

Chapter 12

**Office Automation and
Differentially Affected Groups:
Working Women and Minorities**

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Office Automation and Differentially Affected Groups: Working Women and Minorities

This chapter gives closer attention to two overlapping groups within society who have an especially strong stake in the long-range impacts of office automation—working women and workers belonging to racial and ethnic minorities. A number of issues are now actively before Congress related to employment and economic equity for women and minority groups. This assessment is not primarily directed at exploring these complex clusters of issues. The assessment nevertheless reveals obvious relationships between office automation, as a broad technological, economic and social trend, and the special concerns of working women and minorities, which have been noted throughout the report. This chapter is intended only to provide some general background on these themes in the hope of contributing to future, more detailed assessments of the effect of technological change on these issue areas.

Many of the trends discussed throughout this report will affect women office workers as compared to male office workers either differently or to a different degree, because men and women tend to be concentrated in different occupations, jobs, and industries, and at different levels of organizational hierarchies. Economic, social, and legal conditions of long standing, largely unrelated to technology, have a bearing on how technology effects the life of specific groups within the larger society.

With office automation there will be fewer jobs in some occupational categories and more in others; those now held predominantly by women are most likely to decrease in number,

and those that women increasingly aspire to hold will change in less predictable ways. The possibility of working at home tends to have a different meaning for men and women because their family roles tend to be, at present, very different.

Congress now has before it a number of bills dealing with pay equity and comparable worth. These issues are not directly tied to office automation, but because automation will affect both the number and nature of office jobs and the skills they require, any attempts to compare jobs within a specific formal job classification or the demands of jobs across formal classifications must take such changes into account. The resolution of these issues will of course be determined by many other factors besides judgments about the comparability of jobs. Legal and regulatory pressures as well as economic, behavioral, and attitudinal factors and explicit management decisions affect how jobs are designed, how they are filled, and how they are compensated.

Section 1 of this chapter provides some background on the history of women's position in office work, summarizes their present white-collar occupational status, briefly discusses the evidence for pay inequity in white-collar jobs—particularly those directly tied to computer-related work—and highlights the relationship between these issues and the potential effects of office automation. The potential effects of office automation on minorities and their relatively recent entrance into these positions is explored in section 2.

SECTION 1: WOMEN IN THE WORKPLACE

The History of Women and Work in the Office

In the early 19th century men performed clerical work in offices as an apprenticeship in business. This was the first step on a career ladder that led to management positions. The tremendous expansion in commerce in the mid-19th century and the accompanying expansion in paperwork required a great expansion in the office work force. Many businesses grew in scale after the Civil War from small firms with a few clerks and office boys into large corporations with national and international interests. Organizations were restructured into functional divisions and clerical work tended to be broken down into specialized tasks requiring an increase in supervisory positions.

The first significant recorded use of women in an office in the United States occurred during the Civil War when, in spite of great opposition, the U.S. Treasurer General, Francis Elias Spinner, hired women clerks to alleviate a severe shortage of available male labor.¹ By 1880, offices were being mechanized with typewriters and telephones. Organizations (sometimes unwittingly) began to recruit women for de-skilled clerical jobs while the men retained the management/administrative jobs.² For example, "The Bowery Savings Bank of New York installed its first typewriter in 1894—without realizing that only females had been trained to use the new-fangled contraption. So the bank promptly hired its first women. . . ."³ Although the new technology, typewriters, did not cause the expansion in office work that brought about the recruitment of women, it did facilitate the movement of women into office work, in that typing was not pre-labeled as "men's work" and therefore unsuitable for women.⁴

¹Margery Davies, *Woman Place Is at the Typewriter* (Philadelphia, PA: Temple University Press, 1982).

²Joan Scott, "The Mechanization of Women's Work," *Scientific American*, vol. 24, No. 3, pp. 167-185.

³Sidney Feldman, "Women in Banking: An Overview of an Underutilized Resource," *The Bankers Magazine*, vol. 166, March-April 1983, p. 70.

⁴Davies, op. cit.



