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THE EFFECT OF SEX ON HOURLY WAGES

by
Howard Marshall Iams

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Sociology)
in The University of Michigan
1973

Doctoral Committee:

Associate Professor Reynolds Farley, Chairman
Professor David Goldberg
Professor Eva Mueller
Associate Professor Paul M. Siegel

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CHAPTER I

THE PROBLEM AND REVIEW OF THE LITERATURE

Recently, members of Women's Liberation have focused attention upon the status of women by claiming that there is extensive, systematic discrimination against women. Some members of the Women's Movement have argued that compared to males, females with equal or better qualifications receive occupational positions which are of lower socioeconomic standing. Furthermore, given similar occupations, women are paid less than men. This dissertation investigates the degree to which such charges are valid specifically in terms of the earnings of women. Using techniques of multiple regression and the decomposition of the inequality in earnings, which have been applied extensively to the study of the status of Negro Americans, data from the Census of the Population: 1960 one-in-one thousand sample is analyzed to determine the validity of the claim that women earn less than men with equal qualifications. This dissertation examines why the hourly wages of women differ from those of men.

This dissertation is in the tradition of research on social differences. Previous investigations within this

tradition use discrepancies in earnings between groups of people to study social differences and their roots. A differential exists whenever the average earnings of two groups are not equal, and consequently the relative earnings ratio of two groups does not equal unity. (Hereafter the term "relative earnings of women" will refer to the ratio of the average earnings of women to the average earnings of men.) Either dissimilarities between the groups in socioeconomic characteristics or unequal returns from characteristics such as education may cause a relative earnings ratio above or below unity. Usually researchers have explored which dissimilarities in characteristics are important. Frequently, they examined a model in which the relative earnings ratio between sets of people was calculated as if one group of people possessed the other group's characteristics but retained their own pay rate for these characteristics. In this manner researchers sought to establish whether the relative earnings of groups reflect unequal pay rates for socioeconomic characteristics.

Thus, researchers studying differences in earnings between groups have determined the relative earnings ratio and some of the reasons for it. However, they have not determined with certainty whether such differentials emanate from choice or discrimination. Although job choice in higher status occupations may be available to women, they might choose employment in lower status occupations. Present research has not ascertained the extent to which "choice"

or discrimination is the cause.

Studies pertaining to the status of Negro Americans illustrate the potentialities of research into discrepancies in earnings. During the 1960's, researchers focused on the relative earnings of Negroes in order to test the claims of economic discrimination by spokesmen for the Civil Rights movement. More than one hundred years after emancipation, spokesmen for the Civil Rights Movement assert there is still extensive economic discrimination against Negroes while their opponents claimed that existing differences reflect the qualifications of Negroes as compared to whites. Social scientists investigating this topic found that there are extensive differences in the relative earnings of Negroes and whites. Even taking educational differences into account, Negroes in 1960 earned less income than whites (Siegel 1965). Furthermore, when a model was constructed which simulated the earnings Negroes would have if they had the same background in several characteristics which whites actually possessed, Negroes still would have earned much less than whites earned (Duncan 1969). This discrepancy may reflect discrimination. Another aspect of research on social differences is illustrated by those investigators who determined that the relative earnings of Negroes were moving towards unity in the 1960's (Palmore and Whittington 1970; Farley and Hermalin 1972). Complementing the work of the researchers on the relative earnings, other researchers studied the actual process of

discrimination. Hiestand's (1970) review of the literature reported that investigators found racial discrimination in employment practices. Those practices might account for part of the differences in earnings of Negroes relative to whites.

Discrimination and Women

Three sources of evidence have indicated that women may also experience what some have called 'discrimination'. One source consists of legislative and legal action. Another is the work of the Bureau of Labor Statistics on labor markets. Third is the work of investigators of social differences paralleling the work that has studied income differences between Negroes and whites. The evidence suggests that there is a discrepancy in hourly earnings between women and men.

Over the past half-century some people have believed that there has been sex discrimination in employment and pay and have agitated for its legal prohibition. By 1960 there were equal pay provisions in twenty-four states but laws prohibiting sex discrimination in employment hiring and promotion in only two states. In fact many state legislatures required discrimination in hiring by restricting legal working hours and working conditions for women (Schulder 1970, p. 106). These laws may channel sex discrimination into unequal access to jobs rather than unequal pay.

The major legal changes came in 1963 with the Equal Pay Act and in 1964 with the Civil Rights Act. Action by the federal government designed to improve the conditions of Negro Americans was also applicable to women. Enforcement of these provisions indicate that there was sex discrimination. According to the 1967 Annual Report of the Equal Employment Opportunity Commission enforcing 1964 Civil Rights Act, one-third of the complaints filed under the act were by women (Rossi 1970, p. 106). Because a case was considered only if there was a plaintiff, this proves only that some women <u>believed</u> there was discrimination. Yet there is some evidence that there actually was discrimination. The Wage and Hour Division found seventeen million dollars in underpayments contrary to the 1963 Equal Pay Act by April, 1970 (Moran 1970, p. 241). Because most of these workers were women, this provides an estimate of the cost of actual employer discrimination. But this figure is only the minimum figure. Resulting from both limited coverage of the acts and the procedures for developing and settling complaints by enforcement agencies, the total amount of actual discrimination is unavailable (Kantowitz 1969, p. 110 and p. 113; Rossi 1970, p. 101-102).

The investigations of the Bureau of Labor Statistics indicated that a major part of the inequality in earnings results from differences in employment patterns. Their studies were periodically conducted in metropolitan areas to analyze wage differentials in a limited segment of the

labor force, usually eight office and three plant occupations. The investigations suggested a slight decline between 1959 and 1970 in the discrepancy between the sexes, but women still earned less than men. The Bureau determined that in 1965 men earned 5 per cent to 35 per cent more than women earned for the same specific occupation (McNulty 1967, p. 40). The investigator indicated that much of the differential in pay is created by higher paying establishments excluding women from employment. In fact, within firms employing both men and women, the median wage of men was no more than 5 per cent higher than the median wage of women in all but one occupation. The Bureau found similar results in 1970 in the analysis of ten of the eleven occupations considered in 1965 (Buckley 1971, p. 43). The studies were limited in coverage of the labor force and ignored differences in qualifications which could affect hiring. Nevertheless, such studies support allegations of hiring and pay discrimination for women.

Researchers on the relative earnings of women duplicated methods of researchers on inequality of earnings between Negroes and whites. Investigations of data covering the entire labor force typically concluded that women earn less than men. Thus, Sanborn (1964, p. 534) found women earned 58 per cent of the amount earned by men in 1949, and Sawhill (1968, p. 51) determined women earned 46 per cent of the amount earned by men in 1959. In addition to covering the entire labor force, these types of data permit the

investigator to take account of what some consider different qualifications between the sexes. But even after adjustment for dissimilarities between the sexes in social and demographic characteristics, discrepancies in earnings remain. Using published 1950 Census data, for example, Sanborn (1964, p. 534) standardized for distributional differences in hours worked, education, age, race, urbanization, and detailed occupation and found that women earn only 76 per cent of the amount earned by men. Sawhill (1968, p. 57) analyzed data from the Census of the Population: 1960 one-in-one thousand sample by standardizing for differences in hours worked, education, age, race, urbanization, occupation, region and industry, but still found that women's relative earnings remain at approximately 61 per cent men's earnings. However, it should be noted that Sawhill, unlike Sanborn, corrected for differences singly rather than simultaneously. After Sawhill adjusted simultaneously for major occupation and major industry, she found little change in the disparity between the earnings of women and the earnings of men. The Survey Research Center of Michigan collected data from family heads in 1959 on income, education-age, occupation, population size, region, unemployment, race, geographic mobility, disability, and native intelligence (grades in school). In a study of family heads Morgan et al. (1962, p. 48) reported data which indicate that even after simultaneous adjustments for these characteristics, women earn 62 per cent of the amount

men earn. After adjustments for dissimilarities between the sexes in socioeconomic characteristics, each of these investigators found that the relative earnings of women is less than unity.

The three types of investigations of the inequality in earnings between the sexes document that there are differences. While these studies consider some reasons for the differential in earnings, they focus on the extent of the inequality rather than why differences may exist. Most studies used a limited set of variables for the explanation or did not distinguish the differences in characteristics from differential pay for characteristics.

This dissertation studies some factors contributing to the inequality of hourly earnings between men and women in the United States. It ascertains the effects of differences in socioeconomic characteristics and of exchange of social characteristics. The characteristics studied are as follows: education, potential work experience, occupation, industry, age, marital status, and race. These aspects have not been systematically studied to date. The study partially answers the following questions:

1. What does age and marital status contribute to the differential in hourly wages between white men and white women?

2. Does the differential in hourly wages between white men and women reflect differences in educational, occupational or work experience character-

istics? How does age and marital status of white women affect the influence of differences in characteristics?

3. Does the inequality in hourly wages of white men and women reflect differences in the rate of pay for education, work experience, or occupational position? If so, which payments for specific variables account for part of the differential in wages? How do the age levels and the marital status of white women affect the differential in wages between the sexes?

4. How do black women differ from white women relative to white men in wage differential, effects of mean differences in social characteristics and effects of payment differences for social characteristics?

5. Does the differential in hourly wages between white men and white women reflect different industrial employment or different payment for industrial positions or both? How do specific industrial attributes contribute?

The Setting: The United States

The objective of the present section is to discuss the explanatory variables considered in this study. First, reasons for considering the variables in the study are discussed. Then, empirical differences on the variables between men and women are considered. Finally, the possible

impact of the variable on the inequality in hourly wages between the sexes is suggested given previous studies on the subject. The variables considered are the following: 1. Earnings, 2. Labor Force Participation, 3. Potential Work Experience, 4. Education, 5. Occupational Position, 6. Industry of Employment and 7. Specific Industrial Characteristics.

Earnings

Investigators of the status of women in the United States have used two measures of earnings. One measure is hourly wages (Sawhill 1968; Fuchs 1971; Cohen 1971). The other measure is yearly earnings (Sanborn 1964; Ferriss 1971; Suter and Miller 1973). Investigators with both measures arrive at similar conclusions if some form of adjustment is made for unequal hours worked in the year between the sexes. They conclude that men earned more than women.

Labor Force Participation

Lower labor force participation reduces the total of annual hours of paid work. Most investigators recognized that dissimilar levels of labor force participation between women and men could contribute to the inequality of earnings between women and men. Women may earn less annually because they work less annually.

In the United States women worked fewer hours annually than men work because a larger proportion of women than men divide their time between domestic obligations

and paid work. In 1959 for example, only 47 per cent of employed women worked 48 or more weeks in the year compared to 71 per cent of the employed men (U.S.: Bureau of the Census 1964b, Table 12). In April, 1960, only 70 per cent of the employed women reported working more than 35 hours per week compared to 86 per cent of the employed men (U.S. Bureau of the Census 1964b, Table 1).

Adjustment for discrepancies in labor force participation levels between the sexes accounts for part of the inequality in earnings for women. After accounting for occupational differences, Sanborn (1964, pp. 538-541) determined from published Census data of 1950 that adjustment for level of labor force participation increased the relative earnings of women from 64 per cent to 74 per cent of the amount earned by men. Based on the one-in-one thousand sample of the 1960 Census, adjustment for labor force participation discrepancies in 1959 raised the earnings of women from 46 per cent to approximately 61 per cent of the earnings of men (Sawhill 1968, p. 55; Fuchs 1971, p. 10). While discrepancies in labor force participation level accounted for part of the difference in earnings between the sexes in each time period, the relative earnings of women were still less than unity. In fact analysis of data from the Census of the Population: 1960 indicated that women earn a significantly lower hourly wage than men even after adjustment for annual

hours worked.[1]

Potential Work Experience

The history of a worker's employment can influence earnings via employment or promotion. For one thing, past experience sometimes contributes to the skill level of employees. Cohen (1971, p. 442) suggested that on-the-job training occurs between age twenty and thirty when "most women have their children." He argued that although the person while training will receive less payment than another equally qualified person not training, the trained person will earn more after the training period. "When women enter the labor force at age 30, they have less general training than men of the same age, who have been in the labor force throughout their twenties" (Cohen 1971), p. 442). In addition, past work experience with one particular employer--often termed seniority--can be the basis of higher payment or of decisions about who works overtime, who is layed off, or who is promoted. For these reasons, past work experience can influence earnings, and, given sexual differences in lifetime work experience, can contribute to differences in the earnings of the sexes.

---

[1]Based on a random sub-sampling of white wage and salary workers of both sexes from the one-in-one thousand sample of the Census of the Population: 1960. Sample was restricted to non-agricultural workers working 35 or more hours in a week in April, 1960, and working 50 or more weeks in 1959. The sub-sample contains 275 women and 264 men.

When considering employment or promotion, employers may use the work potential of an employee in the future. Mary Keyserling addressed a conference as follows:

> Why the conspicuous underuse of women in the labor force and the slowness of our efforts to do a better job? . . . Let's start with the view so frequently stated 'it doesn't pay to promote a woman or train her for supervisory jobs or other managerial assignments. Why? Because she'll only marry and leave and the investment will be wasted.' (Keyserling 1968, p. 3).[1]

Keyserling cited as evidence the results of a study of 1900 firms by the Administrative Management Society which found 32 per cent of the employers interviewed prefered men because they were more stable and dependable (Keyserling 1968, p. 5). Other investigations put forth similar conclusions (U.S. President's Commission on the Status of Women 1965, p. 47; National Manpower Commission 1957, p. 29; Killian 1965, pp. 131-134). Evidence suggests that employers consider worker stability important for employment and promotion.

Labor Force Participation

Studies of labor force participation, employee job tenure, and job mobility provide sources of information on past work experience and worker stability in the labor force. Investigators have found that the proportion of men exceeds the proportion of women in the labor force.

---

[1]At the time Mary Keyserling was Director of the Women's Bureau in the Wage and Labor Standards Administration of the U.S. Department of Labor.

For example, Bowen and Finegan (1969, pp. 35-469) found that in 1960 the proportion in the labor force of white men with spouse present exceeded other groups defined by race and sex. However, the proportions in the labor force of most groups were affected by marital status, age, education, and other socioeconomic characteristics. The data from 1960 in Table 1.1 indicate that some subsets of women--such as never-married women of ages 25 to 54--had higher proportions in the labor force than some subsets of men--such as men without spouse present ages 25 to 54 (93.9 vs. 89.8). Most women in the United States marry and their labor force experience largely determines the participation rate of all women. Consequently, if one applies the proportions in the labor force of a cross sectional study to a hypothetical cohort of people--creating a synthetic cohort--most men exceed most women in labor force experience at a given age. As measured by proportion in the labor force, women have lower levels of lifetime employment experience than men.

Job Tenure

Investigations of job tenure by the Bureau of Labor Statistics in January of 1963, 1966, and 1968 support the hypothesis that men have greater past work employment than women. These studies defined job tenure as the length of time a worker had been employed by the present employer as reported in the Current Population Surveys. In each

TABLE 1.1.--Unadjusted and Adjusted Labor Force Participation Rate of Urban Dwellers by Age and Marital Status for United States: 1960[d]

Marital Status	Age 25 to 54		Age 55 to 64	
	Unadjusted Rate	Adjusted Rate	Unadjusted Rate	Adjusted Rate
		Men[a]		
Married Wife Present	98.1	98.0	87.5	87.3
Other	89.8	90.2		
Widowed			73.2	75.3
Never Married			73.3	74.7
Other			79.5	78.6
		Women with Spouse not Present[b]		
Never Married	93.9	91.2	77.2	68.3
Other				
Widowed	76.1	80.5	56.2	61.1
Separated or Divorced	87.7	88.5	69.2	64.0
Other	64.7	66.2	56.0	54.9
		Women with Spouse Present[c]		
All Married	35.8	35.8	28.2	28.2
Age of Children				
No Children Under 18	53.4	56.1		
Under 6 only	19.3	13.2		
Under 6, 6 to 13	17.8	15.0		
Under 6, 14 to 17	24.2	23.6		
Under 6, 6 to 13 and 14 to 17	21.9	20.7		
6 to 13	36.6	36.2		
6 to 13, 14 to 17	34.8	36.5		
14 to 17	48.1	53.3		

[a]Age 25 to 54 is taken from Table 3-1. Age 55 to 64 is taken from Table 9-2.

[b]Age 25 to 54 is taken from Table 8-1. Age 55 to 64 is taken from Table 9-2.

[c]Age 25 to 54 is taken from Table 5-2 except Married All which is from Table 5-1. Age 55 to 64 is from Table 9-2.

[d]Adjusted for Age, Color, Schooling, and other income than wage and salary or self-employed. Source of data was the 1/1000 sample of the 1960 U.S. Census.

Source: Bowen and Finegan (1969, Tables 3-1, 5-2, 8-1, and 9-2).

study the job tenure of men exceeded the job tenure of women and with few exceptions the relationship was maintained regardless of race, age, major occupation or major industry. In each study, the extent that all men exceeded all women in median years of job tenure increased as workers were older (Hamel 1963, p. 1145; Hamel 1967, p. 33; O'Boyle 1969, p. 18).

O'Boyle found in a survey of January, 1968, that age of workers closely associated with years of job tenure of workers. Age explained over 92 per cent of the variance in job tenure of workers for white men, white women, and black women. When O'Boyle regressed years of job tenure on years of age, sex had an effect independent of age on the level of job tenure. The partial regression coefficients were as follows: .381 for white men, .205 for white women, and .191 for black women. These indicate that for each additional year of age, white men on the average had a greater increment in job tenure than white or black women.

Although regression analysis was not used in earlier studies, there were similar relationships between age, job tenure, and sex. For example, in 1963 the median value of years of job tenure at ages 25 to 34 was 1.5 years greater for men than for women--3.5 years versus 2.0 years. At ages 55 to 59 this difference increased to 6.9 years of job tenure, (see Table 1.2). Although age closely associates with levels of job tenure, studies indicate that sex had an independent effect on the relationship between job tenure

and age. On the average, men have higher levels of job tenure than women.

TABLE 1.2.--Median Years of Continuous Tenure with One Employer by Age and Sex for the United States: January 1963

Sex	Age						
	20-24	25-34	35-44	45-49	50-54	55-59	60-64
Men	1.0	3.5	7.6	10.7	12.3	14.1	15.6
Women	1.1	2.0	3.6	5.6	6.6	7.2	9.3

Source: Hamel, Harvey G. (1963, Table A).

Yet, age specific job tenure of women was probably affected by marital status. In 1960 a high proportion of never-married women were in the labor force between ages 25 and 54 (Bowen and Finegan 1969, p. 262). If this data belonged to a synthetic cohort, the continuous participation over time would create lengthy lifetime work experience for single women. Suter and Miller (1973, p. 964) calculated that the following percentages of women reported working at least six months in every year since completing school: 55 per cent of all single women, 30 per cent of all married women without children, and 3 per cent of all married women who had borne children. Their data consisted of actual lifetime work histories retrospectively reported by women ages 30 to 44 in 1967, (Parnes et al. 1970; Suter and Miller 1973). In summary, never-married women should have higher levels of continuous employment than other women.

Studies of job tenure support the hypothesis that never-married women have extensive work experience. Hamel (1963, p. 1146) noted that single women under age 45 have much the same job tenure level as men under age 45, but the job tenure of women over age 45 exceeded that of men over age 45. This is evident from the comparison of the age specific median levels of job tenure reported for men in Table 1.2 with those reported for single women in Table 1.3, (compare row one of each table). Yet, most women in the labor force have been married, and their experience heavily influences the overall age specific tenure levels of women. Consequently, the general level of job tenure of men exceeds that of women regardless of age, occupation, education, and industry.

TABLE 1.3.--Median Years of Continuous Tenure with One Employer by Age and Marital Status for Women Usually Employed Full-Time in the United States: January 1963

Marital Status	Age			
	14-24	25-34	35-44	45 and over
Single	.9	3.6	7.5	14.7
Married Husband Present	1.0	2.1	3.7	6.8
Other Marital Status	.8	1.5	3.4	7.1

Source: Hamel, Harvey G. (1963, Table 4).

O'Boyle (1969) studied job stability and the relation

on job tenure of employees in 1963. His analysis indicated that longer job tenure in 1963 increased the likelihood of continuous employment for men but not for women between 1963 and 1968. For both groups, increased age meant increased levels of continuous employment, i.e., stability, at each of three levels of job tenure.[1] In general, women had lower levels of stability, continuous employment, than men in various combinations of age with job length in 1963 (O'Boyle 1969, p. 22). (Women exceeded men in only 6 of 22 comparisons.) This analysis suggests that the job stability of men is greater than the job stability of women.

In contrast to the above results concerning job stability between 1963 and 1968, a study of job changes in 1961 indicated that women had lower job turnovers than men. Eleven per cent of the men working in 1961 changed jobs but only 8.5 per cent of the women (Bancroft and Garfinkle 1963, p. 6). As with stability analysis from job tenure, job changes declined with age. Unlike the results of studies of job tenure, more men changed jobs than women at ages 20 to 24, 25 to 44, and 45 to 64.

How can the apparently conflicting results be reconciled? Job changes were defined to include transfers between jobs where the employer was the same. However, job tenure refered to the number of years with the same

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[1]The job tenure levels were 5 to 10, 10 to 15, and over 15 years of job tenure.

specific employer, for example U.S. Steel, regardless of the job. If only job changes in both occupation and industry were considered, a definition similar to job tenure, the percentage of women with job changes slightly exceeded the percentage of men in 1961 (Bancroft and Garfinkle 1963, p. 10). This suggests that the differing definitions of stability contribute to the conflict in results. However, it may be that in a given year more women are stable, but in the long term more men are stable. A Bureau of Labor Force Statistics study on job starts and stops of women in 1964 analyzed why women left the labor force between 1962 and 1964. Many married women left the labor force for family responsibilities, and in addition, 10 per cent of those working said they would stop if family obligations required it (Rosenfeld and Perrella 1965, p. 107). Evidently many women were temporarily in the labor force; in fact two-thirds of the employed women in each marital status category did not know how long they would continue working. Given both this study and the previously cited material on labor force participation, more women may be stable workers within one particular fifty-two week period, but over a lifetime, more men than women may be stable workers.

Effects of Potential Work Experience

Several sources of evidence have indicated the sexes differ in employment stability and level of past

experience. The only study of the effects of lifetime work experience on the relative earnings of women was conducted by Suter and Miller (1971). They analyzed information collected by the Current Population Survey under the direction of Parnes (1972). Their analysis indicated that after adjustments in levels of education, occupational status, and current level of labor force participation of the employee, the relative annual earnings of women increased from 54 per cent to 62 per cent of men's annual earnings by adjusting for lifetime work experience (Suter and Miller 1973, p. 970). Part of the effect of greater experience may result from seniority as Cohen (1971, p. 446) estimated that greater seniority contributed to higher wages of men. Apparently differences in the extent of past employment affects the earnings of women relative to men.

Education

Another variable for consideration is education as measured by formal years of schooling reported by the respondent. Some may wish to consider education a measure of learning and skills. Beverly Duncan (1968, pp. 666-669) has argued that the results of the Coleman Report suggest:

> . . . that out of school learning is facilitated by the intellectual skills acquired through formal schooling.
> . . . If overlap in achievement between less able children in successive grades is not great and if, at each grade level, it is children of lesser ability who become school leavers, the distribution of adults by grades completed will be a more or less faithful representation of their distribution by ability or command of valued language.

In summary there is some support for those desiring to consider grade attained as a measure of employment related skill. Also, level and type of education are qualification for employment in American society. Educational requirements have been increasing for the same occupations over time (Collins 1971). Consequently education could influence earnings by affecting occupational position. In addition, differences in education could be associated with motivational differences that affect pay. Any differences in level of education could explain partly the discrepancies in average hourly wages between the sexes.

There was little difference between women and men in the level of education in 1959. The mean education level was 11.31 years for women compared to 11.25 years for men.[1] Based on data for employed workers over age 25, there was only a slight difference in the distributions of the sexes across nine education levels as indicated by the index of dissimilarity. The index of dissimilarity is a summary measure of distribution differences which indicates the percentage of one group which would have to change categories in order for the distributions of two groups to be equal.[2] The size of the index was only 5.1 in 1950 and

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[1]Based on the previously defined sub-sample of white workers from the one-in-one thousand sample of the Census of the Population: 1960.

[2]The index of dissimilarity = $\Sigma / x_{im} - x_{iw} \Sigma / 2$ with x_i = percent in category; and m referring to men and w referring to women.

9.6 in 1960 (U.S. Bureau of the Census 1952, Table 44; U.S. Bureau of the Census 1963a, Table 8). There was little difference between the sexes in education level and distribution.

Past studies indicate that differences in educational level and distribution across educational categories have had slight influences on the relative earnings of women. After adjustment for the effects of differences in hours worked and type of occupation, adjustment for differences in educational distribution had little effect on the relative earnings of women in 1949 (Sanborn 1964, p. 537) and had no effect on the relative hourly wages of women in 1959 (Sawhill 1968, p. 57). Using 1966 data, Suter and Miller (1973, pp. 969-970) ascertained that differences in mean level of education had little influence on the relative annual earnings of women. Differences in educational level do not appear to influence the differences in earnings between the sexes.

Although educational differences between the sexes did not explain the inequality in earnings between women and men, the rate of return from years of education affected earnings. Suter and Miller (1973, p. 971) studied exchange rates of education for income of men and women ages 30 to 44 years who worked in 1966. With a model of annual earnings regressed on education and occupational status, the partial regression coefficient of the exchange of education for earnings that belonged to women was less

than one-half the level of the coefficient belonging to men. When analysis was restricted to women who reported that they had worked at least six months in 75 per cent of the years after completion of school, women received a return from education at only 76 per cent of the rate belonging to men. Pay differences for education evidently affect the relative earnings of women.

Occupational Position

Payment for work varies from job to job. Differences in job location could affect the earnings of women compared to men. Because occupation is an indicator of job location, differences in occupational location could affect the relative earnings of women.

In every society occupations held by women can be distinguished from those held by men (Bernard 1971). In the United States women were usually located in professional, technical, and clerical white collar occupations (National Manpower Council 1957, pp. 67 and 156; U.S. President's Commission on the Status of Women 1965, pp. 60-63) while men were distributed across many occupations. The distribution among major occupational categories for women differed from that for men. The index of dissimilarity across nine major occupational groups for employed workers was 40.9 in 1950 and 41.5 in 1960 indicating that over 40 per cent of the women had to change major occupations in order to be employed in the same pattern as men

(U.S. Bureau of the Census 1952, Table 17; U.S. Bureau of the Census 1963c, Table 37). When the measurement of occupational position was refined by analyzing the Census detailed occupational categories, the difference increased. From published Census data Gross calculated the index of dissimilarity between men and women and found that it varied between 65.6 in 1900 to 69.0 in 1960 (Gross 1968, pp. 200-204).[1] After analysis by a procedure which weights each occupational category equally, he determined there was a very slight decline in the index over time. According to Gross, the decline was created by a movement of men into occupations traditionally held by women and not vice versa. The index of dissimilarity in each case was substantial although short of the maximum value of 100.0.

The index of dissimilarity indicates the extent of segregation but does not measure how the patterns diverge. In fact the patterns differed because occupations were either entirely composed of males or were predominately composed of females with a small proportion of males. In both 1950 and 1960, over one-half of the detailed Census

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[1]The study reports use of "approximately 300 to 400" categories in each year which the Census provided for each year between 1900 and 1960. Occupations with small numbers were treated as zero categories (Gross 1968, p. 202). Because the number of categories may have varied from year to year, this information should be considered indicative of the differential. The index of dissimilarity is affected by the number of categories used and change over time could reflect changes in the number of categories. Gross does not specify if a constant number of categories was maintained. Regardless, substantial differentials are evident for each year.

occupations, as classified in 1960 (U.S. Bureau of the Census 1968a, Table 1), had males as 90 per cent or more of its membership as can be seen in Table 1.4. Despite the large discrepancies indicated by both the index of dissimilarity and the frequency distribution of occupations by proportion of membership who were male, Oppenheimer (1968) claimed that if industry specific jobs were examined the differences in the Census category location between the sexes would have increased in 1960.

Investigators determined that adjustments for occupational differences did not explain all of the inequality in earnings between the sexes. For example, Sanborn's (1964, p. 534) adjustments for differences in distribution across the detailed occupational categories of the 1950 Census increased the relative earnings of women annually from 58 to 65 per cent of the amount earned by men. Additional adjustment for differences in hours and weeks worked increased the relative annual earnings of women to 75 per cent of the amount earned by men. Sawhill (1968) adjusted the relative hourly wage of women for differences in distribution across major occupational categories and the relative earnings of women remained constant at 61 per cent of the amount earned by men. Finally, the Women's Bureau (1969, p. 2) examined the annual earnings of full-time, full-year workers and determined that women earned 41 to 66 per cent of the annual earnings of men, depending upon the major occupation category considered.

TABLE 1.4.--Frequency of Detailed Occupations with Specified Proportions of Workers Who Are Male, in the United States: 1950 and 1960

Proportion of Employees Who Are Male	Frequency Year 1950	Frequency Year 1960	Cumulative Proportion Year 1950	Cumulative Proportion Year 1960
.00-.04	12	16	.025	.034
.10-.09	10	6	.047	.047
.10-.14	4	6	.055	.059
.15-.19	4	2	.064	.064
.20-.24	3	6	.071	.076
.25-.29	4	6	.079	.089
.30-.34	6	5	.091	.100
.35-.39	4	5	.100	.110
.40-.44	9	11	.119	.134
.45-.49	10	5	.140	.144
.50-.54	11	7	.163	.159
.55-.59	11	10	.187	.181
.60-.64	14	15	.217	.212
.65-.69	11	19	.240	.253
.70-.74	13	7	.268	.268
.75-.79	17	25	.304	.321
.80-.84	30	25	.376	.374
.85-.89	48	40	.469	.459
.90-.94	55	56	.586	.577
.95-1.00	195	199	1.000	1.000

Source: U.S. Bureau of the Census (1968, Table 1).

Investigators found that substantial differences remained between the earnings of women and the earnings of men after adjustment for discrepancies in occupational distribution and in differences in labor force participation level in a year.

Fuchs (1971, p. 14) argued that if occupations were compared in enough detail,much of the differential in earnings between women and men would have disappeared. Sanborn's analysis of Bureau of Labor Statistics data, which had finer distinctions between operative and clerical workers than the 1950 Census, lends some support to Fuchs' claim. Sanborn (1964, p. 539) determined that for a subsample restricted to clerical and operative workers women earned a higher percentage of earnings relative to men, about 82 per cent, than he had previously found with Census data. However, Fuchs noted that even if all of the income differential were explained by occupational differences, the problem remained but would shift to explaining differences between the occupations of women and men.

Some evidence suggests that payment for work in an occupation is more important than occupational distribution differences. An occupational position is a category defined by a Census occupational title. Occupational prestige of occupational titles measures the social standing of occupations. Although not identical with occupational position because quite different occupational positions may have similar prestige scores, it is closely

related (Blau and Duncan 1967, p. 7). In 1960 there was no significant difference between the prestige of occupations held by women on the average to the prestige of occupations held by men.[1] Suter and Miller (1973, pp. 969-970) found only slight differences in their study of data collected in 1967.[2] However, they found substantial differences between the payment to the sexes for occupational status. Women who reported working six months in 75 per cent of the years since completion of school exchanged occupational status at only 60 per cent of the rate men exchanged occupational status for income (Suter and Miller 1973, p. 971). This study indicates the importance of differences in payment for occupational status.

Industry of Employment

Some employers believe women are likely to remain employed a shorter duration than men, (see page 12). They consequently are reluctant to hire women at both professional and non-professional levels. Employers also believe

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[1]Occupational Prestige is a measure of the social standings given by people to NORC surveys conducted in 1963, 1964, and 1965. There are separate ratings for 301 of the detailed non-agricultural Census occupations, (see Chapter II for further discussion). The results of information on prestige in 1960 were based on the previously defined sub-sample of white men and women from the one-in-one thousand sample of the Census of the Population: 1960.

[2]Occupational status for the Suter and Miller study is based on calculations by Duncan for the 1947 NORC study with 90 occupations.

women are less likely to appear at work when they are employed. However, evidence indicates that 'level of skill, age, length of service, and record of job stability are more important than sex' (U.S. President's Commission on the Status of Women 1965, p. 47). In fact a study of employees over seventeen years of age in 1963-1964 indicated that there was only a slight difference in lost time despite beliefs to the contrary; women lost 5.4 days on the average, and men lost 5.6 days (Women's Bureau 1966b).[1] Yet beliefs about sexual differences in stability within a year and over a longer period of time can influence the hiring and promotion of women.

