereas only half of the white male labor force has 15 years or less work experience. Once the age differences are taken into account, by looking at row percents within the age categories, there is little difference by racial group on the distribution of work experience.

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[1]The Panel Study of Income Dynamics (PSID) was designed as a nationally representative sample of the U.S population, so the PSID can be used to develop estimates for the U.S. population. In addition to questions on demographic characteristics, the PSID covers topics such as employment, earnings, fertility, and transfer payments. For this study, special tabulations have been produced of the distribution of years of work experience for several age-race-sex categories. The tabulations presented here represent individuals who reported that they were in the labor force, either working or actively looking for work, during the week the survey was taken in 1982. Years of work experience were obtained from the responses to the question "How many years have you/has [another household member] worked since age 18?" The survey question does not differentiate between full-time and part-time work, nor does it distinguish between work for the entire year or parts of years. In addition, the PSID questions are usually asked of the male member of the household, so in families with a man and woman present, the responses for both are provided by the man. The responses for men and women are subject to recall errors, and the responses for women are also subject to what is referred to as "proxy respondent error."

TABLE 4-1

DISTRIBUTION OF WORK EXPERIENCE BY AGE FOR WHITE ADULT MEN

Age	Years of Work Experience 0-5	6-15	16-25	25+	Total a/
25-34					
Row percent	53.1	46.9	0.0	0.0	100.0
Column percent	97.3	55.3	0.0	0.0	36.0
35-44					
Row percent	1.7	55.1	43.2	0.0	100.0
Column percent	2.1	44.3	48.9	0.0	24.5
45-54					
Row percent	0.6	0.6	50.6	48.2	100.0
Column percent	0.6	0.4	48.7	35.7	20.8
55 and up					
Row percent	0.0	0.1	2.8	97.1	100.0
Column percent	0.0	0.1	2.4	64.3	18.6
Total a/					
Row percent	19.7	30.5	21.7	28.1	100.0
Column percent	100.0	100.0	100.0	100.0	100.0

a/ Columns and rows may not sum to totals due to rounding.

Source: 1982 Panel Study of Income Dynamics Tabulations.

TABLE 4-2

DISTRIBUTION OF WORK EXPERIENCE BY AGE FOR BLACK ADULT MEN

Age	Years of Work Experience 0-5	6-15	16-25	25+	Total a/
25-34					
Row percent	54.1	45.8	0.0	0.2	100.0
Column percent	99.4	67.1	0.0	0.5	49.6
35-44					
Row percent	0.0	57.1	42.9	0.0	100.0
Column percent	0.0	32.6	50.30	0.0	19.3
45-54					
Row percent	0.4	0.6	47.1	51.8	100.0
Column percent	0.3	0.3	47.6	37.9	16.6
55 and up					
Row percent	0.6	0.0	2.4	97.0	100.0
Column percent	0.3	0.0	2.1	61.7	14.5
Total a/					
Row percent	26.9	33.8	16.5	22.8	100.0
Column percent	100.0	100.0	100.0	100.0	100.0

a/ Columns and rows may not sum to totals due to rounding.

Source: 1982 Panel Study of Income Dynamics Tabulations.

Overall, the pattern of work experience by age is consistent with what one would expect given the high rates of labor force participation for adult men. Of the men age 35-44, less than 2 percent had under 6 years of work experience. Of the men age 45-54 in the labor force, only about 1 percent had 15 years or less work experience, and virtually all of the male labor force age 55 and above had at least 25 years of work experience.

The distribution of work experience for the adult female labor force differs significantly from the distribution for men. Little difference in years of work experience exists between men and women ages 25-34 in the labor force, but in the higher age categories women have significantly less work experience than men of the same age. For men age 35-44, under 2 percent had fewer than 6 years of work experience compared with 25 percent of women in this age group. In the 45-54 category, virtually all men in the labor force had over 15 years of work experience, while over half of the women had 15 years or less experience. For workers age 55 and over, over 95 percent of the men had at least 25 years of work experience compared with only about 40 percent of the women. Beyond the age of 35, women in the labor force have, on average, much less work experience than men of the same age. This finding is not surprising, given the lower labor force participation rates of women in past years.

Unlike the situation for men, the two racial groups of women have substantially different patterns of work experience (Tables 4-3 and 4-4). Black women have had higher labor force participation rates than white women, and consequently, black women over age 35 also have more years of work experience. Among white women in the labor force age 35-44, 27 percent had 5 or fewer years of work experience compared with 16 percent of black women in that age group. For white women age 45-54, about 40 percent had over 15 years of work experience, whereas over 70 percent of the black female labor force in that age group had over 15 years of work experience. In the 55 years and older age category, black women also had a great deal more work experience, with 65 percent reporting over 25 years of work experience compared with only about 40 percent of white women in that age group.

4.2 LABOR FORCE MOBILITY

Table 4-5 shows differences in labor force entry rates and length of time in the labor force by race, sex, and educational attainment.[2] Women tend to enter the labor force more frequently than men during the adult years, and minority individuals have a slightly higher frequency of entry. People with less than a high school education have more entries than those with a high school diploma. Once an entry to the labor force is made, expected duration is

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[2]By making use of the longitudinal nature of the Current Population Survey (CPS), it is possible to estimate the probabilities that individuals with various demographic and socioeconomic characteristics will change their labor force status during a one-year period. Smith and Horvath (1984) have developed preliminary estimates for the 1979-1980 period. It should be kept in mind, however, that the CPS does not follow people who move, so matched samples from two CPS surveys are not necessarily representative of the population as a whole.

TABLE 4-3

DISTRIBUTION OF WORK EXPERIENCE BY AGE FOR WHITE ADULT WOMEN

Age	Years of Work Experience 0-5	6-15	16-25	25+	Total a/
25-34					
Row percent	51.8	47.9	0.2	0.0	100.0
Column percent	62.2	39.1	0.5	0.0	36.7
35-44					
Row percent	27.0	55.2	17.8	0.0	100.0
Column percent	21.4	29.9	26.2	0.0	24.3
45-54					
Row percent	18.1	41.0	32.3	8.6	100.0
Column percent	13.9	21.5	45.9	24.9	23.5
55 and up					
Row percent	4.8	27.5	28.9	38.8	100.0
Column percent	2.4	9.5	27.3	75.1	15.6
Total a/					
Row percent	30.6	44.9	16.5	8.1	100.0
Column percent	100.0	100.0	100.0	100.0	100.0

a/ Columns and rows may not sum to totals due to rounding.

Source: 1982 Panel Study of Income Dynamics Tabulations.

TABLE 4-4

DISTRIBUTION OF WORK EXPERIENCE BY AGE FOR BLACK ADULT WOMEN

Age	Years of Work Experience 0-5	6-15	16-25	25+	Total a/
25-34					
Row percent	54.0	46.0	0.0	0.0	100.0
Column percent	81.9	52.0	0.0	0.0	43.4
35-44					
Row percent	16.2	58.6	23.1	2.1	100.0
Column percent	13.0	35.1	26.3	3.9	23.0
45-54					
Row percent	5.4	22.5	57.4	14.5	100.0
Column percent	3.6	11.2	53.9	21.9	19.0
55 and up					
Row percent	2.9	4.5	27.7	64.8	100.0
Column percent	1.5	1.7	19.8	74.2	14.5
Total a/					
Row percent	28.6	38.4	20.3	12.6	100.0
Column percent	100.0	100.0	100.0	100.0	100.0

a/ Columns and rows may not sum to totals due to rounding.

Source: 1982 Panel Study of Income Dynamics Tabulations.

TABLE 4-5

LABOR FORCE MOBILITY OF ADULTS BY SEX, RACE, AND EDUCATION, 1979-80

	Race		Educational Attainment		
	White	Other	Less than High School	High School to 14 Years	15+ Years
MEN					
Number of entries into labor force per person age 25	1.5	1.8	2.0	1.5	1.4
Expected duration per entry (years)	22.5	15.9	14.6	22.5	25.8
WOMEN					
Number of entries into labor force per person age 25	3.0	3.1	3.3	3.2	2.7
Expected duration per entry (years)	8.0	7.6	5.4	7.6	10.3

Source: Smith and Horvath (1984).

23 years for white men and only 8 years for white women; minority men have a shorter expected duration than white men and minority women have a slightly shorter duration than white women. These calculations by Smith and Horvath confirm the basic findings from the PSID. Men tend to remain in the labor force more consistently than women, and minority groups tend to also have more periods of time outside the labor force.

4.3 SUMMARY

The high rate of labor force participation for men leads to a strong association between work experience and age. Because the black labor force is younger than the white labor force, black men, on average, have less work experience than white men. However, within a given age group black and white men have similar work experience totals; black women, on the other hand, have significantly more work experience than white women the same age. There are major differences in years of work experience by sex, with men having substantially more work experience than women in the same age group. For example, virtually all men age 45 to 54 have over 15 years of work experience, but only 45 percent of women that age have over 15 years experience. Studies of labor force entry and exit have yielded similar results. Adult women have twice as many labor force entries as men, and women remain in the labor force for a shorter period. In addition, nonwhites and individuals with less than a high school education tend to have a higher than average number of labor force entries. Because the labor force participation rate for women has been rising, many of the differences between men and women may diminish.