Women were not accepted wholeheartedly into the labor force. There was strong opposition from young men who felt they would be losing opportunities because women worked for less pay. Many people felt that women would lose their femininity if allowed to work in offices and would then be unsuitable wives and mothers. Proponents argued that office work did not denigrate women but rather provided them with training that would make them better household managers, and also argued that the office would benefit from women's "higher moral code."

When the U.S. economy was mainly agricultural, women were an equal and important part of the economic team maintaining a family farm. In addition, single working-age wom-

¹Davies, op. cit., ch. 5

en were often expected to earn some income from at-home work such as sewing, knitting, and preparation of food for sale. When women left the farm to work, it was as domestic workers and later as factory workers. For women, this meant higher wages and increased economic independence over work at home. However, their wages were still quite low and working conditions poor.

When office work became available to women, there was a large pool of women to seek these jobs, which were easier, cleaner, and had more status than factory jobs. Small farm employment declined from three-fourths of the labor force in 1820 to one-half in 1880. During this period many small family farms were barely able to make a living or went out of business, requiring their daughters to seek employment elsewhere.⁶ The same thing was happening to many small family businesses that had used the unpaid labor of the owners' daughters.

In the first half of the 20th century, educational levels were increasing significantly, with many more women than men completing high school. Since literacy was required for office work, women gradually became the preferred sex for clerical employment in expanding businesses. Commercial business schools became common in the 1850s to fill the needs for clerks trained in office skills. They offered arithmetic, bookkeeping, penmanship, stenography and by 1880, typewriting. By 1890, they enrolled 80,000 students (for comparison, grades 1 through 12 enrolled 298,000 at that time).⁷

Until late in the 19th century, these students had been almost entirely men, but with the restructuring of businesses and office work and the cutting off of the career ladder from clerk to manager, men instead sought training in business management in the universities, whose now proliferating business schools did not admit women.

The opportunity to work in offices brought women into the labor market in steadily in-

⁶Davies, op. cit., ch. 4.

⁷Janice Weiss, "Educating for Clerical Work: The Nineteenth Century Private Commercial School," *Journal of History*, spring 1981, p. 407.

creasing numbers after 1890. In 1890, 17.4 percent of women aged 20 to 64 were in the labor force; by 1920, 22.9 percent and by 1940, 29.4 percent.⁸

In 1984, the participation rate for women aged 20 to 64 was 64.1 percent. Historically nonwhite women participated in full-time work in greater numbers than white women, but were limited to fewer occupations. Their rate in 1890 (for the same age group) was 39.3 percent and is currently 65 percent. Work force participation for men is about 75 percent.

The burgeoning of office work influenced women's increased participation, but other factors were also powerful. Birth rates had been declining throughout American history; whether this was a cause or an effect of women's growing participation in the work force is a matter for some debate. Birthrates declined in the period 1890-1947, reaching historic lows during the 1930s. The birthrate increased rapidly during the 1950s, the baby boom years. These periods were paralleled and reflected in labor force participation rates for women of childbearing years, which increased steadily between 1890 and 1947, and decreased for 20- to 40-year-old women in the 1950s.⁹

During this century, the acceptance of married women in the labor force slowly increased. In 1900, less than 2 percent of married women were employed, and employers often fired working women who married and did not voluntarily leave. But from 1920 to 1940 their participation rate doubled, from 9.7 to 20 percent.¹⁰

Women's participation rates in past decades did not increase at the same pace for all age groups. Women went to work in great numbers during World War II. Women whose children were past early childhood tended to stay in the labor force after the war, while the par-

⁸James Smith and Michael Ward, "Women's Wages and Work in the Twentieth Century" (The Rand Corp.) October 1984.

⁹Ibid. p. 5.

¹⁰Ibid. pp. 7-9.

ticipation of younger women dropped considerably in the late 1940s.¹¹

Discrimination kept the majority of women working in offices in clerical positions until recent times. In 1919, Civil Service examinations covered 260 occupations, but for nearly 60 percent of those occupations, the examinations were not open to women.¹² As recently as the 1960s positions were advertised in newspapers as "male" and "female."