Among other reasons for possible employer differentiation are physical differences between men and women which are believed important (Prather 1972, p. 172; Hiestand 1970, p. 9). Women are hired often where jobs require dexterity which is considered a feminine attribute (National Manpower Council 1957, p. 2), but are not hired where jobs require physical strength. (This could reflect previously mentioned state laws which place specific limits for women on hours and weight lifting.) However, Sullerot (1971, p. 128) claimed it is the general practice to overrate requirements of physical strength and to down play

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[1] In 1970 women lost an average of 4.7 days of work and men an average of 3.2 days of work (U.S. Public Health Service 1972, Table 8). The 1963 data was closer to the period of study and may provide a better approximation to the census period.

dexterity even when the job tasks do not require strength. Finally, employers may not hire women for certain occupations or jobs within occupations because of traditional norms on the sex-type of jobs (Kantowitz 1969, p. 280; Hedges 1970, p. 19; National Manpower Council 1957, pp. 88-89).

There were differences in the distribution of men and women across major industries in both 1950 and 1960. Based on thirteen nonagricultural, industrial categories, the index of dissimilarity was 35.1 in 1950 and 34.8 in 1960 (U.S. Bureau of the Census 1957, Table 1; U.S. Bureau of the Census 1964a, Tables 133, 134, and 91). Although less than the maximum value of 100.0, the two values indicate 35 per cent of women would need to change categories to produce equivalent distributions between the sexes. Evidently men and women are not employed in the same industries.

Only two studies have considered the effects of placement in type of industry. Using the 1960 Census one-in-one thousand sample, Sawhill (1968, p. 67) determined that distributional differences accounted for 1.1 per cent of the discrepancy in annual earnings. She also noted that the hourly wage varied by detailed industry category but claimed that she was unable to discern any interesting trends. Levitin et al. (1971, p. 249) analyzed a survey conducted in 1969 and determined that major industry affected the relative earnings of women. They established

an expected wage based on the returns men received from education, job tenure, occupational prestige, supervisory responsibility, and hours of work. Apart from the specific industrial attributes of unionization, organization size and white collar employment, the discrepancy between earned and expected earnings was related to major industry of employment independently of major occupation. Industry of employment may affect the earnings of women relative to men.

Several characteristics of industries could affect the level of inequality between the sexes. Those explored will be as follows: percentage of employees in a major industry who were in labor unions, percentage of managers in an industry who were women, employment outside the South, employment in urban areas, and employment by government. A hypothesis based on theory and research will be developed for each factor. Previous research, such as it is, will be discussed at the end of the entire section.

Labor unions can influence work rules, job tenure, security, and compensation. Any of these could affect employer behavior (Reynolds 1964, p. 187). Unions may insist upon uniform work rules and upon new employees working under the same conditions as older workers. If women gained entrance to jobs, these rules could contribute to equal treatment of the sexes if applied. For example, when women were employed in industries during World War II, unions insisted women receive equal pay for equal work,

but only after unions vigorously resisted the introduction of women workers into plants, (National Manpower Council 1957, p. 152). The emphasis on seniority also works against workers not presently employed--such as women--because it insures the employment of older workers before new workers are hired (Greer 1959). Furthermore, Cook's (1968) analysis indicated that most unions accepted dual pay scales for the sexes with lower pay for women. Unless women are covered by contracts with equal pay provisions, unionization may decrease the relative wages of women.

Because of limited coverage of women employees by union contracts, the benefits of labor unions to women may be minimized. Union membership is concentrated within blue collar occupations in manufactures, construction and mining while women tend to work in white collar positions in trades and services. In 1966, unions covered 32 per cent of all wage and salary workers but only 22 per cent of women wage and salary workers (U.S. Bureau of the Census 1971, p. 1). It is hypothesized that the benefits of unionism affect men but not women, and consequently increase the differential in hourly wages between the sexes.

Conflict theorists have hypothesized that rewards are distributed on the basis of the social power of groups. In order for women to achieve a larger share in rewards, this theoretical position suggests that women must have a substantial proportion of powerful positions in work

organizations. Quinn et al. (1968) found that managerial positions were important because their members influenced the actual decisions of hiring and promotions. Because of the complexity of the modern work organization, managers had access to vital information, had influence on information flow, and had control over power resources in the organization (Lenski 1966, pp. 349-352, and 365). Consequently, if conflict theorists are correct, the proportion of managers who were women should influence the relative wages of women.

Workers outside the South have better wages than workers employed in the South (Reynolds 1964). This could affect the relative earnings of women as well as earnings in general. However, in 1960 the index of dissimilarity between the four regions was only 4.5 for employed workers (U.S. Bureau of the Census 1964a, Table 103). Sawhill's analysis of region indicated that there was variation in the relative earnings of women across regions in 1960, but that there was no overall effect on the relative earnings of women in the United States.

Working in a large urban area affects employment opportunities and may benefit women. The size of a population center was related to economic function performed in the center (Duncan et al. 1960). In large population centers a greater mixture of economic functions increased the occupational mixture (Galle 1963) and consequently increased the variety of employment opportunities. Epstein

(1971, p. 197) has suggested several reasons why women benefit from working in metropolitan areas. First, working in large metropolitan areas provides employment opportunities which offset the limited geographical mobility of married women who only move with their husbands. Second, large economic centers provide women with 'opportunities to train and work which increase the closer the person is to the center of the city' (Epstein 1971, p. 133). Finally, she claims that women in large cities have access to more child care facilities enabling them to work. Others have pointed out that people in large metropolitan areas are at the historical center of change where less restrictive norms of "woman's role" have evolved, and may increase employment opportunities (Hauser 1971; Baker 1964, p. 21; National Manpower Council 1957, p. 14). For these reasons, it is hypothesized that women, particularly ever-married women, benefit from living and working in metropolitan areas.

Public employment may affect the relative earnings of women. Federal and many state and local government jobs have been part of civil service systems with people theoretically hired as paid workers on the basis of merit. As evidenced by the specification of sex for job openings in the federal government between 1934 and 1963, merit hiring and payment may not be the actual practice, but the merit policy may influence procedures in public organizations. A thorough study was conducted by the Civil Service

and reported in the Annual Report of the U.S. President's Commission on the Status of Women (1965). Women were in lower grades in 1960 than men; three-fourths of all men employed were in grades achieved by only one-fourth of the women. But even though there was evidence of differential treatment, the commission reported that women were not paid differently than men in the same positions. The hypothesis is that there will be less inequality within the public sector of the economy compared to the private sector.

The analysis by Fuchs (1971) is one of the few which considered the effect of specific industrial characteristics on the relative earnings of women. Fuchs categorized workers on the basis of sex, race, age, and years of education, and calculated the average wage received in each category. This average was considered the 'expected wage' to workers with the specified characteristics. The ratio of the average hourly wage earned by women divided by the average hourly wage earned by men in the same category formed the 'female expected wage relative to male.' Then,for any industry with 50 or more men and 50 or more women--46 industries in all--Fuchs divided the average hourly wages received by women in the detailed Census industry by the average hourly wages actually received by men in the same industry to create the relative earnings ratio. With industry as the unit of analysis, 'the relative earnings ratio' was regressed on the 'female

expected wage relative to male' and selected characteristics of the industries provided the test for the hypothesis of employer discrimination.

Fuchs stated that:

> . . . a finding that the differential is related to institutional characteristics such as unionization or establishment size would tend to support the employer discrimination hypothesis. If, however, differences in the differential can be explained primarily by differences in worker characteristics such as schooling and age, the discrimination hypothesis tends to be refuted. (Fuchs 1971, p. 13)

When he regressed the relative earnings ratios on both types of variables singly, several relationships were evident. The 'female expected wage relative to male' was the largest in explained variation in the simple regressions and the most significant partial regression slope in a multiple regression equation using both types of characteristics. Fuchs concluded that both findings tend to support the hypothesis that labor markets are competitive and employer discrimination is not a major factor. This argument is weak because Fuchs did not examine all of the contribution to earnings differences between the sexes that employer discrimination could cause. Part of the 'female expected wage relative to male' could be a constant discrepancy in pay for age, education, and race from employers to women. Consequently, differences in the 'female expected wage relative to male' may include employer discrimination rather than being separate from employer discrimination as presumed. The procedure of

Fuchs does not permit separation of the inequality into a segment reflecting entirely discrepancies in socio-demographic characteristics and a segment reflecting totally pay differences between the sexes.

The previously discussed study by Levitin et al. (1971, p. 249) reported industry characteristics associated with the discrepancy between the actual earnings of men and the expected earnings of women if they had the returns of men from occupational prestige, education, hours of work, and job tenure. Multiple Classification Analysis indicated that the discrepancy was associated with size of employment organization, union membership, and white collar job occupation apart from the effects of major occupation and major industry. Evidently, specific characteristics affect the relative earnings of women.

Summary of Previous Work

Evidence indicates differences have existed between the hourly earnings of women and men. Several characteristics theoretically and empirically are associated with the differential. The objective of this study is to 'shed light' on the nature of the differential and its association with characteristics. The study will take the differential in hourly earnings between the sexes and ascertain how much of the differential is associated with specified socioeconomic characteristics. The remainder of the inequality after taking into account social

characteristics indicates the effect of other factors not directly brought into the model, and the effect of differential pay for variables in the model, and an interaction between differences in means and differences in rates. When the differential remains after standardization for selected variables, some may say that the inequality represents discrimination. The reader must keep in mind that this does not 'prove' discrimination. Utilization of differences as evidence of discrimination is hazardous. Even payment differences for a variable, such as education, could reflect variables associated with education which are measured in the model. Certainly persistent differences are congruent with the notion that there is an underlying force of differential treatment to the sexes--often termed discrimination--which accounts for the inequality. However, this study can only suggest the maximum differential which exists without respect to differences in the specific characteristics in the model. It can not conclusively determine the actual extent of any "outside force."

CHAPTER II

THE DATA AND METHODOLOGY

The present chapter discusses the source of the data and measurement of variables. In addition, the chapter describes the method of data analysis for the study. An illustration of the method accompanies the discussion of the procedure of analysis.

The Data Source

The data source for this study is the one-in-one thousand sample of the Census of the Population: 1960. This sample is a random selection of one of every thousand households in the United States enumerated by the U.S. Bureau of the Census in April, 1960. The information collected sets limits on the number and type of variables available for the study. For example, there is no access to attitudes of respondents. Yet, there is available for individuals extensive information on socioeconomic characteristics, labor force participation in 1959 and 1960, and some locational characteristics. The study also uses a randomly drawn sub-sample from the one-in-one thousand sample which approximates national characteristics in terms of age and regional distributions. Both samples

should closely approximate the characteristics of full-time, wage and salary workers in the civilian non-agricultural labor force in 1959 and 1960.

Sampling Error

Sampling error contributes error to the data. Because sampling error should be random in incidence, the net effects on the results of analysis should be negligible. However, to the extent the Census did not cover specific population groups distortions are created that are systematically related to the social characteristics of omitted respondents. These omissions can bias the findings. While these effects can be severe, the major study groups--white men and women who are full-time wage and salary workers--should not be heavily affected. Shryock and Siegel (1971, p. 261) estimate an undercount in the 1960 Census of 2.8 per cent for white men, 1.6 per cent for white women, and 10.9 per cent for nonwhite women. When black women are considered, coverage bias may affect results.

Response Errors

Other distortions can occur because of inaccurate recording and coding of information. An analysis of some of the information to be used in this study indicates that there is only a minor effect on the relationships among the variables because of unreliability (Siegel and Hodge 1968). It is believed that the information source

for the study is a reasonable approximation to the population of people studied.

In order to curtail measurement error the study will be restricted to nonagricultural wage and salary workers. Agricultural workers can receive part of their earnings in kind which could depress earnings. In addition women workers on the farm are sometimes considered as unpaid family workers despite their contributions to the farm. Finally, Miller (1966, p. 211) suggests that part of the reason for the differences between responses on the Current Population Survey and the Census report occurred because there were a larger number of persons who had small amounts of income which went unreported in the Census. The sample restrictions should increase the reliability of estimates of earnings and labor force participation in 1959-1960.

Interaction effects can introduce bias into this type of investigation. The objective of the study is basically to determine if sex interacts with possible contributors to earnings. Both age and race also interact with the other variables under study. Consequently, the sample is stratified by categories created by the cross-classification of sex, age, and race. The categories are based on combinations of men and women of ages 20 to 34, 35 to 44, and 45 to 64 years for blacks and whites. Because marital status of white women affects lifetime employment, white women are separated into those

who ever married and those who never married. The stratification will permit more accurate comparisons between men and women and will provide information on how age and race of workers as well as marital status of white women affect the relative earnings of women.

Errors of Omission

The Census of the Population: 1960 has errors in the information collected as all sources of information do. What is the effect of measurement error on the least squares regression estimates which will be used in this study? The estimates of parameters from regression equations are remarkably robust, i.e., one can violate assumptions which were used in mathematically proving the statistic (Bohrnstedt and Carter 1972, pp. 118-143). However, the failure to measure a variable which should be included on theoretical grounds biases the estimates of the parameters for the variables included (Rao and Miller 1971, p. 31). Because of this error, the variables included absorb the effects of variables excluded based on their covariation. This characteristic of regression estimates will be used in the study by determining the effect on partial regression coefficients for variables in the equation created by adding a set of variables. In contrast to exclusion of relevant variables, unreliable measurement of variables in the equation create an underestimation of the population parameters (Bohrnstedt and

Carter 1972, p. 133). This is especially troubling because Bohrnstedt and Carter estimate that 'most variables used in sociology have a reliability below .8 and this lowers the regression estimate by 20 per cent or more.' The net effect of misspecification of the equation and measurement error cannot be determined. Consequently, interpretations of the results of this study can 'shed light' on the subject but cannot be conclusive.

Hourly Wage

Part of the difference in annual earnings between the sexes reflects differential hours worked in the labor force. Women are more likely to work part-time in the labor force (Sawhill 1968, pp. 39-40). Several solutions to the problem have been tried. One solution is to regress earnings estimates for workers and include an indicator of full-time work among the independent variables. Unfortunately the solution lacks precision. Greater detail in measuring hours of employment is available when measures of annual earnings are regressed on independent variables which include annual hours worked. Some suggest that logarithmic transformations should be made, but Hill's (1959, p. 372) work indicates that this only makes a slight difference in predictions. Hill found that the logarithmic transformation is a better approximation of the relationship with income but that the predictions of the equation with the transformation do not differ

significantly from those with the additive model. A variation of the method of using annual hours is to divide the annual earnings by the number of annual hours worked. This process takes into account differences in hours of participation and reduces the number of independent variables required in the equation. A savings in the number of variables increases the accuracy of regression estimates. Consequently, this study will adjust annual earnings for the annual hours worked to obtain the dependent variable, hourly wage.

When dividing annual earnings by annual number of hours worked, estimates must be used for annual hours. The wage and salary earnings to an individual in 1959 is available directly from the Census. But total annual hours worked in 1959 is not. An estimate can be made by multiplication of the number of weeks worked in 1959 times the number of hours worked in the Census week. Utilization of the hours worked in the survey week is subject to bias as an estimate of hours worked in the average week but has been used by investigators (Fuchs 1968; Fuchs 1971; Cohen 1971). Fuchs (1968) has argued that with 1960 Census data this procedure is not greatly biased given its close approximation to other measures known to be more accurate. The coding to estimate hours worked in the week is presented in Table 2.1. Workers will be restricted to those working 50 to 52 weeks in 1959 and the number of weeks is estimated as 51. Annual earnings will

be coded with the midpoint of the Census interval. Based on the fitting of earnings data to a Pareto Curve by Miller (1966, p. 216), the open interval of 25,000 dollars or more is estimated as 44,000 dollars. Hourly wages is calculated in this manner.

TABLE 2.1.--Average Hours Used for Census Intervals for Workers with over 35 Hours Reported in the Census Week

Interval of Hours	Value Assumed
35 to 39	37.5
40	40.0
41 to 48	44.5
49 to 59	54.0
60 or more	60.0

Potential Work Experience

As discussed in Chapter I, potential work experience may affect employee earnings. Because work experience is not directly available from the Census, an indicator of potential work experience must be used. The study will use several tactics to measure potential work experience, but to the extent the 'true' value is unmeasured and correlated with variables in the equation the parameters included in the equation will be biased. Suter and Miller (1973) found differences in level of reported lifetime work experience accounted for 8.1 per cent of the discrepancies in annual earnings between the

sexes for all workers age 30 to 44. Their estimate was apart from differences in education, occupational status, and full-time work. This effect is probably reduced by taking into account the annual hours worked. However, interpretations should be considered in light of the possible bias from using proxies for work experience and subsequent error.

Age Adjusted for Job Tenure

The extent of lifetime employment was not directly available from the Census and must be estimated. Age was available but is suspect as a true measure of 'potential work experience' because of greater discontinuities in the work history of women. This study estimates years of employment by adjusting age to reflect race-sex specific levels of average job tenure as estimated by the Bureau of Labor Statistics in 1968. Job tenure is the amount of time an employee reports working for the current employer. From data in the Current Population Survey of January, 1968, O'Boyle (1969, p. 18) regressed job tenure on age, (see Chapter I). The explained variance of this model was quite high in each stratum suggesting there is little error in predicting job tenure from age. (The coefficient of determination was .989 for white men, .929 for white women, .973 for nonwhite men, and .953 for nonwhite women.) O'Boyle carefully analyzed the cross-sectional data of the survey. Although a longitudinal study is needed for conclusive results, age appeared to be closely related to

job tenure regardless of occupation, industry or education. For example, O'Boyle found that variation in job tenure across age groups in a major industry exceeds the variation across major industries in an age category. "Nearly all the evidence indicates a strong correlation between job tenure and age in each of the four sex-color classes" (O'Boyle 1969, p. 20).

The adjustment factors were partial regression coefficients from the equations of job tenure regressed on age for white men, white women and black women which O'Boyle (1969, p. 18) calculated. The variable age adjusted tenure measures the amount of job tenure represented by an individual's age based on the equation of the experience of people of the same race and sex. Because never-married white women have average levels of job tenure which equal or exceed those of white men, (see Hamil (1963) as discussed in Chapter One), the adjustment factor for age will be the same for both white men and white never-married women. Because ever-married women constitute 82 per cent of white women in the labor force (U.S. Bureau of the Census 1964b, Table 6), they will receive the partial regression slope belonging to all white women. Age of workers is multiplied by these slopes.

Can the relationships of age and job tenure in 1968 be applied to data in 1959? For one thing, the level of unemployment in 1959 was 5.5 per cent but was only 4.0 per cent in 1968. This suggests that the economic

situations may differ. However, the definition of unemployment had been changed in this period to exclude those not attempting to find a job in the past four weeks and consequently lowered the unemployment rate in 1968 artifically. For example, in February, 1967, the published unemployment rate for men would have increased from 3.1 to 3.6 per cent if men wanting work but not having looked in the past four weeks were included in the labor force as they were in the 1959 definition, (calculated from data of the U.S. Bureau of Labor Statistics (1968, Table A-3; Perrella and O'Boyle 1969, Table 1). This suggests that the unemployment rates in 1959 and 1968 were more similar than published data indicate.

Another reason that the 1968 age-tenure relationship may be used is that the relationship in 1968 may be the same as 1959 despite the changed unemployment rates. A possible test is to compare the relationships in 1968 to those in 1963 when unemployment was 5.7 per cent. The age tenure relationship was very strong in 1963 (Hamil 1964, p. 1145), (see Table 1.3). As in the 1968 study, the age tenure relationships were maintained even taking into account occupation and industry. The evidence suggests that the age tenure relationship was maintained over time.

The intercepts of the equations and mean characteristics were not reported by O'Boyle and hence only partial regression coefficients were used for the adjustment of

age to reflect average levels of job tenure. Despite this, the estimates of job tenure in 1959 approximate the relationships observed in job tenure in January, 1963. Hamil (1963, Table 3) reported the years of job tenure of full-time women who were single and married spouse present at ages 25 to 34, 35 to 44, and 45 and over. The ratio of the median tenure of single to median tenure of married women at these ages were 1.71, 2.03, and 2.16. These ratios compare favorably with the mean estimates in 1959 of tenure of never-married to tenure of ever-married white women which were 1.70 at age 20 to 34, 1.85 for ages 35 to 44, and 1.89 for ages 45 to 64. Although not precisely the same, the ratios were the same approximate values and follow the same trends with age.

Data from the 1960 Census suggest that adjusting age for tenure levels in 1968 successfully estimates the effects of lifetime work experience of never-married white women, ever-married white women, and black women. When being a mother was estimated by a dichotomous variable and added to a model with education, occupational prestige, race, and age adjusted for tenure as a measure of work experience, the explained variance of hourly wages was not increased. These results are similar to those reported by Suter and Miller (1973, p. 972) who had a measure of lifetime work experience actually reported by respondents.[1]

[1]Miller and Suter analyzed women ages 30 to 44 years in 1967 while the Census data was for full-time wage and salary workers ages 20 to 64.

Of course to the extent that the adjustments do not produce estimates reflecting differences in lifetime work experience, the analysis for this study could be erroneous. Yet, this procedure for estimating job tenure appears to yield similar results to actual estimates of work experience.

Index of Instability

The potential worker experience was evaluated also as potential for future labor force participation. An index of instability was operationalized as the 'drop out rate' developed by Bowen and Finegan (1969, p. 250). It is an index of instability based on the likelihood that the census enumeration in 1960 found persons reporting that they were in the labor force between 1950 and 1960 but not in the labor force at the time of the Census. The measure was estimated from published figures on the labor reserve in the 1960 Census and calculated for sex- age- education- major occupation specific subsets for this study. A higher value of the index indicates greater instability. There is a marked contrast between the sexes with women sharply higher on this measure of job instability. A value was imputed to each worker given the joint classification of the worker on sex, age, education, and major occupation, (see Table 2.2). The measure does not actually estimate the instability of the particular workers in the study but estimates the instability of all workers similar to those workers.

TABLE 2.2.--Proportion Not in the Labor Force from Those Ever in the Labor Force Between 1950 and 1960 for Occupation, Age, Education, and Sex, in the United States[a]

Age	Professional	Manager	Clerical	Sales	Crafts	Operator	Private Household Servant	Other Service	Laborer	Not Reported
Men of Less than 8 Years Education										
20 to 24	.125	.054	.081	.096	.077	.064	.117	.018	.111	.213
25 to 44	.068	.033	.051	.046	.040	.051	.147	.074	.087	.144
45 to 54	.068	.053	.065	.068	.056	.070	.112	.078	.106	.116
55 to 64	.155	.138	.142	.151	.142	.159	.162	.153	.195	.174
Women of Less than 8 Years Education										
20 to 24	.374	.429	.471	.659	.292	.442	.360	.557	.458	.357
25 to 44	.308	.235	.416	.473	.297	.379	.254	.393	.398	.265
45 to 54	.216	.201	.276	.354	.244	.293	.216	.292	.324	.255
55 to 64	.314	.301	.346	.391	.310	.395	.292	.354	.420	.333
Men of 8 Years Education										
20 to 24	.096	.063	.057	.055	.058	.049	.085	.102	.102	.171
25 to 44	.028	.022	.030	.034	.027	.031	.120	.053	.069	.101
45 to 54	.051	.037	.038	.045	.040	.043	.092	.059	.080	.086
55 to 64	.087	.107	.112	.106	.103	.111	.122	.135	.160	.144
Women of 8 Years Education										
20 to 24	.513	.360	.542	.650	.399	.498	.412	.606	.492	.380
25 to 44	.320	.266	.421	.473	.345	.396	.280	.410	.428	.290
45 to 54	.213	.212	.241	.331	.233	.279	.223	.269	.335	.275
55 to 64	.303	.276	.300	.366	.304	.346	.265	.317	.422	.350

TABLE 2.2.--Continued

Age	Professional	Manager	Clerical	Sales	Crafts	Operator	Private Household Servant	Other Service	Laborer	Not Reported
					Men of 9 to 11 Years Education					
20 to 24	.076	.028	.064	.067	.050	.051	.307	.096	.098	.147
25 to 44	.024	.018	.027	.026	.020	.026	.131	.043	.064	.094
45 to 54	.027	.027	.031	.032	.031	.034	.073	.054	.070	.080
55 to 64	.085	.092	.119	.083	.095	.091	.080	.115	.142	.125
					Women of 9 to 11 Years Education					
20 to 24	.367	.459	.529	.740	.523	.520	.410	.622	.507	.388
25 to 44	.357	.293	.459	.532	.361	.434	.292	.439	.449	.308
45 to 54	.190	.202	.232	.354	.239	.281	.216	.277	.320	.252
55 to 64	.251	.279	.270	.379	.270	.343	.267	.305	.046	.816
					Men of 12 Years Education					
20 to 24	.044	.019	.045	.042	.041	.037	.130	.078	.079	.105
25 to 44	.013	.008	.017	.012	.013	.018	.079	.025	.043	.057
45 to 54	.021	.021	.024	.022	.025	.028	.121	.049	.057	.054
55 to 64	.073	.085	.102	.075	.091	.095	.059	.118	.140	.105
					Women of 12 Years Education					
20 to 24	.335	.309	.448	.664	.452	.458	.364	.519	.399	.345
25 to 44	.402	.284	.503	.550	.388	.454	.303	.425	.462	.310
45 to 54	.192	.174	.205	.323	.217	.267	.215	.249	.306	.234
55 to 64	.221	.224	.234	.349	.229	.324	.250	.282	.341	.294

TABLE 2.2.--Continued

Age	Professional	Manager	Clerical	Sales	Crafts	Operator	Private Household Service	Other Service	Laborer	Not Reported
					Men of 13 to 15 Years Education					
20 to 24	.238	.117	.266	.241	.299	.349	.289	.040	.435	.339
25 to 44	.030	.011	.042	.022	.037	.056	.161	.061	.161	.074
45 to 54	.019	.017	.026	.029	.022	.036	.064	.038	.077	.063
55 to 64	.071	.085	.104	.076	.103	.089	.095	.123	.173	.121
					Women of 13 to 15 Years Education					
20 to 24	.329	.344	.445	.680	.477	.560	.406	.511	.367	.388
25 to 44	.432	.316	.511	.578	.394	.460	.345	.421	.418	.284
45 to 54	.190	.167	.215	.328	.201	.282	.175	.254	.279	.239
55 to 64	.226	.213	.242	.355	.269	.323	.236	.286	.365	.259
					Men of 16 or More Years Education					
20 to 24	.121	.081	.277	.143	.328	.448	.148	.376	.600	.280
25 to 44	.017	.010	.046	.017	.048	.097	.248	.105	.201	.068
45 to 54	.012	.013	.030	.021	.039	.047	.148	.055	.074	.049
55 to 64	.048	.072	.089	.065	.137	.146	.258	.150	.124	.097
					Women of 16 or More Years Education					
20 to 24	.200	.264	.376	.608	.254	.518	.385	.466	.663	.247
25 to 44	.370	.356	.556	.616	.492	.454	.321	.509	.380	.254
45 to 54	.099	.156	.224	.345	.185	.268	.169	.226	.263	.133
55 to 64	.141	.209	.246	.297	.241	.310	.243	.249	.750	.187

[a]The proportion is the number in the Labor reserve divided by the number in the Labor Reserve and the Experienced Civilian Labor Force. Calculated from published Census tables.

Source: U.S. Bureau of the Census, (1966, Table 15) and U.S. Bureau of the Census, (1960, Table 11).

Marital Status

The calculations for white women will be made separately for ever-married and never-married women. Analysis in the first chapter indicated that the lifetime employment histories of women who never marry are similar to those of white men and quite different from those of white women who ever-marry. This was the basis of the different adjustments for tenure to age for white women based on marriage. Analysis of the sub-sample from the one-in-one thousand sample of the Census of the Population: 1960 supports interpretations that never-married women are similar in experience to white men in contrast to ever-married white women. The previously discussed sub-sample of 275 women and 264 men consists of white, full-time, wage and salary workers in the civilian non-agricultural labor force in 1959-1960. Multiple Classification Analysis (MCA) provided information which was interpreted as evidence of interaction between marital status and age for white women, (see Appendix I for a fuller discussion of the MCA analysis). The pattern of age effects for white women who never-married were parallel to the pattern of age effects for white men independent of the effect of education. However, the pattern of age effects on hourly wages for white ever-married women were quite different, possibly because of the effect of motherhood. Consequently, the MCA analysis supports the results of tenure studies and participation studies and the decision to

stratify white women on the basis of marital status.

Occupational Location

One measure of equivalence of occupation is level of prestige of the occupational position. Prestige is an evaluation of 'the social standing' by respondents. This measure has been found to be stable over time in the United States (Hodge et al. 1962). Occupational prestige is measured from actual evaluations of prestige of occupations and industries. In 1964 a survey by NORC gathered prestige ratings of 209 occupations and 71 industries. In 1965 an additional 101 occupational titles were evaluated by respondents for an NORC survey. The objective of the surveys was to assess the prestige of the occupational categories used by the U.S. Bureau of the Census in the Census of the Population: 1960. Siegel (1971) linked the results of the NORC surveys to the Census categories. There are 301 unique prestige ratings for the occupations. Because this procedure measures the actual evaluation of prestige in the United States, the measure should be an improvement upon previous prestige estimates based upon income, education, and prestige ratings of 90 occupational titles.

Another measure of occupational position is the major occupational group of employment. Although much less precise than occupational prestige, major occupational categories broadly define the nature of work in

occupations. Professionals, managers, and sales workers often work with people. Clericals work with symbols. Craftsmen, laborers, and operators work mainly with objects. Few women are employed in craftsman, laborer, and managerial positions which could create problems in estimation of regression coefficients. Separate dichotomous variables will measure professional-technical-managerial, clerical, sales, and operative major occupational groups.

Education

Educational data are available from the Census in groupings of years of school completed. The measurement of education in years of schooling completed provides an interval estimate of the variable. The categories used were 0, 2.5, 6, 7, 8, 10, 11, 12, 14, 16, and 17. These categories generally underestimate the actual number of years of school completed.

Industry of Employment

Major industry of employment will be as follows: retail trade; wholesale trade; communication, utilities, and transportation; professional service; manufacturing 'unskilled' and 'skilled'; and manufacturing 'white collar' and 'professional.' The latter four categories were used by Eidson (1971). 'Unskilled' manufacturing refers to industries which are labor intensive, have a higher proportion of operatives and laborers, a high level of unemployment, and below average earnings. Food processing

and textiles are examples. 'Skilled' manufacturers refers to industries such as metals and non-electrical machinery where a large proportion of employees are craftsmen, few employees are women, and all employees receive high earnings. The 'white collar' industries are printing and publishing where there is a high proportion of skilled workers, high numbers of women, low unemployment, high growth, and high earnings. Finally 'professional' industries consist of chemicals and scientific instruments where the work force consists mainly of professional workers and few women. This type of industry has low unemployment, high growth and above average earnings. The 'unskilled' were combined with 'skilled' and 'white collar' with 'professional' because of limited numbers of women in categories. These basic categories are used to measure general industry effects.

Place of Employment

Area locations of work are based on responses of people on their region of residence in the Census week and metropolitan location of employment in the Census week. Variables will indicate location in the central city or suburban ring of the Standard Metropolitan Statistical Area. Also, regions are identified as West, South, North Central, and North East. The locational variables reflect characteristics in the Census week and may not actually refer to employer locations for 1959-1960.

Class of Worker

Employment by government refers to a variable indicating whether a worker is employed by any governmental unit in any major industry in the economy. It is based on the respondent's answer to the question on "class of worker: government- persons who worked for any governmental unit (Federal, State, Local, or International) regardless of activity which the particular agency carried on.", (U.S. Bureau of the Census 1964a, p. LXXIII). This characteristic is broader than just employment by public administration and includes workers in education, health, utilities, and some manufactures. This variable identifies employment of a worker in the public or in the private sectors of the economy.

Additional Variables

The percentages of union workers in major industries were derived from codings developed by Fuchs (1968).[1] The percentages of managers who were women in major industries in 1960 were calculated from published information on employed workers in the Census of the Population: 1960, (U.S. Bureau of the Census 1963a, Table 2). For both characteristics values were imputed to individual workers

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[1]Fuchs provided percentages of workers belonging to unions for detailed industrial categories excluding miscellaneous industries. These percentages were extended to major industrial categories by weighting figures from the U.S. Bureau of the Census (1967, Table 1).

on the sample tape depending on the major industry of employment, that is both of these industrial characteristics are taken from data sources external to information on the one-in-one thousand sample of the Census of the Population: 1960, (see Table 2.3).