CHAPTER 5

OCCUPATIONAL MOBILITY OF THE ADULT LABOR FORCE

As the economy changes over time, because of factors such as technological change, shifts in consumer preferences, and changes in exchange rates, the industrial and occupational composition of the workforce needed by firms is likely to change. In this chapter we examine the occupational mobility of the labor force in recent years to see to what extent the adult labor force changed occupations.[1] Before drawing conclusions from the BLS occupational mobility data, it is important to note some of the limitations of the data. As noted by Sehgal in her analysis, respondents may tend to overstate occupational change in a retrospective survey, and changes between the months covered in the survey will not be counted. Another issue to consider is how broad are the categories used to define occupations. The CPS uses the Bureau of the Census 3-digit occupational code, which defines 441 occupations. In many cases, separately classified occupations are quite close in nature, whereas in other cases there may be great differences within an occupation. For example, typists, secretaries, and stenographers are coded as distinct occupations but heart surgeons and psychiatrists are both coded as physicians. Thus, in some cases mobility may not involve any new skills, while in other cases job content could change a great deal without any reported mobility occurring.

A large majority of adult workers in 1983 worked in the same occupation one year earlier. Of the 79 million adults employed in January 1983, almost 86 percent worked in the same occupation a year earlier, 7 percent were employed in different occupations, 4 percent were unemployed, and 4 percent were not in the labor force. For adults employed in both 1982 and 1983, 7.5 percent changed occupations.

As Table 5-1 demonstrates, occupational mobility is strongly related to age. Younger workers tend to switch occupations more often for several reasons. First, younger workers may not realize which occupations suit them best in terms of aptitude, interest, salary, and career path. In addition, as workers remain in a given occupation, they may acquire specific skills relevant to that occupation that would increase their pay in that occupation, whereas workers in a new occupation generally have to start at the bottom of the ladder. Furthermore, to the extent that employers pay for some occupational training through formal or informal on-the-job training, they are less likely to hire older workers from a different occupation because the employers would have less time to recoup the investment. Table 5-1 also indicates that occupational mobility is somewhat higher for women than for men in all age categories except for workers 65 and older. The largest difference by sex occurs at age 35-44, when women are more likely to be reentering the labor force.

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[1]The data for this analysis were obtained from tabulations of the Bureau of Labor Statistics' (BLS) January 1983 Current Population Survey (CPS), which included a special supplement on occupational mobility, and from Sehgal (1984).

TABLE 5-1

OCCUPATIONAL MOBILITY RATES BY AGE AND SEX FOR 1982-1983 a/

Age	Men	Women	Both Sexes
25-34	11.5	11.9	11.7
35-44	6.7	7.8	7.2
45-54	4.8	4.9	4.8
55-64	3.1	3.8	3.4
65 years and older	1.9	1.4	1.7
All adults	7.2	7.9	7.5

a/Number of persons employed in a different occupation in 1983 as a proportion of the total employed in 1982 and 1983.

Source: Sehgal (1984) and unpublished BLS data from the January 1983 Current Population Survey.

Although the percentage of the workforce changing occupations in a given year is under 8 percent, it appears that a majority of workers change their occupations at least once after age 25. For example, in 1983 the median length of time in current occupation for men age 35-44 was 10.4 years, indicating that 50 percent of men in this age group were in their current occupation less than 10.4 years. The median occupational tenure in 1983 was 9.2 years for adult men and 6.2 years for adult women. (Because we are not observing completed periods of employment, these figures do not provide an estimate of expected occupational tenure.) Table 5-2 presents the distribution of occupational tenure for adult men and women. Women are more concentrated in the lower tenure categories because they tend to be more mobile, and they have lower labor force participation rates.

Occupational mobility also varies across occupations. Table 5-3 presents occupational mobility rates for 13 broad occupational categories by sex, and Table 5-4 shows in which categories workers who had changed occupations worked the previous year. The data in Table 5-3 indicate that mobility rates vary considerably among different categories of occupations, ranging from 3.6 percent for men in farming, forestry, and fishing to 11.9 percent for men in the handlers, equipment cleaners, helpers, and laborers category. The mobility rates for women are higher in all categories except administrative support, including clerical, other service, machine operators, and laborers. The data in Table 5-4 demonstrate that for the reported categories, much of the mobility into the selected categories is from other occupations in the same category; for example, 44 percent of the mobility among men into professional occupations is from men in other professions. The data in Tables 5-3 and 5-4 provide information on mobility into selected occupational categories. BLS does not publish data on mobility out of various occupations.

The published data on occupational mobility are not sufficiently detailed to determine the extent to which occupational mobility represents advancement in a career path or internal labor market compared to horizontal or downward movements due to layoffs and other factors.

Overall, the adult labor force includes a large number of people who changed occupations between January 1982 and January 1983, although the percentage of the labor force that changed occupations is not large. Approximately 5.5 million adults, representing 7.5 percent of the labor force who worked in both years, changed occupations between January 1982 and January 1983. This finding is similar to those of earlier BLS studies which indicate that about 8.5 percentage of the labor force changed occupation between January 1977 and January 1978 and between January 1980 and January 1981.

TABLE 5-2

DISTRIBUTION OF OCCUPATIONAL TENURE FOR ADULTS IN 1983 BY SEX

Tenure	Men	Women
1 year or less	10.2%	15.1%
2 years	7.1	9.0
3 years	6.9	9.3
4-5 years	12.6	15.5
6-9 years	15.2	17.1
10-14 years	16.4	15.3
15-19 years	19.1	7.7
20-24 years	7.7	4.7
25 years and over	13.9	6.1

Source: Unpublished BLS data from the January 1983 Current Population Survey.

TABLE 5-3

OCCUPATIONAL MOBILITY OF ADULT MEN AND WOMEN INTO 13 CATEGORIES OF OCCUPATIONS a/

Occupation	Men	Women
Executive, Administrative, and Managerial	6.9	10.9
Professional Specialty	5.1	5.6
Technicians and Related Support	6.6	6.9
Sales Occupations	9.5	10.0
Administrative Support, Including Clerical	9.2	8.4
Private Household	N/A	6.2
Protective Service	6.4	13.1
Service, Excluding Private Household and Protective Service	9.1	6.6
Precision Production, Craft, and Repair	6.3	7.4
Transportation and Material Moving	6.8	7.9
Handlers, Equipment Cleaners, Helpers, and Laborers	11.9	11.3
Farming, Forestry, and Fishing	3.6	4.7

a/ Number of persons employed in a different 3-digit (Bureau of the Census Occupational Code) occupation in 1983 as a proportion of the total employed in 1982 and 1983 (e.g., 5.1 percent of men who were employed in a professional specialty occupation in 1983 and worked in 1982 were employed in a different professional specialty occupation or in an occupation in another category in 1982).

Source: Sehgal (1984).

TABLE 5-4

OCCUPATIONAL DISTRIBUTION OF EMPLOYED CIVILIANS AGE 25 AND OVER, WHO CHANGED OCCUPATIONS BETWEEN JANUARY 1982 AND JANUARY 1983, BY SEX

Occupation	Different Occupation in January 1982		Administrative and Managerial	Professional Specialty	Technicians and Related Support	Sales	Administrative Support Including Clerical	Protective Service	Other Service	Precision Production Craft and Repair	Machine Operators, Assemblers, Inspectors	Transportation and Material Moving	Handlers, Equipment Cleaners, Helpers, and Laborers	Farming, Forestry, and Fishing
	Number (in thousands)	Percent												
Men														
Total, 25 years & Over[1]	3,054	100.0	14.2	10.1	3.2	11.0	7.9	1.8	5.9	18.7	10.3	8.3	5.6	3.0
Executive, administrative and managerial	477	100.0	41.4	12.5	5.0	12.3	6.6	0.6	4.6	9.7	3.1	2.7	1.0	0.5
Professional specialty	304	100.0	13.3	44.0	7.9	5.1	4.3	0.4	6.5	10.7	0.9	3.1	1.8	2.0
Technicians and related support	79	100.0	11.6	15.9	11.9	2.1	19.1	1.6	7.7	17.9	6.1	2.9	3.2	-
Sales occupations	441	100.0	20.0	6.9	2.4	30.6	9.2	2.4	2.3	11.6	4.0	3.9	4.4	2.3
Administrative support, including clerical	219	100.0	11.8	8.3	3.7	7.3	25.0	0.3	5.0	17.4	5.6	6.7	7.6	1.1
Women														
Total, 25 years & Over[1]	2,403	100.0	10.1	12.6	2.4	12.5	34.6	0.3	12.9	1.7	8.2	1.8	1.5	0.4
Executive, administrative and managerial	316	100.0	25.4	15.1	2.5	14.1	30.3	0.7	4.1	1.9	3.0	1.1	1.7	-
Professional specialty	286	100.0	8.4	48.0	5.5	8.5	15.0	-	9.8	0.1	3.0	0.1	-	0.1
Technicians and related support	77	100.0	7.8	8.6	9.9	4.8	40.0	-	25.3	-	1.0	2.6	-	-
Sales occupations	308	100.0	10.4	9.3	2.0	24.3	29.5	0.7	12.5	1.8	4.9	1.4	0.7	0.7
Administrative support, including clerical	786	100.0	9.0	6.3	1.6	9.3	59.1	0.2	7.6	0.7	3.2	2.6	0.2	-

[1] Includes other occupations, not shown separately.

Source: Sehgal (1984).