Current and Future Labor Force Participation of Women

In 1984, 53 percent of all women aged 16 or older were in the labor force in the United States, totaling nearly 44 percent of the civilian work force.¹³ Between 1972 and 1982, women accounted for 68 percent of the 14 million increase in employment in white-collar occupations. For those women born in 1951 to 1955 (now 30 to 34 years old) the participation rate is now 66.7, a considerable increase over earlier cohorts.¹⁴ As older women, who were raised, educated, and socialized when the traditional nonemployed housewife was the norm, decline in numbers, the overall participation rate can be expected to rise. Moreover, the birth rate is likely to remain low, and there has been a dramatic increase recently in continued labor force participation of women during childbearing years, including continued participation by mothers of young children.

The available work force in 2000 will consist predominantly (75 percent) of people already in the work force in 1985. Today, 80 percent of the clerical work force is female, and 30 percent of working women are clerical workers. That gender segregation in clerical jobs has, over the long range, been increasing in

¹¹Women's household burdens decreased during the early 20th century because of fewer children and because of the introduction of labor-saving devices for the home. There is still debate, however, as to whether or not this provided housewives with extra free time; there were also fewer women per household, the family servant disappeared, and new tasks appeared, Davies, op. cit., app. table 5.

¹²*Employment and Earnings* (Washington, DC: U.S. Department of Labor, Bureau of Labor Statistics, January 1985), p. 156.

¹³Smith, op. cit., p. 8.

spite of changing social attitudes and public policy objectives. Women continue to cluster in traditionally female occupations, constituting 80 percent of all administrative support workers compared to only 32 percent of managers, administrators, and executives in 1983.¹⁵ These higher level jobs account for only 7 percent of all jobs held by women, even though they include many members of the traditional female occupations of registered nurse, health technician, elementary school teacher, librarian, and social worker. Where women are in management positions, they are mostly in the lowest rungs of management."

A report on Microelectronics and Working Women for the National Research Council notes that although there has not been widespread labor displacement of women by means of layoffs, there has been lack of growth in occupations that have been their main source of employment.¹⁷ In the United States, employment growth in the clerical occupations shows a lag behind increases in the volume of business in insurance, banking, and other offices where women have been so highly concentrated. A Canadian study confirms that jobs such as secretaries, filing and other office clerks, bank tellers, keypunch operators, telephone operators, mail handlers, and the supervisory personnel for these positions are among the slower growing occupations.¹⁸ OTA's analysis (chapter 2) points to a long-range decline in jobs held predominantly by women. Already employment declines have occurred in the heavily automated insurance industry in keypunch operators, bookkeepers, file clerks, mail handlers, and typists.¹⁶

¹⁵*Facts on Women Workers* (Washington, DC: U.S. Department of Labor, Office of the Secretary, Women's Bureau, 1984).

¹⁶*Time of Change: 1983 Handbook on Women Workers* (Washington, DC: U.S. Department of Labor, Office of the Secretary, Women's Bureau, 1983), Bulletin 298, pp. 52-53.

¹⁷Diane Werneke, "Microelectronics and Working Women: A Literature Summary," *Committee on Women's Employment and Related Social Issues* (Washington, DC: National Academy of Sciences, 1984), prepared for the National Research Council.

¹⁸Werneke, op. cit.

¹⁹Eileen Appelbaum, "The Impact of Technology on Skill Requirements and Occupational Structure in the Insurance Industry, 1960-1990" (Philadelphia, PA: Temple University, Apr. 1, 1984).