TABLE 2.3.--Percentage of Workers in Selected Major Industries Who are Unionized and Percentage of Managers in Selected Major Industries Who are Women, in the United States: 1960

Industry	Employees Who Are in Unions Percent of Industry	Managers Who Are Women, Percent of all Managers in Major Industry
Mining	41	2
Construction	58	2
Manufacturers:		
Unskilled	43	7
Skilled	62	7
White Collar	42	29
Professional	47	7
Communication-Utility Transportation	58	6
Wholesale Trade	41	6
Retail Trade	11	23
Finances-Insurance	4	20
Professional Service	1	38
Other Services	10	28
Public Administration	10	18

Source: Fuchs (1968, Table I-2), U.S. Bureau of the Census (1967, Table 1), and U.S. Bureau of the Census (1963b, Table 2).

Method of Analysis

In this section the method used by Duncan (1969) and proposed in a slightly altered form by Winsborough and Dickinson (1969) will be examined. The effects of education and age on the differential in hourly earnings between the sexes provide an example of the procedure of analysis. The example suggests that the differential reflects both differences in payment for a year of education and age and differences from other characteristics not included in the model.

As analysis of demographic data indicates, differences in means between two groups can be separated into three components: the effect of differences in composition; the effect of differences in rates; and an interaction between differences in composition and differences in rates, (Kitagawa 1955). The components can be estimated with data from least squares regression equations. Using regression models, Suter and Miller (1973) calculated the effect of differences in composition, (i.e., direct standardization), while Levitin et al. (1972) calculated the effect of differences in payment, (i.e., indirect standardization). Winsborough and Dickinson (1969) have termed these the argument effect and the function effect.

Effect of Mean Adjustment

In analyzing the income differences between white and nonwhite men, Duncan (1969) suggested that the calculation could be made of the effect on the differential

if nonwhite men were to have the mean characteristics of white men for selected variables but retain their own earnings return for characteristics. This is calculated by multiplying the partial regression coefficients of nonwhite men times the mean values for characteristics of white men and adding the intercept of nonwhite men. The derived value is the average wage of nonwhite men. The effect of this adjustment can be calculated by inserting into the regression equation for nonwhite men the mean characteristics of white men and determining the earnings of nonwhite men given this change. Hereafter, this is termed the mean adjustment.

Effect of Function Adjustment

Duncan (1969) calculated the effect of inserting the mean characteristics of nonwhite men into the regression equation belonging to white men. The calculated earnings indicate what nonwhite men would earn if they retained their own social characteristics but received the pay return that white men actually have. Hereafter, this adjustment will be termed the function adjustment.

Standardization Interaction

When differences in the mean characteristics are related to differences in the regression coefficients, the sum of the mean and function effects may not equal the size of the actual inequality. This discrepancy is due to standardization interaction effects which were

extensively discussed by Kitagawa (1955) in reference to demographic standardization.[1] The union of the effect of the function adjustment plus the effect of mean adjustment equals the sum of the effects plus the effect of standardization interaction. Depending upon the covariation between the function effect and the mean effect, the standardization interaction effect may be either positive or negative. After first adjusting for the mean effect the net effect of adjusting the function equals the sum of the function effect plus the interaction effect (Winsborough and Dickinson).

The discussion of Kitagawa (1955) indicates that interpretations should focus upon the changes in the actual mean of the studied group with standardization. If interpretations focus upon the difference between the mean of the base group and the mean of the study group after standardization, the standardization interaction effect must be included. Previous analysis of wage differentials have rarely calculated the effects of <u>both</u> mean and function adjustments. This inquiry studies the change in relative wages of women from both adjustments.

[1]Following an extension of Winsborough and Dickinson's (1969) application to regression equations of Kitagawa's analysis, the standardization interaction effect is calculated by the following formula:

$$\text{Standardization Interaction} = \sum_{i=1} [(b_{im}-b_{iw})\ (\bar{X}_{im}-\bar{X}_{iw})\ ]$$

With b_i = partial regression coefficient of variable i
$\bar{X}_i$ = mean level of variable i
m = belongs to men
w = belongs to women.

An Example of Analysis

In 1960 men earned a larger income than women. If adjustments are made for differences in annual hours worked, the differential remains. The randomly selected sub-sample discussed above was analyzed. In this sub-sample the white men earned $2.75 per hour, but white women earned only $1.71 per hour. The comparison between the average wage of the two groups is facilitated by calculating the mean wage of women divided by the mean wage of men. When the ratio is multiplied by 100 the ratio indicates the percentage of the mean wage of men that women earned on the average. If the ratio that results is less than 100, women earn less than men on the average. If the ratio is greater than 100, women earn more than men earn on the average. In the subsequent material this ratio will be termed the 'relative wage ratio' of women. In the present case the ratio is 62 indicating that per hour of employment women earned about 62 per cent of the earnings of men. Differences in the annual hours of labor force participation of men and women in a year did not account for the differential in earnings between the sexes for the random sub-sample of white workers.

As discussed previously, part of the differential in hourly wages between the sexes may reflect differences in levels of education and levels of age. The mean level of education was 11.2 years for men and 11.3 years for women based on the characteristics of the random sub-sample.

The mean age level of men was 41.6 years and of women was 41.8 years. Suppose one could intervene to eliminate differences in education and age. How much of the inequality would be eliminated, if any? The mean wage of women would change from $1.71 to $1.69. When the relative wage ratio is calculated for the resulting adjusted wage, there is a relative wage of 62 or the ratio was essentially unchanged from the adjustment. One can conclude that a change in the mean characteristics of education and age would have no effect. In other words, differences in education and age do not account for differences in income.

One can estimate the effect on the relative wage of women if women had the same payment as men for education and age as well as unspecified characteristics. In contrast to the previous adjustment, this would change the differential in hourly wages. The mean hourly wage of women would become $2.76 compared to the $2.75 of men. In contrast to the change in means, the change in the function (i.e., the intercept and partial regression coefficients) of the regression equation would change the relative wage ratio from 62 to 101. The change in relative wage ratios indicates women would change from earning only 62 per cent of the wage of men to earning 101 per cent of the wage of men if they were paid the same as men in the regression model. Differences in payment for these and other characteristics account for all of the difference in the mean hourly earnings between the sexes.

At this point it has been determined which component accounts for more of the discrepancy in mean hourly wages between men and women. With only age and education in the model, it was calculated that differences in payment, (i.e., the intercepts and partial regression coefficients) account for more of the discrepancy than differences in the mean level of characteristics. But does this reflect lower pay for a year of education and a year of age? By testing for significantly different regression slopes, one can make a decision of which pay differences account for the "pay effect." The null hypothesis is that the partial regression coefficient of men was equal to or less than the partial regression slope of women. The null hypothesis was rejected with years of education and with years of age at the .01 level of significance. Women earned significantly lower returns from both a year of education and a year of age. Payment differences for these characteristics contribute to the lower relative wage of women.

Because of possibilities of specification error and measurement error, the results are only suggestive of contributions to the inequality of mean hourly wages between men and women. Evidently differences in the mean level of education and the mean level of age do not account for the discrepancy. Differences in payment between the sexes evidently account for much of the differential in average earnings. Because education and age are

sometimes thought of as measures of employee qualification, some may conclude at this point that women are being rewarded less for their merit. This is a hasty conclusion dependent on the measurement of variables and the accuracy of education and age as proxies for "merit." The analysis indicates which component of the equation analyzed in this study affected the mean hourly wages of women. The study will shed light on the causal nexus surrounding the differential in hourly wages between the sexes. However, it can only be suggestive of why earnings differences exist. Definite conclusions of discrimination would require experimental evidence not presently available.

CHAPTER III

THE EFFECT OF SEX ON WAGES OF WHITE WOMEN

In Chapter I hypotheses were presented on the effects of many variables, and in the previous chapter a means of assessing their contributions to wage differences was discussed. The present chapter considers the contributions of education, potential work experience, and occupational position for white men and women. The section considers the effects of differences in these characteristics and differences in payment for these characteristics. In the present chapter influences of stratification by age and marital status for white women are examined as well. Finally the effect of marriage is considered.

Hourly Wages

White women earned 62 per cent of the average hourly wage of white men considering the entire one-in-one thousand sample from the Census of the Population: 1960.[1] The sample was stratified into three age groups for the following sub-groups: white men, never-married white women, and ever-married white women. At all ages men had a higher

[1]The ratio of the entire sample was .618 which closely approximates the ratio of .621 for the sub-sample analyzed in Chapter II.

mean wage than each type of women. In Table 3.1, the wage of men was higher than the wage of women in each comparison of row 4 between column two and columns three and four, between column five and columns six and seven, and between column eight and columns nine and ten. For example, white men at the younger age level earned $2.39, but never-married women at the younger age level earned only $1.61. As discussed previously, the ratio of average wages of women to average wages of men multiplied by 100--termed the relative wage ratio--permits ready comparisons between the sexes. The relative wage ratio of each type of women was less than unity indicating white men earn more than each type of women. In fact the highest ratio, which belonged to never-married white women, was only 70 or about 70 per cent of the wage earned by men of the same age level, (column two in panel one of Table 3.2). Although stratification of the sample affects the wage ratio, it does not eliminate the differential in hourly wages between the sexes. This indicates that age level and marital status both affect the relative wage of women but do not account for the entire discrepancy between the wages of men and women.

Trends in the variation of the relative wage ratio indicate the effects of the stratification variables. The wage ratio of never-married women consistently exceeded the ratio of ever-married white women. Looking at the ratios of column two of panel two of Table 3.2, one sees

TABLE 3.1.--Mean Levels of Education, Age Adjusted for Tenure, Occupational Prestige, and Hourly Wages for White Men and Women by Marital Status and Age: 1960[a]

Variables (1)	Age 20 to 34			Age 35 to 44			Age 45 to 64		
	Men (2)	Never-Married Women (3)	Ever-Married Women (4)	Men (5)	Never-Married Women (6)	Ever-Married Women (7)	Men (8)	Never-Married Women (9)	Ever-Married Women (10)
Education (Years)	11.9	12.4	11.7	11.5	12.2	11.3	10.3	11.5	10.5
Age Adjusted Tenure (Years)	10.7	9.6	5.6	15.0	15.0	8.1	20.1	20.4	10.8
Occupational Prestige	39.5	42.0	40.3	41.1	41.6	38.0	39.3	41.1	37.3
Hourly Wages (Dollars)	2.39	1.67	1.61	2.99	2.09	1.69	3.00	2.07	1.66

[a]The sample consists of full-time wage and salary workers in the civilian nonagricultural labor force. Other Tables in this Chapter refer to this sample.

Source: One-in-one thousand sample of The Census of the Population: 1960.

TABLE 3.2.--Ratios of Mean Hourly Wages of White Women, With Mean and Function Adjustments, to Mean Hourly Wages of White Men, by Marital Status and Age: 1960[a]

Age	Unadjusted	Mean Adjusted Models[b]: Education	Mean Adjusted Models[b]: Education Age Adjusted Tenure	Mean Adjusted Models[b]: Education Age Adjusted Tenure Occupational Prestige	Mean Adjusted Models[b]: Education Age Adjusted Tenure Major Occupational Group	Function Adjusted Models[c]: Education	Function Adjusted Models[c]: Education Age Adjusted Tenure	Function Adjusted Models[c]: Education Age Adjusted Tenure Occupational Prestige	Function Adjusted Models[c]: Education Age Adjusted Tenure Major Occupational Group
	Ratio of Wage of Women to Wage of Men Multiplied by 100								
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel 1: Never-Married Women									
20 to 34	70	68	74	74	70	102	91	93	88
35 to 44	70	67	67	68	64	104	104	102	98
45 to 64	69	63	63	64	58	109	110	108	103
Panel 2: Ever-Married Women									
20 to 34	67	68	91	90	88	99	51	55	49
35 to 44	57	57	54	58	55	98	88	85	83
45 to 64	56	55	64	63	62	102	89	90	90

[a]Independent variables are years of education, age adjusted for 1968 tenure relationship between job tenure and age, occupational prestige and major occupational group. See text for definition of variables. The wages of never-married and ever-married women are divided by the wages of all men.

[b]Wages of women adjusted by inserting the mean levels of characteristics of men into the equation of women with the regression of hourly wages on the independent variables specified in the columns. Mean adjustments are direct standardization.

[c]Wages of women adjusted by inserting the mean levels of characteristics of women into the equation of men with the regression of hourly wages on the independent variables specified in the columns. Function adjustments are indirect standardization.

Source: One-in-one thousand sample of the Census of the Population: 1960.

that the ratio in each row of panel one was larger than the ratio in each row of panel two. Since the ratios in the same row have the same wage of men as denominator, the larger ratio of never-married women indicates the negative relation between marriage and earnings. Evidently marriage was correlated with limitations relevant to rewards for employment.

There was an age effect for ever-married women. In panel two of Table 3.2, the relative wage ratio in column two declined with rows of increased age level. With increased age these women earned less relative to the earnings of white men. Because the ratio of never-married white women remained constant at older age levels, (see panel one of Table 3.2), there was not a consistent age effect on the relative wage ratios of all women. If this cross-sectional survey material is viewed as if it were the record of a synthetic cohort, the trends in the relative wage ratios suggest that white ever-married women had limitations associated with their employment which increased with age but white never-married women did not.

The Effect of Different Characteristics

Stratification by age level and marital status of women did not eliminate the differential. As can be seen in Table 3.1, women and men have dissimilarities in levels of education, age adjusted for tenure, and occupational prestige. More evident are the differences between the

TABLE 3.3.--Percentage of Employees in Major Occupational Groups for White Men and Women by Marital Status and Age: 1960

Occupation (1)	Age 20 to 34			Age 35 to 44			Age 45 to 64		
	Men (2)	Never-Married Women (3)	Ever-Married Women (4)	Men (5)	Never-Married Women (6)	Ever Married Women (7)	Men (8)	Never-Married Women (9)	Ever-Married Women (10)
Professional Technical	16	14	10	14	17	10	10	17	10
Managerial	9	3	3	13	5	5	14	6	5
Clerical	11	64	61	9	53	44	11	49	39
Sales	9	3	3	8	4	8	7	5	9
Operatives	24	8	14	21	13	22	21	13	20
Other	31	8	9	35	8	11	37	10	17
Total Number	6215	761	1190	5522	283	1371	6723	438	2168

Source: One-in-one thousand sample of the Census of the Population: 1960.

TABLE 3.4.--Partial Regression Coefficients from the Regression of Hourly Wages on Education, Age Adjusted for Tenure and Occupational Prestige for White Men and Women by Marital Status and Age: 1960

Independent Variables[a]	Men				Never-Married Women				Ever-Married Women			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
					Panel 1: Age 20 to 34							
Education	.120	.116	.074	.082	.098**	.086**	.068	.057*	.082*	.088**	.040	.046**
Age Adjusted Tenure		.226		.210		.128**		.237		.106**		.109**
Occupational Prestige			.019	.014			.011**	.010			.015*	.015
Intercept	.96	-1.42	.77	-1.38	.46	-.62	.37	-.70	.65	-.02	.54	-.15
Adjusted Coefficient of Determination[b]	.08	.18	.12	.20	.10	.21	.12	.23	.07	.09	.12	.14
					Panel 2: Age 35 to 44							
Education	.198	.200	.128	.130	.152**	.152**	.101	.101	.096**	.096**	.051**	.051**
Age Adjusted Tenure		.046		.048		(-.014)		(-.025)		(-.013)		(.003)
Occupational Prestige			.023	.029			.023	.032			.019**	.019**
Intercept	.70	-.00	.33	-.41	.24	.44	-.10	.27	.61	.72	.41	.43
Adjusted Coefficient of Determination[b]	.12	.12	.15	.15	.19	.19	.25	.24	.11	.11	.19	.19

TABLE 3.4.--Continued

Independent Variables[a]	Men				Never-Married Women				Ever-Married Women			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
					Panel 3: Age 45 to 64							
Education	.214	.219	.121	.124	.134**	.135**	.070**	.076**	.079**	.081**	.030**	.032**
Age Adjusted Tenure		.041		.027		(.009)		(-.002)		(.028)		(.020)
Occupational Prestige			.046	.046			.023**	.023**			.023**	.023**
Intercept	.80	-.07	-.06	-.63	.51	.33	.25	.29	.83	.51	.48	.26
Adjusted Coefficient of Determination[b]	.10	.10	.16	.16	.16	.16	.22	.22	.06	.06	.12	.12

[a]Row entries are partial regression coefficients of the variables in a model regressing hourly wages on the variables contained in one column. Parentheses around a partial regression coefficient indicate that the coefficient did not have a significant effect on wages--it is not twice its standard error. The coefficient of women is significantly below the coefficient of men if it has one star (.05 level) or two stars (.01 level) above it for a one tail T-test.

[b]See Rao and Miller (1972 , p. 21).

Source: One-in-one thousand sample of the Census of the Population: 1960.

TABLE 3.5.--Partial Regression Coefficients from the Regression of Hourly Wages on Education, Age Adjusted for Tenure, and Major Occupational Group for White Men and Women, by Marital Status and Age: 1960

Independent Variables[a] (1)	Age 20 to 34			Age 35 to 44			Age 45 to 64		
	Men (2)	Never-Married Women (3)	Ever-Married Women (4)	Men (5)	Never-Married Women (6)	Ever-Married Women (7)	Men (8)	Never-Married Women (9)	Ever-Married Women (10)
Education	.101	.049**	.055**	.148	.105*	.061**	.134	.078**	.040**
Age Adjusted Tenure	.219	.130**	.122**	.045	(-.019)	(.003)	(.018)	(.004)	(.034)
Professional-Technical-Managerial	.152	.635	.544	.613	.628	.728	1.359	1.073*	.906**
Clerical	-.173	.463	.470	-.278	(.293)	.489	(-.159)*	.711	.655
Sales	(-.075)	(.243)	(.066)	(.148)	(-.302)	(-.032)*	.258	(.344)	(.097)
Operative	-.118	.303	.303	-.137	(.070)	.380	-.083	.463	.438
Intercept	-1.14	-.63	-.12	.48	.81	.58	.94	.42	.38
Adjusted Coefficient of Determination[b]	.19	.26	.14	.14	.23	.21	.16	.23	.14

[a]Row entries are partial regression coefficients of the variables in a model regressing hourly wages on education, age adjusted tenure, and major occupational group. Parentheses around a partial regression coefficient indicate that the coefficient did not have a significant effect on wages--it is not twice its standard error. The coefficient of women for education and age adjusted tenure is significantly below the coefficient of men if it has one star (.05 level) or two stars (.01 level) above it for a one tail T-test.

[b]See Rao and Miller (1972 , p. 21).

Source: One-in-one thousand sample of the Census of the Population: 1960.

sexes in percentages employed in major occupational categories, (see Table 3.3). Some have proposed that women earn less than men because they have dissimilar characteristics. The adjustment procedure described tests this hypothesis. If differences remain after adjustment for differences on independent variables, the wage differential partially reflects other influences. As discussed in Chapter I, education, potential work experience, and occupational location are often noted in the literature as contributors to the wage differential. But differences in these characteristics did not account for the entire wage differential between the sexes in 1960. Regression models by least squares method were calculated separately for women and men using years of schooling, age adjusted for tenure as a means of potential work experience, and either occupational prestige or major occupational census category, (see Table 3.4 and Table 3.5). The mean level of characteristics of women were inserted into the regression equation of men and the expected wage from this adjustment was estimated. Even with the characteristics of men, the relative wage ratios contained in columns three through six of Table 3.2 all remained below 82 except for younger, ever-married women. In general, women earned 82 per cent or less of the average wage earned by men. The differential in wages remained for both groups of white women even after they received the mean levels of education, age adjusted for tenure, and occupational

location possessed by white men. As measured in this study, the hypothesis must be rejected that the differential solely reflects differences in access to education, potential work experience, and occupational position.

The Effect of Payment for Characteristics

Both the mean differences of education, age adjusted for tenure, and occupational position and the stratification variables of age and marital status affected the relative wages of women. But neither stratification nor mean adjustments account entirely for the higher average hourly wage of men. When payment for specified characteristics is measured by unstandardized regression slopes and payment for unspecified influences is measured by the intercept of the unstandardized regression equation using the least squares method, the effect of differential payment on the relative wages of women is determinable.

The major factor in the higher wage of men was differential payment to the sexes. With all models for both marital groups of women, the relative wage of women increased with the adjustment for the function of men, (compare columns two to columns seven to ten in Table 3.2). In fact the function adjustment usually created a relative wage closer to unity than the mean adjustment produced. The ratios in columns seven to ten of Table 3.2 exceeded the value of ratios in columns three to six in twenty-two of twenty-four comparisons. Evidently the main source of

the wage differential between the sexes is differential payment. If women were changed such that they had the mean characteristics of men on education, age adjusted for tenure, and occupational position, they sometimes would have average wages closer to those of men. But if the situation for women were changed such that they received the payment of men for these characteristics and retained their own social characteristics, they frequently would have average hourly wages equal to those of men. A discussion of specific sources of payment differences follows.

Specific Payment Differences

Potential Work Experience: Age Adjusted Tenure

The measure of potential work experience considered was age adjusted for average job tenure. Among young men and women, this variable influenced both hourly wages and the relative wage of men. In row two of panel one in Table 3.4 the regression coefficients of tenure were all significant--each was at least twice the size of its standard error. Also, the coefficient of determination increased with the addition of tenure to the model of education and to the model of education and occupational position (see panel one of Table 3.4). Level of tenure affected hourly wages, and in addition, influence of tenure contributed to the higher relative wage of men. The partial regression slope of younger men was significantly higher than the slope of younger women in three of four

models in Table 3.4.[1] Among younger workers potential work experience generally contributed to hourly wages and to the wage difference between the sexes. Only never-married young women with a model of education, occupational prestige and age adjusted tenure were an exception.

In contrast to the younger age level, the effects of age adjusted for tenure were minimal at the middle and older age levels. In no instance did it increase the coefficient of determination, nor did its addition to a model change the partial regression coefficients of other variables. Both of these suggest a minimal effect on hourly wages from tenure. Finally only among men was the regression slope of tenure significant, but even for men, the size of the partial regression slopes for tenure were quite small (as is evident in row two of Table 3.3). For middle and older age levels, tenure level had little connection to wages. In addition the null hypothesis that women had equal or greater regression slopes for tenure could not be rejected for any model. As measured by age

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[1]Significant rejection of the null hypothesis is indicated by one star for the .05 level and two stars for the .01 level. Note that the regression coefficient of age adjusted for tenure is affected by its adjustment factor. The only coefficients in equations that are affected are coefficients of age adjusted for tenure. If never-married women had the adjustment factor of ever-married women, the coefficients would increase and would not be significant. However, the published research on job tenure and labor force participations suggest that never-married women are the same as men in their past work experience and the assumption of the same adjustment factor for never-married women and for men is accurate.

adjusted for tenure, work experience was of slight consequence for either the hourly wages of groups or the wage differentials between the sexes.

Changes in the intercepts of the equations for middle and older age levels also suggest that work experience did not contribute to the higher wages of men. The intercept of a regression equation estimates the mean effect on the dependent variable hourly wages of all variables excluded from the model (Rao and Miller 1971, pp. 5-6). The relevant variables to hourly wages were considered tentatively as education, age adjusted for job tenure, and occupational position. Because there were negligible effects from tenure in each model for each group and no significant differences for tenure slopes for age levels, the assumption was made that the changes in intercepts between middle and older age levels indicated the effect of increased work experience.[1] As measured in dollars, the changes in intercepts were -.22 for men, +.04 for never-married women, and -.18 for ever-married women

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[1]Because other variables do not affect the intercept of the equation with the assumption the model includes the relevant variables, the change in the intercept between middle and older age levels measures the influence of a change in age, a measure of work experience. Actually the effects of tenure must not be significantly different between the two age levels in each group for this technique to hold. Such was the case; neither men, never-married women, nor ever-married women had significantly different slopes for tenure between the two age levels.

when occupational prestige was the measure of occupational position.[1] Men did not receive a greater increase than women from changed experience. With major occupation as the measure of occupational position, the intercept changes for the respective groups were -.24, -.62, and -.26. For ever-married women but not for never-married women the change in average experience between age levels did not contribute to the higher wages of men. Because occupational prestige is a more precise measure of occupational position than major occupation, the results with occupational prestige are likely more accurate.[2] Changes in experience evidently did not contribute to the higher wage of men relative to the wage of women.

The analysis of intercepts should not be accepted without caution because it is dependent on two assumptions. One is that all important characteristics are in the model--there will be more confidence in this assumption when industrial characteristics are in the model. As the data analysis has implied the synthetic cohort model, it

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[1]The intercept of the equation of the full model with education, age adjusted for tenure, and occupational position in row four of columns four, eight and twelve of panels two and three of Table 3.4 were used. The intercept for the equation of people ages 35 to 44 (panel two) were subtracted from that of people ages 45 to 64 (panel three).

[2]This is extensively discussed in the section of the paper on the effects of payment for occupation. Basically, the partial regression coefficients of major occupational groups cannot be used for cross-sex comparisons because of bias.

was assumed that the only difference between the two age levels was experience. Of course the data actually were obtained from different people at age levels and not from one group of people over time. Despite these assumptions the results of analysis of intercepts and regression slopes gave the same result--no effect of additional experience. This concurrence of different analysis techniques lends confidence to the conclusion that level of work experience is only of consequence to the higher wages of men for young persons; the hypothesis that experience differences generally contributes to the higher wages of men is rejected.

Potential Work Experience: Instability

An alternative measure of potential work experience was the index of instability. As was discussed in Chapter II, a higher value on the index indicates that employees between 1950 and 1960 with similar categories of education, age, and major occupation were more likely to not be in the labor force at the time of the Census. As measured by the index of instability in this study, the employment future of workers had a limited effect. The variation in hourly wages explained by instability ranged from 0 to 10 per cent, but most models explained less than 4 per cent of the variation, (see the adjusted coefficient of determination in column two of Table 3.6). One indication of the limited effects were the minimal changes in

TABLE 3.6.--Partial Regression Coefficients from the Regression of Hourly Wages of Education, Index of Instability, and Occupational Prestige for White Men and Women, by Marital Status and Age: 1960

Independent Variables[a]	Men				Never-Married Women				Ever-Married Women			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Panel 1: Age 20 to 34												
Education		.120	.120	.080		.098**	.093**	-.069**		.082*	.082**	(.044)**
Index of Instability	-.007		-3.765	-3.111	-.015*		-.640	(-.209)	(-.001)		(-.186)	-3.672
Occupational Prestige				.016				.010				(-.000)
Intercept	.06	.96	1.12	.93	.47	.46	.80	.49	.45	.65	.73	.29
Adjusted Coefficient of Determination[b]	.03	.09	.11	.14	.02	.10	.10	.12	.00	.07	.07	.12
Panel 2: Age 35 to 44												
Education		.198	.183	.128		.152**	.155	.103		.096**	.105**	.055**
Index of Instability	-.002		-5.683	(.318)	(-.003)		(-1.007)	(-.198)	(.000)		-.983	(-.275)
Occupational Prestige				.029				.002				.018**
Intercept	.03	.70	1.03	.30	.45	.24	.66	-.02	.44	.61	.95	.51
Adjusted Coefficient of Determination[b]	.03	.12	.12	.15	.00	.19	.20	.24	.00	.11	.12	.19

TABLE 3.6.--Continued

Independent Variables[a]	Men				Never-Married Women				Ever-Married Women			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
					Panel 3: Age 45 to 64							
Education		.214	.211	.130		.134**	.114**	.086*		.079**	.051	.031
Index of Instability	-.003		(-.454)	1.387	-.023**		(-1.218)	(.930)	-.016**		-2.166	(.058)
Occupational Prestige				.047				.025**				.023**
Intercept	.08	.80	.86	-.27	.29	.51	1.03	-.17	.29	.83	1.70	.45
Adjusted Coefficient of Determination[b]	.03	.10	.10	.16	.10	.16	.17	.22	.06	.06	.07	.12

[a]Row entries are partial regression coefficients of the variables in a model regressing hourly wages on the variables contained in one column. Parentheses around a partial regression coefficient indicate that the coefficient did not have a significant effect on wages--it is not twice its standard error. The coefficient of women is significantly below the coefficient of men if it has one star (.05 level) or two stars (.01 level) above it for a one tail T-test.

[b]See Rao and Miller (1972, p. 21).

Source: One-in-one thousand sample of the Census of the Population: 1960.

the adjusted coefficient of determination when the index of instability was added to the model. At all ages the coefficient barely changed when the index of instability was added to a model with education (see Table 3.6), to a model of education and occupation, (contrast columns four, eight, and twelve of Table 3.4 to columns five, nine and thirteen of Table 3.6), and to a model with education, age adjusted for tenure, and occupation. For example, in Table 3.4 the adjusted coefficient of determination increased from .097 to .101 with the addition of instability to the model with education for never-married women, (contrast columns seven and eight in Panel 1). This indicates that the index was not closely related to hourly wages of workers and probably had little effect on them apart from education and occupational status. These results are manifest in all panels for all strata in Table 3.6.

Further support for this interpretation comes from the non-significance of the partial regression coefficients for the index. In the majority of cases the partial regression slopes were less than twice the size of their standard errors--indicated by parenthese around the partial regression coefficients.

Young men had the only consistently significant partial regression coefficient for the index of instability in the models with education or occupational status. With age adjusted for tenure, the other measure of work experience, added to the model, the index of instability had

no net effect. Path models indicated that the effect of the index really reflected indirect effects of age adjusted for tenure and occupational position on wages through the index when age adjusted for tenure was excluded from the model. The data suggest that age adjusted for tenure as a measure of work experience adequately measures the effects of discontinuous participation in the labor force. Because the index of instability does not appear to have effects apart from education, occupational position, and age adjusted for tenure--three variables very similar to those used to impute values--the index of instability will not be considered in subsequent analysis but will be considered as additional support for age adjusted for tenure as a measure of effects of lifetime work experience.

Education

Some writers suggest that the educational level possessed by a worker is indicative of employment qualifications or merit. Education was measured in years of school completed. In each model calculated with education, age adjusted for tenure, and occupational position, education had a significant positive effect on hourly wages. In row one of each panel in Table 3.4 and of Table 3.5 for each group, the partial regression coefficients of education were at least twice the size of their standard errors indicating that they have a significant effect on hourly wages. Education influences the payment of hourly

wages in each group.

Education also affected the wage differential between the sexes. The null hypothesis was that the regression slope of hourly wages for a year of education belonging to women was equal to or greater than the regression slope belonging to men. The null hypothesis was rejected, usually at the .01 level of significance, in twenty-six of thirty models involving education, age adjusted for tenure, and occupational position (see columns six through thirteen in Table 3.4 and columns three, four, six, seven, nine and ten in Table 3.5). No other variable considered in the models approached the consistent contribution to higher wages of men than payment for education had. Regardless of age level, marital status, and the effect of payment for either occupational position and/or age adjusted for tenure, women received less payment for a year of what some consider a measure of merit. As hypothesized, pay differences for education are evidently of consequence to the relative wage of women.

Occupational Position

As measured by either occupational prestige or by major occupational group, occupational position had a sizeable impact on hourly wages in each group. When added to the model of education or the model of education and age adjusted for tenure, both measures of occupational position increased the adjusted coefficient of determination

as is evident in the last row of Table 3.4 and Table 3.5. In addition the partial regression slopes for occupational position were usually significant in effect on hourly wages. With the exception of the sales occupation variable, almost all measures of occupational position were at least twice their standard error (see row three of Table 3.4 and rows three through six in Table 3.5). Occupational position is closely associated with the wages of men and women at all ages regardless of the effects of education and age adjusted for tenure.

The null hypothesis for occupational position was that women would have partial regression slopes equal to or greater than those of men. When major occupational group identifies occupational position, the null hypothesis almost was never rejected. But as indicated in row three of Table 3.4, the null hypothesis was rejected in eight of twelve models when occupational prestige measured occupational position. The results of the two measures are in conflict: Women generally receive less for a point of prestige but do not receive less for location in the major occupational groups identified. Furthermore, the conflict is contrary to the proposal of Fuchs (1971, p. 14) that more precise measurements of occupational position would reduce or eliminate the discrepancy in hourly wages between men and women. Occupational prestige is more precise which means a greater discrepancy should be present with major occupation than with occupational prestige.