CHAPTER 6

PROJECTIONS OF THE ADULT LABOR FORCE THROUGH 1995

6.1 INTRODUCTION

Up to this point we have concentrated on the characteristics of the labor force at the present time. In this chapter projections of the adult labor force through 1995 are presented. The purpose of the chapter is to identify not only the expected changes in size and demographic composition of the adult labor force but also the expected changes in the quality of the labor force.

This chapter is by necessity more speculative than the previous chapters. Excellent information is available about the size and distribution by age, race, sex, and educational attainment of the labor force today. In making projections over the next 10 years, however, it is necessary to make a number of assumptions about how people will behave in terms of labor force participation. Thus, we will need to review the procedures used by the Bureau of Labor Statistics (BLS) in making their projections. Projections of the educational attainment of the labor force and population are no longer produced, although the Department of Education does publish projections of the number of degrees to be awarded. We have used the Department of Education's projections to develop our own projections of the educational attainment of the labor force, but these projections should be regarded as preliminary.

Because so little information exists regarding the current levels of training and adult education, it is not surprising that we have not found any projections on these dimensions of the labor force. This report therefore includes only our best estimates of the trends these activities are likely to follow over the next 10 years.

6.2 THE BUREAU OF LABOR STATISTICS' METHODOLOGY FOR LABOR FORCE PROJECTIONS

The most widely used labor force projections are those developed by the Bureau of Labor Statistics (BLS). Labor force participation rates are projected for 64 age-race-sex groups by analyzing past trends for the 1962-1981 period and selected subperiods, then selecting the growth rate for the subperiod deemed most appropriate for each of the 64 groups. Finally, the participation rates are modified if past trends are judged not likely to continue for the entire projection period. Labor force size is then projected by applying the participation rates to the Bureau of the Census population projections, which are based on trends in birth and death rates and net migration.

Because of the uncertainty involved in making these projections, BLS has developed high, middle, and low scenarios for alternative projections of the size and characteristics of the labor force. Their best-judgment set of projections is referred to as the "middle scenario"; these are the figures used in this report and most frequently cited by others.[1]

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[1]For a more complete description of the BLS labor force methodology, see Appendix A.

6.3 PROJECTIONS OF THE LABOR FORCE IN 1990 AND 1995

A summary of the labor force projections based on the BLS middle growth scenario is presented in Table 6-1. Overall growth of the entire labor force between 1982 and 1995 is projected to be more than 21 million people. While this sounds like a large number of people to add to the labor force in 13 years, the annual growth rate is only 1.4 percent. Unlike recent experience, the youth labor force, age 16 to 24, is expected to decline in absolute size between 1982 and 1990 and also from 1990 to 1995.

Between 1982 and 1990 the adult labor force is projected to grow by over 17 million people, or about 20 percent. Between 1982 and 1995, adult labor force growth is expected to be almost 29 percent, with an increase of close to 25 million people. The annual rate of growth is 2.3 percent for the 1982 to 1990 period and 1.4 percent for the 1990 to 1995 period.

The growth patterns projected by BLS are not the same for all groups in the labor force, so the labor force will look somewhat different in 1990 and 1995 than it did in 1982. In the BLS middle-growth projection, participation rates of women continue to rise absolutely and relative to those of men. Based on these projections, women will make up 47 percent of the labor force age 25 to 54 in 1995, compared with 46 percent in 1990 and 43 percent in 1982.

Blacks and other minority group members are projected to have higher labor force growth rates than whites.[2] The black and other share of the adult labor force increases from 13 percent in 1982 to 14 percent in 1990 and 15 percent in 1995. The BLS projections show high percentage changes for black women ages 25 to 54. Between 1982 and 1990, the BLS projects a 42 percent increase in the number of adult black women in the labor force; between 1982 and 1995, the projected increase is nearly 64 percent, corresponding to an annual growth rate of 3.9 percent.

The most marked change over the 13-year period will be in the age distribution of the labor force. As noted earlier, the low birth rates following the baby boom will lead to actual declines between 1982 and 1995 in the number of teenagers and young adults ages 20 to 24. The 25- to 34-year-old category increases somewhat between 1982 and 1990 and decreases slightly from 1990 to 1995. The 35 to 44 group shows the sharpest growth rate of any age category, and by 1995 it contains more members of the adult labor force than any other age group. Table 6-2 shows how the age distribution of the adult labor force is expected to shift over the 13-year period.

The decline in the share of workers over age 55 may appear unusual in view of the general aging trend expected for the population. Offsetting population increases in the older age categories is the projected decline in labor force participation among older Americans. The BLS projects the participation rate

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[2]The BLS term "black and other" includes blacks and other nonwhites. Hispanics are included in this category only if they are not classified as white. The BLS projections do not identify Hispanics separately.

TABLE 6-1

CIVILIAN ADULT LABOR FORCE, BY SEX, AGE, AND RACE IN 1982 AND BLS MIDDLE GROWTH PROJECTION TO 1995

Labor Group	1982	1990	1995	Percent Change 1982-1990	Percent Change 1982-1995
Men					
25-34	17,793	19,569	18,105	10.0%	1.8%
35-44	12,781	17,469	19,446	36.7	52.1
45-54	9,784	11,142	13,807	13.9	41.1
55-64	7,174	6,419	6,311	-10.5	-12.0
65 and over	1,845	1,828	1,728	-0.9	-6.3
Women					
25-34	13,393	16,804	16,300	25.5	21.7
35-44	9,651	14,974	17,426	55.2	80.6
45-54	7,105	8,718	11,125	22.7	56.6
55-64	4,888	4,612	4,671	-5.6	-4.4
65 and over	1,185	1,329	1,337	12.2	12.8
White men 25-54	35,565	41,864	44,232	17.7	24.4
White women 25-54	25,619	34,081	37,433	33.0	46.1
Black and other men 25-54	4,792	6,316	7,126	31.8	48.7
Black and other women 25-54	4,529	6,415	7,419	41.6	63.8
Total labor force	110,204	124,951	131,387	13.4	19.2
Total adult labor force	85,599	102,864	110,257	20.2	28.8

Source: Bureau of Labor Statistics Bulletin 2197. Employment Projections for 1995. p.3.

TABLE 6-2

AGE DISTRIBUTION OF THE ADULT LABOR FORCE FROM 1982 TO 1995 USING BLS MIDDLE GROWTH PROJECTIONS

Age Group	1982	1990	1995
25-34	36.4%	35.3%	31.2%
35-44	26.2	31.5	33.4
45-54	19.7	19.3	22.6
55-64	14.1	10.7	10.0
65 and over	3.5	3.1	2.8

Source: Bureau of Labor Statistics Bulletin 2197. Employment Projections for 1995, p. 3.

for males 55 and over to decline from almost 44 percent in 1982 to only about 35 percent in 1995 and for the female rate to decline from nearly 23 percent to about 20 percent.

Overall, the 1995 BLS middle growth projections forecast an older and more female labor force than was the case in 1982. It is not clear whether the adult labor force in 1990 and 1995 will have more work experience than the current labor force. Nearly 60 percent of the projected growth in the adult labor force is due to greater labor force participation by women. Since women tend to have less work experience than men, the gains in work experience due to the aging of the population will be at least partly offset by this influx of less experienced workers.

In Table 6-3 we compare the BLS projections to those of the ICF Macroeconomic-Demographic Model (MDM).[3] The MDM projections differ somewhat from the BLS projections. Most of the MDM projections lie within the range of the BLS high and low growth projections, although there is no strong pattern of higher or lower estimates by the MDM. The exceptions are for women age 35 to 44 and 45 to 54 in 1990 where the MDM projections are below the BLS low growth estimates; in simulating 1980 participation rates, the MDM was about 5 percentage points too low for these two groups of women. It is impossible to know whether the MDM projections are better or worse than the BLS projections. While the MDM includes variables that economic theory indicates should influence labor force participation, the BLS method does not use a simple time trend to capture shifts in participation over time.

6.4 PROJECTIONS OF THE EDUCATIONAL ATTAINMENT OF THE LABOR FORCE

This section presents our projections of the educational attainment of the labor force in 1990. The section first discusses the general methodology used to derive these projections, then presents the results of applying the methodology, and finally, discusses the limitations of the projections. A more detailed discussion of the methodology and limitations of these projections and documentation of the data sources used is provided in Appendix B of this report.

6.4.1 Methodology Used to Project the Educational Attainment of the Labor Force

The projections of the educational attainment of the labor force in 1990 presented here are based upon a variety of data sources. The primary source of data used is "Projections of Education Statistics to 1992-93" prepared by the National Center for Education Statistics (NCES). The NCES projects

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[3]The ICF Macroeconomic - Demographic Model (MDM) is described in detail in Anderson (1982). The MDM estimates labor force participation rates for 16 age-sex groups jointly with the unemployment rate, the labor force share, and the wage rate.