Future employment opportunities for women, although dependent on growth of total demand in the economy, may be more dependent on the opportunity for increasing their skills, work experience and upward job mobility, which would allow them to take advantage of changing job requirements. However, these opportunities may not materialize. In the insurance industry, as overall female employment has increased in all job categories, the professional jobs into which they have moved have frequently been changed to lower pay levels to reflect lower skill levels.²⁰

New jobs are emerging in the computer and technical specialist occupations, especially for engineers, computer analysts, and paraprofessional computer technicians, positions in which relatively few women are employed. According to the Bureau of Labor Statistics, computer specialist jobs increased from 275,000 in 1972 to 585,000 in 1980. Women increased their share of these jobs from 17 percent in 1972 to 26 percent in 1980. However, women were more likely to be programmers than systems analysts (a higher level, higher paid position).²¹

Whether it cuts off career ladders, eliminates unskilled clerical work, or requires more or different training and skills, office automation will change the nature and skill requirements of traditional office occupations and jobs.²² Whether or not these changes will be reflected in changes in job title, job classification, and compensation levels remains to be seen. Historically, "women's" jobs have paid less than "men's" jobs. The figures comparing men's and women's average salaries are well known, as are the many discussions of the reasons for

the differences. The reasons usually offered include differences in education and experience, occupational and industry choices, job mobility and number of hours worked. However, men who go into "female" lines of work earn more than women in those fields. Female full-time, year-round clerical workers had a median income of \$10,997 in 1980 while male clerical workers had a median income of \$18,247. A similar differential is found in all occupations.²³

Pursuing a career in the computer industry does not automatically alter traditional relationships. There were compelling reasons to expect to find relatively little male-female disparity in computer-related occupations, especially programming. The occupations are new, women have been involved in the field from the beginning, there has been a steady sellers' market, and the growth of the industry coincided with implementation of affirmative action and equal employment regulations. However, women are paid less than men in every computer specialization, in every industry, and at every organizational level.²⁴

The possibility of a general decline in compensation associated with de-skilling of work and enhanced interchangeability of workers (generally in conjunction with anticipated job polarization) is also of concern to some researchers. While these conditions have been noted in specific organizations, particularly those in office-oriented industries, the counter trend toward job enlargement in both office-oriented industries and general offices may provide some offset. Another uncertainty is the effect of large-scale shifts in the structure of the economy, together with changes in labor supply, on the wage structure (holding job content constant).

Some observers express concern about undercompensation for skills that may not be

²⁰Barbara Baran, "Insurance Industry and Trade Strategies," draft report prepared for the Office of Technology Assessment, September 1984, p. 6.

²¹Carol Boyd Leon, "Occupational Winners and Losers, 1972-80," *Monthly Labor Review*, June 1982, p. 22.

²²Arbeidsnotat fra forskningsprøvet "Teknologiens betydning for kvinners arbeidsliv" (Working Paper From the Research Program "Technology and Women's Work") *Journal for Social Research*, vol. 23, 1982, pp. 519-534; Roslyn Feldberg and Evelyn Glenn, "Technology and Work Degradation: Effects of Office Automation on Women Clerical Workers," *Machina Ex Dea*, Joan Rothschild (ed.) (New York: Pergamon Press, 1983), p. 72; and Baran, op. cit., p. 136.

²³"American Women: Three Decades of Change" (Hearings before the U.S. Congress, Joint Economic Committee, Washington, DC, Nov. 9, 1983), Testimony of Lewis Kincannon, Bureau of the Census, p. 26.

²⁴Philip Kraft, "Computers and the Automation of Work," State University of New York at Binghamton and Center for Survey Research, University of Massachusetts, 1984.

captured in formal job descriptions but are nevertheless essential. Automation may de-skill some jobs, but it may also involve a change from manually intensive work to mentally intensive work that requires closer attention and increased responsibility for accuracy. Increased knowledge about the operations of the whole organization may be required to ensure accuracy of data input. These "invisible skills" become apparent only when they are not performed well."

As office automation changes tasks and jobs, blurring the distinctions between "men's" and "women's" work and between clerical and professional work, the opportunity is available to objectively evaluate jobs, their skill requirements, and compensation. Major changes in the occupational mix and in job content are likely to bring about pressure for new pay structures. In economic theory, individual pay is a function of the contribution of the individual to the organization's output; hence, pay generally increases with productivity. In a competitive market wages are also influenced

²⁵Joan Greenbaum, Cydney Pullman, and Sharon Szymanski, The Labor Institute, "The Impact of Office Automation on the Municipal Workforce of New York City: A Case Study, contract report for the Office of Technology Assessment, April 1985.