A possible reason for the conflict is the degree each measure specifies occupational location. Occupational prestige is a value, based on social ratings of a random sample, which is attached to each detailed occupation in the Census categorization scheme. As discussed in Chapter II, individual measures exist for approximately three hundred finely defined occupational positions--there are 301 unique values for detailed occupations. But quite different occupations may have similar prestige values. For example, the prestige ratings of occupations in the blue collar sector overlap (see Table 3.7). The end result is that the average prestige levels for men and women are quite similar, and the distributions of men and women at units of prestige points are quite similar.

TABLE 3.7.--Mean Level of Occupational Prestige in Major Occupational Groups: 1964-1965

Occupation	Prestige	Occupation	Prestige
Professional-Technical and Kindred	59.6	Operatives and Kindred	28.7
Managers, Officials, and Proprieters except Farm	50.4	Private Household Workers	19.6
Clerical and Kindred	39.4	Service except Private Household	19.6
Sales Workers	33.6		
Craftsmen, Foremen, and Kindred	38.8	Laborers Except Farm and Mine	18.4

Source: Siegel (1971, Table 2.5).

With major occupational groups, the index of dissimilarity was 40, a sizeable level of dissimilarity. The reason for the large dissimilarity is evident from examining the blue collar sector. The proportion of women in the occupations service, laborer, and craftsman ranged from 10 per cent of never-married women to 20 per cent of ever-married women, but the proportion of men ranged from 30 to 40 per cent depending on age level, see Table 3.3. While women in the blue collar sector other than operative are located in service positions, men are located predominately in craftsman positions (U.S. Bureau of the Census 1964a, Table 88). Because craftsman positions are much higher paid than service positions, the unspecified occupations in the model have higher average wages for men and women. This biases the comparison of the specified dummy variables because they are contrasted to the omitted categories. For cross-sex comparisons from partial regression coefficients, occupational prestige as the measure of occupational location is more accurate.

Because the omitted category biases direct comparison of the partial regression slopes of major occupational groups, the mean wage for each category and the net effects of each category apart from education and age adjusted for tenure were calculated. The procedure replicates information from Multiple Classification Analysis, (the procedure is discussed in Appendix I). Briefly, an average of education and tenure effects were calculated by

multiplying the respective partial regression coefficients times their means, (for example, for men ages 20 to 34 this value was 1.20 for education and 2.34 for tenure). These average effects are added to the intercept of the equation which measures the mean effects of variables excluded from the equation, (for men ages 20 to 34 this value was -1.14). This value is the mean wage of workers in the omitted occupations of craftsmen, laborer, and service workers, (for men ages 20 to 34, this value is $2.41). The mean wage of a specified occupation is calculated by adding the value of the regression coefficient of the category to the mean wage of the omitted category, (see Table 3.8). The net effects of being in a category apart from education and age adjusted for tenure are calculated by subtracting the mean wages of the entire group from the stratum wage in each category for the group (see Table 3.8). Finally the relative wage ratios can be calculated for both groups of women for each category specified and the omitted groups, (see Table 3.9).

In all major occupational groups the mean wage of men exceeded the mean wage of both ever-married and never-married women as is evident from rows one to five of each panel in Table 3.8. In fact the average payment in each of the five occupational groups at any age level was higher for men than the mean wage of women, (the mean wage of women is located in row four of Table 3.1). Yet the relative wages of women in Table 3.9 vary across occupational

TABLE 3.8.--Mean Wages and Net Effects of Occupational Categories Adjusted by Multiple Classification Analysis for Effects of Education and Age Adjusted Tenure for White Men and Women by Marital Status and Age: 1960[a]

	Men		Never-Married Women		Ever-Married Women	
(1)	Adjusted Wage (2)	Net Effect (3)	Adjusted Wage (4)	Net Effect (5)	Adjusted Wage (6)	Net Effect (7)
			Panel 1: Age 20 to 34			
Professional-Technical-Managerial	$2.56	$.17	$1.87	$.20	$1.75	$.14
Clerical	2.23	-.16	1.69	.03	1.68	.07
Sales	2.33	-.06	1.47	-.20	1.28	-.33
Operative	2.29	-.10	1.53	-.13	1.51	-.10
Other	2.41	.02	1.21	-.44	1.21	-.40
Stratum Mean Wage	2.39	-	1.67	-	1.61	-
			Panel 2: Age 35 to 44			
Professional-Technical-Managerial	$3.48	$.49	$2.43	$.34	$2.02	$.32
Clerical	2.58	-.40	2.10	.01	1.78	.09
Sales	3.01	.02	1.50	-.59	1.26	-.43
Operative	2.73	-.26	1.87	-.22	1.67	-.02
Other	2.87	-.12	1.80	-.29	1.29	-.40
Stratum Mean Wage	2.99	-	2.09	-	1.69	-
			Panel 3: Age 45 to 64			
Professional-Technical-Managerial	$4.04	$.10	$2.46	$.41	$2.07	$.41
Clerical	2.52	-.47	2.09	.04	1.82	.16
Sales	2.94	-.06	1.73	-.32	1.27	-.40
Operative	2.60	-.40	1.85	-.20	1.60	-.06
Other	2.08	-.31	1.39	-.67	1.17	-.50
Stratum Mean Wage	3.00	-	2.07	-	1.66	-

[a]The group specific means are apart from 'mean effects' of education and age adjusted for tenure. Net effects are expressed as deviations from the stratum mean wage. Calculations are based on the equations in Table 3.5.

Source: One-in-one thousand sample of the Census of the Population: 1960.

TABLE 3.9.--Ratios of Mean Hourly Wages of White Women to Mean Hourly Wages of White Men by Occupational Categories Adjusted by Multiple Classification Analysis for Effects of Education and Age Adjusted Tenure by Marital Status of Women and Age: 1960[a]

Occupational Category (1)	Age 20 to 34		Age 35 to 44		Age 45 to 64	
	Never-Married Women (2)	Ever-Married Women (3)	Never-Married Women (4)	Ever-Married Women (5)	Never-Married Women (6)	Ever-Married Women (7)
Professional-Technical						
Managerial	73	69	70	58	61	51
Clerical	76	75	81	69	83	72
Sales	63	55	50	42	59	43
Operative	67	66	69	61	71	62
Other	51	50	63	45	52	44

[a]Wages in category adjusted by multiple classification analysis for 'mean effects' of education and age adjusted for tenure. Calculations based on the wages in Table 3.8. Ratios are multiplied by 100.

Source: One-in-one thousand sample of the Census of the Population: 1960.

categories.

The mean effects of major occupational categories indicate that the relative wages in the sales occupations were consistently lower than the relative wages of operative, (compare rows three and four of Table 3.9). This suggests that women were not paid wages closest to men's wages in all of the white collar occupational categories which are used frequently as indicators of higher social status. In addition the data are not congruent with the hypothesis that greater discrepancies occur in all occupation which could involve physical activity because women are not as well equipped as men by nature to handle the work. It is likely that more physical activity would be required in operative than sales positions. (It should be noted that these results are suggestive as few women actually worked in sales positions and the partial regression coefficients of women were consequently instable.)

The highest relative wages in 1960 were paid in clerical occupations which are typically 'feminine.' In all marital status-age strata the relative wage ratios of women clerical workers were the highest. Differences between the sexes in the effects of employment in clerical occupations contributed to the high relative wage of clerical workers. Apart from education and age adjusted for tenure, women received consistently positive effects while men received large negative effects to their wages from employment as clerical workers, (see row two of each

panel of Table 3.8). the high relative wage reflects low rewards to men rather than high wages to women. In fact, for women, professional and managerial occupations had higher average wages than clerical positions, (see row one of each panel of Table 3.8). Interestingly enough the average wages of men were lowest of all specified major occupational categories in the clerical category.

The pay rates for major occupational categories, prestige of major occupational categories, and distribution across major occupational categories shed light on the effect of occupational status on the relative earnings of women. As mentioned, in 1960 forty or more per cent of each group of women but few men were clerical workers. Clerical work had an average prestige value approximately equal to the mean prestige of each group of men and women, (see Table 3.7), but women in clerical positions had low wages relative to the mean wage of all men of the same age. Over fifty per cent of all men at each age worked in the blue collar sector which had low prestige levels compared to clerical positions. But men had higher average wages in each blue collar category than the mean wage of each group of women, (see rows four and five of each panel of Table 3.5). This resulted in a higher return to men for occupational status.

In general women are unable to convert occupational status into hourly wages to the same extent as men. Men receive a significantly higher return from occupational

prestige. This suggests that given locations of similar social status, men receive more earnings from an hour of work than women.

Conclusion

Although each type of difference has effects with models of education, age adjusted for tenure, and occupational position, the effects of differences in payment exceed the effects of differences in social characteristics. If women had the mean level of education, age adjusted for job tenure, and occupational prestige, they sometimes would receive a higher average hourly wage. Yet they almost always would receive a higher average hourly wage if they had the payment derived from these characteristics as measured by the regression function of men. Furthermore, women more often would derive greater benefit from a change in payment than a change in mean characteristics.

Two characteristics contributing to the wage difference were payment for occupational prestige and for years of education. Regardless of marital status, women are paid less for socially equivalent positions and for a year of education--what some consider to be a measure of merit. This study has extended the age range covered by Suter and Miller to all workers ages 20 to 64. Yet the findings fit the results of Suter and Miller who analyzed data collected for Parnes on women and men ages 30 to 44. It finds the conclusion of Suter and Miller still applies

that:

> Women are unable to exchange education and occupational status into earnings at the same high rate as men even when they are full-time workers with considerable lifetime work experience. The inability to convert occupational status into income, to the same extent as men, suggests that much of the remaining unexplained difference in male-female earnings could be attributable to discrimination in payment for jobs with equal status level as men. (1973, p. 971).

Perhaps some women do experience discrimination. Suter and Miller (1973, p. 971) suggest that "a lower regression slope of income on occupational status . . . is indicative of discrimination in payment for jobs of equal status." Application of this principle would mean that as measured in this study there is evidence of discrimination in payment to ever-married women and to never-married women for jobs of equal status and merit.

The continuing wage differential for never-married women despite higher levels than men of education, age adjusted for tenure, and occupational prestige is support for the plausibility of discrimination. Never-married women have comparable lengths of employment to men. In addition never-married women do not have the family obligations which have affected the employment patterns of many women. Yet they earn at most 70 per cent of the hourly wage earned by men. If they had the social characteristics of men, they would earn at most 82 per cent of the wage of men. Perhaps this is the 'cost of being a woman.' The 18 per cent or larger difference in the wages of never-married women largely reflect differential payment.

Despite their similarities in background and employment histories, never-married women always earned lower returns on a year of education and earned lower returns in five of six models with occupational prestige--often these lower returns were significantly different from chance as can be seen in Table 3.4. These differences in payment are at the causal nexus of the wage differential created by sex. Certainly the data is congruent with the hypothesis of sex discrimination even for never-married women.

The Effect of Marital Status

As previously discussed the unadjusted wages of never-married women exceeded the unadjusted wages of ever-married women at each age level. It was suggested that there may be limitations correlated with marriage relevant to employment rewards. For full-time wage and salary workers these limitations may also associate with age as the relative wage of ever-married women declined while the relative wage ratios of never-married women remained constant. In fact the percentage of the hourly wage of never-married women earned by ever-married women was 96 at younger age but only 81 per cent at older age, (see column two of Table 3.10). Bowen and Finegan (1969, p. 249) in analysis of labor force participation proposed that the only difference between never-married women and ever-married women is the family obligations of ever-married women. Such a statement is difficult to document but if

TABLE 3.10.--Ratios of Mean Hourly Wages of Ever-Married Women, Mean Adjustments and Function Adjustments, to Mean Hourly Wages of Never-Married Women by Age: 1960[a]

	Ratio of Wage of Ever-Married to Wage of Never-Married Women				
		Adjusted Mean[b] Models		Adjusted Function[c] Models	
Age	Unadjusted	Education	Education Prestige	Education	Education Prestige
(1)	(2)	(3)	(4)	(5)	(6)
20 to 34	.96	100	100	.96	.96
35 to 44	.81	.85	.86	.94	.91
45 to 64	.81	.84	.86	.93	.93

[a]Independent variables are years of education and occupational prestige.

[b]Wages of ever-married women adjusted by inserting the mean levels of characteristics of never-married women into the equation of women with the regression of hourly wages or independent variables specified in the columns. Mean adjustments are direct standardization.

[c]Wages of women adjusted by inserting mean levels of characteristics of ever-married women into the equations of never-married women with the regression of hourly wages or the independent variables specified in a columns. Function adjustments are indirect standardization.

Source: One-in-one thousand sample of the Census of the Population: 1960.

true could attribute the differential in wages for women of different marital groups to choice of marriage. At present, however, data do not permit us to determine if ever-married and never-married women are in fact the same except for marital status or if there is a selective factor--that is women desiring a career may chose to not marry. The previous section indicated that this dilemma may not be critical to the cost of being a woman as both women who ever marry and women who never marry earned lower hourly wages than men. Yet it does remain to be studied why women who ever-married earn substantially lower wages than women who never marry.

Marriage affects the employment stability of women. The net effects of more continuous employment of never-married women are longer job tenure. The effects of marriage can be inferred from the reasons women give for quitting the labor force. In 1964, the majority under age 35 gave family reasons--mainly marriage and pregnancy (Rosenfeld and Perrella 1965, p. 1081). Also influencing the level of work of women, at least in 1966, was the disapproval of the husband of a working wife and belief that mothers should not work (Parnes et al. 1970, pp. 69-74).[1] In general, lower commitment to employment is associated with marriage of white women. As evidence of

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[1]This is the sample of women ages 30 to 44 years discussed by Parnes (1972) and analyzed by Suter and Miller (1973).

work commitment, the research team directed by Parnes (Manpower Administration 1970, p. 175) interpreted an affirmative response to the question "If by some chance you (or your husband) were to get enough money to live comfortably without working, do you think that you would work anyway?" Seventy-five per cent of the not married women who did not have children but only 56 per cent of other white women in the sample gave an affirmative response.[1] Although one can only guess how men might respond to this question, this study indicates fewer ever-married women were committed to employment in 1966-67 than never-married women.

As noted previously, the only significant effects of age adjusted for tenure were at the younger age level. With this measure of potential work experience, only younger never-married women had a significantly higher partial regression slope than ever-married women. Although with the model of education, age adjusted for tenure, and occupational prestige never-married women did benefit from the changes in intercepts between middle and older age levels, the increment was only 20 cents greater than that of ever-married women. Long term stability and its resultant increase in average job tenure does not appear to be of large direct consequence to the higher wages of

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[1]Presumably the bulk of women not currently married and without children at ages 30 to 44 in 1966-67 were never married women, and the bulk of the other women were ever-married women.

never-married women compared to ever-married women.

The research team under Parnes (Parnes et al. 1970, p. 213) suggested analysis of their data indicated employment continuity may be of indirect effect on the higher wages of never-married women. Their findings were as follows:

> The reasons for variation in pay and earnings among women were very complex. One factor is undoubtedly the extent of upward occupational mobility. For example, never-married women obtained more education than their counterparts and, in general, began their careers in jobs calling for higher education and yielding higher rates of pay. Together with a better start, such women experienced net upward mobility from first to current (or last) job. Regrettably, however, the same cannot be said for ever-married women, a larger group. Not only did such women start lower on the occupational ladder, but proportionally more experienced downward rather than upward mobility. The extent to which this phenomenon is related to the structure of part-time job opportunities, to the deterioration of employment skills through nonuse, or to other factors will be explored in some detail at some later time.

This explanation was presented in the analysis of the study of women 30 to 44 years of age in 1966-67. If one looks at the age strata of this study as the record of a synthetic cohort over time, several observations from the above can be examined.

As expected the hourly wages of women who ever-married were 96 per cent of the hourly wages of women who never-married at ages 20 to 34 but declined to 81 per cent at older ages, (see column two of Table 3.10).

At all age levels, the means of education and occupational prestige were significantly higher for never-

married women than ever-married women.[1] As the model suggested, younger married women had access to less education and lower prestige jobs. For education the mean differences were approximately constant over all ages; never-married women had about one year more in mean years of education. The model suggested that the net occupational mobility of never-married women would be upward and of ever-married women would be downward. The 1960 Census does not have information on occupational mobility, but over the lifetime of the synthetic cohort one would expect an increase in the differential in occupational status. As is evident in Table 3.1, the mean prestige of never-married women compared to ever-married women was 1.6 prestige points at age 20 to 24 and increased to 3.8 prestige points higher at age 45 to 64. This was in spite of the almost constant educational difference of those employed at all ages. The results for mean differences from the 1960 Census fit the model proposed for a more limited age group at a later point in time.

But the summary from Dual Careers (Parnes et al. 1970, p. 213) implies that the consequences of marriage

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[1] The means are presented in Table 3.1. The t test was $t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{n_1 s_1 + n_2 s_2^2}{n_1 + n_2 - 2}} \quad \sqrt{\frac{n_1 + n_2}{n_1 n_2}}}$ with 1 refering to never-married women and 2 referring to ever-married women. The tests were significant at the .01 level of significance for a one tail test.

on hourly wages occur through lower means in education and occupational prestige. The decomposition of the differences in means tests this. With the models of education and of education and occupational prestige, the relative wage ratios after adjustment for mean differences between ever-married and never-married women were calculated. As can be seen in Table 3.10 if one gave the mean characteristics of never-married women to ever-married women, one would account for most of the trivial difference in wages at ages 20 to 34, but the more substantial difference at older age levels would not be eliminated. The bulk of the differential at middle and older age levels would be eliminated if ever-married women had the payment of never-married women in the two models. Furthermore, significance testing of partial regression slopes indicates that education was the only attribute for which never-married women were significantly higher paid. The slope of education was significantly higher at the .01 level even taking into account the effects of payment for occupational status, (the models are in Table 3.4). Never-married women derived more benefit from their increased years of education than from their increases in occupational status at a later time. Evidently it is higher educational levels established earlier in life which is of greater consequence to the differential than occupational changes during middle and older age. Choice of educational level appears to have effects throughout life.

Education was more closely related to the wages of never-married women than ever-married women as indicated by the adjusted coefficient of determination in the model with education in Table 3.4, and the above significance testing of the partial regression slopes for the marital groups. But the question of why is like answering the old saw of "which came first, the chicken or the egg"? Parnes et al. phrased the dilemma as follows:

> Thus it appears that marriage and child-bearing, as might be expected interfere with advanced education and consequent access to white collar, especially professional and technical, positions. Alternatively, some women with a high committment to work may be inclined not to marry, to postpone marriage, or not to have children, thus increasing their chances of securing advanced education and access to better jobs. (1970, pp. 151-152)

Either reason is plausible. Either marriage directly affects educational attainment or women who select or are selected for marriage differ from those remaining never-married. The alternatives cannot be resolved, but there is evidence that the process begins by the teen years and continues through the college years. The proposal is that marriage associates with limitations on acquisition of education. First acquisition of college work and then acquisition of graduate education will be considered.

When elementary or secondary students ages 14 to 17 years who were single and without having had children were interviewed in January, 1968, 70 per cent of the white young women and 74 per cent of the white young men reported aspirations to go to college (Parnes et al. 1971,

pp. 157-159). This aspiration level will likely 'be lowered as time passes' given the percentages in 1967 actually reporting they had one or more years of college: 41 per cent of white men and 27 per cent of white women age 20 to 24 and only 34 per cent of white men and 27 per cent of white women age 25 to 29 (U.S. Bureau of the Census 1968b, Table 1). Many are unlikely to realize their great aspirations, but if past history is relevant to the future, fewer women than men will realize their aspirations to college education. For these young women, aspirations to attend college were closely tied to the age they believe ideal for a young woman to get married. The percentages of women aspiring to go to college with choice of ideal marital age were: 18 per cent for 18 to 19 years ideal, 52 per cent with 20 to 24 years ideal, and 63 per cent for over 25 years ideal (Parnes et al. 1971, Table 7.7, p. 168). Those believing later marriage ideal were more likely to aspire to sixteen years of education. Women remaining single were actually more likely to report attending college in 1960 (U.S. Bureau of the Census 1964c, Table 8). If these data sets are representative of the time period, marital status of women evidently affected the plans for and actual attendance of women in college in this period of time.

The study of college graduates in 1961 indicates that plans for graduate school were associated with marital status of women. Apart from the academic performance in

college, those women seniors married or expecting to be married by the next fall were far more likely to report that they would never attend graduate school (Davis 1966, p. 88). Of those in the upper half of academic performance 38 per cent of the marital group but 18 per cent of those not planning to be married by Fall, 1961, reported they would never attend. For the lower half academically, the respective figures were 47 per cent and 28 per cent. As was the case of plans for college, plans for graduate school education, given women had made it through college, were limited for women planning or having earlier marriage.

The material presented above suggests that earlier marriage of white women associates with limited educational aspirations. It also finds that marriage of white women associates with acquisition of less education. Assuming that the synthetic cohort view of the 1960 Census data is appropriate, the results suggest that the limited education of married women, more so than occupational status of jobs, has lifetime consequences for the relative wage of women. Some might claim that there is evidence that marriage limits education. Because husband's negative views on working wives (Parnes et al 1970, pp. 72-76) and the obligations of motherhood felt by women (Rosenfeld and Perrella 1965) both associate with lower employment of women, these factors influence acquisition of education. Such an argument would attribute the choice for marriage of women as the causal means. The higher average earnings

of never-married women would then estimate the cost of marriage to white women and would be approximately 15 per cent of the hourly wage of never-married women for women over 35 years of age. But evidence cannot be conclusive. Association does not mean causation. Furthermore data are not available to establish the time ordering of events affecting education. Neither plausible model can be rejected. Possibly the results of the longitudinal surveys undertaken by Parnes et al. (Parnes 1972) will allow people to unravel the dilemma.

Summary

The analysis in this chapter suggests that the differences in social characteristics contribute to the wage differentials between white men and selected groups of women. The differences in payment of women contributed heavily to wage differences between the sexes but particularly for white never-married women. The analysis suggested that the 'cost of being a woman' may be the differential between the wages of white men and white never-married women. This cost appears to be approximately 18 per cent of the hourly wages of white men. In addition, there were wage differences associated with marriage of white women.

The results should be accepted cautiously. As previously discussed, errors from undercoverage, measurements, and misspecification could affect the data and

analysis. In fact subsequent work will introduce characteristics of industries of employment, a variable set known to be relevant.

CHAPTER IV

EMPLOYMENT IN INDUSTRIES

Studies by the Bureau of Labor Statistics (BLS) on labor markets suggest that most of the difference in earnings between men and women in eleven specific blue collar and clerical jobs results from the exclusion of women from higher paying establishments, rather than differential pay for the same specific job (McNulty 1967; Buckley 1971). Perhaps differential payment between white men and women for socioeconomic characteristics may not be present if specific industrial categories are examined. Although specific employment organizations cannot be considered with this data set, major industrial categories of employment organizations can be studied. The findings of this chapter support the conclusions of Chapter III that payment differences between the sexes contribute to lower wages of women relative to the wage of men, i.e., relative wage ratios of women less than unity.

Predictions

Based on the results of BLS studies, specification of industrial categories should change the mean adjusted and function adjusted relative wage ratios of women. The

BLS studies suggest that payment within industries were approximately equal for men and women who held the same job, but women were excluded from higher paying organizations. If major industrial categories specified in regression equations identify the more rewarding industrial distribution of men, differences in distributions across industrial positions should contribute to differences in earnings. Consequently, specification of major industrial categories should increase the effect on the relative wages of women from adjustment for differences between the sexes in socioeconomic characteristics.

When characteristics related to the dependent variable but unrelated to the independent variables of a regression equation are not specified in a regression equation, the mean effects of the unspecified variables are measured by the intercept of the regression equation (Roa and Miller 1972, p. 21). To the extent that major industrial categories had effects on wages uncorrelated with the independent variables used in Chapter III, the wage effects of major industrial categories would be measured by the regression equation intercept. If men and women have different distributions across industrial categories, part of the differences in wages between the sexes would be attributable to differences in intercepts. The effect of different intercepts would have been included in the effect of function adjustment to the relative wages of women in previous analysis. The effect of function adjustment

should decrease from its previous influence on the relative wages of women with the inclusion of major industrial categories in the model.

To the extent industrial distributions were associated with wage effects of education, work experience, and occupational prestige, specification of industrial categories would affect the partial regression coefficients of education, work experience, and occupational prestige. Differences between the sexes in the partial regression coefficients of variables in the model contribute to the influence of function adjustments to the relative wages of women. Dissimilar industrial distributions would have accounted previously for part of the effects attributed to differences in partial regression coefficients of education, work experience, and occupational prestige. Consequently, specification should eliminate payment differences for socioeconomic characteristics. It also should decrease the previous influence of function adjustments on the relative wages of women.

The results of BLS studies on specific jobs in specific organizations suggest that the specification of major industrial categories influence the impact of differences in means and differences in payment on the relative wages of women. In fact, the results of BLS studies suggest that mean differences in characteristics should account for almost all of the differential in earnings between the sexes. In addition the payment differences should almost

be eliminated when industrial categories are taken into account. With the specification of major industrial categories in equations, it is expected:

a) Mean adjusted ratios will exceed function adjusted relative wage ratios.

b) Mean adjusted relative wage ratios will increase while function adjusted ratios decrease non-randomly.

c) Payment differences between the sexes will disappear for education, work experience, and occupational prestige.

In order to test the predictions, five dichotomous variables specifying categories of industries were added to the model of education, work experience, and occupational prestige. The categories are retail trades; communication, utilities and transportation (CUT); professional services; manufacturing 'blue collar'; and manufacturing 'white collar'. The first three categories are Census categories. The latter two categories were used by Eidson (1971). Manufacturing 'white collar' consists of chemicals, electrical machinery, printing and publishing, and professional and scientific industries. Other durable and nondurable industries are classified as manufacturing 'blue collar'. In general, men were more likely to work in 'blue collar' manufacturing than women, (see Table 4.1).

TABLE 4.1.--Percentages of Employees in Major Industrial Categories for White Men and Women by Marital Status and Age: 1960[a]

Major Industrial Categories[b] (1)	Age 20 to 34			Age 35 to 44			Age 45 to 64		
	Men (2)	Never-Married Women (3)	Ever-Married Women (4)	Men (5)	Never-Married Women (6)	Ever-Married Women (7)	Men (8)	Never-Married Women (9)	Ever-Married Women (10)
Communications, Utilities, Transportation	11	12	10	11	11	6	13	7	5
Retail Trades	13	10	13	10	10	19	10	12	20
Professional Services	6	19	17	5	22	15	7	22	21
Manufacturing 'Blue Collar'	29	16	21	31	17	24	31	17	21
Manufacturing 'White Collar'	11	11	10	10	10	10	9	10	8
Other	30	32	30	31	30	26	31	33	26
Total Number	6282	767	1204	5606	288	1384	6806	444	2171

[a]The sample consists of full-time wage and salary workers in the civilian nonagricultural labor force. Other tables in this chapter refer to this sample unless otherwise noted.

[b]See text for definitions of categories.

Source: One-in-one thousand sample of the Census of the Population: 1960.

Results

The adjusted coefficient of determination increased from 2 to 6 per cent with the addition of major industrial categories to the independent variables of education, age adjusted for tenure, and occupational prestige. (Compare the coefficients of determination of Table 4.2 to those in Table 3.3 of Chapter III). These changes indicate that the industrial categories were associated with variation in hourly wages apart from covariation with education, age adjusted for tenure and occupational prestige. Thus, industrial categorical effects influence the intercepts of the previous regression equations.

Adjusted Ratios

As predicted, mean adjusted relative wage ratios increased and function adjusted ratios decreased when major industrial categories were added to the model, (see Table 4.3). Thus, differences in means may be more important and differences in payment less important to the relative wages of women when industrial categories are taken into account. But few changes in relative wage ratios exceeded 5 per cent in size. Changes of more than 5 per cent occurred in only two of six strata with mean adjustments and three of six strata with function adjustments. This suggests that changes may reflect random error in some strata.[1]

[1]Changes of greater than 5 per cent were selected as large enough to indicate influences other than sampling error on the relative wage ratios of women.

TABLE 4.2.--Partial Regression Coefficients from the Regression of Hourly Wages on Education, Age Adjusted Tenure, Occupational Prestige, and Major Industrial Categories for White Men and Women by Marital Status and Age: 1960[a]

Variables (1)	Age 20 to 34			Age 35 to 44			Age 45 to 64		
	Men (2)	Never-Married Women (3)	Ever-Married Women (4)	Men (5)	Never-Married Women (6)	Ever-Married Women (7)	Men (8)	Never-Married Women (9)	Ever-Married Women (10)
Education	.094	.064**	.052**	.141	.105	.059**	.138	.085**	.045**
Age Adjusted Tenure	.209	.128**	.108**	.056	(-.013)	(-.014)	.037	(.002)	.037
Occupational Prestige	.015	.014	.016	.030	.024	.020**	.046	.028**	.025**
Communications, Utilities, Transportation	.156	(.107)	(.042)	.242	(.231)	.257	.140	(.291)	.230
Retail Trades	-.221	-.211	-.256	-.135	-.353	-.184	(-.175)	-.282	-.151
Professional Services	-.649	-.267	-.266	-.618	(-.202)	-.201	-.670	-.470	-.225
Manufacturing 'Blue Collar'	.210	(.105)	(.065)**	.346	(-.009)**	.190*	.333	(.098)*	.250
Manufacturing 'White Collar'	.276	(-.011)**	.136*	.486	(.140)*	.232**	.474	.360	.297
Intercept	-1.62	-.87	-.21	-.85	.07	.11	-1.08	-.04	-.13
Adjusted Coefficient of Determination[b]	.24	.27	.19	.18	.27	.25	.17	.28	.15

[a]Row entries are partial regression coefficients of the variable in a model regressing hourly wages on the variables in column one. Parentheses around a partial regression coefficient indicate that the coefficient did not have a significant effect on wages--it is not twice its standard error. The coefficients of men is significantly greater than the coefficient of women if it has one star (.05 level) or two stars (.01 level) above it for a one-tail test.

[b]See Rao and Miller (1972, p. 21).

Source: One-in-one thousand sample of the Census of the Population: 1960.

TABLE 4.3.--Ratios of Mean Hourly Wages of Women, with Mean and Function Adjustments, to Mean Hourly Wages of Men by Marital Status and Age: 1960[a]

	Ratio of Wage of Women to Wage of Men Multiplied by 100				
		Mean Adjusted Models[b]		Function Adjusted Models[c]	
Age	Unadjusted	Education Age Adjusted Tenure Occupation	Education Age Adjusted Tenure Occupation Industry	Education Age Adjusted Tenure Occupation	Education Age Adjusted Tenure Occupation Industry
(1)	(2)	(3)	(4)	(5)	(6)
	Panel 1: Never-Married Women				
20 to 34	70	74	75	93	89
35 to 44	70	68	68	103	98
45 to 64	69	64	65	108	102
	Panel 2: Ever-Married Women				
20 to 34	67	91	92	55	79
35 to 44	56	58	65	85	79
45 to 64	56	63	71	90	81

[a]Independent variables are years of education, age adjusted tenure, occupational prestige, and major industrial categories. See text for definition of the variables. The wages of never-married and ever-married white women are divided by the wages of all white men.

[b]Wages of women adjusted by inserting the mean levels of characteristics of men into the equation of women with the regression of hourly wages on the independent variables specified in the columns. Mean adjustments are direct standardization.

[c]Wages of women adjusted by inserting the mean levels of characteristics of women into the equation of men with the regression of hourly wages on the independent variables specified in the columns. Function adjustments are indirect standardization.

Source: One-in-one thousand sample of the Census of the Population: 1960.

Contrary to the predictions derived from results of BLS studies, payment differences were not eliminated by addition of major industrial groups to the equation. As before, the function adjusted relative wage ratios exceeded the mean adjusted relative wage ratios by 10 per cent in all strata except young ever-married women. The effect on the relative wage ratios of changing the regression function of women exceeded the effect of changing the mean levels of socioeconomic characteristics of women. Again, the inability of women to transform their socioeconomic characteristics into wages in the same manner as men had greater impact on the relative wages of women than did differences in distribution on socioeconomic characteristics.

Specific Differences in Payment

Contrary to predictions, the patterns of men receiving larger partial regression coefficients than women continued for payment of education, work experience, and occupational prestige. Specification of major industrial groups had little effect on payment for education, work experience, and occupational prestige. As before, men had higher partial regression coefficients than women for occupational prestige in comparisons within four of six strata of women--significantly higher within three of six strata, (see row three of Table 4.2). As before, men had significantly higher slopes for work experience only in

comparison with women at younger age, (see row two of Table 4.2). Finally, men had significantly higher partial regression slopes in five of six strata for education as was the case when major industrial categories were not in the model, (see row one of Table 4.2). These patterns indicate that men still received greater payment for specific socioeconomic characteristics, contrary to the predictions derived from BLS studies.