TABLE 6-3

COMPARISON OF ADULT LABOR FORCE AND PARTICIPATION RATE PROJECTIONS FROM THE BLS MIDDLE GROWTH MODEL AND THE ICF MACROECONOMIC-DEMOGRAPHIC MODEL

	Labor Force				Participation Rate			
	1990		1995		1990		1995	
Labor Group	BLS	MDM	BLS	MDM	BLS	MDM	BLS	MDM
Men								
25-34	19,569	19,329	18,105	17,840	93.7	94.6	93.1	94.0
35-44	17,469	17,049	19,446	18,610	95.6	94.9	95.3	94.4
45-54	11,142	11,055	13,807	13,309	91.3	89.7	91.1	88.4
55-64	6,419	6,838	6,311	6,440	65.5	68.6	64.5	65.0
65 & Over	1,828	2,104	1,728	1,950	14.9	17.3	13.3	15.2
Women								
25-34	16,804	15,378	16,300	16,592	78.1	74.3	81.7	86.1
35-44	14,974	12,753	17,427	15,310	78.6	68.2	82.8	74.6
45-54	8,718	7,614	11,125	9,582	67.1	58.2	69.5	60.3
55-64	4,612	4,460	4,671	4,530	41.5	41.0	42.5	42.0
65 & Over	1,329	1,294	1,337	1,263	7.4	7.2	7.0	6.6

Source: BLS projections from Bureau of Labor Statistics Bulletin 2197. Employment Projections for 1995. p. 3.

ICF Macroeconomic-Demographic Model projections from simulations run in December 1983.

TABLE 6-4

NCES PROJECTIONS OF DEGREES AWARDED

	High School	Bachelor's	Advanced Degrees a/	High School Equivalency Credentials c/
Men				
1980-1981	1,480	469,883 b/	147,043 b/	252
1981-1982	1,438	473,364 b/	145,532 b/	252
1982-1983	1,368	480,000	143,000	308
1983-1984	1,312	485,000	143,000	308
1984-1985	1,280	480,000	141,000	314
1985-1986	1,273	470,000	139,000	326
1986-1987	1,297	465,000	138,000	338
1987-1988	1,330	462,000	138,000	344
1988-1989	1,289	462,000	137,000	344
1989-1990	1,199	462,000	137,000	344
Women				
1980-1981	1,541	465,257 b/	148,696 b/	238
1981-1982	1,499	479,634 b/	150,014 b/	238
1982-1983	1,427	490,000	152,000	192
1983-1984	1,368	485,000	153,000	192
1984-1985	1,334	480,000	154,000	196
1985-1986	1,326	475,000	155,000	204
1986-1987	1,351	470,000	154,000	212
1987-1988	1,380	465,000	153,000	216
1988-1989	1,337	465,000	152,000	216
1989-1990	1,245	465,000	152,000	216

a/ Advanced degrees are computed as the sum of master's and first-professional degrees awarded.

b/ These data are actual, not projected.

c/ High school equivalency credentials are not projected by sex. To distribute the degrees, we assumed that the ratio between male and female equivalency-degree recipients was the same as the ratio between male and female high school dropouts, or 1.60, provided by the Digest of Education Statistics, page 71.

degrees awarded and enrollment by age, sex, and level of education. We used these projections as the basis of our estimates; hence, our primary task was to convert the projections of degrees awarded into attainment of the labor force. Table 6-4 presents the NCES projections of degrees awarded.

The general methodology used to project the educational attainment is as follows:

(1) Calculate the number of people with high school, college, and advanced degrees in 1981.

(2) Add the number of degrees awarded, by age and sex, for each year from 1981 to 1990 to the numbers calculated in step (1).

(3) Convert the 1990 "number of people" in the population with various degrees to "educational attainment," i.e., calculate the number of people with only a high school education and with only a college education.

(4) Project the educational attainment of the labor force by multiplying the answers from step (3) by the appropriate labor force participation rates (labor force participation rates are disaggregated by age, sex, and level of education).

(5) Using projections of the 1990 labor force, calculate the percentages of the labor force with various levels of education.

6.4.2 Assumptions and Sources of Uncertainty

Many assumptions and simplifications were needed to apply the above methodology. The limitations and problems imposed by these assumptions are fully documented in Appendix B. However, we will briefly state some of the major limitations and sources of uncertainty here:

(1) <u>The number of people with advanced degrees is most likely overestimated</u> - Because information on the educational attainment of the labor force in 1990 is available only in terms of number of years completed, some simplifying assumptions relating years of schooling and degrees were necessary. We assumed that any person with over four years of college had an advanced degree; however, many students take more than four years to complete college degrees, and others enroll in advanced education without completing a masters or first-professional degree. This problem applies predominantly to the older age groups, since most of the advanced degrees attributed to the 25-34 year olds in our projections are from the NCES projections of degrees, and not from the educational attainment of the population in 1981.

(2) <u>Not all sources of education are reflected in these projections</u> - Two-year colleges, vocational training, adult education, and other formal and informal learning will continue to be important sources of education for the labor force. In fact, two-year colleges are projected to become an increasingly popular form of education. In 1980, 37 percent of the enrollment in all institutions of higher education was in two-year colleges, and this

percentage is expected to increase to 41 percent by 1990.[4] However, because of the unavailability of suitable data, these sources of education are not reflected in our projections. Hence, many of the people we project to have only a high school education will actually have an associates degree, vocational certificate, or some other form of education beyond the high school level.

3) The labor force participation rates, by education level, projected for 1990 are associated with a large degree of uncertainty. Information from the March 1981 Current Population Survey substantiates that a relationship between education level and labor force participation rate. The Department of Labor projects labor force participation rates in 1990 by age and sex, but not by education. Because the focus of this analysis is on the educational attainment of the labor force, we felt it necessary to project participation rates by education. To do this, the simplifying assumption was made that the participation rates by education level for each age group, as documented by the March 1981 Survey, would increase or decrease proportionally with overall labor force participation rates for each age group.[5] The projected participation rates are presented in Table 6-5, which clearly demonstrates the relationship between education and labor force participation.

The impact of educational attainment on participation rates is not as strong for younger men as for older men and women, since practically all younger men (25-44) work, regardless of their education. The difference between participation rates of women with a college degree and women with less than four years of high school can be quite striking. For instance, the projected participation rate for 25- to 34-year-old women with a college education is 94 percent, whereas the rate for women in that age group with less than 4 years of high school is only 57 percent.

However, the assumption that participation rates by education level increase linearly with overall participation rates may not be accurate. It is conceivable, for instance, that the projected increased participation rates for 25- to 34-year-old women, from 67 percent in 1981 to 78 percent in 1990, is reflected in an increased participation rate for women with less than a college education only, as opposed to an increase for women of all educational levels.

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[4]NCES, Projections of Education Statistics to 1990-1991, Volume 1, p. 3.

[5]Because labor force participation rates have a direct relationship with education, labor force participation rates will increase as the proportion of people with higher education increases. Thus, to project the participation rates by education level in 1990, we first calculated the overall participation rate that would result from the increased education of the population. We then adjusted the participation rates by education level to reflect the difference between the participation rate projected by the BLS and the rate resulting from the increased education of the population.

TABLE 6-5

LABOR FORCE PARTICIPATION RATES PROJECTED FOR 1990

	25-34	35-44	45-54	55-64
Men				
Overall Rate	93.7	95.6	91.3	65.5
less than 4 years high school	88.2	89.2	83.1	56.2
4 years high school	94.9	96.0	92.1	67.6
1-3 years college	93.0	96.2	92.2	69.5
4 years or more college	94.9	98.3	97.5	76.3
Women				
Overall Rate	78.1	78.6	67.1	41.5
less than 4 years high school	56.7	61.9	53.8	31.5
4 years high school	80.0	79.5	69.1	43.6
1-3 years college	85.6	85.2	74.0	48.8
4 years or more college	94.1	86.6	75.3	52.7

Source: ICF projections.

Because of this uncertainty in our projections of labor force participation rates, we present estimates of the educational attainment for both the labor force and the population.

6.4.3 Educational Attainment in the United States in 1990

This section presents our projections of the educational attainment of the labor force and of the entire population in 1990. It is important, when reviewing these results, to bear in mind the limitations and uncertainties associated with these projections.

Educational Attainment of the Labor Force. Table 6-6 presents our projections of the educational attainment of the labor force in 1990. The table indicates that, in 1990, 86 percent of the male labor force and 90 percent of the female labor force will have a high school degree; 27 percent of the men in the labor force and 23 percent of the women in the labor force will have a college degree.

Examining the educational attainment of the labor force by age yields some insights. The percentage of the labor force with a high school degree is lower for older age cohorts, (except for the 35- to 44-year-old male cohort, which has a higher percentage of college graduates than the 25- to 34-year-old male cohort), from a high of nearly 93 percent of the 25- to 34-year-old female labor force having a high school degree to a low of 81 percent of the 55- to 64-year-old male labor force.

The 35-44 year olds, for both men and women, have the highest percentage of college degrees: approximately 32 percent of men and 26 percent of women. Although, at first glance, it may be surprising that the 25-34 year olds are less well educated than the 35-44 year olds, this finding can be explained by a number of factors. First, not all education is complete by age 34. Of 4-year college enrollees in 1980, over 11 percent of the men were over age 34, as were 17 percent of the women. Similarly, of those enrolled in the fifth year of college or higher, 22 percent of the men and 30 percent of the women were over age 34. This finding holds true, to a certain extent, for high school degree recipients: 15 percent of those taking the high school equivalency test in 1983 were older than 34[6] (a finding which may account, in part, for the higher percentage of high school graduates among 35- to 44-year-old men workers than 25-34 year olds).

Second, college enrollment of males in the late 1960's experienced a great, temporary increase, attributable to young men enrolling in college to avoid the draft and to relatively high salaries for college graduates.[7] The number of males with college degrees in 1990 between ages 35 and 44 directly reflects this increase in enrollment rates.