SECTION 2: OFFICE WORK AND MINORITIES

Black workers account for 10.2 percent²⁶ of the clerical work force, which is comparable to the black share of the labor force and the population. Hispanic Americans account for 5 percent of this occupational category." For minority women, especially, the movement into clerical jobs has in fact represented an important channel of upward social mobility.²⁸

²⁶*Employment and Earnings* (Washington, DC: U.S. Department of Labor, Bureau of Labor Statistics, January 1985), p. 177.

²⁷The Hispanic category includes black and white Hispanics, so the true number of black clerical workers is difficult to ascertain.

²⁸See: Diane Nilsen Westcott, "Blacks in the 1970s: Did They Scale the Job Ladder?" *Monthly Labor Review*, June 1982;

by supply and demand. For example, an abundance of teenage candidates for fast food-service work in the recent past may be one reason why the pay is low. That situation is changing now with the decrease in the number of young workers entering the labor force. But in practice, other factors confound pay structures so that there may not be a direct relationship between the pay and the supply of workers. If fast food restaurants in the future were faced with raising pay rates to attract needed workers, they could further automate their tasks and insist on more self-service by customers. It is evident from the experience in other consumer service industries, for example banking, that we are becoming more and more a self-service society. This could also be the case in offices as professionals perform their own typing and graphics tasks and clients input information directly into computers, receive output directly into their own computers, and print the information themselves.

The effect of information and communication technologies on the nature of work, on job classifications, and on compensation structures is thus far broader than the issue of pay equity and comparable worth for women, but it will have a direct and immediate relationship on those discussions.

(See table 12-1.) They began moving into office work in significant numbers only in the 1950s. Black women increased their share of clerical jobs by 163 percent between 1950 and 1960. Women of Hispanic origin increased their share by 333 percent,²⁹ now making up about 4 percent of the clerical work force.

Center for the Study of Social Policy, "A Dream Deferred: The Economic Status of Black Americans, July 1983; and Thierry Noyelle, "The New Technology and the New Economy: Implications for Equal Opportunity," work in progress, Columbia University, New York, February 1985.

²⁹*U.S. Census of Population for 1950: Occupational Characteristics*, Special Report P-E No. 1 B, p. 1B-31; and *U.S. Census of Population, 1960: Occupational Characteristics* (Washington, DC: U.S. Department of Commerce, Bureau of the Census, p. 23).

Table 12-1 .—Minority Employment in Administrative Support Occupations, 1950=80

Year	Total	White		Black		Other	
		Male (%/0)	Female (%/0)	Male (%/0)	Female (%/0)	Male (%)	Female (%)
1950	6,864,600	2,476,710 (36.1)	4,187,820 (61.0)	109,740 (2.1)	75,060 (1.1)	5,580 (0.08)	9,690 (0.14)
1960	9,617,874	2,821,463 (29.3)	6,048,678 (63.3)	184,823 (1.9)	197,263 (2.1)	22,500 (0.23)	41,998 (0.44)
						Hispanic	
						Male (%)	Female (%/0)
1970	13,748,260	3,258,901 (23.7)	9,346,947 (68.0)	330,492 (2.4)	691,097 (5.0)	144,309 (1.1)	297,116 (2.2)
1980	16,851,398	3,235,744 (19.2)	11,325,716 (67.2)	435,365 (2.6)	1,200,516 (7.1)	234,132 (1.4)	595,461 (3.5)

SOURCE: Data are derived from the U.S. Department of Commerce, Bureau of the Census, U.S. Census for 1950-1980. Washington, DC.

Between 1960 and 1976 the proportion of minority women workers employed as domestics dropped from 35 to 9 percent, while the percentage employed in clerical work increased from 9 to 26 percent, and the percentage in professional and technical jobs rose from 7 to 14 percent. Half of all minority women were in the work force in 1976, compared to 47 percent of white women. The movement of black and Hispanic women into office occupations has thus occurred almost entirely within the last 30 years and has aided many of them to move into the middle class.