In summary, the predictions of BLS studies were only partially consistent with these data. Differences in payment did not become negligible when major industrial categories were added to the model.

Employment in Major Industries

Some might suggest that all bureaucracies are the same. For example, the BLS studies did not note if differential hiring and payment between the sexes varied with type of employer. However, Blau and Scott (1962, Chapter Two) suggest that all bureaucracies are not alike but have different goals and different operating procedures. Predictions can be made from analysis of their work with respect to organizations they term service organizations and business organizations. Service organizations emphasize service to clients. To accomplish this goal, these organizations emphasize work consistent with objective standards of performance based on professional standards. On the other hand, business organizations emphasize efficiency,

productivity, and profit. In terms of the discussion by Blau and Scott, one could predict that in professional service organizations, the 'ideal type' of objectivity and service would result in equality of treatment of employees regardless of sex. In business organizations, women might receive differential treatment if it contributes to organizational goals.

Multiple Classification Analysis

The wages of men and women were estimated by calculations similar to Multiple Classification Analysis. This technique was described in Appendix I. Briefly, the characteristics of the average man and woman are used to estimate the wages in a major industrial category.

First, the wages adjusted for effects of other variables are estimated in each category. In each stratum, the 'mean effects' of education, work experience, and occupational status are calculated. The means of these characteristics are multiplied times the partial regression coefficients of these characteristics in Table 4.2. Then, the sum of 'mean effects' are added to the regression equation intercept, (see row six of Table 4.4). This value estimates the mean wage of the average person employed in the omitted category, i.e., construction, mining, wholesale trades, business services, and public administration. The effect of being employed in a specified category, for example professional services, is calculated by adding the

TABLE 4.4.--Mean Wages and Net Effects of Major Industrial Categories Adjusted by Multiple Classification Analysis for Effects of Education, Age Adjusted Tenure, and Occupational Prestige for White Men and Women by Marital Status and Age: 1960[a]

Variables (1)	Men		Never-Married Women		Ever-Married Women	
	Adjusted Wage (2)	Net Effect (3)	Adjusted Wage (4)	Net Effect (5)	Adjusted Wage (6)	Net Effect (7)
			Panel 1: Age 20 to 34			
Communications, Utilities and Transportation	$2.51	$.12	$1.82	$.15	$1.70	$.09
Retail Trade	2.13	-.26	1.50	-.17	1.40	-.21
Professional Services	1.70	-.69	1.45	-.22	1.39	-.22
Manufacturing "Blue Collar"	2.56	.17	1.82	.15	1.72	.11
Manufacturing "White Collar"	2.63	.24	1.70	.03	1.79	.18
Other	2.35	.04	1.71	.04	1.66	.05
Stratum Mean Wage	2.39	-	1.67	-	1.61	-
			Panel 2: Age 35 to 44			
Communications, Utilities and Transportation	$3.09	$.10	$2.36	$.27	$1.93	$.24
Retail Trade	2.71	-.28	1.78	-.31	1.49	-.20
Professional Services	2.23	-.26	1.93	-.16	1.47	-.22
Manufacturing "Blue Collar"	3.19	.20	2.12	.03	1.86	.17
Manufacturing "White Collar"	3.33	.35	2.27	.18	1.91	.21
Other	2.85	-.14	2.13	.05	1.67	-.02
Stratum Mean Wage	2.99	-	2.09	-	1.69	-
			Panel 3: Age 45 to 64			
Communications, Utilities and Transportation	$3.04	$.04	$2.46	$.40	$1.88	$.22
Retail Trade	2.72	-.27	1.88	-.17	1.50	-.16
Professional Services	2.23	-.77	1.70	-.36	1.43	-.23
Manufacturing "Blue Collar"	3.23	.24	2.26	.21	1.90	.24
Manufacturing "White Collar"	3.37	.38	2.53	.47	1.95	.29
Other	2.90	-.10	2.17	.11	1.65	-.01
Stratum Mean Wage	3.00	-	2.07	-	1.66	-

[a]The group specific means are apart from 'mean effects' of education, age adjusted tenure, and occupational prestige. Net effects are expressed as deviations from the stratum mean wage. Calculations are based on the equations in Table 4.3.

Source: One-in-one thousand sample of the Census of the Population: 1960.

partial regression coefficient of the professional services category to the mean wage of the omitted category, (see row three of Table 4.4).

The next step is to calculate the effect from employment in a category on the wages of people in each stratum. The net deviations from the mean wage of the stratum were estimated by subtracting the stratum mean wage from the adjusted mean wages in the stratum. These indicate the net effects of employment in specific categories apart from education, work experience, and occupational prestige, (see Table 4.4).

Finally, in each row of Table 4.4, the wage of women in a column was divided by the wage of men of the same age. This estimation separately calculated the relative wages of ever-married and of never-married white women for each major industrial category. These ratios have been adjusted for the net 'mean effects' of education, work experience, and occupational prestige. In each industry, the ratio estimated the wages of the average woman of a particular age and marital status compared to those of the average man of the same age, (see Table 4.5).

Professional service industries usually had the highest relative wage ratios of women--in five of six strata. Never-married women in professional services had relative wage ratios over 5 per cent larger than never-married women in retail trades and in 'blue collar' manufactures in all strata. In comparisons with never-married women in CUT and

TABLE 4.5.--Ratios of Mean Hourly Wages of White Women to Mean Hourly Wages of White Men by Major Industrial Categories Adjusted by Multiple Classification Analysis for Effects of Age Adjusted for Tenure, Occupational Prestige and Education by Marital Status and Age: 1960[a]

Variables	Age 20 to 34		Age 35 to 44		Age 45 to 64	
	Never-Married Women	Ever-Married Women	Never-Married Women	Ever-Married Women	Never-Married Women	Ever-Married Women
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Communication, Utilities and Transportation	73	68	76	63	81	62
Retail Trade	71	66	66	55	69	55
Professional Services	85	82	87	66	76	64
Manufacturing "Blue Collar"	71	67	66	58	70	59
Manufacturing "White Collar"	65	68	68	57	75	69
Other	73	71	75	59	75	57

[a]Wages in each category adjusted by Multiple Classification Analysis for 'mean effects' of education, age adjusted for tenure, and occupational prestige. Calculations based on the wages in Table 4.4. Ratios are multiplied by 100.

Source: One-in-one thousand sample of the Census of the Population: 1960.

in 'white collar' manufactures, never-married women had 5 per cent higher relative wage ratios in two of three strata. Finally, ever-married women in professional services had relative wage ratios at least 5 per cent higher than women in retail trades, 'blue collar' manufactures, and 'white collar' manufactures.

These results provide general confirmation of the prediction derived from the discussion of Blau and Scott (1962). Yet, the results of MCA can be biased by multicollinearity. If the young men in the professional services had higher levels of education than average for all young men, for example, the 'mean weighting' procedure of the calculations underestimate the 'true wage' of the young men in professional services. Rather than receiving the mean weight from education, young men in professional services actually should receive a higher value than the mean weight reflecting their higher educational level than the mean of all young men. This could bias the relative wage ratios of women if sex interacts with the collinearity.

Because the focus of analysis is on the wages of women relative to those of men, the possible influence of the effects of collinearity can be ignored if the bias was consistent for men and women within an industrial category. But the relative wage ratios are influenced if sex interacted with the collinearity. If young men in professional services had higher educational levels than the mean level of all young men, and young women in professional services

equal or lower levels of education than the mean level of young women, bias would occur for relative wage ratios. In this case, men would receive less, and women could receive more, wages than they should receive when they are employed in professional services from the mean weighting procedure of education. This bias could affect interpretations if interaction occurred in more than one category of major industries by affecting the ratios.

Analysis Within Industries

Because of the possible bias from multicollinearity and interactions, separate industries were examined from the major industrial categories of professional services, 'blue collar' manufactures, 'white collar' manufactures, and communications, utilities, and transportation (CUT).[1] Two predictions were made from the previous analysis. First, payment differences will remain between the sexes for socioeconomic characteristics despite the conclusions from BLS studies. Second, the expectation is that there will be less dissimilarity between the sexes within professional services industries than there is among industries selected from manufactures and CUT. The data is consistent with both predictions.

Detailed Census industrial categories employing at least 100,000 men and 100,000 women were selected for

[1]Because the focus concerns the relative wage ratios in one industry compared to another, analysis within industries would not be subject to the problem of interpretation from collinearity.

TABLE 4.6.--Mean Levels of Education, Age Adjusted for Tenure, Occupational Prestige, and Hourly Wages for White Men and Women by Selected Industrial Categories: 1960

Variables	Professional Services				Communications Utilities Transportation			Manufacturing 'Blue Collar'			Manufacturing 'White Collar'		
	Education	Engineering Misc.	Hospital Medical	Welfare, Religious Nonprofit	Telephone	Transportation	Utilities	Fabricating Metal	Machinery except Electrical	Textiles	Chemicals and Scientific Instruments	Electrical Machinery	Printing and Publishing
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Men													
Education	13.8	14.3	11.8	13.7	11.9	10.3	10.9	10.7	11.0	9.1	11.9	11.8	11.8
Age Adjusted Tenure	16.1	14.1	16.6	17.1	14.5	16.3	16.0	15.6	15.7	15.8	15.2	14.9	15.1
Occupational Prestige	49.2	55.8	47.1	55.5	44.3	36.3	39.0	38.4	40.8	33.5	42.8	43.5	41.6
Hourly Wages	2.69	3.54	2.51	2.12	3.20	2.69	2.78	2.98	2.96	2.09	3.34	3.12	3.28
Total Number	494	145	253	240	242	1377	568	611	912	295	633	689	384
Women													
Education	14.2	12.4	11.9	11.7	11.6	11.6	12.5	10.8	11.0	9.2	11.4	10.5	11.7
Age Adjusted Tenure	10.9	9.7	10.3	11.3	9.7	10.3	10.0	9.7	9.8	9.2	10.4	9.7	9.8
Occupational Prestige	51.1	45.8	46.9	43.8	39.5	39.9	41.7	35.3	38.2	30.9	39.1	37.3	41.8
Hourly Wages	2.02	2.00	1.59	1.70	1.91	1.95	1.87	1.94	1.86	1.40	2.02	1.92	1.92
Total Number	322	89	687	90	267	110	77	117	101	170	139	229	132

Source: One-in-one thousand sample of the Census of the Population: 1960.

analysis. The selection was based on published Census Tables for wage and salary workers in the Civilian Labor Force employed 50 to 52 weeks in 1959 (U.S. Bureau of the Census 1967, Table 13). The selection was made from professional services, manufactures and CUT. All industries in professional services and in 'white collar' manufactures were included in the categories selected. The sample consisted of those employees defined as part of the sample of this dissertation: white, wage and salary workers in the civilian labor force ages 20 to 64 who worked over 35 hours in the Census week and at least 50 weeks in 1959. Because the numbers of women employees in the thirteen categories were limited, (see row five of panel two in Table 4.6), calculations were made for all white women and all white men. This contrasts with previous analysis which stratified the sample by age cohort and marital status of women.

Examination of mean levels of education, age adjusted for tenure, and occupational prestige indicate that in some categories men have mean levels higher than those of women and in some categories the reverse occurs. Men did not have consistently higher levels of education than women either in professional service industries, (see columns two to five of Table 4.6), or in other selected industries, (see columns six to fourteen of Table 4.6). Men had higher mean levels of education than women in two of four categories of professional services and in four of

nine other selected industries. Mean levels of both work experience and occupational prestige were usually higher for men than women. There is some variation in the results of comparison of the means of men to the means of women for characteristics. It is possible that multicollinearity of means interacting with sex could account for the previous results that women in professional services earned higher wages relative to men than do women in other industries.

In each selected industry the mean hourly wage of women was lower than the mean hourly wage of men, (see Table 4.6). At best, women earned 75 per cent of the hourly wage of men. As can be seen in row one of Table 4.7, the relative wage ratio of women varied across the selected industries. Engineering and miscellaneous services, (see column three), and hospital and medical services (see column four) were not distinguished by high relative wage ratios compared to ratios of industries outside professional services. Yet, the two highest unadjusted relative wage ratios belonged to women in educational services and in welfare, religious, and nonprofit services, (see columns two and five). Some categories of women in professional services had high relative wage ratios compared to other industries.

Adjustment for differences in mean levels of education, work experience, and occupational prestige do not change the results. Hourly wages were regressed on

TABLE 4.7.--Ratios of Mean Hourly Wages of White Women, With Mean and Function Adjustment, to Mean Hourly Wages of White Men by Selected Industries: 1960[a]

	Professional Services				Communications Utilities Transportation			Manufacturing 'Blue Collar'			Manufacturing 'White Collar'		
Adjustments	Education	Engineering Misc.	Hospital Medical	Welfare, Religious Nonprofit	Telephone	Transportation	Utilities	Fabricating Metal	Machinery except Electric	Textiles	Chemicals and Scientific Instruments	Electrical Machinery	Printing Publishing
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Unadjusted	75	56	63	80	60	73	67	65	63	67	61	62	59
Mean Adjusted[b]	80	71	70	95	72	83	75	75	64	75	72	80	64
Function Adjusted[c]	85	61	55	81	76	98	93	78	83	84	75	64	76

[a]Independent variables are years of education, age adjusted tenure, and occupational prestige. See text for definition of the variables. The ratio is multiplied by 100.

[b]Wages of women adjusted by inserting the mean levels of characteristics of men into the equations of women with hourly wages regressed on education, age adjusted tenure, and occupational prestige. Mean adjustments are direct standardization.

[c]Wages of women adjusted by inserting the mean levels of characteristics of women into the equation of men with hourly wages regressed on education, age adjusted for tenure, and occupational prestige. Function adjustments are indirect standardization.

Source: One-in-one thousand sample of the Census of the Population: 1960.

education, age adjusted for tenure and occupational prestige, (see Table 4.8). The wages of women were adjusted by giving them the mean levels of men for the independent variables, (see row two of Table 4.7). Even after adjustment, women employed in welfare, religious and nonprofit services had the highest relative wage ratio of the selected industries. Educational services was the industry with the third highest relative wage ratio of women. Despite elimination of differences between men and women in mean socioeconomic characteristics women in two of four professional services continue to have higher wages relative to those of men in other industries.

After adjustment for function differences between men and women, the professional service industries were distinctly different from other industries. The function adjusted relative wage ratio of women was usually greater than the mean adjusted relative wage ratios of women. That is, differences in payments to men and to women were usually more important to the relative wages of women than differences in mean levels of socioeconomic characteristics between men and women. This relationship occurred in fully eight of nine categories outside professional service industries. The major exceptions were professional service industries. The function adjusted ratio was larger than the mean adjusted ratio in only one of four professional service industries. The payments to men and to women appear more similar within industries of professional

TABLE 4.8.—Partial Regression Coefficients from the Regression of Hourly Wages on Education, Age Adjusted for Tenure and Occupational Prestige for White Men and Women by Selected Industrial Categories: 1960[a]

	Professional Services				Communications Utilities Transportation			Manufacturing 'Blue Collar'			Manufacturing 'White Collar'		
Independent Variables	Education	Engineering Misc.	Hospital Medical	Welfare, Religious Nonprofit	Telephone	Transportation	Utilities	Fabricating Metal	Machinery except Electrical	Textiles	Chemical and Scientific Instruments	Electrical Machinery	Printing and Publishing
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Men													
Education	.112	(.190)	.229	(-.004)	.180	.073	.134	.159	.176	.101	.186	.215	(.065)
Age Adjusted Tenure	.094	.180	.179	(.068)	.121	.052	.076	.089	.073	.037	.037	.131	.150
Occupational Prestige	.016	(.022)	.021	-.009	.026	.044	.022	.039	.033	.040	.121	.025	.055
Intercept	-1.17	-2.91	-4.15	1.38	-1.86	-.49	-.75	-1.64	-1.48	-.75	-2.31	-2.46	-2.03
Adjusted Coefficient of Determination[b]	.20	.12	.26	.05	.47	.15	.30	.25	.19	.21	.20	.26	.16
Women													
Education	.108	(.059)	.097**	.109	(-.004)**	.016*	(.050)*	.078*	(.092)*	(.019)**	(.051)**	.054**	.049
Age Adjusted Tenure	.037**	(.050)**	.028**	(.035)	.043**	.047	.066	.043**	(.001)**	.014	.022 **	.055**	.033**
Occupational Prestige	(.002)	.018	.012	(-.009)	.035	-.003	.037	.010	(.009)	(.021)**	.053	.034	.025*
Intercept	-.00	-.04	-.41	.41	.16	1.39	-.99	.32	.48	.61	.02	-.47	-.01
Adjusted Coefficient of Determination[b]	.19	.19	.21	.18	.20	.07	.29	.22	.04	.06	.25	.06	.15

[a] Row entries are partial coefficients of the variable in a model regressing hourly wages on the variables in column one. Parentheses around a partial regression coefficient indicate that the coefficient did not have a significant effect on wages-- it is not twice its standard error. The coefficient of men is significantly greater than that of women if it has one star (.05 level) or two stars (.01 level) above it for a one-tail T-test.

[b] See Rao and Miller (1972, p. 21).

Source: One-in-one thousand sample of the Census of the Population: 1960.

services than they do within industries other than professional services.

Payment for a particular characteristic was defined as the partial regression slope of the characteristic in a multiple regression equation. Men generally had greater coefficients than women for a year of education, a year of work experience, and a unit of occupational prestige. The coefficient belonging to men was higher than that belonging to women in twelve of thirteen industries for a year of education, thirteen of thirteen industries for a year of work experience, and seven of thirteen industries for a unit of occupational prestige, (compare panel one to panel two of Table 4.8). This indicates that men were frequently paid more for socioeconomic characteristics than women in the same industry.

Despite the uniformly higher payment to men than to women for socioeconomic characteristics, the professional service industries were distinctly different from other industries. Men generally received significantly higher payment for a year of work experience in all industries. This was unaffected by being within professional services. Men rarely received significantly higher payment than women for a year of education and a unit of occupational prestige within professional service industries, but they frequently did outside professional service industries. Within professional services, only the category of hospital and medical services paid men significantly more than women for

a year of education. Only the category of educational services paid men significantly more for a unit of occupational prestige. In contrast, most other industries paid men significantly more than women for both characteristics. Except for payment of work experience, the higher payment to men compared to women for socioeconomic characteristics were usually nonrandom outside professional services but random within professional services.

Two conclusions can be made from the analysis of the hourly wages of women relative to men within four strata of professional service industries, three strata of CUT, and six strata of manufactures. First, the more equitable payment to men and women inside compared to outside professional services reinforces the earlier conclusion based on MCA. There does appear to be more equitable treatment of women relative to men in professional services. This is consistent with the conclusions drawn from Blau and Scott. Second, a finer specification of industrial categories did not eliminate differences in payment between men and women. Women received lower wages than men within more precisely defined industrial categories. Contrary to the results of the BLS, limited access to higher paying organizations did not account for the lower wages of women relative to men when positions other than solely clerical and operative jobs are considered.

Conclusions

This chapter examined the possibility that access to higher paying organizations rather than higher payment to men than women accounted for the lower wages of women relative to men. Differences in payment between the sexes for education, work experience, and occupational prestige continued despite specification of major industrial categories and examination of payment within selected detailed industrial categories. Women were paid less than men for a year of education, a unit of occupational prestige, and a year of work experience. Regardless of the specification of major industrial categories or the stratification by industry, men often earned more than women from socioeconomic characteristics. Many of these differences were probably nonrandom events. (The possible exception was treatment of employees within professional service industries, but even there payment differences remained.) Differences in payment in models with education, work experience, and occupational prestige exceeded the effects of differences in mean characteristics despite taking into account influences of industrial categories of employment. The higher payment to men than women appears to be more important than differences in levels of socioeconomic characteristics.

There was at best partial support for the BLS finding that women are employed in lower paying organizations rather than lower paid for similar employment. On

the one hand, the conflict between the results of this dissertation and the BLS studies may reflect a lack of precision in specifying industries of employment. On the other hand, the broader coverage of the labor force in this dissertation could account for the conflict. These alternatives are both consistent with the data. This data set cannot ascertain which possibility is most accurate.

CHAPTER V

CHARACTERISTICS OF THE INDUSTRY OF EMPLOYMENT

In Chapter IV the proposition that white men and white women are paid equally for specific jobs was tested by specifying major industrial categories as well as occupational prestige. In this chapter several attributes predicted to be associated with higher wages of white women relative to white men are considered:

a) Employment in the public sector of the economy
b) Employment in metropolitan areas
c) Residence in the Western or Southern regions
d) Employment in organizations with lower proportions of unionized workers
e) Employment in organizations with higher proportions of women managers

Analysis of the data in this chapter indicates that employment in the public sector of the economy was the only characteristic which was consistently and nonrandomly associated with higher wages of white women relative to those of white men.

As discussed in Chapter IV, studies on labor markets by the Bureau of Labor Statistics (BLS) indicate that the

payments of men and women are similar for the same positions, but that employers who pay higher wages tend not to hire women. This received only partial support from analysis of the entire full-time civilian nonagricultural labor force with a model of hourly wages regressed on education, age adjusted for tenure, occupational prestige, and major industrial categories. The following characteristics were specified in a model with education, age adjusted for tenure, and occupational prestige:

a) Employment in the public sector or in the private sector of the economy, i.e., class of workers

b) Employment in the central city or suburban ring of the Standard Metropolitan Statistical Areas (SMSAs)

c) Residence in the Western, in the Southern or in the North Central regions

d) An index of unionization in the employee's major industrial category of employment

In general, white men and women appear to have quite similar characteristics on the average, (see Table 5.1 and Table 5.2). However, men do have a higher mean value than women on the index of unionization. This indicates that men work in major industrial categories which have a larger percentage of unionized workers. Men also have a lower mean value than women on the index of women managers. This means that men work in categories which have a lower

TABLE 5.1.--Percentages of Sample in Economic Sectors, Regional Residence Locations, and Metropolitan Employment Locations for White Men and Women by Marital Status and Age: 1960[a]

Variables (1)	Age 20 to 34			Age 35 to 44			Age 45 to 64		
	Men (2)	Never-Married Women (3)	Ever-Married Women (4)	Men (5)	Never-Married Women (6)	Ever-Married Women (7)	Men (8)	Never-Married Women (9)	Ever-Married Women (10)
Employer:									
Public	11	15	17	12	18	19	14	15	19
Private	89	85	82	88	83	81	86	86	81
Region:									
West	16	15	14	11	14	8	35	19	17
South	26	24	23	17	19	19	15	29	23
North Central	27	30	32	41	39	42	23	24	30
North East	31	30	31	30	28	30	28	29	30
Metropolitan:									
Suburban Ring	25	27	24	20	20	15	19	49	22
Central City	46	46	49	61	62	62	51	24	51
Outside SMSA	28	26	27	20	18	23	30	27	27
Total Number	6282	767	1204	5606	288	1384	6806	444	2171

[a]Sample consists of full-time wage and salary workers in the civilian nonagricultural labor force. Other tables in this chapter use this sample.

Source: One-in-one thousand sample of the Census of the Population: 1960.

TABLE 5.2.--Mean Levels of Education, Age Adjusted for Tenure, Occupational Prestige, Index of Unionization, and Index of Women Managers for White Men and Women by Marital Status and Age: 1960

Variables (1)	Age 20 to 34			Age 35 to 44			Age 45 to 64		
	Men (2)	Never-Married Women (3)	Ever-Married Women (4)	Men (5)	Never-Married Women (6)	Ever-Married Women (7)	Men (8)	Never-Married Women (9)	Ever-Married Women (10)
Education (Years)	11.9	12.4	11.7	11.5	12.2	11.3	10.3	11.5	10.5
Age Adjusted Tenure (Years)	10.7	9.6	5.6	15.0	15.0	8.1	20.1	20.4	10.8
Occupational Prestige	39.6	42.0	40.3	41.1	41.2	38.0	41.1	41.1	37.3
Hourly Wages (Dollars)	2.39	1.67	1.61	2.99	2.09	1.69	3.00	2.06	1.66
Index of Percentage of Workers Unionized[a]	34	24	25	36	24	25	35	21	21
Index of Percentage of Women Managers[a]	13	18	17	12	18	18	13	19	20

[a]The entries of the indices are the mean levels of the index values of all workers in a stratum calculated by summing the index values of all workers and dividing by the number of workers in a stratum.

Source: One-in-one thousand sample of the Census of the Population: 1960.

percentage of managers who are women. Although they are quite similar in most of their characteristics, white men and women appear to work in major industrial categories with somewhat different characteristics.

Results

When the industrial employment characteristics were added to the model of education, age adjusted for tenure and occupational prestige, the coefficient of determination adjusted for degrees of freedom increased 3 to 14 per cent depending upon the stratum, (compare the last row of columns in Table 3.3 of Chapter III to the last row of columns in Table 5.3 of Chapter V). For example, the coefficient of young men increased from $.^{20}$ to $.^{27}$ with additional specification of the industrial characteristics previously listed, (compare the last row of column two between Table 3.3 and Table 5.3). Also, the coefficient of young never-married women increased from .23 to .30, (see column three), and the coefficient of young ever-married women increased from .14 to .23, (see column four). The increases in the adjusted coefficient of determination indicate that the characteristics of public employment, SMSA location, regional location, index of unionization, and index of women managers were associated with the variation in hourly wages apart from covariation with attributes of education, age adjusted for tenure, and occupational prestige.

TABLE 5.3.--Partial Regression Coefficients from the Regression of Hourly Wages on Education, Age Adjusted for Tenure, Occupational Prestige, Class of Worker, Region, Metropolitan Location, Unionization and Women Managers for White Men and Women by Marital Status and Age: 1960

Variables (1)	Age 20 to 34			Age 35 to 44			Age 45 to 64		
	Men (2)	Never-Married Women (3)	Ever-Married Women (4)	Men (5)	Never-Married Women (6)	Ever-Married Women (7)	Men (8)	Never-Married Women (9)	Ever-Married Women (10)
Education	.083	.059*	.044**	.132	.099	.050*	.133	.082**	.036**
Age Adjusted Tenure	.027	.122**	.095**	.054	(-.019)*	(-.002)*	.047	(.001)	(.030)
Occupational Prestige	.016	.012	.017	.031	.021*	.019**	.014	.024**	.024**
Index of Women Managers	-.009	-.008	-.008	.011	(-.006)	-.006	-.014	-.011	-.011
Index of Unionization	.005	.002**	.003*	.066	(.004)	.006	(.003)	.006	.004
Employer: Public	-.183	.200	.120	-.323	.339	.263	-.438	.387	.207
Region: West	.221	(-.025)**	(.073)*	.124	.356	.115	(-.060)	(.002)	.120
South	-.150	-.138	-.176	-.166	(.117)	(-.063)	-.152	(-.126)	-.178
North Central	(.065)	(.009)	(-.088)**	(.079)	(.114)	(.033)	(-.028)	(-.113)	(-.053)
Metropolitan:									
Suburban Ring	.334	.212*	.236*	.479	.459	.240**	.511	.421	.292**
Central City	.367	.297	.245	.478	.417	.357*	.587	.565	.402**
Intercept	-1.75	-.86	-.19	-1.02	-.22	.10	-1.06	-.22	-.06
Adjusted Coefficient of Determination[b]	.27	.30	.23	.20	.32	.32	.19	.34	.20

[a]Row entries are partial regression coefficients of the variable in a model regressing hourly wages on the variables in column one. Parentheses indicate the partial regression coefficient is not significant--twice its standard error. The coefficient of men is significantly greater than that of women if it has one star (.05 level) or two stars (.01 level) above it for a one-tail test.

[b]See Rao and Miller (1972, p. 21).

Source: One-in-one thousand sample of the Census of the Population: 1960.

As discussed in Chapter IV, the prediction derived from BLS studies was the disappearance of differences in payment between the sexes for occupational prestige, education, and age adjusted for tenure. This disappearance should occur when the characteristics of public employment, SMSA location, regional location, and indicies of major industries were added to the model of hourly wages regressed on education, age adjusted for tenure, and occupational prestige. Payment for a characteristic was defined as the partial regression coefficient indicating cents per hour paid for a unit of a characteristic.

There were only slight changes in the patterns of larger partial regression coefficients of men compared to women for a year of education, a year of age adjusted for tenure, and occupational prestige created by addition of industrial characteristics to the model. The following occurred:

a) Compared to women, men had significantly higher partial regression slopes for occupational prestige in four rather than three strata (see row three of Table 5.3).

b) Men continued to have significantly higher slopes than women for a year of education in five strata, (see row one of Table 5.3).

c) Men continued to earn significantly more cents per hour from a year of age adjusted for tenure, i.e., work experience, in contrasts with young

women.

Contrary to predictions based on BLS studies, the higher payments to men than women for occupational prestige, education, and age adjusted for tenure did not disappear when industrial characteristics were added to the model.

Adjusted Ratios

As before in Chapter IV, the ratios of the wages of women relative to the wages of men, i.e., the relative wage ratios, changed when industrial characteristics were included in the model. Compared to the size of the ratio in Chapter III with models of occupational prestige, education, and age adjusted for tenure, the mean adjusted ratios increased and the function adjusted ratios decreased with the addition of industrial characteristics to the model, (contrast columns three and four and columns five and six in Table 5.4). Similarly, mean adjusted and function adjusted ratios usually changed less than 5 per cent in magnitude with the addition of industrial attributes. In only one of six strata did a mean adjusted ratio increase more than 5 per cent, while function adjusted ratios decreased more than 5 per cent only in strata of ever-married women. Consequently, many of these changes in relative wage ratios could reflect random influences.

Also, contrary to prediction derived from BLS studies, the function adjusted relative wage ratios

TABLE 5.4.--Ratios of Mean Hourly Wages of White Women, with Mean and Function Adjustments, to Mean Hourly Wages of White Men by Marital Status by Age: 1960[a]

	Ratio of Wage of Women to Wage of Men Multiplied by 100				
		Mean Adjusted Models[b]		Function Adjusted Models[c]	
Age	Unadjusted	Education Age Adjusted Tenure Occupation	Education Age Adjusted Tenure Occupation Industry	Education Age Adjusted Tenure Occupation	Education Age Adjusted Tenure Occupation Industry
(1)	(2)	(3)	(4)	(5)	(6)
	Panel 1: Never-Married Women				
20 to 34	70	74	74	93	90
35 to 44	70	68	69	103	100
45 to 64	69	64	66	108	104
	Panel 2: Ever-Married Women				
20 to 34	67	91	90	55	50
35 to 44	56	58	62	85	79
45 to 64	56	63	70	90	83

[a]Independent variables are years of education, age adjusted tenure, occupational prestige, indices of unionization and women managers in major industrial categories, regional location, metropolitan location, and class of worker, (see Table 5.3). See text for definition of variables. The wages of never-married and ever-married women are divided by the wages of all men.

[b]Wages of women adjusted by inserting the mean level of characteristics of men into the equation of women with the regression of hourly wages on the independent variables specified in the columns. Mean adjustments are direct standardization.

[c]Wages of women adjusted by inserting the mean levels of characteristics of women into the equation of men with the regression of hourly wages on the independent variables specified in the columns. Function adjustments are indirect standardization.

Source: One-in-one thousand sample of the Census of the Population: 1960.

continued to exceed the mean adjusted ratios by 10 per cent in all strata of women except for young, ever-married women. This suggests that in accounting for the lower mean wages of white women relative to white men, the effects of higher payment to men than women continued to exceed the effects of different characteristics.

The predictions based on BLS studies were only partially consistent with the data. Even with more precise specification of industrial characteristics in Chapter V than in Chapter IV, payment differences remain between men and women. As in Chapter IV, the effects of specific attributes associated with employment will be examined.

Specific Attributes of Employment

This section presents the effects of payment for specific employee attributes predicted to be associated with higher wages of women relative to those of men. One technique is by adjustments through a procedure similar to Multiple Classification Analysis (MCA) for the average effects of variables not directly analyzed, (see Appendix I of Chapter II). The example will be public employment with adjustment for other characteristics. The necessary information for the calculations are in Table 5.1, Table 5.2, and Table 5.3.

a) The mean levels of characteristics are in Table 5.2.

b) The proportional weights are from Table 5.1.

c) The partial regression coefficients are from Table 5.3.