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[6]American Council on Education, The GED Statistical Report. Washington, D.C. 1983.

[7]See Freeman (1976) for a discussion of trends in college enrollment.

TABLE 6-6

PROJECTION OF EDUCATIONAL ATTAINMENT OF THE LABOR FORCE IN 1990 BY AGE AND SEX

	25-34 Years	35-44 Years	45-54 Years	55-64 Years	25-64 Years
Men					
Percentage by Category					
Less than 4 yrs high school	13.8	10.7	15.8	18.9	13.8
High school diploma	66.5	56.9	54.4	53.7	59.5
4 yrs college	13.5	17.0	13.5	14.8	14.8
5 or more yrs college	6.2	15.4	16.4	12.6	12.0
High school and above	86.2	89.3	84.2	81.1	86.2
College and above	19.7	32.4	29.9	27.4	26.7
Women					
Percentage by Category					
Less than 4 yrs high school	7.4	10.3	14.0	15.5	10.5
High school diploma	70.4	63.3	64.8	68.2	66.7
4 yrs college	16.3	15.0	12.6	10.1	14.5
5 or more yrs college	5.9	11.4	8.6	6.2	8.3
High school and above	92.6	89.7	86.0	84.5	89.5
College and above	22.2	26.4	21.2	16.3	22.8

Source: ICF projections .

Third, labor force participation rates by education are different for 25-34 year olds than for 35-44 year olds. Table 6-5 reveals that for men age 35-44, the participation rate for those with a college education is 98.3 percent, 2.8 percent greater than the average participation rate for that age group. However, for 25- to 34-year-old males, the participation rate for college graduates is only 1.3 percent greater than the average rate. Thus, the relatively greater labor force participation of college graduates in the 35- to 44-year-old category means that the 35- to 44-year-old members of the labor force tend to be relatively more educated than those 25-34 years old.

Comparing the educational attainment of men and women in the 1990 labor force (Table 6-6), we see that the percentage of labor force participants with at least a high school diploma is greater for women than for men in all age categories. On the other hand, the percentage of men with college and advanced degrees is much greater than the percentage of women with such degrees in the older age categories (35-64) but is actually lower in the 25- to 34-year-old category.

Educational Attainment of the Population in 1990. It is useful to review the projections of the educational attainment of the population for two reasons. First, because these projections are not dependent upon labor force participation rates, it is easier to see the extent to which they exhibit the expected trends in education discussed in Chapter 2. Second, because our projections of labor force participation rates by education are, as noted previously, associated with some uncertainty, it is worthwhile to examine projections that do not have this potential source of bias. Our projections of the educational attainment of the population are presented in Table 6-7.

The labor force is, for all age categories, more educated than the population; the difference in education is especially great for 55-64 year olds. It is interesting to note that, although the percentage of labor force participants with a high school education is consistently greater for the women than men, this is not true for the population as a whole. Rather, the men have either an identical percentage of high school graduates (25-34 year olds) or they have a higher percentage. This apparent dichotomy is due to the fact that female labor force participation rates are more dependent upon education than are male participation rates.

Comparison between Educational Attainment in 1981 Versus 1990. Table 6-8 presents a comparison between the educational attainment of the labor force in 1981 and 1990. As expected, both men and women in the labor force are projected to be more educated in 1990 than in 1981. The proportion of the labor force with a high school education is projected to increase from 79 percent to 87 percent for men, and from 83 percent to 90 percent for women. Clearly, the largest factor responsible for this projected increase is the fact that the less educated 55-64 year old (in 1981) cohort will no longer be in the labor force by 1990. The increase in the educational attainment of the female labor force is also attributable to women's increased participation in higher education.

TABLE 6-7

PROJECTION OF EDUCATIONAL ATTAINMENT OF THE POPULATION IN 1990

	25-34 Years	35-44 Years	45-54 Years	55-64 Years	25-64 Years
Men					
Percentage by Category					
Less than 4 yrs high school	14.4	12.0	18.2	24.3	16.0
High school diploma	66.1	56.6	53.9	52.2	58.6
4 yrs college	13.3	16.5	12.6	12.7	14.1
5 or more yrs college	6.1	14.9	15.4	10.8	11.3
H.S. and above	85.6	88.1	81.8	75.7	83.4
College and above	19.4	31.4	28.0	23.5	25.4
Women					
Percentage by Category					
Less than 4 yrs high school	14.4	14.0	19.6	24.7	17.0
High school diploma	67.2	61.2	61.6	62.5	63.5
4 yrs college	13.5	14.5	11.3	7.6	12.4
5 or more yrs college	4.9	11.4	8.6	6.2	7.0
H.S. and above	85.6	86.0	80.4	75.3	82.9
College and above	18.4	24.9	18.9	12.8	19.4

Source: ICF projections.

TABLE 6-8

COMPARISON BETWEEN EDUCATIONAL ATTAINMENT OF THE LABOR FORCE IN 1981 AND 1990

Category	Percentage by Category									
	25-34		35-44		45-54		55-64		25-64	
	1981	1990	1981	1990	1981	1990	1981	1990	1981	1990
Men										
< 4 yrs high school	13.4	13.8	19.9	10.7	29.2	15.8	33.3	18.9	21.5	13.8
High school diploma but < 4 yrs college	60.1	66.5	53.1	56.9	48.6	54.4	47.5	53.7	53.9	59.5
4 or more yrs college	26.5	19.7	27.0	32.4	22.2	29.9	19.2	27.4	24.6	26.7
High school and above	86.6	86.2	80.1	89.3	70.8	84.2	70.8	81.1	78.5	86.2
Women										
< 4 yrs high school	10.5	7.4	16.7	10.3	23.0	14.0	28.6	15.5	17.4	10.5
High school diploma but < 4 yrs college	65.8	70.4	64.3	63.3	63.0	64.8	60.6	68.2	64.0	66.7
4 or more yrs college	23.8	22.2	18.9	26.4	14.0	21.2	10.8	16.3	18.6	22.8
High school and above	89.6	92.6	83.2	89.7	77.0	86.0	71.4	84.5	82.6	89.5

Source: ICF Projections and Young (1982).

Examining educational attainment in 1981 and 1990 by age reveals that, for every age category except that of 25-34 year olds, the 1990 labor force is projected to be more educated than than the 1981 labor force. The fact that more 25-34 year olds had college degrees in 1981 than are projected to have degrees in 1990 can be attributed to at least two factors. First, as noted previously, male college enrollment experienced a substantial increase during the Vietnam war. Males who enrolled in college in the late 1960's would be between 25-34 years old in 1981, and hence this category has a very high percentage of college graduates. A second factor is the projected shift to older ages in the age distribution of college enrollees, thus increasing the average age at which students receive degrees.

Several major conclusions can be drawn from these projections. In 1990, most of the labor force will have at least a high school education; over one quarter of the male labor force and one fifth of the female labor force will have a college education. By 1990, the difference between the educational attainment of men and women for the youngest age group of the adult population (25-34) will be almost eliminated. Although this study was not able to carry the projections through to 1995, the 1990 projections do provide some insight about the attainment one could expect by 1995. Clearly, the departure of the older workers from the labor force will continue to be a major reason for the increased educational attainment of the labor force. Even in 1990, the difference between the education of the younger and the older workers is substantial. Hence, even if the educational attainment of young workers does not change between 1990 and 1995, the 1995 labor force will be more educated than the 1981 or 1990 labor force.

6.5 THE QUALITY OF THE ADULT LABOR FORCE THROUGH 1995

In this chapter we have reviewed the evidence available on how the adult labor force is expected to change through 1995. The overall pattern that we have found is that the labor force is likely to be of higher quality in terms of education and work experience than is now the case. In terms of age, we find that the labor force is likely to be somewhat older in 1990 and 1995 than was the case in 1982 -- the median age of the total labor force is projected by BLS to rise from 35 in 1982 to 36 in 1990 and 37 in 1995. Because nearly 60 percent of the increase in the labor force through 1995 is due to the influx of women (who, on average, have less work experience than men), the average amount of work experience cannot be easily projected for 1995, but it is likely to be slightly higher than the current levels. The adult labor force, according to our preliminary projections, is likely to have more years of schooling than is now the case.

Projections on the training of the labor force have not been attempted here, primarily because of the very limited data available about the current level of training received by the workforce. Industry-sponsored training is likely to be a function of changes in the types of skills required. Many of the occupations expected by BLS to grow the most in terms of absolute numbers require few skills, and the higher educational attainment of the adult labor force may reduce the need for training of the adult labor force. Because of pressure to reduce the Federal deficit, Federally sponsored training is not likely to grow in real terms for the next several years, and the number of apprentices completing training has remained relatively constant since 1970.

6.6 SUMMARY

Between 1982 and 1995 approximately 25 million people are projected to be added to the adult labor force. Although this is a large number of added labor force participants, it represents annual growth of approximately 2 percent. The median age of the labor force is projected to rise by only two years in this period, from 35 to 37. However, the small change in the median age does not tell the entire story; the labor force growth is highly concentrated in the 35 to 54 age range, with declines projected for youth and for the age 54 and above categories.

