

The Effects of Microtechnology on Working Women

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This paper is an overview of opinions, and an analysis of technological change. It considers the debates about the possible consequences of new technological innovations for women in the work force, particularly in the service sector. Although predictions are exceedingly difficult to make, to a large degree the effects of technology on our society's social and economic structure will be based in the conditions which prevail today. By looking at present conditions it is easier to assess the future possibilities and form of technological change.

Technological change is a modern commonplace, often considered to be closely linked to the general progress of humankind as a whole. But the process and causes of technological evolution are hard to isolate, and it is often difficult to predict with precision the trajectory of technological change. Thus there are very different prognoses of its effects on women. Some researchers have described the development of the microprocessor (the 'chip') as a revolutionary new innovation which will influence all aspects of production and of work life:

Because microelectronics can now be introduced in almost every sector of society, the chip will have far-reaching implications in every sphere of economic activity and in every area of employment.

While the extent to which the diffusion of the 'chip' constitutes a revolution or an evolution is debatable, it is almost universally accepted that the microprocessor will affect women workers more than any other group. This is not a result of any inherent qualities of the microprocessor itself, but is simply a result of the fact that the structure of the present labour market makes it more likely that technology will be used in areas where women workers are concentrated.

The microprocessor is designed to increase the efficiency and ease of the handling of information, and it is in information-based industries that women workers predominate. The labour-intensive nature of office work makes it more fruitful ground for the application of technology; hence, the future of female employment is likely to be influenced differently than the employment of men. Moreover, the introduction of the chip and its extensive use throughout the production process has implications for the organization of work, and thus is likely to change the quality of women's working lives. Whether or not the introduction of microprocessor technology into women's work will create a new Taylorist form of work organization involving increased specialization and division of tasks, or whether it will result in a reintegration of skills, is central to the debate over the possible future forms of work organization.

More generally, changes in the quality of women's work lives will have great implications for the future of the women's movement and for women's struggles for equality in the workplace. In this way, the influence of microtechnology on the working life of women is likely to be felt throughout society as women's economic, social and political circumstances change. This overview of the prevailing analyses will identify the likely course of technological change, i.e., its effect on women's social and economic position. It will, in addition, try to identify some of the external factors which bear on women's future position as a result of the microchip. A reorientation of government, corporate and women's perceptions may be necessary to influence the course of technological change so that it improves, rather than reduces, women's ability to influence their own social and economic circumstances.

I. Women in the Workforce

The trend in most industrialized countries since the end of the Second World War has been an increase in the presence of women in the workforce. Some of the reasons for this phenomenon include changing social conditions, economic pressures for a second income, and a generally expanding economy which has been able to absorb women who also have family duties. While the presence of women in the labour force has been expanding, by and large this growth has not been at the expense of men. Women have entered jobs not previously considered to be 'male' or 'female' occupations. For these reasons this tendency creates little competition between men and women for 'women's jobs.'

No competition occurred because women's expansion into the labour force coincided with the growth of the service sector, and with the expan-

sion of the economy as a whole. While more women are working, the jobs they are taking are concentrated in the service sector (women fill 80% of service sector jobs).² The International Labour Organization states that the rapid growth in the service sector industries occurred during a period of economic expansion which increased demand for services. Because the service industry is traditionally labour intensive, growth meant a higher demand for workers, and as more women became employed demand for some services increased as a consequence. The increased employment of women was thus the result of the entry of new women (married women with children) into the workforce rather than transfers from other sectors.³

As 'clustering' of women's employment across economic sectors is evident, the phenomenon is compounded by segregation within the service sector. These areas are non-manual occupations such as banking and commerce, clerical work, and professional and technical jobs. Within the professional and technical group, women are concentrated in teaching and health care. In the service group women tend to work in domestic service and catering.⁴ In the United States, women represented 68% of all clerical workers and 40% of all sales workers in 1960. In 1979 these figures had increased to 80 and 46% respectively.⁵ An analysis of the hierarchical location of women's jobs in the service sector indicates that women are clustered in those jobs at the lowest end of the scale. Industrial market economies show the highest degree of clustering, socialist countries less so, although in both cases a high proportion of women are concentrated in clerical work. In Britain:

Women hold 74% of office jobs, and these comprise 36% of women's total employment. In particular office occupations, women hold almost all jobs: 98.6% of secretarial, shorthand and typing jobs, for example. Eighteen per cent of women office workers work in manufacturing industries as against 66 per cent in services industries.⁶