Separate calculations are made in each stratum defined by age, sex, and marital status of women. The average wage of private employees is calculated by first multiplying the regression coefficients in the equation times their means, (times their proportions if they are dichotomous variables). These 'mean effects' are then summed and added to the regression equation intercept. This figure is the average wage of private employees in the stratum adjusted for 'mean effects' of other variables, (see columns of adjusted wages in row one of Table 5.5). The net effect of being in private employment is calculated by subtracting the actual mean wage of the stratum, (see row four of Table 5.1) from the adjusted wage of private employees in each age stratum. The average wage adjusted for 'mean effects' belonging to public employees is calculated by summing the partial regression coefficient of public employment with the sum of 'mean effects' of other variables and the intercept of the equation. Results of the MCA adjustments are in Table 5.5. The relative wage ratios of women with adjusted wages are calculated by dividing the wage adjusted for 'mean effects' of never-married women and of ever-married women by the wage adjusted for 'mean effects' of white men of the same age, (see Table 5.6). Each industrial category has a ratio.

TABLE 5.5.--Mean Wages and Net Effects of Class of Worker, Region and Metropolitan Location Adjusted by Multiple Classification Analysis for Effects of Education, Age Adjusted for Tenure, and Occupational Prestige for White Men and Women by Marital Status and Age: 1960a

Variables (1)	Men		Never-Married Women		Ever-Married Women	
	Adjusted Wage (2)	Net Effect (3)	Adjusted Wage (4)	Net Effect (5)	Adjusted Wage (6)	Net Effect (7)
			Panel 1: Age 20 to 34			
Employer: Public	$2.23	$-.16	$1.84	$.18	$1.71	$.10
Private	2.41	.02	1.64	-.02	1.59	-.02
Region: South	2.22	-.17	1.55	-.11	1.51	-.10
West	2.60	.21	1.67	-.00	1.76	.15
North Central	2.44	.05	1.70	.03	1.60	-.01
North East	2.37	-.02	1.69	.02	1.69	.08
Metropolitan:						
Suburban Ring	2.47	.08	1.66	-.01	1.66	.05
Central City	2.50	.11	1.74	.08	1.67	.06
Outside SMSA	2.14	-.25	1.45	-.22	1.42	-.19
Stratum Mean Wage	2.39	-	1.67	-	1.61	-
			Panel 2: Age 35 to 44			
Employer: Public	$2.71	-$.27	$2.37	$.28	$1.92	$.22
Private	3.04	.05	2.03	-.06	1.65	-.04
Region: South	2.82	-.17	2.10	.01	1.62	-.08
West	3.11	.12	2.34	.25	1.80	.10
North Central	3.06	.08	2.10	.01	1.71	.02
North East	2.98	-.00	1.98	-.10	1.68	-.01
Metropolitan:						
Suburban Ring	3.11	.13	2.20	.11	1.70	.01
Central City	3.11	.13	2.15	.07	1.82	.12
Outside SMSA	2.63	-.35	1.74	-.35	1.46	-.23
Stratum Mean Wage	2.99	-	2.09	-	1.69	-
			Panel 3: Age 45 to 64			
Employer: Public	$2.64	-$.36	$2.37	$.31	$1.83	$.17
Private	3.07	.08	1.98	-.07	1.62	-.04
Region: South	2.90	-.10	1.99	-.07	1.52	-.14
West	2.99	-.01	2.11	.06	1.82	.16
North Central	3.02	.02	2.00	-.06	.165	-.02
North East	3.05	.05	2.11	.06	1.70	.04
Metropolitan:						
Suburban Ring	3.10	.10	2.06	.01	1.69	.02
Central City	3.17	.18	2.21	.15	1.80	.13
Outside SMSA	2.59	-.41	1.64	-.41	1.40	-.27
Stratum Mean Wage	3.00	-	2.07	-	1.66	-

[a]The group specific means are apart from 'mean effects' of education, age adjusted tenure, and occupational prestige. The group specific means are also apart from proportional effects of the variables employer, region, and metropolitan. Net effects are expressed as deviations from the stratum mean wage. Calculations are based on equations in Table 5.3

Source: One-in-one thousand sample of the Census of the Population: 1960.

TABLE 5.6.--Ratios of Mean Hourly Wages of White Women to Mean Hourly Wages of White Men by Class of Worker, Regional Residence, and Metropolitan Employment Location Adjusted by Multiple Classification Analysis by Marital Status and Age: 1960

Variables	Age 20 to 34		Age 35 to 44		Age 45 to 6	
	Never-Married Women	Ever-Married Women	Never-Married Women	Ever-Married Women	Never-Married Women	Ever-Married Women
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Employer:						
Public	83	77	87	71	90	70
Private	68	66	67	55	64	53
Region:						
South	70	68	74	57	69	53
West	64	68	75	58	66	51
North Central	70	66	68	56	66	55
North East	71	71	66	56	69	56
Metropolitan:						
Suburban Ring	67	67	69	58	67	54
Central City	70	67	71	55	70	57
Outside SMSA	68	67	66	55	64	54

[a]Wages in each category adjusted by Multiple Classification Analysis for 'mean effects' of education, age adjusted for tenure, and occupational prestige. Wages also adjusted for proportional effects of the variables employer, region, and metropolitan. Calculations based on the wages in Table 5.5. Ratios are multiplied by 100.

Source: One-in-one thousand sample of the Census of the Population: 1960.

Public Employment

As expected, public employment not only consistently had a significant effect on hourly wages, (twice its standard error in row six of Table 5.3), but employment by government consistently increased the wage of women relative to men. Women had positive effects and men had negative effects from employment in the public sector of the economy, (see the columns of net effects in row two of Table 5.5). Ratios of the adjusted wage of women to the adjusted wage of men varied from 70 to 90 per cent in the public sector. In contrast, the ratios varied from 53 to 68 per cent in the private sector, (see rows one and two in Table 5.6). In each stratum, women had from 11 to 25 per cent higher wage ratios in the public compared to the private sector. The much larger ratios in the public sector indicate that the effects of public employment on the relative wages of women are probably nonrandom. Public employment appears to systematically contribute to higher wages of women relative to men apart from other characteristics in the model--education, age adjusted for tenure, occupational prestige, index of unionization, index of women managers, metropolitan employment location, and region of residence.

Region of Residence

Residence in the Western, in the Southern and in the North Central regions were identified by dichotomous

variables. Often the partial regression coefficients of regions did not significantly affect hourly wages as indicated by coefficients lower in value than twice their standard error, (see rows nine to eleven in Table 5.3). The relative wage ratios of wages adjusted for 'mean effects' were higher in the West than in the North Central and North East in four of twelve contrasts. Ratios in the South were higher than those in the North Central and North East in two of twelve contrasts. There were no striking trends in the ratios of particular regions in contrast to ratios in other regions, (see rows three to seven in Table 5.6).

Metropolitan Employment Location

The employment location in the Standard Metropolitan Statistical Area, SMSA, was directly identified from the 1960 Census. In each stratum of Table 5.5, employees in metropolitan areas had a higher average wage than employees outside metropolitan areas, (see rows eight to ten in Table 5.5). Metropolitan employment also affects the wages of some women relative to men. At middle and older ages, never-married women had relative wage ratios which were at least 5 per cent larger in metropolitan locations than outside the SMSAs, (see Table 5.6). However, relative wage ratios less than 5 per cent larger in the SMSA compared to outside the SMSA suggest that most men benefited as much as most women from employment in the SMSA. In

general, metropolitan area employment locations do not substantially affect the average wages of women in a different manner than they affect the average wages of men.

The Index of Unionization

The index of unionization is the proportion of employees in major industrial categories who were unionized in 1960. The index identifies effects on wages associated with major industrial categories with larger or smaller proportions of unionized workers. Because the value given to individual workers was intervally scaled, analysis was based on significance testing of partial regression coefficients.

The index of unionization had a positive, significant effect on hourly wages in eight of nine strata in row five of Table 5.3. (The coefficients were twice their standard errors.) Although the partial regression coefficients of men always had a larger positive value than those of women, only young men received significantly greater payment than women for a unit increase in the index of unionization.

If this index is assumed to identify the wage effects of unionization, the data indicate that unionization uniquely added to the difference in wages between the sexes only at younger age. At other ages, unionization did not have effects apart from those identified by other variables. Unionization of each worker was not directly identified.

Thus, the unique effects of unionization could reflect other influences correlated with unionization in major industrial categories such as on-the-job training. This possibility could not be assessed.

The Index of Women Managers

The percentage of managers who are women in major industrial categories was calculated. This percentage constituted the index of women managers. The index was assumed to be associated with the degree women possess managerial positions, and thereby, the power of these positions. Actually, the index also may measure influences correlated with employment of greater proportions of women as managers. Because the index of women managers was an interval measure, analysis was based on significance tests.

The effects of the index were significantly negative in all but one of nine strata of employees, (see row four of Table 5.3). When the index indicates larger proportions of women were employed as managers in major industrial categories, employees were paid lower wages. Relative to men, women gained in wages from employment in industries with larger proportions of women as managers. This gain occurred because the partial regression coefficients of men had a greater negative effect on wages than the coefficients of women. Nevertheless, there were no differences unlikely by chance as indicated by significance testing, (see row four of Table 5.3). Evidently,

the index of women managers indicates that characteristics of major industrial categories associated with higher proportions of women managers do not benefit women with higher wages relative to men.

Summary

Patterns in payment differences for education, age adjusted for tenure, and occupational prestige were only slightly associated with industrial characteristics. Yet, white women in the public sector of the economy have higher wages relative to white men than do white women in the private sector. The higher relative wages of publically employed women are apart from the following variables: a) education, b) age adjusted for tenure, c) occupational prestige, d) regional location of residence, e) metropolitan location of employment, f) index of unionization, and g) index of women managers. Other hypothesized associations involving variables d) through g) in the list were not consistently nonrandom in contribution to higher wages of women relative to those of men.

If the public sector is the most important industrial characteristic, one would expect marked differences between the public and private sectors in the mean adjusted and function adjusted relative wage ratios. One also would expect marked differences between the two sectors in the partial regression slopes of education, age adjusted for tenure, and occupational prestige belonging to women

compared to those belonging to men. The next chapter stratifies employees by class of worker into publically and privately employed men and women. The chapter considers differences between the two sectors of the economy in the relative wages of white women.

CHAPTER VI

THE EFFECT OF CLASS OF WORKER ON THE RELATIVE WAGES OF WOMEN

Most employees in the public sector of the economy are employed under merit systems--the civil service. In the system of civil service the practices for hiring, promotion, and payment for work in positions are set by a board which is a semi-autonomous of the political system. Often the system was created as a response to political patronage systems by reformers in order to force the public sector to emphasize performance on the job rather than political favors as the basis of public employment. For example, the Federal Civil Service was created to insure 'merit in employment and promotion in order to eliminate the political spoils system,' (Moskow et al. 1970, p. 29). The U.S. Civil Service Commission (1970, p. 1) considers the Civil Service Act to be the "real turning point in Government Careers for women "because" women were permitted and even encouraged to compete in civil service examinations on the same basis as men." At the same time the Commission noted that:

> Equality of the sexes with respect to pay finally became a reality when the Classification Act of 1923

> established the present pay system whereby the salary rate for each job is determined solely on the basis of the duties and responsibilities that make up the job. The federal Government was the first among major employers to put into effect the principle of equal pay for equal work.

In 1960 coverage by merit civil service systems applied to 90 per cent of all federal employees (U.S. Civil Service 1960, p. 27), and to some degree applied to employees of more than 50 per cent of all state governments and 10 per cent of county governments (Moskow et al. 1970, pp. 88-89), and to 73 per cent of all municipalities over 10,000 in population (Nolting and Arnold 1960, p. 163). Most public employees in 1960 were covered by merit systems.

The only force comparable to merit system policies in the private sector might be labor unions which "typically insisted on 'equal pay for equal work'" (Reynolds 1962, p. 484). However, unions have not been effective advocates of equal treatment of women as recognized by the Equal Pay Act of 1963 (Kantowitz 1969, pp. 135-136). A study by Cook (1968, pp. 126-127) suggests the limited effects of unionism on equal treatment of the sexes; it found that apart from the UAW, unions accept the dual pay system for the sexes. Also, in 1960 only 18 per cent of all union members and 4.7 per cent of national officials were women (Dewey 1971, pp. 42-45) which indicates women were not even widely covered by trade unionism. While most public employees are under systems advocating equal pay regardless of qualitative characteristics such

as sex, few private employees are covered by effective programs which demanded equal pay regardless of sex.

The objectivity of the merit system can be over-emphasized. Considerations other than merit may be part of the operating procedure of the Civil Service System. This is exemplified on the Federal level by the increase of an applicant's rating by the military veteran's preference. Among employees in 1960, fully 65 per cent of all men but only 8 per cent of all women had a veteran's preference (U.S. Civil Service Commission 1960, p. 4). In addition, appointing officials could specify sex of applicants for positions in 1960. Based on information in a study for the U.S. President's Commission on the Status of Women (1965, p. 51), the specification was usually for men when it occurred--of 454 positions available between Nov. 13 and Dec. a, 1961, 45 per cent specified men and 7 per cent specified women.[1] Much of this specification was needless as indicated by the agency response to a Civil Service Commission requirement of justification for specification of sex or a position. Between Feb. 4 and March 3, 1962, one woman and eleven men were specified for 682 positions, a noticeable drop from 1961. There is evidence that the Federal Civil Service was not alone in deviations from a strict adherence to the principles of merit. For example, the Women's Commission recommended

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[1]Here and after, the President's Commission on the Status of Women is termed the Women's Commission.

that the standards of state and local Civil Service Systems be revised after examining reports on 43 states and 32 cities (1965, p. 51). Perhaps too great an emphasis is being placed on the effects of 'merit' systems.

What are the effects of deviation from merit in the Federal service? The Women's Commission (1965, pp. 44-54 and pp. 118-128) conducted a study of the Federal Civil Service and reported its results:

> In the Commission's canvass of Federal Civilian employment no significant differences in the treatment of either sex in terms and conditions of employment such as pay, premium pay, leave, insurance, retirement, and appellate rights and procedures.

In marked contrast to the private sector where unions ratify contracts with dual pay systems, the federal service did not have sex based distribution of rewards for work. But there were discrepancies in the distribution of men and the distribution of women across the eighteen pay grades of the Civil Service Classification system. These probably contributed to unequal average income between the sexes. Based on the distributions of all Federal Civil Service employees in 1960 (Women's Commission 1965, pp. 122-127), the index of dissimilarity was calculated to be 53 indicating that 53 per cent of one group would have to change grades to create equal distributions between the sexes. In fact, men were distributed at higher grades than women as 53 per cent of all men but only 6 per cent of all women were at grades nine or higher. The Women's Commission (1965, p. 50) suggested that the policies of

the Civil Service were involved as ". . . policies and practices concerning appointment and advancement were such as to demand immediate action." This could explain a difference in the earnings of men and women in the public sector.

An alternative explanation is that the social characteristics of men and women differ, not the treatment of the sexes for employment. The Women's Commission (1965, p. 52) noted that Civil Service studies indicated that women had voluntary quits between 2½ and 3 times those of men which could affect advancement opportunities. In addition, "Almost half the women who leave federal agencies give reasons related to family responsibilities" (Women's Commission 1965, p. 52). This is the same as results of studies of the entire Civilian Labor Force at that time, (see Rosenfeld and Perrella 1965, Table 2, p. 1081 and Table F, p. A-7). The reasons that single women quit were similar to those of men--better pay, broader experience, or dissatisfaction with working situation. Nevertheless, the advancement of single women was noticeably, but not strikingly, greater than that of married women (Women's Commission 1965, p. 52). If never-married women receive lower payment for employment than men, the lower payment is suggestive of the effects of differential employment and promotional practices.

There is some evidence that the merit system may have had an effect in 1960. Women received higher relative

wages compared to men from public employment. Based on analysis of Chapter V, women received higher relative wages compared to men in public employment. This analysis is supported by the findings of Fuchs (1971, pp. 13-14). For full and part-time employees of 46 of 145 detailed Census industrial categories, Fuchs analyzed the aggregated characteristics in the one-in-one thousand sample of the Census of the Population: 1960. Fuchs found that the percentage of employees in a detailed industrial category employed by government negatively associated with wages of men and positively associated with the wages of women, but unfortunately failed to ascertain why women had higher relative wage ratios from government. Nor did the analysis in Chapter V find out why publicly employed women had higher wages relative to men than privately employed women.

Either different social characteristics or different treatment in the public and private sectors of the economy could be the source of higher relative wage ratios. The effect of public employment will now be examined. Attempts will be made to choose between two plausible explanations: differential social characteristics or differential treatment.

This analysis differs from that of Fuchs in that government employment of each worker is directly

identified. The Census class of worker indicates if a person was a government or a private employee. The effect of public employment will be examined apart from other characteristics which could influence the relative wages of women. Analysis is made of hourly wages regressed separately for public and private employees. The independent variables are years of education, years of age adjusted for tenure, and units of occupational prestige.

Results

The average of the wages of women divided by those of men was 76 in the public sector but 59 in the private sector of the economy. (This ratio is termed the relative wage ratio of women.) In other words, women earned 76 per cent of the wages of men when working for government, (State, Local, Federal, and International). In contrast, women only earned 59 per cent of the wages of men when employed by private enterprise. After stratification by age and class of worker, the average wages of women were lower than the average wages of men in each stratum, (contrast the wages in row four between columns two to four, columns five to seven

and eight to ten in panels one and two of Table 6.1). The relative wage ratios were all less than unity, (see column two of Table 6.2). Even taking into account the effect of marital status of women, class of worker, and age level through stratification, the wages of women are less than the wages of men.

Yet, public employment consistently affected the wages of both men and women. At each age level the average hourly wages of women were higher, and the average hourly wages of men were lower in public compared to private employment, (in each column compare row four between panels one and two of Table 6.1). Therefore, the relative wages of women were higher in all strata in the public sector, (see Table 6.2).

Because age and marital status of women affect the relative wages of women, the type of employer did not affect women uniformly. Even after stratification by age and type of employer, the wages of never-married women exceeded those of ever-married women, (contrast columns three to four, six to seven, and nine to ten in Table 6.1). For different reasons, the relative wages of ever-married women were closer to those of never-married women at younger compared to older ages in both the public and private sectors of the economy. There was a sharp decline from 66 per cent at young age to 53 per cent at older age for ever-married women in the private sector--a decline of 13 per cent--but a decline of only 4 per cent (from 75 to 71)

TABLE 6.1.--Mean Levels of Education, Age Adjusted for Tenure, Occupational Prestige, and Hourly Wages for White Men and Women by Marital Status, Age, and Class of Worker: 1960[a]

Variables (1)	Age 20 to 34			Age 35 to 44			Age 45 to 46		
	Men (2)	Never-Married Women (3)	Ever-Married Women (4)	Men (5)	Never-Married Women (6)	Ever-Married Women (7)	Men (8)	Never-Married Women (9)	Ever-Married Women (10)
Panel 1: Public Employees									
Education (Years)	12.8	14.0	12.7	12.3	13.6	12.6	10.8	13.4	12.0
Age Adjusted Tenure (Years)	11.0	10.1	5.6	15.0	15.3	8.2	20.3	20.3	10.9
Occupational Prestige	44.8	50.0	46.3	44.6	45.5	45.5	41.4	49.4	44.0
Hourly Wages (Dollars)	2.26	1.93	1.70	2.72	2.53	1.97	2.64	2.49	1.87
Panel 2: Private Employees									
Education (Years)	11.8	12.1	11.5	11.4	11.8	11.1	10.1	11.1	10.2
Age Adjusted Tenure (Years)	10.7	9.5	5.7	15.0	15.0	8.1	20.3	20.4	10.8
Occupational Prestige	38.8	40.8	39.3	40.5	40.8	36.7	38.8	39.2	35.7
Hourly Wages (Dollars)	2.41	1.63	1.60	3.03	1.99	1.65	3.07	1.95	1.62

[a]The sample consists of full-time wage and salary workers in the civilian nonagricultural labor force. Other tables in this section refer to this sample.

Source: One-in-one thousand sample of the Census of the Population: 1960.

TABLE 6.2.--Ratios of Mean Hourly Wages of Women, with Mean and Function Adjustments, to Mean Hourly Wages of Men by Marital Status, Age, and Class of Worker: 1960[a]

	Ratio of Wage of Women to Wage of Men Multiplied by 100						
		Mean Adjusted Models[b]			Function Adjusted Models[c]		
Age	Unadjusted	Education	Education Age Adjusted Tenure	Education Age Adjusted Tenure Occupational Prestige	Education	Education Age Adjusted Tenure	Education Age Adjusted Tenure Occupational Prestige
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel 1: Never-Married Women Public Employees							
20 to 34	86	77	83	83	105	99	100
35 to 44	93	84	83	86	108	109	108
45 to 64	94	75	74	74	117	116	117
Panel 2: Ever-Married Women Public Employees							
20 to 34	75	76	109	107	99	67	68
35 to 44	72	71	53	52	102	92	87
45 to 64	71	66	71	72	108	99	101
Panel 3: Never-Married Women Private Employees							
20 to 34	68	67	73	72	102	90	92
35 to 44	66	64	64	64	103	101	102
45 to 64	64	60	60	62	107	108	105

TABLE 6.2.--Continued

Age	Ratio of Wage of Women to Wage of Men Multiplied by 100						
		Mean Adjusted Models[b]			Function Adjusted Models[c]		
	Unadjusted	Education	Education Age Adjusted Tenure	Education Age Adjusted Tenure Occupational Prestige	Education	Education Age Adjusted Tenure	Education Age Adjusted Tenure Occupational Prestige
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel 4: Ever-Married Women Private Employees							
20 to 34	66	67	89	88	99	45	54
35 to 44	54	55	53	58	98	96	94
45 to 64	53	52	61	62	100	85	85

[a]Independent variables are years of education, age adjusted for 1968 tenure relationship between job tenure and age, and occupational prestige. See text for definition of variables. The wages of never-married and ever-married women are divided by the wages of all men.

[b]Wages of women adjusted by inserting the mean levels of characteristics of men into the equation of women with the regression of hourly wages on the independent variables specified in the columns. Mean adjustments are direct standardization.

[c]Wages of women adjusted by inserting the mean levels of characteristics of women into the equation of men with the regression of hourly wages on the independent variables specified in the columns. Function adjustments are indirect standardization.

Source: One-in-one thousand sample of the Census of the Population: 1960.

for never-married women, (see column two of panels three and four in Table 6.2). In the public sector the relative wages of ever-married women decreased slightly from 75 to 71 per cent, but the relative wages of never-married women increased with increases in age level from 86 per cent at young age to 94 per cent at older age--an increase of nine per cent, (see panels one and two in Table 6.2). If the data are considered the record of a synthetic cohort over time, the wages of never-married women in the public sector increased relative to men with aging, but the wages of other women decreased. Evidently, the type of employer interacts with the effects associated with marital status over time.

Multiplying the relative wage ratio of women in the public sector of the economy times the average wage of men in the private sector estimates the wage women would have if women attained the same relative wages in the private as in the public sector. The wage of privately employed, never-married women would increase by this adjustment as follows:

a) An increase of 43 cents at ages 20 to 34
b) An increase of 83 cents at ages 35 to 44
c) An increase of 94 cents at ages 45 to 64

Increases for the respective groups of ever-married women would be 22 cents, 55 cents, and 55 cents. Depending on the stratum, the wage of women would be from 22 cents to 94 cents per hour larger if women in the private sector had

the same relative wage ratios as women in the public sector.

Adjusted Ratios

Differences in Characteristics

The higher wage ratios of men could result from greater differences in social characteristics between the sexes in the private than in the public sector of the economy. The mean adjustment procedure takes into account differences in social characteristics by giving women the mean characteristics of men in the appropriate stratum. After mean adjustment, both men and women in the age strata have the same characteristics for variables specified in a model. Least squares regression equations were calculated in each stratum with the independent variables of education, age adjusted for tenure, and occupational prestige. When the mean characteristics of men were inserted into the equations of women, the relative wage ratios were lower after adjustment in 13 of 18 models with public employees and 10 of 18 models with private employees, (compare column two to columns three to five in Table 6.2). In the majority of cases, if women had the same average as men for education, age adjusted for tenure, and occupational status, they would earn even less than they earned with their own social characteristics.

Differences in Payment

Women were given the payment of men for their own social characteristics by inserting the mean characteristics

of women into the equations of men. Women received higher ratios than their original relative wage ratios in 32 of 36 models, (contrast the wage ratios in column two to ratios in columns six to eight in Table 6.2). Unlike the situation with mean adjustments, ratios always increased larger than 3 per cent in size after function adjustments. This suggests that the changes in ratios were probably not from random differences. Women would usually benefit from the payment of men for their own characteristics--the only exceptions in both economic sectors were two of three models for ever-married young women. This suggests that the wage return from education, age adjusted for tenure, and occupational prestige is less for women than men. The importance of payment differences is indicated by the larger relative wage ratios in 32 of 36 models after function adjustments than after mean adjustments, (compare columns five to seven with columns two to four in Table 6.2). In both the public and private sectors of the economy, differences in the payment of the sexes contributed more to the lower wages of women relative to men than did differences in mean levels of education, age adjusted for tenure, and occupational prestige.

Specific Differences in Payment

Payment for a variable was operationalized as the partial regression coefficient in a least squares regression equation. The partial regression coefficient

TABLE 6.3.--Partial Regression Coefficients from the Regression of Hourly Wages on Education, Age Adjusted for Tenure, and Occupational Prestige for White Men and Women, by Marital Status, Age, and Class of Worker: 1960

Independent Variables[a]	Men				Never-Married Women				Ever-Married Women			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
					Panel 1: Public Employees Age 20 to 34							
Education	.093	.087	.061	.058	.173	.139	.156	.123	.064	.069	.039	.045
Age Adjusted Tenure		.135		.131		.125		.125		.139		.135
Occupational Prestige			.010	.009			(.005)	(.005)			.011	.011
Intercept Adjusted	1.06	-.34	1.03	-.33	.49	-1.28	-.51	1.30	.89	.05	1.68	-.13
Adjusted Coefficient of Determination[b]	.11	.17	.13	.18	.30	.39	.30	.39	.05	.10	.09	.13
					Panel 2: Public Employees Ages 35 to 44							
Education	.165	.167	.118	.118	.178	.180	.120	.121	.103**	.103**	.061**	.061**
Age Adjusted Tenure		(.040)		.062		(.038)		(.011)		(-.072)		(-.076)
Occupational Prestige			.017	.018			(.027)	(.027)			.018	.018
Intercept Adjusted	.69	.07	.51	-.45	.09	-.51	-.37	.54	.67	1.26	.39	1.01
Adjusted Coefficient of Determination[b]	.22	.22	.26	.26	.18	.16	.20	.18	.12	.12	.17	.17

TABLE 6.3.--Continued

Independent Variables[a]	Men				Never-Married Women				Ever-Married Women			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Panel 3: Public Employees Age 45 to 64												
Education	.171	.173	.125	.128	.204	.207	.178	.178	.105**	.106**	.078**	.079**
Age Adjusted Tenure		(.022)		(.019)		(-.052)		(-.058)		(.014)		(.015)
Occupational Prestige			.019	.019			(.011)	(.012)			.011*	.011*
Intercept Adjusted	.79	.31	.48	.07	-.24	.78	-.41	.71	.61	.44	.44	.26
Adjusted Coefficient of Determination[b]	.26	.26	.30	.30	.32	.32	.33	.34	.18	.18	.21	.21
Panel 4: Private Employees Ages 20 to 34												
Education	.128	.124	.078	.088	.078**	.073**	.054*	.048**	.085**	.091**	.041**	.046**
Age Adjusted Tenure		.240		.221		.124**		.125**		.102**		.105**
Occupational Prestige			.021	.016			.010**	.011			.016*	.016
Intercept Adjusted	.90	-1.64	.66	1.61	.68	-.44	.56	-.57	.68	-.03	.50	-.17
Adjusted Coefficient of Determination[b]	.09	.19	.13	.21	.06	.17	.07	.19	.07	.09	.12	.14
Panel 5: Private Employees Ages 35 to 44												
Education	.210	.212	.133	.135	.131**	.131**	.083**	.083**	.087**	.087**	.047**	.048**
Age Adjusted Tenure		.050		.046		(-.033)		(-.041)		(-.009)		(-.005)
Occupational Prestige			.033	.033			.022*	.022*			.018**	.018**
Intercept Adjusted	.63	-.14	.17	-.53	.45	.94	.11	.72	.68	.76	.46	.42
Adjusted Coefficient of Determination[b]	.12	.12	.16	.16	.15	.15	.21	.21	.09	.09	.16	.16

TABLE 6.3.--Continued

Independent Variables[a]	Men				Never-Married Women				Ever-Married Women			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
					Panel 6: Private Employees Ages 45 to 64							
Education	.232	.238	.126	.131	.109**	.111**	.051**	.052**	.069**	.070**	.022**	.024**
Age Adjusted Tenure		.050		.033		(.017)		(.007)		(.028)		(.021)
Occupational Prestige			.055	.055			.025**	.025**			.025**	.025**
Intercept Adjusted	.72	-.35	-.35	1.04	.74	.37	.41	.26	.91	.60	.49	.25
Adjusted Coefficient of Determination[b]	.10	.10	.16	.17	.11	.10	.17	.17	.04	.04	.10	.10

[a]Row entries are partial regression coefficients of the variables in a model regressing hourly wages on the variables contained in one column. Parentheses around a partial regression coefficient indicate that the coefficient did not have a significant effect on wages--it is not twice its standard error. The coefficient of women is significantly below the coefficient of men if it has one star (.05 level) or two stars (.01 level) above it for a one tail T-test.

[b]See Rao and Miller (1972, p. 21).

Source: One-in-one thousand sample of the Census of the Population: 1960.

measures the cents per hour paid for possession of one unit of the characteristic. Statistical tests for slopes were made with work experience, occupational status, and education.

Work Experience

The partial regression slopes of age adjusted for tenure were generally significant in their effect--twice their standard error--only at the younger age level, (see row two of Table 6.3). The only exception is men in the private sector, but even there the coefficients were always quite small above age 35. As can be seen in Table 6.3, addition of age adjusted for tenure to a model substantially increases the adjusted coefficient of determination only at age 20 to 34. On the whole, age adjusted for tenure is closely associated with hourly wages only at ages 20 to 34. Using age adjusted for tenure as a measure of work experience, analysis of the data suggests that the workers in both economic sectors benefit little from added experience beyond age 34.

Comparisons were also made between the partial regression slopes of age adjusted for tenure of men and those of both marital groups of women. The null hypothesis was that the partial regression slope of men is equal to or less than the slope of women age 20 to 34. The hypotheses were rejected in all four models in the private sector at the .01 level but failed to be rejected in any

model in the public sector, (rejection of the hypothesis is indicated in Table 6.3 by one star above the coefficient for the .05 level and two stars for the .01 level). Apart from marital status, education, and occupational position, age adjusted for tenure contributed to the higher wages of men at age 20 to 34 in the private sector but not in the public sector.

Above age 34 the coefficients of men were always larger than those of women in the private sector. In the public sector, men sometimes had coefficients larger than those of women. However, above age 34 the null hypothesis was rarely rejected. Hypotheses were rejected at the .05 level in three models at middle and older age levels in the public sector. Yet, the level of significance indicates this result has a five per cent chance of occurring by chance. Given that some strata of publically employed women are relatively small in number--all are at least 53 but with three variables reliable estimates probably require 75 people in a strata--sampling error cannot be ignored as a plausible explanation of the significant differences at the .05 level. Also, differences in these models are of limited consequence to the relative wages of women apart from education, occupation, and marital status.

The National Manpower Council (1957, p. 95 and 1958, p. 81) suggested a plausible reason for the results with age adjusted for tenure. They found representative

employers in seven discussion meetings across the United States reluctant to give women on-the-job training. Fifteen years later the American Telephone and Telegraph Company admitted the practice in a settlement with the EEOC and Department of Labor in January, 1973. AT&T agreed to compensate "women operators and clerks who might have applied" for craft jobs of installing, maintaining, and repairing equipment, positions which involve on-the-job training, (New York Times January 27, 1973, section 4, p. 4). Oppenheimer (1970, pp. 104-105) argued that although employers are reluctant to hire women for positions requiring on-the-job training, they hire them in jobs where skill can be obtained before employment--jobs such as school teaching, nursing, and secretarial work.