The racial and sex composition of the labor force is projected to change significantly between 1982 and 1995. The increase in labor force participation by women is projected to continue through 1995, and women will constitute 47 percent of the labor force ages 25 to 54 in 1995 compared to 43 percent in 1982. Nearly 60 percent of the additional members of the labor force are projected to be women. Blacks and other nonwhites have significantly higher projected labor force growth rates than whites. The black and other share of the adult labor force is projected to grow from 13 percent in 1982 to 15 percent in 1995. Slightly over 20 percent of the adult labor force growth in this period is projected to consist of blacks and other nonwhite minorities.

The educational attainment of the adult labor force is projected to rise between 1981 and 1990, as older workers retire and are replaced by workers with more years of schooling. In 1981, 1 out of 5 adult men in the labor force lacked a high school diploma, and by 1990 the corresponding figure is projected to be 1 out of 7; the proportion of adult women in the labor force who lack a high school diploma is projected to drop by 1990 from 1 in 6 to 1 in 10.

Projections of the share of the adult labor force with at least 4 years of college show some significant changes among adults ages 25 to 34. For women the proportion with a college education is projected to drop slightly, but for men the drop is from 27 percent to 20 percent. By 1990 the female adult labor force is projected to include a greater share of college graduates than the male labor force.

CHAPTER 7

CONCLUSIONS AND POLICY CONSIDERATIONS

7.1 CONCLUSIONS

The success of the United States economy depends in large part on the ability of the labor force to perform the jobs available and to adapt to the changing needs of employers. In this report, the education, training, and work experience of the adult labor force have been analyzed for the present, and projections of the labor force size and characteristics through 1995 have been reviewed. The analysis leads to four major conclusions which are presented and discussed below.

1. Most adults in the labor force are able to obtain employment, but a significant number of individuals, concentrated among blacks and Hispanics, face serious unemployment problems.

In 1983, which was a very poor year for the labor force by historical standards, almost 93 percent of the adult labor force was employed. However, over 6.5 million adults, representing 7.5 percent of the labor force, were unemployed. Some of the unemployed experienced the normal frictional unemployment that occurs between jobs, but approximately one-third of the unemployed were out of work for 15 weeks or more, and one-sixth were unemployed 27 weeks or more.

Black and Hispanic adults tended to have more serious unemployment problems than whites. While the unemployment rate for whites ages 25 and over was 6.7 percent in 1983, the corresponding rates for blacks and Hispanics were 14.4 percent and 11.3 percent respectively. Members of minority groups also have longer spells of unemployment than whites.

Many jobs today require a high school education, but nearly 1 in 5 members of the adult labor force lacks a high school diploma; these individuals may have more troubles than others in changing occupations. Educational attainment is significantly lower among blacks and Hispanics in the adult labor force than among whites Nearly one-third of blacks and one-half of Hispanics in the adult labor force lack a high school education, compared to one-sixth of the whites.

Adult women in the labor market do not have the same problems as minority groups. The unemployment rate for women is close to the rate for men, and their educational attainment is similar. The primary problem women face in the labor market is earnings rather than employment; for the past three decades women employed full-time on a year-round basis have earned approximately 60 percent of men's earnings. Although this earnings gap is a subject of considerable interest, it is beyond the scope of this report.

2. The adult labor force is not static in nature; there are considerable changes in the education and training of the labor force every year.

The adult labor force changes its characteristics in two ways. First, older workers retire and are replaced by younger workers. Because of the high birth rates following World War II, the labor force first declined in median age and is now rising. Younger members of the labor force have more years of schooling than those leaving the labor force, so the average educational attainment is rising.

The second way that the labor force changes is that workers obtain education and training to improve their current skills or obtain new skills. The data reviewed indicate that 40 percent of vocational education students, almost 800,000 people, are over age 24. It has been estimated that 9.5 million adults participated in adult education in 1981, and 35 percent of the workforce indicated that they had taken training while on their current jobs to increase their skills. The figures just cited undoubtedly include a great deal of overlap, but it is clear that millions of adult workers improve their skills through vocational education, college, formal company training, and informal on-the-job training. On an annualized basis, the Federal government provides classroom and on-the-job training to 320,000 economically disadvantaged adults through Title IIA of the Job Training partnership Act (JTPA), and approximately 125,000 dislocated workers receive training or job search assistance through Title III JTPA programs each year.

A significant number of adults change occupations each year. While all the changes may not have been voluntary, it is estimated that about 5.5 million adults change occupations each year.

3. Adult training and education are concentrated among those who are already doing relatively well in the labor market

Several surveys indicate that the training and adult education that take place are significantly more concentrated among the groups that already do well in the labor market. Participation rates in adult education are twice as high in white-collar jobs as in blue-collar jobs (23 percent compared to 11 percent), and another survey found that 61 percent of professional workers took training to improve skills on their current job compared to under 25 percent for most blue-collar jobs.

Blacks and Hispanics are overrepresented in blue-collar occupational categories such as laborers, handlers, and service occupations and underrepresented in white-collar occupations such as managerial, professional, and technical occupations. Thus, most of the skill acquisition by the adult labor force is not likely to help these minority groups improve their position in the labor market. Members of minority groups are served to a great extent by JTPA programs for the economically disadvantaged, but it has been estimated that fewer than 2 percent of those eligible participate in JTPA.

4. Overall, the employment situation for the adult labor force is likely to improve somewhat by 1995, but there will remain a large number of people with labor market problems.

Although it is not possible to project business cycle conditions or the exact occupational mix demanded by employers in the future, there are several reasons to believe that the quality of the adult labor force will be higher in 1995 than at present. Because of the aging of the baby boom generation, the vast majority of labor force growth will be in the 35 to 54 year old age bracket while the 25 to 34 year old group will grow very modestly. The unemployment rate for younger adults is about 3 points higher than for adults between 35 and 54, so the aging of the labor force is likely to reduce unemployment. A second reason that the adult labor force is likely to be more highly qualified in 1995 is that educational attainment is projected to increase significantly. The percentage of men in the adult labor force with less than a high school education is projected to drop from the 1981 level of 22 percent to under 14 percent in 1995, and a similar drop is projected for women; slight increases are projected for the share of the labor force with a college degree over that period.

Minority groups, which have had more serious labor market problems than whites, are projected to increase their proportion of the adult labor force. It is estimated that 20 percent of the growth in the adult labor force will consist of blacks and other nonwhites; projections on the share of growth attributable to Hispanics are not available. If these groups continue to have employment problems as they do currently, their increased share of the labor force might partially offset the factors mentioned above.

7.2 POLICY CONSIDERATIONS

The development of policies to assure efficient utilization of the adult labor force requires information on the demand for labor as well as the supply. Because this study has examined only the supply side of the labor market, specific policy recommendations are inappropriate. However, the analysis we have conducted suggests several topics for policy consideration.

1. Caution should be exercised in developing general education and training initiatives for adults.

There are three reasons for moving cautiously in the development of general policy initiatives to encourage education and training of the adult labor force. First, a large majority of the adult labor force is employed at any given time. Second, a substantial number of adults already improve their skills through education, training, and informal on-the-job training. Finally, the adult workforce over the next 10 years will be more experienced and more highly educated than the current workforce. However, if the occupational needs of employers change more rapidly than they do now, there might be a good rationale for a general initiative to expand the education and training of the adult labor force.

2. A stronger case can be made for initiatives to improve the education and training of minorities and individuals with less than a high school education.

Black and Hispanic adults have significantly higher unemployment rates than whites, and the evidence does not suggest that their position will improve soon. Minority groups have lower levels of education than whites, and many observers have suggested that a high school diploma will become increasingly important in the future. Minority group members and individuals with low levels of education are overpresented in low-skill occupations where less adult education and training take place. The Job Training Partnership Act (JTPA) programs serve some of these individuals, but only about 2 percent of those eligible participate in a given year. It will be several years before the effectiveness of JTPA programs is known, so it is not yet known if these programs provide an effective approach to helping these individuals.

3. Data on the education and training received by the adult labor force are very limited, and more knowledge would be useful in formulating labor market policies.

There are no good sources of data on training provided by the private sector, but many analysts have estimated that formal and informal training provided by firms greatly exceeds public sector training. Government programs such as vocational education and JTPA publish some data on the types of training that are provided, but it is not possible to obtain an adequate overall picture of how much training is provided in a given year. It would be valuable to take stock of the nation's current investment in the education and training of adults before new policies are developed.

APPENDIX A

METHODOLOGY FOR THE BUREAU OF LABOR STATISTICS' LABOR FORCE PROJECTIONS

Labor force projections are one of five components of the BLS Economic Growth Model System: (1) labor force, (2) aggregate economic performance, (3) industry final demand and total industry production, (4) industry employment levels, and (5) occupational employment by industry.[1] Labor force projections are developed from Bureau of the Census population projections, which are based on trends in birth rates, death rates, and net migration.

Participation rates are projected for 64 age-race-sex groups by using the following method: (1) past trends for the 1962-1981 period and for selected subperiods are analyzed; (2) the growth rate for the subperiod considered most appropriate is selected for each of the 64 groups; and (3) participation rates are modified if past trends are judged not likely to continue for the entire projection period. Labor force size is then projected by applying the participation rates to the Bureau of the Census population projections.

Unlike estimates of current employment statistics, labor force projections might be more appropriately characterized as an art rather than a science. The projections require judgments about whether or not past trends will continue into the future and on what periods to use in estimating the trends. In recognition of this problem, BLS has developed more than one set of labor force projections. Their best-judgment set of projections is referred to as the "middle scenario"; these are the figures used in this report and most frequently cited by others.