By 1980, over 29 percent of employed black women held clerical jobs, and 14 percent held professional jobs. The wages of all minority women relative to white women rose from 70 percent in 1960 to 94 percent in 1976.³⁰ But between 1976 and 1980 their income slipped to 86 percent of that of white women. In 1976, black female clerical workers' wages were 107 percent of that of white female clerical workers, but it slipped to 97 percent in 1980.³¹ One reason for the higher level in 1976 is thought to be that black women had been in these jobs longer and thus had higher pay levels because of seniority. After 1976, higher paid, educated black women may have been moving out of clerical work and into supervisory, manage-

ment, and professional jobs as these options opened up for them.

Black and Hispanic males also increased their share of clerical jobs considerably between 1950 and 1960. Black males held a larger share of clerical positions in the 1950 census than did black females. The balance changed however by the time of the 1960 census, when black women slightly outnumbered black men in clerical jobs; they have increased this gap steadily since 1960.

During the 1970s, minority workers made significant gains in moving into white-collar occupations and in advancing within these occupations. Their share of professional jobs such as credit and collection managers and office managers increased tremendously as did their share of clerical jobs such as bill and account collectors, secretaries, and statistical clerks. The jobs that showed the largest growth for minorities between 1972 and 1981 are shown in table 12-2. Many of these positions are, however, still at the lower end of the scale and thus most likely to be affected by job displacement from office automation; the black workers also tend to have least seniority since these jobs became open to them only in recent years.

Because of a growing economy and the active interest in social change in the United States, employment opportunities for minorities have seen noteworthy improvements in the last two decades. However, black workers still have significantly higher unemployment

³⁰ "Minority Women Workers: A Statistical Overview," *Manual on Pay Equity: Raising Wages for Women's Work*. Joy Ann Grune (ed.), Committee on Pay Equity, November 1981, pp. 31-34.

³¹ Westcott, *op. cit.*, p. 37.

Table 12.2.—Minority Employment in Selected Occupations as a Percent of Total Employment, 1972 Compared to 1981

Occupation	Minority employment	
	1972	1981
Computer specialists	5.5	9.4
Bank officials and managers ...	2.6	5.5
Credit and collection managers .	1.4	4.4
Office managers,	1.0	4.0
Bank tellers	4.9	7.6
Billing clerks	6.7	10.5
Bookkeepers	3.6	6.3
Collectors, bill and account. .	5.0	10.8
File clerks	18.0	22.9
Secretaries	5.2	7.2
Statistical clerks	8.4	15.1
Typists	12.0	17.8

SOURCE U S Department of Labor, Bureau of Labor Statistics, *Current Population Survey A Databook* vol 1 Washington, DC 1982 pp 651667

rates than whites and also higher rates of involuntary part-time work. Both of these trends could be intensified by the use of office automation. The changing nature of skills required for beginning and mid-level jobs and the changing nature of job training (see chapter 3) will also have an effect on the future employment levels of minorities in offices, unless their access to training is increased. Minority workers will have to find ways to obtain the more formalized and more off-the-job training required to fill positions in the office.

Another problem for the minority workers is the strong trend in the last decade for offices to move from the central city to the suburbs, and for business and industries to grow in the South and Southwest and shrink in the Northeast. Because 55 percent of black Americans live in central cities, as compared to 24 percent of whites, and only about 22 percent of blacks live in the suburbs, the movement of offices from central cities to suburbs decreases their opportunity for office employment. Government employment in central cities, which has been a significant source of employment for minority workers, is likely to stabilize and may well decline. The shift of office work to the Southwest tends to further decrease the access of black women to office jobs, although it increases opportunities for Hispanics.

The greater instability of worklife for minorities and their concentration in the lower level clerical jobs indicates that their efforts to better their status may be more difficult in the future than it has been in the past decade. The availability to them of training and education and the continued growth of the U.S. economy is of the highest importance if minorities are to maintain and increase the progress they have made.