The 'reluctance' explanation is congruent with the data. For many workers the period of on-the-job training is age 20 to 34 when age adjusted for tenure had a significant impact on wages in 1960. The supposed denial of on-the-job training to women would also be consistent with the significantly higher partial regression slopes for men at this age. But why would the public sector not have the differentiation between the sexes characteristic of the private sector? A higher percentage of workers in the public sector are in professional and clerical positions compared to private employees. (This is indicated by summing the percentages in rows one and three in Table 6.4 and comparing panel one to panel two in columns three,

TABLE 6.4.--Percentage of Employees in Major Occupational Groups for White Men and Women by Marital Status, Age, and Class of Worker: 1960

Variables (1)	Age 20 to 34			Age 35 to 44			Age 45 to 64		
	Men (2)	Never-Married Women (3)	Ever-Married Women (4)	Men (5)	Never-Married Women (6)	Ever-Married Women (7)	Men (8)	Never-Married Women (9)	Ever-Married Women (10)
Panel 1: Public Employees									
Professional-Technical	31	46	28	24	34	27	18	42	27
Managerial	5	11	2	10	6	4	12	8	6
Clerical	20	46	61	20	43	54	18	44	44
Sales	0	0	0	0	0	1	0	0	0
Operative	5	1	0	7	4	1	9	0	4
Craftsman-Other	39	6	0	39	13	12	42	6	19
Total Number	724	98	177	860	53	207	1214	83	418
Panel 2: Private Employees									
Professional-Technical	14	10	6	12	13	6	8	10	6
Managerial	10	3	3	13	5	5	14	6	5
Clerical	10	67	61	7	55	43	9	50	38
Sales	10	3	4	9	5	9	8	6	11
Operative	27	9	16	24	15	25	24	16	24
Craftsman-Other	30	8	9	34	16	12	36	12	15
Total Number	5558	669	1027	4746	235	1177	5592	361	1763

Source: One-in-one thousand sample of the Census of the Population: 1960.

four, six, seven, nine, and ten). Positions with limited on-the-job training and greater pre-employment training expenses are far more characteristic of the public sector of the economy. The data are congruent with the 'reluctance' supposition.

Occupational Prestige

The effect of occupation can be examined by measuring the prestige of the 301 Census detailed occupational titles of the positions that workers reported in the Census. In 30 of 36 models in Table 4.3 with occupational prestige, the partial regression coefficient of prestige was significant--twice its standard error, (see row three of each panel in Table 6.3). In the same 30 of 36 models the addition of prestige to a model increased the adjusted coefficient of determination from 2 to 8 per cent. At all ages and with both prestige models, neither did the coefficient of determination increase more than 2 per cent nor were any of the partial regression slopes of prestige significant for never-married women in public employment. For these women alone the prestige of occupational titles does not associate closely with hourly wages.

The null hypothesis for comparison between the sexes was that the coefficient of men was equal or less than the coefficient of women. In the private sector of the economy, the null hypothesis was rejected in ten of twelve models and the partial regression slope of men equalled or

exceeded the slope of women in all models, (see row three of panels four through six in Table 6.3). However, the partial regression coefficients of publically employed men were only significantly higher in 2 of 12 comparisons, and they were higher in only 6 of 12, (see panels one to three of Table 6.3). The higher payment to men for occupational status usually makes a marked contribution to the higher relative wages of men in the private sector but does not in the public sector.

Education

Payment for years of education contributed to higher wages of employees. In each model the partial regression coefficient of education was twice its standard error indicating a significant effect on hourly wages, (see row one of each panel in Table 6.3). But stratification by type of employment affected the contribution of education to the higher hourly wages of men. As can be seen in panels four to six of Table 6.3, the null hypothesis that the slope of men was equal or less than that of men was rejected in all 24 models in the private sector. (The double star above most coefficients indicates rejection of the null hypothesis at the .01 level.) In the public sector hypotheses were rejected in 8 of 12 models for ever-married women; the exceptions were young women. But the null hypothesis failed to be rejected for all models with never-married women. In fact in all 12 comparisons

the partial regression slopes of education were larger for never-married women than for men. (This can be seen in row one of panels one to three of Table 6.3). Differences in payment for a year of education do not contribute to the higher wages of men for publically employed never-married women and young ever-married women, but do contribute in other cases--the majority of which are significant by chance at the .01 level. Payment for education partially explains the higher relative wage of publically employed never-married women.

Summary

The hypothesis proposed earlier was that there should be less differential treatment of women in the public sector of the economy. The hypothesis is consistent with 1960 Census data on hourly wages paid to full-time wage and salary workers. Privately employed women earned from 22 to 94 cents less per hour than they would if paid the same wage relative to men as publically employed women. Different patterns in payment between the sectors appeared more important than differences in social characteristics. Several differences between patterns of payment in the public and private sectors were noted:

1. Young men earned significantly higher wages than both young never-married and young ever-married women for a year of age adjusted for tenure in the private

but not in the public sector.

2. At all age levels, privately employed men always earned a significantly higher payment for occupational status regardless of the marital status of women, but publically employed men only earned significantly higher payment for occupational prestige than middle and older aged ever-married women.
3. The payment for a year of education in the private sector was always significantly greater for men than women, but in the public sector the payment to never-married women was consistently higher than the payment to men. In addition, men had significantly greater payment for education in the public sector only in comparisons with middle and older aged ever-married women.

Although it cannot be proven conclusively, the data are congruent with the hypothesis that differential treatment of women is greater in the private sector of the economy.

Conclusions

In analysis of 1967 data on men and women ages 30 to 44, Suter and Miller (1973, p. 971) found that "Women

are unable to change education and occupational status into earnings at the same high rate as men even when women are full-time workers with considerable lifetime experience." This study indicates that regardless of marital status the finding is accurate for privately employed women of all ages. If differential payment for a year of education or occupational status is indicative of discrimination, then there is evidence of discrimination in the private sector of the economy. The generality of the above proposition must be qualified by present data on the public sector. Among publically employed women, the results of Suter and Miller are only accurate for older ever-married women. In the other five groups defined by age and marital status, women received greater payment than men for either education or occupational status. As measured in this study, the 1960 Census data are only congruent with the hypothesis of discrimination for both educational and occupational status among privately employed women and older publically employed ever-married women, but all women earned far less than men.

Some may consider these results an estimate of the 'cost' of being a woman. Yet only a few differences in social characteristics have been taken into account because of limitations of the data set. Because the selectivity factor cannot be eliminated completely, the differences in the two sectors could merely reflect differences in social characteristics rather than differential

treatment. Because there is a considerable amount of unexplained variance in each stratum, it is plausible that other variables which have not been considered such as psychological factors could be related. Another element of caution should be exercised in interpreting the results of age strata as if it were a synthetic cohort. For example, workers at one point in time may not have been employed for the same type of employer earlier or may not have been employed at all. The data could not detect this. The experience of people at different ages than an actual group is only suggestive of the experiences of a 'real' group of people. The results of this study must be considered suggestive of experiences over time. These results could also reflect differences in the cohorts at different ages and the data could not detect it.

CHAPTER VII

THE WAGES OF BLACK WOMEN IN 1960

In the 1960's investigations into the status of Negro Americans ascertained that discrimination existed. After comparing the earnings of black and white men from unpublished "Occupational Changes in a Generation" data in 1962, Duncan (1969, p. 97) concluded that for black men ". . . achievements at subsequent stages of the life cycle, already lowered by initial handicaps, are further reduced when favorable circumstances cannot be capitalized on as readily." Multivariate analysis of the status of black women has not been systematically explored in order to examine the applicability of Duncan's interpretation to women. Based on published 1960 Census data on all civilian members of the labor force, Price (1969, p. 114) offered evidence that the circumstances of women may differ from those of men with respect to income differences. He found that the income of nonwhite females was closer to that of white females than the income of nonwhite males was to that of white males. After calculating that the nonwhite females earned 96 per cent of the median income of white females, Price concluded: "Thus,

as far as total income goes, there is little evidence of economic discrimination outside the South against nonwhite females compared to white females." The findings of Price on income inequality suggest that Duncan's conclusion may not apply to females.

Price (1969, p. 114) proposed several reasons that white and nonwhite women in contrast to men may have quite similar median incomes.

> This could mean that both nonwhite and white females are equally subject to discrimination, that the nonwhite female is less threatening and therefore less subject to discrimination against them than the nonwhite male, or that the nonwhite female works more weeks and hours.

From the data used in the present study, it is not possible to examine the second proposition. Because this study found evidence which some may construe as discrimination against white women, (see Chapters III to VI), the first possibility is plausible. Yet the latter explanation remains a possibility as Census data utilized by Price did not adjust for differences between white and nonwhite women in annual hours worked.

Method

This chapter examines the wages of black women in the one-in-one thousand sample of the Census of the Population: 1960 who were full-time wage and salary workers in the civilian nonagricultural labor force. It is unlikely that using black rather than nonwhite women would noticeably affect the results, (see Price 1969, p. 17). The

use of earnings rather than income could affect the results but the interpretation of Price sometimes treated income as if it indicated earned wages, (see Price 1969, p. 153). Using nonagricultural wage and salary workers rather than people in the experienced civilian labor force certainly changes the findings, but this modification of the sample increases the reliability of mean estimates of annual hours worked in 1959. These data are analyzed by methods used by Duncan (1969) and discussed earlier by Kitagowa (1955). The data are stratified by age, sex, and race. Because of limited numbers of fully employed black women, white women but not black women are stratified by marital status. Of particular focus are contrasts between ever-married white women and black women because most black women had been married in 1960 (U.S. Bureau of the Census 1964b, Table 18).

Results

Annual Hours Worked

After adjustment for an estimate of annual hours worked in 1959, (see Fuchs 1968, p. 226), the average earned wage of black women was lower than that of white men--the group used for comparison with Negro men by Duncan. Black women earned from 30 to 46 per cent of the hourly wages of white men, (contrast column eight of Table 7.1 to row four of Table 3.1 in Chapter III). However, if white women are considered the appropriate base

group for comparison, the differences in wages between nonwhite and white women are reduced but not eliminated. The average earned wage of black women was lower than that of both never-married and ever-married white women at ages 20 to 34, 35 to 44, and 45 to 64, (contrast column eight of Table 7.1 to row four in Table 3.1). As indicated by the ratio of average wages of black women to average wages of white women, black women earned from 43 to 68 per cent of the wages of white women depending on age (the ratios decreased with increased age) and marital status (ratios were lower relative to never-married than to ever-married white women), (see column two of Table 7.2). Black women earned less than white men and women when annual hours worked are taken into account.

TABLE 7.1.--Mean Levels of Education, Age Adjusted Tenure, Occupational Prestige, Percentages of Union Workers and Women Managers in Major Industries and Hourly Wages of Black Women by Age: 1960

Age	Education (Years)	Age Adjusted Tenure (Years)	Occupational Prestige	Percentage Unionization in Major Indus-ry	Percentage Women Managers in Major Industry	Hourly Wages (Dollars)
(1)	(2)	(3)	(4)	(6)	(7)	(8)
20 to 34	10.7	5.3	30.5	11.3	23.9	1.10
35 to 44	9.9	7.6	26.5	12.5	24.5	1.16
45 to 64	7.8	10.0	23.6	11.3	24.6	.88

Source: One-in-one thousand sample of the Census of the Population: 1960.

TABLE 7.2.--Ratios of Mean Hourly Wages of Black Women, with Mean and Function Adjustments, to Mean Hourly Wages of White Men and White Ever-Married and Never-Married Women by Age: 1960[a]

	Ratio of Hourly Wages of Black Women to Hourly Wages of Whites Multiplied by 100								
		Mean Adjusted Models				Function Adjusted Models			
Age	Unadjusted	Education	Education Occupational Prestige	Education Age Adjusted Tenure Occupational Prestige	Education Age Adjusted Tenure Occupational Prestige Industry	Education	Education Occupational Prestige	Education Age Adjusted Tenure Occupational Prestige	Education Age Adjusted Tenure Occupational Prestige Industry
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
				Panel 1: White Men					
20 to 34	46	50	56	82	76	94	89	49	32
35 to 44	39	44	56	79	69	89	79	66	53
45 to 64	30	35	44	53	58	82	70	56	46
				Panel 2: White Never-Married Women					
20 to 34	66	74	85	113	101	90	86	55	50
35 to 44	56	66	82	115	100	83	72	81	77
45 to 64	43	60	68	82	83	76	67	68	56
				Panel 3: White Ever-Married Women					
20 to 34	68	73	84	86	88	95	88	86	81
35 to 44	68	76	93	96	91	92	83	83	78
45 to 64	53	65	77	78	86	87	76	75	64

[a]Independent variables are years of education, age adjusted for 1968 tenure relationship between job tenure and age, occupational prestige, and industry (class of worker, regional residence, metropolitan employment location, unionization, and women managers). See text for definition of variables. The wages of black women were divided by the wages of all white men in Panel 1, all never-married white women in Panel 2, and all ever-married white women in Panel 3.

Source: One-in-one thousand sample of the Census of the Population: 1960.

Yet, Price suggested that employment in the South should also be considered. A large percentage of black women resided in the South in 1960, (see Table 7.3). As discussed in Chapter V, the hourly wages of women were adjusted through Multiple Classification Analysis calculations for the 'mean effects' of education, age adjusted for tenure, occupational prestige, index of unionization, index of women managers, metropolitan employment location, and class of worker. Then, comparisons of the relative wages of black women between regions in the country were analyzed. Although lower relative wages occurred in the South, the wages of black women were at best 73 per cent of the wages of white women outside the South rather than the 96 per cent reported by Price. When adjustment is made for average annual hours of employment, black women earn less than white women in 1959. Evidently, the congruence in the median incomes of nonwhite and white women partly reflected higher annual hours worked by nonwhite women rather than completely reflecting equal levels of discrimination to women.

Adjusted Ratios

The differential in hourly wages between black and white women may reflect discrepancies in socioeconomic characteristics reflecting either choice or discrimination in access to more rewarded characteristics. It may also result from an inability to translate characteristics into

TABLE 7.3.--Percentage of Black Women in Residental Region, Metropolitan Employment and Class of Worker by Age: 1960[a]

Age	Region				Metropolitan			Employer	
	South	West	North Central	North East	Central City	Suburban Ring	Outside SMSA	Public	Private
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
20 to 24	48.2	3.2	22.1	26.5	64.8	16.3	18.9	21.3	78.7
35 to 44	51.4	8.6	17.3	22.7	64.6	15.8	19.6	22.7	77.3
45 to 64	55.3	6.0	16.1	22.6	62.8	12.1	25.1	11.5	88.5

[a]The sample consists of full-time wage and salary workers in the civilian nonagricultural labor force in 1960. Other tables in this chapter are based on this sample. There were 221 black women ages 20 to 34, 206 black women ages 35 to 44, and 195 black women ages 45 to 64.

Source: One-in-one thousand sample of the Census of the Population: 1960.

income as Duncan suggested was the case for black men. Adjusting for differences in mean characteristics (direct standardization) and differences in payment or function (indirect standardization) suggests which alternative is more consistent with the data. For example, if black women had the same socioeconomic characteristics as white women, relative wage ratios of unity would indicate that access to more rewarded characteristics accounts for the difference in wages between black and white women. Wages of black women are adjusted for both differences in means and differences in function or payment.

Differences in Characteristics

Hourly wages were regressed on education, age adjusted tenure, and occupational prestige, (see Table 7.4 for partial regression coefficients and intercepts of the equations). From the equations in Table 7.4 black women were given first the same level of education as white women, then the same levels of education and occupational status, and finally the same levels of education, occupational status, and age adjusted for tenure. With each addition, the relative wage ratios of black women increased, (contrast the ratios in columns two to five in Table 7.2). Hourly wages were then regressed on education, age adjusted tenure, occupational prestige, index of unionization, index of women managers, class of worker, metropolitan employment location and region of residence, (see Table

TABLE 7.4.--Partial Regression Coefficients from the Regression of Hourly Wages on Education, Age Adjusted for Tenure for Black Women: 1960[a]

	Age 20 to 34				Age 35 to 44				Age 45 to 64			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Education	.075**	.021**	.077**	(.023)**	.093**	(.021)**	.096**	(.024)**	.071**	.044**	.073**	.045**
Age Adjusted Tenure			.110*	.113*			(.097)	(.092)			(.031)	(.028)
Occupational Prestige		.024		.024		.033		.033		.020**		.020**
Intercept	.30	.14	-.31	-.49	.24	.08	-.52	-.65	.33	.07	.01	-.22
Adjusted Coefficient of Determination[b]	.10	.31	.12	.34	.19	.45	.19	.45	.19	.29	.19	.29

[a]Variable row entries are partial regression coefficients of the variable in a model containing the variables with coefficients in the column, parentheses indicate the partial regression coefficient is not significant. The coefficient of white men is significantly greater than that of black women if one star (.05 level) or two stars (.01 level) appear above the coefficient of women for a one tail test.

[b]See Rao and Miller (1972, p. 21).

Source: One-in-one thousand sample of the Census of the Population: 1960.

7.5). With adjustment for mean differences in the models of Table 7.5, the ratios sometimes declined slightly. However, these declines were less than 5 per cent and could reflect random error, (see columns five and six of Table 7.2).

The wage of black women relative to ever-married white women increased at least 20 per cent of the wage of ever-married white women with adjustments for differences in the characteristics considered. (Contrast column six to column two in panel three of Table 7.2.) This adjustment had an increased effect with older age. The most substantial increases came with adjustment for levels of education and then additional adjustment for levels of occupational prestige. With addition of variables, the change in the mean adjusted ratio suggests the effects of differences in newly specified variables apart from association with differences in previously specified variables.

Adjustment for mean differences in education increased the wages of black women relative to ever-married white women from 5 to 8 per cent. This increase in the wage of black relative to white women from adjustment for different levels of both education and occupational prestige exceeded the effect from adjustment for education alone. (Contrast the difference between columns four and five to the difference between columns

TABLE 7.5.--Partial Regression Coefficients from the Regression of Hourly Wages on Education, Age Adjusted Tenure, Occupational Prestige, Index of Unionization, Index of Women Managers, Class of Worker, Regional Residence, and Metropolitan Employment Location for Black Women by Age: 1960[a]

Independent Variables (1)	Age 20 to 34 (2)	Age 35 to 44 (3)	Age 45 to 64 (4)
Education	(.009)**	(.010)**	.025**
Age Adjusted Tenure	(.055)**	(.057)	(.016)
Occupational Prestige	.018	.024*	.017**
Index of Unionization	.004	(-.001)*	.009
Index of Women Managers	-.012	-.013	(-.002)
Employer:			
Public	.367	.321	.506
Metropolitan:			
Central City	.343	.329	.197**
Suburban Ring	.332	.319	(.143)**
Region:			
South	-.418**	-.247	-.392*
West	(.036)	(-.043)	(-.109)
North Central	(-.087)*	(-.152)*	(-.104)
Intercept	.27	.16	.10
Adjusted Coefficient of Determination[b]	.64	.59	.50

[a]Variable row entries are partial regression coefficients of the variable in a model regressing hourly wages on the variables in column one. Parentheses indicate the partial regression coefficient is not significant--twice its standard error. The coefficient of white men is significantly greater than that of women if one star (.05 level) or two stars (.01 level) appear above the coefficient of women for a one tail test.

[b]See Rao and Miller (1972, p. 21).

Source: One-in-one thousand sample of the Census of the Population: 1960.

two and three of Table 7.2.) The relative wage ratio increased 11 per cent at younger age, 17 per cent at middle age, and 12 per cent at older age, (see panel three of Table 7.2). Evidently, access to occupational prestige in 1959-1960 had a greater influence on the relative wages of black women than did attainment of education.

Depending on the base group of whites for comparison, the effect varied from additional adjustments for levels of work experience, class of worker, regional residence, metropolitan location, index of unionization, and index of women managers, (see columns five and six in Table 7.2). Compared to ever-married white women, the relative wages of black women increased slightly at younger age, decreased slightly at middle age, and increased at older age, (see panel three of Table 7.2). There were only minor changes from these adjustments except at older age.

Because education usually is attained before the prestige of the current occupation, the effect of changes in mean adjusted ratio suggest the effect of events in time. The variations suggest that there may be greater contributions to the lower wages of black women later in life than earlier. That is, the data indicate an aging effect. Yet, the data are consistent with a cohort effect. Younger people may differ or experience qualitatively different events than older people. Either possibility is consistent with the data in 1960.

Differences in Payment

The effects of payment differences were ascertained by giving to black women the intercepts and partial regression coefficients from least squares regression models of white women which is termed the function adjustment. With function adjustment, black women keep their own levels of characteristics such as education, but translate the characteristics into wages with the same payments as white women. Adjustment for differences in payment had a substantial effect when the model specified only education. In fact the ratio after adjusting for payment differences exceeded the ratio after adjusting for mean differences in education, (compare columns three and seven in Table 7.2). But the effects from adjustment for payment differences declined as the number of variables specified in the model increased, until all mean adjusted ratios exceeded their respective function adjusted ratios, (contrast columns five and six to columns nine and ten in Table 7.2).

Changes in function adjusted wage ratios of black women imply that a greater part of the differential in hourly wages between black and white women reflects access to less rewarded characteristics rather than payment of less rewards for characteristics already possessed. As discussed in Chapter IV, the change reflects the association of more recently specified characteristics with characteristics previously contained in the model. The decomposition process suggests that the possibility, if not

the high probability, exists that limited access to more rewarded levels of education, occupational status, work experience, and industrial characteristics have greater impact on the hourly wages of black women than limited translation of characteristics into payment.

Specific Differences in Payment

One noticeable difference between the models of black women compared to white women is the closer association between specified variables and hourly wages. In each age stratum, the coefficient of determination adjusted for degrees of freedom was twice as large for black as for white women, (contrast equations in Table 7.4 to equations in Table 3.3). Among black women, approximately half the variation in wages was accounted for by variation in the characteristics in Table 7.5.

Payment for a specific characteristic was defined as the partial regression coefficient of the characteristic. In order to assess the contributions of differences in payment for intervally specified characteristics, significance tests were calculated. The coefficients of black women were compared to the coefficients of white women of the same age. Analysis of nominally scaled variables was made with relative wage ratios of black compared to white women. These relative wage ratios were calculated from MCA adjusted wages as was done in Chapters III, IV, and V.

Intervally Measured Variables

Age adjusted for tenure, i.e., work experience, almost never had a significant effect on wages of black women--the coefficient was less than twice its standard error, (see Table 7.4 and Table 7.5). The only exception was at younger age, but experience was not significant after education, occupational prestige, region, metropolitan location, and indices of unionization and women managers were included in the model. In contrast, the partial coefficients of black women for education, occupational prestige, and indices of unionization and women managers usually were significant in effect on wages of black women, (see Table 7.4 and Table 7.5). The exceptions were the index of unionization at middle age, and the index of women managers at older age. In addition, education did not have a significant effect on wages of younger and middle aged black women when occupational prestige was in the model. Apart from other characteristics in the full model of Table 7.5, only occupational status contributed to the wages of black women at a level that was significant at all ages.

Ever-married white women had significantly higher coefficients than black women for the index of unionization at older age, for the index of women managers at younger and middle age, and for occupational prestige at older age. However, only one of these differences was significant at the .01 level. The coefficient of education was significantly higher for ever-married white women than black women at younger and middle age in the full model of Table 7.5. These payment differences evidently made some contribution to the

higher wages of ever-married white women relative to black women. However, the payment differences were never consistently significant in all models at one age level nor for the same model at all age levels.

Public Employment

As previously analyzed, government employment contributed to the similarity of hourly wages for white women relative to white men. This occurred because the wages of white men were depressed by government employment while the wages of white women were inflated by government employment. Price's analysis (1969, pp. 133-184) indicated that reduction of discrimination in government employment was associated with large relative gains in the occupational and economic status of Negroes. But the role of government employment in the hourly wages of black women relative to white women may vary from that of men because of the interaction for whites between sex and effects of public employment.

Type of employer was measured by a dichotomous variable indicating class of worker, (see Table 7.5). After adjustment for 'mean effects' of other variables through Multiple Classification Analysis type calculations (see Appendix I for a discussion of this procedure), the influence of type of employer were examined. This procedure estimates the wage of the average black woman compared to the average white woman in terms of mean

interval characteristics and modal characteristics for regional residence and employment location in the SMSA. As can be seen in rows one and two of Table 7.6, black women earned a larger wage in the public sector than in the private sector of the economy. Both white and black women, benefit from public employment.

For each category in Table 7.6, ratios of the wage of black women to the wage of each base group were calculated after adjustment for 'mean effects' of other characteristics. In comparisons with white women, publically employed black women at each age had one of the two highest ratios of any category of black women in Table 7.7. Black women in the public sector earned from 56 to 75 per cent of the wages of never-married white women and from 73 to 81 per cent of the wages of ever-married white women. The respective figures in the private sector were 42 to 62 per cent and 51 to 66 per cent, (see rows one and two of Table 7.7). Even in the public sector black women did not have relative wages of unity. Nevertheless, the black women in the public sector had relative wage ratios at least 5 per cent higher than black women in the private sector for each age-marital status stratum. Relative to white women, public employment of black women increases their wages. Yet, it is interesting that even the benefits of public employment to black women do not appear to overcome other limitations.

TABLE 7.6.--Mean Wages and Net Effects of Class of Worker, Regional Residence, and Metropolitan Employment Location Adjusted by Multiple Classification Analysis for Effects of Education, Age Adjusted for Tenure, and Occupational Prestige for Black Women by Age: 1960[a]

Variables (1)	Age 20 to 34		Age 35 to 44		Age 45 to 64	
	Adjusted Wage (2)	Net Effect (3)	Adjusted Wage (4)	Net Effect (5)	Adjusted Wage (6)	Net Effect (7)
Employer: Public	$1.39	$.29	$1.41	$.25	$1.33	$.45
Private	1.02	-.08	1.09	-.07	.83	-.06
Region: West	.90	-.20	1.07	-.09	.73	-.15
South	1.36	.26	1.27	.11	1.01	.13
North Central	1.23	.13	1.16	.01	1.02	.14
North East	1.32	.22	1.32	.16	1.12	.24
Metropolitan:						
Suburban Ring	1.16	.06	1.21	.06	.89	.00
Central City	1.17	.07	1.23	.07	.94	.06
Outside SMSA	.83	-.28	.90	-.26	.74	-.14
Stratum Mean Wage	1.10	-	1.16	-	.88	-

[a]The group specific means are apart from 'mean effects' of education, age adjusted tenure, and occupational prestige. The group specific means are also apart from proportional effects of the variables employer, region, and metropolitan. Net effects are expressed as deviations from the stratum mean wage. Calculations are based on equations in Table 7.5.

Source: One-in-one thousand sample of the Census of the Population: 1960.

TABLE 7.7.--Ratios of Mean Hourly Wages of Black Women to Mean Hourly Wages of White Men and Women by Class of Worker, Regional Residence, and Metropolitan Employment Location Adjusted by Multiple Classification Analysis by Age: 1960[a]

Variables	Age 20 to 34			Age 35 to 44			Age 45 to 64		
	White Men	White Never-Married Women	White Ever-Married Women	White Men	White Never-Married Women	White Ever-Married Women	White Men	White Never-Married Women	White Ever-Married Women
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Employer: Public	62	76	81	52	60	73	51	56	73
Private	42	62	64	36	54	66	27	42	51
Region: South	41	58	60	38	51	66	25	37	48
West	52	81	77	55	54	71	34	48	56
North Central	50	72	77	38	56	68	34	51	62
North East	56	78	78	45	66	78	37	53	66
Metropolitan:									
Suburban Ring	47	70	70	39	55	72	29	43	53
Central City	47	67	70	39	57	67	30	43	52
Outside SMSA	39	57	58	34	52	61	29	45	53

[a]Wages in each category adjusted by Multiple Classification Analysis for 'mean effects' of education, age adjusted for tenure, and occupational prestige. Wages also adjusted for proportional effects of the variables employer, region, and metropolitan. Calculations based on wages in Table 5.5. Ratios are multiplied by 100.

Source: One-in-one thousand sample of the Census of the Population: 1960.

Regional Location

The location of black women in 1960 may have influenced their wages relative to whites. Hill (1965, pp. 31-47), for example, has argued that rigid, systematic discrimination in employment existed in the segregated South in 1960 where Negroes had not shared in the industrial growth after World War II. This possibility is consistent with the data in 1960 for region of residence in the Census week. Black women earned lower wages in the South apart from the effects of education, work experience, occupational prestige, index of unionization, index of women managers, public employment, and metropolitan work location, (contrast rows three to six of Table 7.6). Black women located in the South also had the lowest wages relative to whites of the four regions, (see rows three to six of Table 7.7). However, the difference in relative wage ratios between the South and the next lowest ratio in a region was at least 5 per cent only at younger and older ages suggesting that effects of the South may not be unique at middle age.

Metropolitan Employment Location

Employment location in the central city of an SMSA, in the suburban ring of an SMSA, and outside the SMSA was directly identified for each employee for the Census week. Black women had lower average wages when employed outside the SMSA, (contrast row nine to rows seven and eight of

Table 7.6). However, the relative wages of black women compared to white women were at least 5 per cent below other locations only at younger and middle ages, (contrast row nine to rows seven and eight of Table 7.7). Possibly the location effects from SMSA's are not unique to black women at older age. In general, location of black women in the SMSA increases their wages, and positively affects their wages relative to white women.

Summary

Black women earn less per hour than whites. White women tend to be more highly paid for a year of education. Although black women appear to receive greater wages directly from employment in the public sector, metropolitan employment, and location outside the South, they were unable to overcome other limitations to earn hourly wages equivalent to white women. There is evidence of racial discrimination between black and white women. Yet analysis indicates that lower attainment in education and occupational status for black women contributes far more to the lower wages of black women than do differences in payment in the models calculated. It is the differences in means that had the greatest impact on the wages of black women relative to whites of each marital group. Analysis indicates that limited attainment of socioeconomic characteristics had greater effects later in life than earlier in life. This will be examined further through path analytic

techniques.

A Further Examination: Path Analysis

The analysis of mean adjusted and function adjusted relative wage ratios implies that race partly operates on hourly wages through effects on intervening variables of education, age adjusted for tenure, and occupational status. This section examines the model further by decomposing the effect of being black for hourly wages of all women. The technique used in path analysis with standardized variables. A path diagram is a "representation of a system" which conforms to certain assumptions, (see Land 1969). Although all assumptions for the technique are not met, it is believed that the interpretation of the model in Figure 7.1 is a useful supplement and adds to the validity of the previous interpretation of the time ordering of effects and their import. Interpretation of path diagrams cannot prove causation from least squares multiple regression equations, (Duncan 1966). But the patterns of the model permit assessment of the data with the proposed causal sequence. The specific focus is on the interrelationships suggested by previous analysis.