The alternative BLS projections are developed by using two different methods -- alternative demographic assumptions and econometric models. In the demographically based alternatives, BLS changes the assumptions about the trends in participation of women relative to men, and blacks relative to whites. When the alternative participation assumptions are used, the projections of the total size of the labor force are significantly different -- in 1995 the high demographic projection is a labor force of 141.0 million, the middle projection is 131.4 million, and the low demographic projection is 125.1 million.[2]

Two econometric models were also used to develop alternative projections. One model, referred to as the "marital status model" by BLS, was based on data from 34 metropolitan areas in the 1973 to 1980 period. The second econometric

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[1]For details on the BLS Economic Growth Model System, see Bureau of Labor Statistics Bulletin 2206. Occupational Projections and Training Data. May 1984, pp. 75-79. The description of the BLS labor force projections in the text is taken from this bulletin.

[2]The assumptions and implications of the alternative demographic and economic assumptions are discussed in Bureau of Labor Statistics Bulletin 2197. Employment Projections for 1995. March 1984, pp. 5-7.

model used was the labor force projection component of the Chase Econometric Model. For each macroeconomic model, BLS developed high, middle, and low projections by varying the unemployment rate and real earnings. For the values selected, BLS found very small changes in the labor force projections (less than 1 percent between the high and low scenarios).

The BLS econometric projections can be criticized because of the small difference in unemployment rates selected for the high and low projections; the high and low values of 6.8 percent and 5.2 percent vary by less than the 1983 and 1984 unemployment rates, but the BLS researchers are almost certainly correct in noting that the greatest difficulty in making accurate projections is in projecting future trends in labor force participation that are not related to economic conditions.

BLS recognizes the difficulties in making projections in an area where economic theory is of limited usefulness, and the researchers must use judgment to project which trends will continue and which will change. As part of the monitoring process, BLS publishes articles comparing labor force projections with actual developments. Fullerton (1982) reviewed the BLS projections of the 1980 labor force made in 1965, 1970, 1973, and 1976. As might be expected, the earlier projections were less accurate than the more recent projections. Overall, the 1965 projection for the total size of the labor force was 2.9 percent too low, the 1970 projection was 2.8 percent too low, the 1973 projection was 2.5 percent too low, and the 1976 projection was 1.7 percent too low. The projections tended to be too high for men and older workers of both sexes, and very much on the low side for women under age 55. For example, the 1976 projection of women in the labor force was nearly 3 million too low.

To summarize, economists have been unable to develop methods of projecting the labor force with great accuracy.[3] In particular, there have been great problems in projecting the labor force participation rates of women in the past. As the BLS official who is responsible for the labor force projections put it, "It is very important for users to understand the imprecise nature of projections so they can deal with the information properly."[4] We make use of the BLS projections, but we must emphasize the lack of precision in the projections.

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[3]Accuracy of the Bureau of the Census population projections is not discussed in this report because major shifts in birth and death rates over the next years are not anticipated. However, the Census projection of net immigration remaining at a level of 400,000 per year may be an underestimate. If so, the composition of the labor force particularly by ethnic group, may differ from the BLS projections.

[4]The statement by Ronald E. Kutscher, Associate Commissioner of the Bureau of Labor Statistics, was made in June 1983 and is reproduced in the Bureau of Labor Statistics Bulletin 2197. Employment Projections for 1995. p. 2.

APPENDIX B

METHODOLOGY USED TO PROJECT EDUCATIONAL ATTAINMENT

This appendix describes the methodology and documents the data sources used to project the educational attainment of the labor force in 1990. The appendix also documents major assumptions used, and discusses sources of uncertainty in the projections.

Seven data sources were used to project the educational attainment of the labor force. Projections of enrollment and degrees awarded, by age, sex, and education level, were provided by Projections of Education Statistics to 1991-92.[1] The NCES projections served as the foundation for our projections; hence, the projections presented here can be no more accurate than the NCES projections, and are subject to the same caveats.[2] The second source of data was the Department of Labor's Employment Projections for 1995,[3] which provided projections of the 1990 labor force and labor force participation rates. The third data source, Educational Attainment of Workers, March 1981[4] provided estimates of current labor force participation rates by education level. Data on the 1981 educational attainment of the population were taken from Educational Attainment in the United States ..."[5] The 1980 Census of Population provided information on the age distribution of school enrollees.[6] Finally, the data on the age distribution of high school equivalency students was provided by the GED Annual Statistical Report.[7]

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[1]National Center for Education Statistics, Projections of Education Statistics to 1991-92, forthcoming.

[2]See NCES, Projections of Education Statistics to 1990-91, Volume I, page 1, 1982.

[3]U.S. Department of Labor, Employment Projections for 1995. Bulletin 2197, March 1984.

[4]Young, Anne McDougall, "Educational Attainment of Workers," March 1981, Monthly Labor Review. April 1982.

[5]U.S. Department of Commerce, Bureau of the Census, Educational Attainment in the United States: March 1981 and 1980, Current Population Reports, Population Characteristics, Series P. 20, No. 340, August 1984.

[6]U.S. Department of Commerce, Bureau of the Census, 1980 Census of Population - Detailed Population Characteristics, United States Summary, Section A: United States. Table 260, page 1-27, March 1984.

[7]American Council on Education. GED Annual Statistical Report. Washington, D.C., 1983.

The basic methodology used to project the educational attainment of the labor force in 1990 was as follows:

(1) Begin with the current educational attainment of the population, by age and sex. Estimate the number of people with high school, college, and advanced degrees, by assuming that:

- anyone with any college experience has a high school diploma,
- anyone with four or more years of college has a college degree; and
- anyone with more than four years of college has a graduate degree.[8]

(2) Distribute by age the projected number of high school, college, and advanced degrees[9] awarded for each year from 1981 to 1990. The NCES projections of degrees awarded annually are presented in Table A-1. The derivation of the age distribution of degree recipients will be discussed below.

(3) Project the number of people with high school, college, and advanced degrees in 1990 by adding the degrees projected from 1981 to 1990 to the number of people with degrees in 1981, by age. (To calculate the number of 25 year olds with high school degrees in 1990, for example, compute the sum of the number of 16 year olds with high school degrees in 1981 (March), the number of 16 year olds receiving high school degrees in June 1981, the number of 17 year olds receiving high school degrees in 1982, the number of 18 year olds receiving degrees in 1983, etc.).

(4) Once the number of people with various degrees is calculated, estimate the <u>educational attainment</u> of the population in 1990. Assume, again, that anyone with a college degree has a high school degree. Hence, the number of people with <u>only</u> a high school education is equal to the number of people with high school degrees less the number of people with college degrees. Similarly, the number of people with <u>only</u> a college degree is equal to the number of people with college degrees less the number with advanced degrees.

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[8]The available information on the educational attainment of the population is reported in terms of number years of school completed. Hence, assumptions had to be made about the relationship between number of years and degrees. The assumption that anyone with four or more years of college has a college degree may overestimate the number of college graduates, since some students take longer than 4 years. Similarly, assuming that anyone with more than 4 years of college has a graduate degree will also overestimate the number of people with an advanced degree. This problem is discussed later.

[9]The NCES projects masters, doctors, and first-professional degrees; we assume here that all doctoral degree recipients also have their masters degree, and hence include only masters and first-professional degrees to measure the number of people with advanced degrees.

TABLE B-1

NCES PROJECTIONS OF DEGREES AWARDED

	High School	Bachelor's	Advanced Degrees a/	High School Equivalency Credentials c/
Men				
1980-1981	1,480	469,883 b/	147,043 b/	252
1981-1982	1,438	473,364 b/	145,532 b/	252
1982-1983	1,368	480,000	143,000	308
1983-1984	1,312	485,000	143,000	308
1984-1985	1,280	480,000	141,000	314
1985-1986	1,273	470,000	139,000	326
1986-1987	1,297	465,000	138,000	338
1987-1988	1,330	462,000	138,000	344
1988-1989	1,289	462,000	137,000	344
1989-1990	1,199	462,000	137,000	344
Women				
1980-1981	1,541	465,257 b/	148,696 b/	238
1981-1982	1,499	479,634 b/	150,014 b/	238
1982-1983	1,427	490,000	152,000	192
1983-1984	1,368	485,000	153,000	192
1984-1985	1,334	480,000	154,000	196
1985-1986	1,326	475,000	155,000	204
1986-1987	1,351	470,000	154,000	212
1987-1988	1,380	465,000	153,000	216
1988-1989	1,337	465,000	152,000	216
1989-1990	1,245	465,000	152,000	216

a/ Advanced degrees are computed as the sum of master's and first-professional degrees awarded.

b/ These data are actual, not projected.

c/ High school equivalency credentials are not projected by sex. To distribute the degrees, we assumed that the ratio between male and female degree recipients was the same as the ratio between male and female high school dropouts, or 1.60 (Digest of Education Statistics, page 71).

(5) Estimate the educational attainment of the labor force by multiplying the 1990 population by the labor force participation rate. The choice of labor force participation rates is important and is discussed below.

(6) Calculate the percentage of the projected labor force having high school, college, and advanced degrees.

In order to carry out the above methodology, it was necessary to estimate two major inputs: (1) the age distribution of degree recipients from 1981 to 1990 and (2) the labor force participation rates in 1990.