In the model in Figure 7.1 the hourly wages of women are taken as dependent on interrelationships of education, age adjusted for tenure, occupational status and race, (see Table 7.8 and 7.9 for the equations). The total effect of race on hourly wages can be decomposed into two

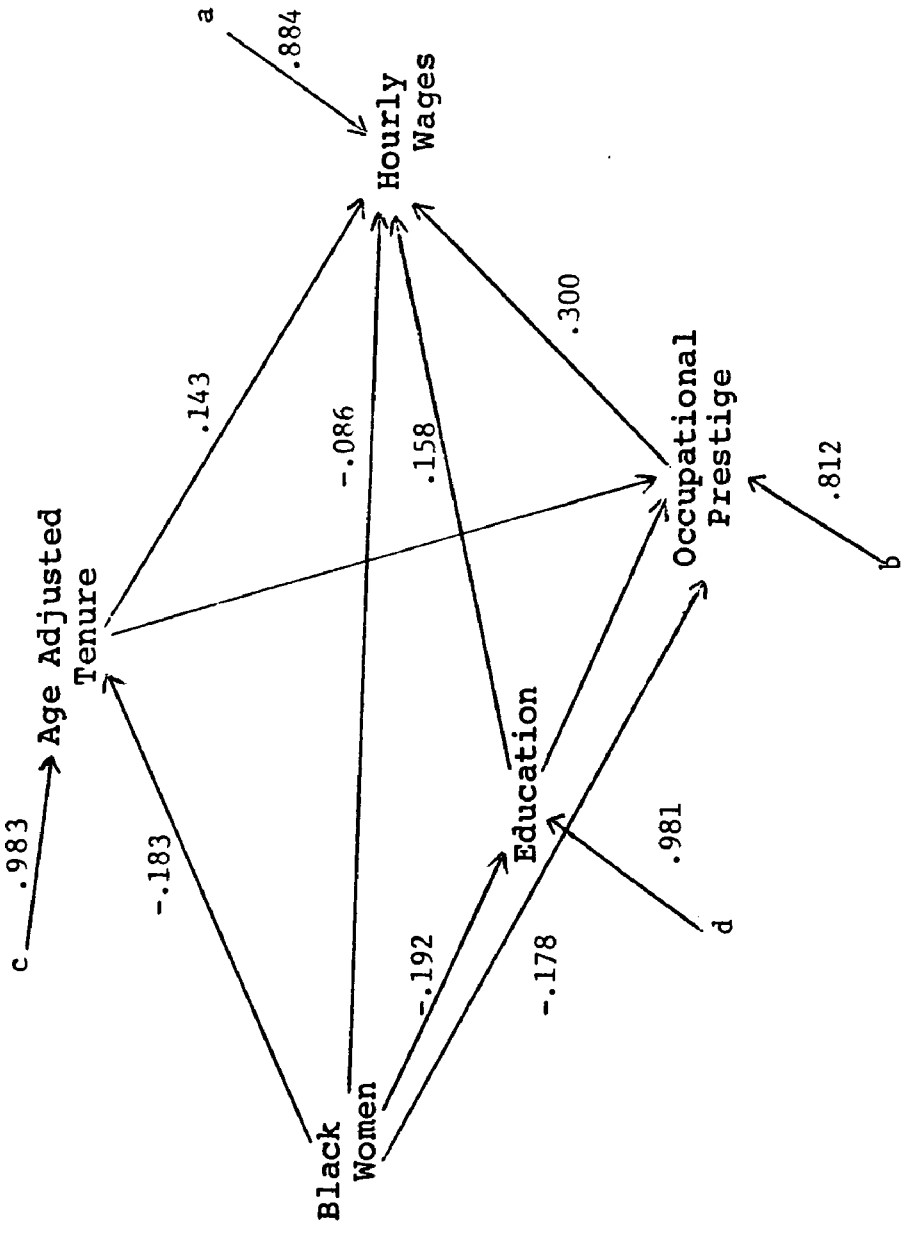


FIGURE 7.1.--Five Variable Path Model Decomposing the Hourly Wages of Black and White Women Ages 20 to 64.

TABLE 7.8.--Coefficients of Correlation Between Characteristics for All Women in 1960

Age Adjusted	A	B	E	O	W
Tenure-----A	-----	-.18	-.03	.05	.19
Black---------B		-----	-.19	-.28	-.23
Education-----E			-----	.55	.32
Occupation----O				-----	.41
Wages---------W					-----
Mean	9.6	.09	11.1	38.0	1.64
Standard Deviation	3.8	.30	2.7	12.1	.82

Source: One-in-one thousand sample of the Census of the Population: 1960.

TABLE 7.9.--Results in Standard Form of Regression of Hourly Wages on Selected Variables with Least Squared Error Criteria, All Women: 1960[a]

Independent Variables	Dependent Variables		
	Wages	Wages	Occupation
(1)	(2)	(3)	(4)
Age Adjusted Tenure	.172	.158	.036
Black		-.086	-.178
Education	.146	.143	.520
Occupation	.316	.300	
Adjusted Coefficient of Determination	.21	.22	.34

[a]The body of the table presents partial regression coefficients in standard form (Beta coefficients). All coefficients are twice their standard error.

Source: One-in-one thousand sample of the Census of the Population: 1960.

parts in this model: 'direct effects' and 'indirect effects.' As indicated by the correlation coefficient, being black had a gross relation of -.228 with hourly wages of all women, (see Table 7.8). In other words, race alone explained 5.2, (that is: (.228) x (.228)), per cent of the variation in the hourly wages of women. The standardized partial regression coefficient indicates that a change in one standard deviation of race is associated with a change in one standard deviation of hourly wages and measures the 'direct effects' of race. Apart from the effects of education, work experience as measured by age adjusted for tenure, and occupational prestige, race had a 'direct effect' of -.086 in Figure 7.1. That is, race directly explains .7 per cent of the variation in hourly wages of women in the model of Figure 7.1. Evidently, association with education, work experience, and occupational status partly accounts for the gross relation between race and hourly wages of women as was suggested in previous analysis.

The model in Figure 7.1 suggests that race had 'indirect effects' of -.138 through influences on the intervening variables of education, work experience, and occupational prestige. This 'indirect effect' decomposes into:

1. effects via education of -.029 (PwePeb)
2. effects via work experience of -.025 (PwaPab)
3. effects via occupational status of -.053 (PwoPob).

As expected from previous analysis, the influence of race through occupational status was more important than the influence of race through either education or work

experience. The 'indirect effects' of race also operate through:

4. the effects of education on occupational status of -.029 (PwoPwePeb)
5. the effects of work experience on occupational status of -.002 (PwoPoaPab)

The findings suggest that the 'indirect effects' of race through influences on level of education, work experience, and occupational prestige exceed the 'direct effects' of race on hourly wages. In addition, they suggest that access to occupational status is more important than either access to work experience or access to education.

The findings from the mapping of variables in Figure 7.1 are consistent with conclusions based on mean and function adjustments for separate strata of women by race, age, and marital status in Table 7.2. If the model in Figure 7.1 is appropriate and does not seriously violate the assumptions of path modeling, access to occupational status was more important to the wages of black women than access to either education or work experience. In fact, events occurring at earlier stages in the life cycle (access to education in this model) had less effect on wages of black women than effects occurring later in the life cycle (first access to work experience as measured by age adjusted for tenure and then access to occupational status). It should be noted that if direct effects of race on occupational status apart from education and work experience are considered evidence of racial discrimination, then discrimination in access to higher status jobs was

congruent with the data in this study. In general, the findings from patterns in the path diagram reinforce the earlier conclusions on the effect of race on events in the life cycle and their subsequent effects on wages of women. A larger portion of the inequality between black and white women in wages results from differential access to characteristics of education, work experience, and occupational status than payment for race apart from these characteristics, and events later in life had a greater effect than events earlier in life.

Summary and Conclusions

Several implications can be drawn from the findings of comparisons between black and white women. First, one reason for similar median income levels between nonwhite and white women experienced workers in 1960 was probably the greater number of hours and weeks of employment for black women. Adjustments for annual hours employed on the average in 1959 resulted in fully employed black women earning less than fully employed white women wage and salary workers. The data confirm one alternative explanation of Price (1969, p. 114) that the relative equality of the median incomes of nonwhite and white women reflects ". . . that the nonwhite female works more weeks and hours."

Second, limited access of black women to education, occupational status, and work experience measured by age

adjusted for tenure, apparently contributed to higher wages of white women. If limited access to these characteristics constitutes evidence of the discrimination referred to by Price, then nonwhite and white females are not equally subject to "discrimination" in access to these characteristics. Support for this interpretation comes from the finding that little or none of the initial inequality in wages remained if black women had access to the characteristics of never-married white women. Also, differences in wages were substantially reduced if black women had access to the characteristics of white ever-married women. Reinforcing the interpretation are findings of both limited effects from giving black women the payment, i.e., the regression function, of white women and from the frequent failure to reject the null hypothesis of equal or lower partial regression slopes of white women. Black and white women appear to have quite similar patterns of payment for most characteristics with the exception of some payment differences for education which appear to be non-randomly higher for white women. If Price meant similar patterns of payment for characteristics to nonwhite and white women, then the data were consistent with his hypothesis that "white and nonwhite females are equally subject to discrimination."

A third implication of the data is that regardless of race, women benefitted from employment in the public sector of the economy. If the base group were white women,

the effects of public employment would yield relative wage ratios of 16 to 24 per cent higher than ratios of black women in the private sector. However, the effects of public employment were evidently not great enough to overcome the effects of other characteristics of black women as the wages of black women in the public sector were substantially lower than the wages of white women apart from 'mean effects' of variables considered in Table 7.5.

Finally, as Duncan concluded, the inability of nonwhite women to capitalize on favorable circumstances later in life contributed to wage differences between nonwhite and white workers. Although it is impossible to describe the findings unambiguously, both the results of changes in mean adjusted relative wage ratios and of path modeling were congruent with Duncan's interpretation. Access to current occupational status above the effects of access to years of schooling earlier in life made substantial contributions to the higher wages of white women. In fact the effects of access to education alone were not as great as the additional effects of limited access to current occupational status. In addition, the ability to translate these characteristics into income did not appear to account for the higher wages of white women except for translation of a year of education into hourly wages.

CHAPTER VIII

CONCLUSION

This dissertation considered data describing the effect of sex on hourly wages in the United States in 1960. The source of data for the study was the one-in-one thousand sample of the Census of the Population: 1960. The sample consisted of wage and salary workers in the civilian nonagricultural labor force who were employed 35 or more hours in the Census week and 50 or more weeks in 1959. After wage and salary earnings in 1959 were divided by estimated hours employed in 1959, several patterns emerged in the hourly wages of women. First, white women earned lower hourly wages than white men. Second, white women who ever-married earned lower wages than white women who never-married. Third, black women earned lower hourly wages than white women.

A Definition of Discrimination

According to Hiestand (1970, pp. 5-7) discrimination can mean many different things. One definition of discrimination is that men and women have differential results in employment, i.e., indirect discrimination. Differences in wages between the sexes are a measure of differential

results in employment. The lower wages of women relative to those of men may reflect generally lower payment to women, lower payment for specific socioeconomic characteristics, limited access to specific socioeconomic characteristics, or a combination of these. This dissertation assessed the possible explanations of lower wages of women relative to those of men.

In this inquiry hourly wages were regressed on socioeconomic characteristics. Payment was operationalized as the intercept and the partial coefficients of the regression equation. Differences between the sexes in payment were measured by calculating the effect on the wages of women by giving them the payment of men from a regression equation. Differential access to specific socioeconomic characteristics was operationalized as the differences between the sexes in mean levels of social characteristics and in proportionate distribution across characteristics. This was assessed by the effect on the wages of women by giving them the socioeconomic characteristics of men. Finally, differential payment for specific characteristics was operationalized as lower partial regression coefficients to women relative to men for a characteristic. Because of the nature of regression analysis with this data set, the results of the study are subject to several shortcomings.

The least squares linear regression models for the analysis assumed additive relationships between variables.

If the relationships should be interactive, the results of the study may be biased.

One interpretive problem is the frequent collinearity of differences between the sexes in payment for these socioeconomic characteristics. In comparisons of black women and white men the collinearity effect was substantial. However, the differences in socioeconomic characteristics usually had a minimal effect on the wages of white women relative to white men. Consequently, collinearity only biased the precise estimation of the effect of payment differences. It did not affect assessment of the importance of payment differences compared to the importance of differences in characteristics.

Measurement error can bias interpretation by not precisely indicating the effects of relevant characteristics. Most socioeconomic characteristics were measured crudely because of the data source. Although any characteristic may be inaccurately measured, the estimate of work experience is most problematic. Lifetime work experience was not available in the data from the Census. Consequently, it was estimated by multiplying the age of a worker times the partial regression coefficient of job tenure, i.e., seniority, regressed on age of workers in 1968. Different calculations were made for white ever-married women, for black women, and for white men and white never-married women. Although the literature on job tenure and labor force participation supports this measurement

procedure, the estimation of lifetime work experience may be erronous. Measurement error biases the precise estimation of the importance of differences in payment as compared to the importance of differences in socioeconomic characteristics between the sexes. This occurs because measurement error biases the estimates of partial regression coefficients for specific characteristics (Rao and Miller 1972).

Finally, the regression models may have omitted relevant variables, i.e., the models were misspecified. For example, psychological differences between men and women were not identified. This omission would bias analysis only if the omitted attributes were uncorrelated with included variables. I believe that the most relevant variables discussed in the literature were included in the models. I believe that the effects are minimal from omitted variables in the models. It remains the task of the skeptic to demonstrate the effects of misspecification of the models.

The data analysis of this inquiry is subject to shortcomings of collinearity, measurement error, and misspecification. The data analysis cannot really 'prove' discrimination, but can be only congruent with a hypothesis of differential treatment of workers by sex or race. Dyer (1968, p. 40) quoted Bertrand Russell that "In any advanced science there is nothing called a cause, and nothing that can be called an effect; there is merely a

formula." Following Russell's idea, this dissertation considered several formulae calculated by regression on least squares criteria. Given these formulae, the author calculated effects attributable to differences in characteristics and to differences in payment. Although these relationships cannot be considered causal, they were consistent with a proposition that discrimination was at the basis of the effect of sex on hourly wages given the criteria of discrimination discussed above.

Results

Using the operational definitions of discrimination discussed above, this dissertation arrived at several conclusions:

a) Apart from different distributions between the sexes in the characteristics of education, work experience, occupational prestige, regional residence, metropolitan employment location, public or private employment, percentage unionization of major industrial categories, and percentages of women managers in major industrial categories, women earned lower hourly wages than men earned.

b) Discrimination against white women in payment explained the lower wages of white women compared to white men.

c) Discrimination against white women in payment for specific characteristics contributed extensively

to the lower wages of white women relative to white men.

d) The discrimination was much greater against privately employed than against publically employed women.

e) Compared to white men, black women were paid less in general, paid less for socioeconomic characteristics and received lower paying socioeconomic characteristics. Relative to white women, black women received lower wages because they received lower paying socioeconomic characteristics.

White Women

Differences in Payment

What is the approximate cost to white women from differences in payment between the sexes? The question is best answered by the change in the wages of women relative to those of men from giving women the payment of men. Before adjustment for payment differences between the sexes, white women received 56 to 70 per cent of the hourly wages of white men. The percentage of the wage of men received by women decreased with older age for ever-married women and decreased with ever being married. Except for young, ever-married women, the wages of white women increased from 17 to 35 per cent of the hourly wages of white men when women were given the same intercept and regression coefficients as men in a model regressing wages on education,

occupational prestige, and work experience. Most women were paid substantially lower wages than men because they were unable to change their characteristics into wages in the same manner as men.

Partial regression coefficients estimate the payment for a unit of a characteristic in an equation. In the equation with hourly wages as the dependent variable, the partial coefficients are expressed as cents per hour for each additional unit of the independent variables. If one assumes that characteristics in a model specify additive components measuring the worth of an employment position, then payment differences estimated by these coefficients estimate the extent white men and women receive different payment for such components. Several conclusions were made in terms of payment to public and private workers in 1960 for occupational prestige, education, and work experience. The sample was stratified by age (young, middle, and old) and into strata of white men, white ever-married women, and white never-married women.

Men received greater wages than women for a year of age adjusted for tenure, an estimate of work experience. In the public sector men <u>sometimes</u> were paid greater wages than women for work experience. In contrast, men <u>always</u> received greater wages than women for work experience in the private economic sector. In most comparisons between strata of men and women, the consistently higher payment to men was not significant. But young men received

significantly greater wages than young women in the private sector.

Men often received greater wages compared to women for a unit of occupational prestige. In the public sector men sometimes changed a unit of occupational prestige into wages at a greater rate than women, but this was significant only compared with older, ever-married women. In the private sector men almost always received significantly higher payment than women for occupational prestige.

I found evidence that men usually were paid significantly higher wages than women for a year of education. These statistically significant differences emerged regardless of characteristics in the model. The notable exceptions were contrasts between white men and never-married or young ever-married white women in the public sector. The coefficients of publically employed, young, ever-married women were not significantly below those of men while those of publically employed, never-married women were always larger than those of men. Yet, most women were paid less than men for a year of educational attainment.

The lower payments to white women than men suggest that women are discriminated against. Is this 'proof' of discrimination? I believe that this question can be answered best from the data on never-married women. First, they typically did not have family related functions associated with the positions of wife and mother. Second,

husbands did not constrain their geographical mobility, their education, their choice of occupation, and their choice of employment. Finally, most fully employed, never-married white women did not have a history of discontinuous employment.

Never-married white women probably were discriminated against. They earned lower wages than men earned. Differences between these women and men in mean levels of education, work experience, and occupational prestige did not explain the consistently lower wages of these women. Rather, the payment to these women of the wage received by white men would have eliminated the wage differential. If the intercept and partial regression coefficients of education, work experience, and occupational prestige belonging to men were given to never-married women, their wages would equal or exceed those of men. In general, employers paid these women lower wages than white men for their merit and the status of their work. If one believes units of education and work experience define employee merit, employers discriminated against never-married women relative to their merit. If one believes occupational prestige defines work of equal social status, then employers discriminated against these women for work of equal status. I believe that these differences in payment for measures of merit and equal status are discrimination against never-married white women.

Levitin et al. (1971, p. 238) state:

> In American Society, particularly in economic life, the dominant ideology is an achievement ideology according to which rewards ought to be based on merit or performance.

The findings of this dissertation provide confirming evidence for speculations that the principle of merit did not apply equally to women in the private sector. The data from this dissertation indicate that white women would experience discrimination even if all white women did not have the family obligations deriving from the functions of wife and mother roles and from constraints associated with a husband.

Private or Public Sector

The findings suggest that public and private ownership of employment organizations influenced the relative wages of white women. Of the employer related characteristics considered in the inquiry, I believe only comparisons between public and private employees displayed marked contrasts in evidence of discrimination against women. First publicly employed white women had substantially higher levels of wages relative to those of men than privately employed white women. This was apart from the effects of marital status of women, age cohort, education, work experience, occupational prestige, regional residence, metropolitan employment location, an index of unionization, and an index of women managers. Second, there was evidence of greater payment differences between the sexes in the private than in the public sector. All women in the

private sector received lower partial regression coefficients than white men for work experience, education, and occupational status. These differences were usually significant. In contrast, the differences in coefficients for these characteristics were significant only in comparisons between men and ever-married women at middle and older age. In fact, never-married women in the public sector provided the only consistent exception to the rule of lower payment to women relative to men for a year of educational attainment. Evidently, some characteristic of the public sector limits the extent of discrimination against women.

I believe there are two plausible reasons for greater discrimination against women in the private than in the public sector in 1960. One reason is that there was no program advocating equal treatment in the private sector, but there was such a program in the public sector. Another was that positions requiring on-the-job training existed in the private sector but were rare in the public sector. Oppenheimer (1970) argued that denial of on-the-job training to women contributed to the disadvantage of women in employment. Women could only be denied on-the-job training in the private sector because few occupations in the public sector had on-the-job training. The relative effects of these explanations for greater discrimination against women in the private sector can not be assessed from the Census data.

Black Women

It is not surprising that race of women had an effect on wages in 1960. There is evidence that racial discrimination existed in the United States, (for example, see Parsons and Clark 1965). The findings of this dissertation suggest that black women were not an exception. Black women earned substantially lower wages than either white men or white women. Additionally, the difference in wages between black women and white increased with increased age.

Surprisingly, relative to being white, being black mainly influenced wages through effects on the intervening variables of education, work experience, and more importantly, attainment of occupational prestige. Based upon several methods of analysis, the general findings for black compared to white women could best be described by stating that limited attainment of characteristics had greater impact on the relative wages of black women than lower payment for equivalent employment characteristics.

The findings also indicate that limited access to education, and to work experience did not explain the lower occupational status of black women relative to white women. I believe that the data are congruent with a hypothesis of discrimination in employment of black women in jobs with more prestigious occupational titles.

Conclusions

The evidence of this study is consistent with a

hypothesis of discrimination in payment for work to white women relative to white men. This contrasts markedly with the conclusions of Fuchs (1971) and agrees with the results of Suter and Miller (1973). The findings also suggest that there is evidence of racial discrimination against black women. I interpret these trends as evidence of discrimination. However, shortcomings of the data analysis can influence interpretations. Thus interpretation of this analysis as definite confirmation of discrimination is problematic.

Further Study

In the United States the Equal Pay Act was adopted in 1963 and the Civil Rights Act became law in 1964. Both legal changes have implications for population and manpower characteristics by banning certain types of discrimination. Underlying these legal changes are policy considerations with implications for the structure and characteristics of the population in the United States. Adoption of these laws provides the opportunity to empirically determine their short term consequences and to set up bases of comparison for later studies. Discrimination against minorities such as blacks and women curtail full utilization of the human resources of the United States. Assessment of the results of legal action on the socioeconomic status of minorities indicates the appropriate direction of future policy decisions.

The author had completed a dissertation which assesses the effect of sex on hourly wages using the Census of the Population: 1960. This data set was collected before the major legal changes in the 1960's. This study can provide a baseline for comparison to the Census of the Population: 1970. This comparison can determine the short-term effectiveness of legal action as the instrument for enacting population policy. If the legal changes have effects, I believe that short term changes should be evident by the time of the 1970 Census. This dissertation also provides suggestions for the course of such a comparison.

Several subjects could be considered with the comparison of this dissertation to data from 1970. Do publicly employed women have greater relative wage ratios than privately employed women? Is there more rapid change in the private than in the public sector in the relative wages of white women? Do differences between men and women increase with increased age? Does the status of black women increase faster than the status of white women? These questions could be answered by comparisons between 1960 and 1970.

The results of this dissertation suggest that the effects of marriage and child rearing on women is a subject which should be pursued in future inquiry. A comparison between 1960 and 1970 Census data might permit some assessment of these effects. Between 1960 and 1970 the cohort

age 35 to 44 in 1960 should not be severely affected by demands of motherhood. This is in contrast to the experiences of the cohort ages 20 to 35 in 1960. This latter group would be affected either by the actual demands or the potentiality of motherhood. This dissertation indicates that the subject merits further research.

APPENDIX I

The procedure of Multiple Classification Analysis (MCA) changes into a more interpretable form the results of both analysis of variance and "dummy variable" regression (Andrews et al. 1967). For each of the independent variable categories the MCA calculations estimates the mean level of the dependent variable. MCA also calculates the net effect on the dependent variable from being in a category and expresses the effect in terms of deviations from the mean level for the entire sample. First the appendix discusses the relation between MCA, analysis of variance, and "dummy variable" regression. Then the appendix discusses the impact of marital status on the functional relation between age and hourly wages with the aid of MCA results.

As discussed in Chapter Five of Andrews et al. (1967), MCA is analysis of variance with unequal cell numbers. The procedure calculates the "true" effects of categories of predictors. It then calculates the effect of being in a category by estimating the value of "fitted constants." A "fitted constant" is termed an MCA adjusted net effect. MCA assumes that the weighted net effects sum to zero. Each net effect indicates the

effect of being in a category "if the group had been exactly like the total population in its distribution over all the other predictor classification" (Andrews et al. 1967, p. 101).

The MCA calculations are also the same as those made in "dummy variable" regression on least squares criteria. In "dummy variable" regression a dichotomous variable indicates membership in a category with one category omitted in order that the system is solveable. For each specified category the partial regression coefficient expresses the extent members deviate in the value of the dependent variable compared to the value of the omitted category. The MCA procedure converts these deviations from the omitted category to deviation from the mean level of the dependent variable for the sample.

Bowen and Finegan (1969, Appendix A) present a direct manner of calculating MCA results from dummy variable regression equations. They calculate an adjusting coefficient from the $\sum_{i=1}^{n} \sum_{j=1}^{n} p_{ij}b_{ij}$ with p_{ij} defined as the proportion of the sample in category ij and b_{ij} defined as the partial regression coefficient of category ij. Their adjusting coefficient omits the $\sum_{j=1}^{n} p_{ij}b_{ij}$ of the ith variable being considered and includes the intercept of the regression equation. The addition of b_{ij} for the ith variable to the adjusting coefficient estimates the mean of the dependent variable for people in the jth category of variable i.

These predicted means for the categories of variable i deviate from the actual mean of the sample by the size of the MCA adjusted net effect.

In this dissertation the MCA results were calculated frequently in the procedure specified by Bowen and Finegan. One deviation from the technical procedure for MCA was made. The functional relationships between the dependent variable and several independent variables were considered linear. Each of these independent variables was measured in interval scale in the equation. These variables were weighted by their means to calculate the "mean effects" of the variables. These "mean effects" were included in the adjusting coefficient. The "mean effects" calculate the effect if the group had the same mean level of the variable as the mean average of the total sample. Consequently, the MCA adjusted net effect indicates the influence of being in the ijth category for a group which had the average value of interval variables and the modal distribution on other dichotomous variables as possessed by the total sample.

For this analysis MCA was calculated separately for men and women. Age was coded 20 to 34 years, 35 to 44 years, and 45 to 64 years for both sexes. Among women the age variable was combined with marital status, ever-married and never-married, to form a pattern variable. This is a variable which absorbs the effects of interaction by

determining the effects of each joint category. Education was added to the model to eliminate the effects of a variable known to be an important contributer to hourly wages which is the dependent variable. Education was coded as less than 8 years, 8 to 11 years, 12 years, and greater than 12 years. The sample for the study was a random subsample of women and men from the one-in-one thousand sample of the Census of the Population: 1960. Wage and salary workers employed 50 or more weeks in 1959 and 35 or more hours in the Census week were sub-sampled. In addition, the sample was restricted to the white civilian non-agricultural labor force.

To analyze the net effects of the age variable, the mean wage for each category was plotted for both sexes. The effect of an increase in age was indicated by connecting the plotted points for men, for ever-married women, and for never-married women. The three age categories in the pattern variable belonging to never-married women estimate the effects of age on the hourly wages of never-married women. When the same procedure is applied to ever-married women, the interaction effect of marital status on age effects can be identified. Both patterns can then be compared to the age effect pattern of men. In addition, the education effects of all men and all women can be separated from the age effects. If there is interaction between marital status and age effects, the net age effects will be quite different for the two marital status categories,

indicating different regression slopes of hourly wages on age. This procedure was designed by the present author to identify the functional form for the relationship between age and wages for men, ever-married women, and never-married women.

Following Andrews et al. (1967), the net effects of educational categories and age categories were added to the grand men for the group in order to calculate the average wage of people with the particular effect, see Table 1. The net effects are the effects of being in the category, for example youngest age level, controlling the effects of the other variable sets, for example education. In order to facilitate the analysis, a figure was constructed which plotted the mean wage for each age category adjusted for gross age effects and age effects net of education. The plotting in Figure 1 indicates that while not exactly the same pattern in detail, the age effects of men and age effects of never-married women were generally the same. Apart from education, higher age level increased the average wage for both groups. But ever-married women had a distinctly different pattern. The wage of ever-married women started at $1.68 in the youngest age level, decreased to $1.61 at middle age, and increased back to $1.65 at the older age. There is evidence that marital status interacts with age effects. As proposed in Chapter II, the age-wage relationship of never-married women parallels that of men, but the age-wage relationships of

ever-married women had a distinctly different functional form from that of men.

Empirically there is support for the proposal to stratify women by marital status. Consequently, they will be stratified into ever-married and never-married women.[1] The sample will also be sub-divided into strata defined by ages 20 to 34, 35 to 44, and 45 to 64. Probably the most important result in terms of subsequent analysis is that the age effects of never-married women closely duplicated the effects for men as was predicted by previous theoretical and empirical work.

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[1]Part of the difference in age effects by marital status reflects the effect of motherhood on ever-married women. If motherhood is taken into account, age effects are similar for both marital groups. However, motherhood cannot enter the regression equations for men as the Census does not provide this information. Age effects serve as a proxie for the discontinuous employment of ever-married women who become mothers.

TABLE 1.--Mean Wages and Net Effects of Education, Age of Men, and Age=Marital Status of Women Adjusted by Multiple Classification Analysis for White Men and Women: 1960[a]

Variables	Men		Women	
	Adjusted Wage	Net Effect	Adjusted Wage	Net Effect
(1)	(2)	(3)	(4)	(5)
Education:[b]				
Below 8 years	$2.67	-.08	$1.61	-.09
8 to 11 years	3.11	.37	1.78	.0
12 years	3.10	.35	1.88	.17
Above 12 years	2.58	-.17	1.70	-.02
Age:				
20 to 34	2.37	-.38	-	-
35 to 44	2.88	.13	-	-
45 to 64	2.98	.23	-	-
Marital Status Age:				
Never-Married Women				
20 to 34	-	-	1.67	-.03
35 to 44	-	-	1.82	.12
45 to 64	-	-	2.36	.66
Ever-Married Women				
20 to 34	-	-	1.67	-.03
35 to 44	-	-	1.61	-.09
45 to 64	-	-	1.65	-.05
Stratum Mean Wage	2.75	-	1.71	-

[a]Group specific means are apart from 'proportional effects' of the other variables in column one. Net effects expressed a deviation from the stratum mean wage. Sample consists of full-time wage and salary workers in the civilian nonagricultural labor force.

[b]Adjusted for effects of age with men and the effects of age-marital status with women.

Source: Sub-sample of the one-in-one thousand sample of the Census of the Population: 1960.

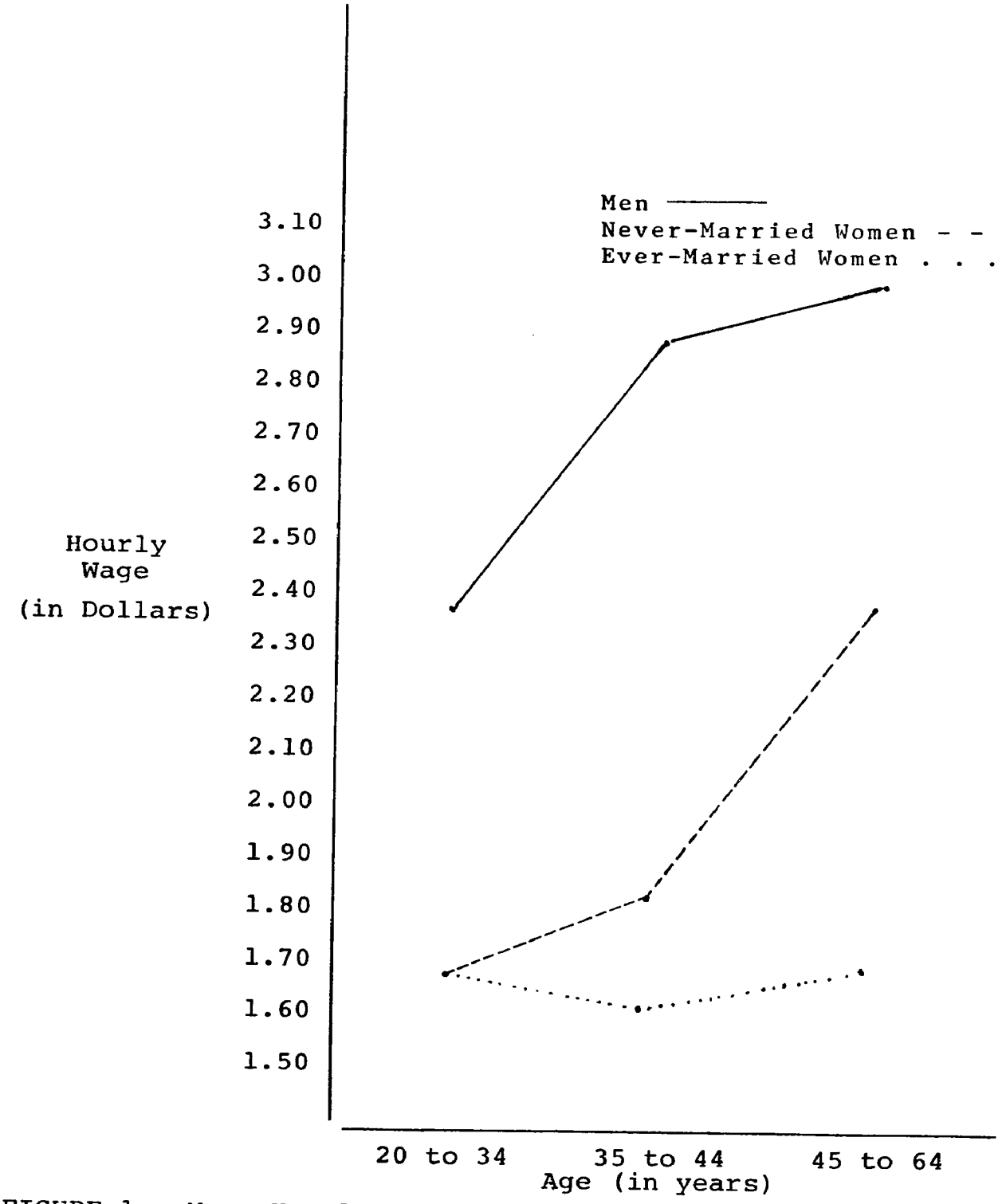


FIGURE 1.--Mean Hourly Wages of Age Categories Adjusted by Multiple Classification Analysis for Effects of Education for White Men and Women by Marital Status: 1960

Source: Random subsample of the one-in-one thousand sample of the Census of the Population: 1960.

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