Projecting the Age Distribution of Degree Recipients

The 1980 Census of the Population provides information on the distribution of students by sex, age, and year in school. The 1980 age distribution of 4th-year high school students, of 4th-year college students, and of all graduate students (more than 4 years of college) were used as the basis of the age distribution projections, which were computed as follows:

- High School Diploma Recipients: We assumed that the age distribution of high school students would remain constant from 1980 to 1990. Hence, the age distribution of 4th-year high school students from the 1980 Census was used throughout.

- High School Equivalency Recipients: The only available information on high school equivalency credentials was the 1983 age distribution of all people taking the equivalency test. This distribution was used for both sexes.

- College and Advanced Degree Recipients: Two sources of information were combined to produce the projections of the age distribution of college and advanced degree recipients. The NCES projects total enrollment in all institutions of higher education, by age group and sex, for 1980, 1982, 1987, and 1990. We converted the projections from age group (e.g., 18-19, 20-21, etc.) to individual ages by using the age distribution within each age group (e.g., the percentage of 18 year olds in the 18-19 age group) from the 1980 Census. We calculated from the 1980 Census the percentage of all enrollees constituted by 4th year and 5th year and above students by age, and multiplied these percentages by the NCES projections of the number of total enrollees to obtain projections of the number of 4th year and 5th year and above enrollees in 1985 and 1990. For example, to project the number of 18-year-old students enrolled in the 4th year of college in 1987, we performed the following calculation:

$$\frac{\text{\# 18-year-old students enrolled in 4th year college in 1980}}{\underbrace{\text{\#18 year olds + \#19 year olds enrolled in all institutions of higher education in 1980}}_{\text{1980 Census}}} \times \underbrace{\text{\#18-19 year olds enrolled in all institution of higher education in 1987}}_{\text{NCES Projection}} = \text{Estimate of the \#18 year olds enrolled in 4th year college in 1987}$$

To obtain similar estimates for the intervening years for which no NCES projections exist, we made the simplifying assumption that the rate of change of enrollment was constant from 1980 to 1982, 1982 to 1987, and 1987 to 1992, and we linearly interpolated the number of students enrolled by age.

We then calculated the percentage of all 4th-year and 5th-year and above students by age to obtain, from 1980 to 1990, the age distribution of 4th-year and 5th-year and above college students, by age and sex. Finally, we assumed that these age distributions reflected the age distribution of degree recipients (probably a reasonable assumption for bachelor's degrees, though less reasonable for advanced degrees).

Projecting Labor Force Participation Rates

The Department of Labor's Employment Projections for 1995 projects labor force participation rates by sex and age, but not by education. Since labor force participation rates are known to vary by education level, and since this effort is dedicated to estimating the educational attainment of the labor force, and not the entire population, we felt it necessary to obtain some estimate of labor force participation rates by education.

In order to perform these estimations, we assumed that labor force participation rates by education level would increase or decrease linearly with overall participation rates by age and sex, i.e., that the ratio between participation rates for people with different education levels would be constant. Hence we adjusted the 1981 participation rates by age and education level[10] to reflect expected changes in the overall participation rates by age and sex from 1980 to 1990.[11]

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[10]Participation rates by educational level were obtained from Young, Anne McDougall, "Educational Attainment of Workers, March 1981" Monthly Labor Review, April 1982.

[11]Because labor force participation rates have a direct relationship with education, labor force participation rates will increase as the proportion of people with higher education increases. Thus, to project the participation rates by education level in 1990, we first calculated the overall participation rate that would result from the increased education of the population. We then adjusted the participation rates by education level to reflect the difference between the participation rate projected by the BLS and the rate resulting from the increased education of the population.

Sources of Uncertainty in the Projections of Educational Attainment of the Labor Force

There are five major sources of uncertainty and error in our projections:

- Uncertainty in the projections of the number of degrees awarded;
- Uncertainty in the relationship between years of school completed and degrees granted;
- Uncertainty in the projections of the age distribution of degree recipients;
- Uncertainty in the projections of the 1990 labor force participation rates; and
- Uncertainty about the extent to which our projections reflect all sources of education.

This section discusses the impact on our projections of each of these sources of uncertainty, and explores possible future steps to increase the accuracy of these projections.

Uncertainty in the Projections of Degrees Awarded. The NCES projects degrees awarded using a variety of forecasting techniques. Their projections are based on demographic projections, projections of enrollment, and projections of current trends (e.g., the increased participation of women in higher education). Like all time series projections, the NCES projections are subject to many sources of error. Population projections, enrollment projections for men and for women, age distribution projections, and projections regarding the longevity of current trends are all potential sources of error and inaccuracy.

Since our projections of educational attainment are based upon the NCES projections, we feel it is important to include the caveat that the accuracy of our projections not be overestimated. These projections should provide a general idea about the educational attainment of the labor force in 1990, but should not be relied upon to provide precise numbers.

Uncertainty in the Relationship Between Years of School Completed and Degrees Awarded. Because of the nature of available data on the educational attainment of the labor force, it was necessary to make some simplifying assumptions regarding the relationship between years of school completed and degrees granted. We assumed, as previously noted, that people with 4 years of high school had high school degrees, that people with 4 years of college had college degrees, and that people with more than 4 years of college had advanced degrees.

The major impact of these simplifying assumptions on our projections of educational attainment is that the number of people with advanced degrees will be overestimated for two reasons. First, many people take 5 years to complete college. Hence, a large percentage of the people with "advanced degrees" in

our study will be people with college degrees only. Second, some people may experience some graduate school training, yet may not be enrolled in degree-granting program or may not complete the degree requirements and will thus not have advanced degrees. Hence, further work needs to be done to correct these assumptions.

Uncertainty in the Projections of the Age Distribution of Degree Recipients. The projections of the age distribution of degree recipients were based upon a number of simplifying assumptions. First, we assumed (for college and advanced degree recipients) that the rate of change of the distribution of enrollment by any group would be constant from 1980 to 1982, 1982 to 1987, and 1987 to 1990. Second, we assumed that the age distribution within each age group would be constant from 1980 to 1990 (see discussion on the age distribution methodology for a clarification of this issue). Finally, we assumed that the age distributions of 4th-year high school students, 4th-year college students, and 5th-year or more advanced college students were reasonable proxies for the age distributions of degree recipients.

This final assumption implies that the dropout rate for 4th-year students is unrelated to age, that the age distribution of students taking 5 years or more to complete their high school or bachelor's degree is the same as that of students who take four years, and that the age distribution of students enrolled in graduate school reflects the age distribution of all graduate degree recipients.

Obviously, each of these simplifying assumptions is associated with some degree of error. Hence, our projections of degrees awarded by age should only be considered a rough estimate of the actual age distribution of degree recipients.

Uncertainty in the Projections of 1990 Labor Force Participation Rates. The labor force participation rates used in this analysis were computed by adjusting current participation rates, by education level, to reflect the forecasted rates for 1990.

Two possible sources of error arise from this projection methodology. First, the participation rates forecast by the Department of Labor may not be accurate. In the past, the Department of Labor has been relatively unsuccessful in predicting the participation rates for women and for older persons (Fullerton, 1982). Hence, our labor force projections will be wrong to the extent that the underlying projections are wrong. This is not a great problem for our projections of educational attainment, however. The projections of the 1990 labor force which we use in this analysis are based upon the Department of Labor's participation rate projections. Hence, our projections of educational attainment of the labor force, in terms of the percentage of the labor force having various degrees, should be insensitive to errors in the Department of Labor's projections.

The second possible source of error is, however, more worrisome. Our projections of the labor force participation rates by education level are the key to distinguishing between the educational attainment of the labor force and the educational attainment of the population. Our assumption that the

ratio between participation rates for various educational levels remains constant is possibly incorrect, and could have significant impact on our conclusions. For instance, the overall participation rate for 35- to 44-year old women is projected to increase from 67 percent in 1981 to 79 percent in 1990. By assuming that participation rates by education increase linearly (after taking into account the participation rate change due to the increased education of the workforce) with the overall rate, we project that participation rates for 35- to 44-year-old women in 1990 will be as follows: 62 percent for women with less than 4 years of high school, 80 percent for women with only a high school degree, and 85 percent for college graduates. If the 18 percent change in participation rate should actually be reflected only in the lowest educational level category, we will be overestimating the education of the work force, relative to the population, by using our estimates.

Therefore, our projections of the educational attainment of the workforce are subject to a substantial degree of uncertainty. For this reason, we present both the educational attainment of the population and the educational attainment of the labor force in the main body of this report (Chapter 6).

Uncertainty in the Extent to Which Our Projections Reflect All Sources of Education. A final problem with our estimates of the educational attainment of the labor force is that, for lack of easily available data, some educational attainment has not been projected. The primary omission in our projections is associate degrees.

In 1980, enrollment in two-year institutions of higher education constituted 37 percent of total enrollment in higher education.[12] Thus, a large proportion of those we project to have only a high school degree may also have associate degrees or other degrees associated with vocational training, which require less than four years of college study.

Unfortunately, the work that would have been required to project associate degrees was beyond the scope of this project. Enough raw data exist, however, that it should be possible, with future effort, to obtain reasonable projections of the degrees awarded at the associate level.

Other sources of education that are not included in our projections are adult education, training, and vocational education. These sources of education were omitted because of the unavailability of suitable data.

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[12]NCES, Projections, 1982, pp. 39-41.

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