Most part-time workers are women and a greater proportion of all women employed, when compared to men, are in part-time employment.⁷ Two factors explain the large numbers of women in part-time jobs in industrial market economies: 1. an increase in part-time jobs in the service sector and 2. an increase in the labour force participation of married women with children for whom part-time work is more desirable.⁸ Women make up the majority of part-time workers in trade, finance, clerical and sales jobs, despite the fact that part-time work is more prevalent in retail trade than in wholesale trade, banking and insurance.⁹

This prevalence of part-time work among female workers presents ob-

stacles to unionization, and, as a result, women's participation in unions has been low. Part-time workers tend to spend less time at work and therefore to be less concerned with issues surrounding the workplace. Women with children find themselves overburdened and have no time to participate in unions, and turnover rates tend to be high among female workers. Drives for greater organization also tend to be focused in the industrial sector, where women are underrepresented. These low levels of unionization among women may also compound the 'clustering' effect. Despite these problems, women's overall level of unionization has been increasing as women's participation in the work force rises.¹⁰

The 'clustering' of women into part-time, low-status work has a number of consequences. The most obvious result is that women will often find themselves in positions subordinate to men, a situation which further reinforces women's relative social powerlessness. Women are more likely to have low-skilled and routine duties as file clerks, typists, key punchers, price taggers and cashiers. Although such jobs may not lack responsibility, women have little knowledge of planning and organization of work as whole. Such low-skilled low-status work is often paid little, and the lack of unionization contributes to the possibility of economic exploitation. Most service sector jobs for women are similarly considered to be 'dead end,' with little or no chance for advancement.¹¹ Women workers are also vulnerable to job loss during economic downturns, even though many women work out of necessity.

The most important consequence of women's low position in the hierarchical labour market is their unique vulnerability to technological change. In terms of employment effects and of quality of work life, women are concentrated in occupations which are most susceptible to the introduction of new technologies. There are three main reasons why women are more vulnerable to the effects of technology in the workplace. First, women are concentrated in the service sector where technology has not been applied in the past, and so the likelihood of new technologies being introduced into these areas is increasing. Clerical work has grown at a faster rate than production work, yet capital investment is much higher in the production sector than in the office. There is a focus on the high paper component and the need to reduce time wasted retrieving and storing information.¹² Second, women do the types of jobs within the service sector which are easily adapted to new technologies, being labour intensive. Due to the fact that most occupations dominated by women involve information handling, and because such jobs are low-skilled, routine or monotonous tasks, they are much more open to mechanization. Third, labour-intensive work is subject

to cost-cutting measures as the number of women workers increases and the cost of labour rises. Increased competitive pressures created by economic recession increase these tendencies for managers to eye the office with a view to reducing costs and increasing productivity in this area. The diffusion of the microprocessor will undoubtedly be the most important cause of future adjustments.

Future trends in women's participation in the labour market indicate a higher rate of structural unemployment—where there will be fewer job opportunities for women workers. Technological change, or the adoption and diffusion of new innovations throughout the economy, may take 5–20 years for the first applications, and widespread use may occur within 1–15 years.¹³ Clerical work, the mainstay of female work for the last couple of decades, is likely to be a less promising area of future employment than it has been in the past. While the numbers of women entering the workforce is likely to increase, thus offsetting the projected drop in the labour force due to demographic factors, the absorption capacity of the market is in doubt because of the segregation of women into the service sector.¹⁴ Technological displacement could result in a lowered growth rate in the number of low-skilled clerical jobs available. Projections are notoriously difficult to make, but because of the segregation of the female labour force to service sector jobs, and to low-skilled low-paid work in all sectors, women as a group will likely be affected negatively by the diffusion and introduction of technology.

II. Employment Effects

There are basically two opposing views as to the future and present effects of technological innovation on women's employment. Optimists argue that any job losses created by new technologies will be offset by the creation of new jobs due to higher productivity levels and economic expansion. The reduction in the cost of microprocessors will ensure that the new technology is diffused throughout the economy, and thus it will improve economic performance. Optimists tend to see new technologies as a trade-off which may cause short-term displacement for some unskilled workers, but which will ultimately improve the health of the economy and thus increase employment for all groups. In addition, new jobs will be created by the new technology in the professional and technical ranks. Some examples of such new jobs are: electronics installers, shift supervisors, computer programmers, control supervisors, control clerks, etc.¹⁵ There is often a sense of urgency about the prescriptions for applying new technology:

Make no mistake. These technologies must be applied. They must be applied to every facet of our industries and our businesses, if these industries are to enjoy the productivity gains that will render them competitive in the international marketplace. To resist or to slow down the rate of diffusion is tantamount to guaranteeing massive unemployment in the future.¹⁶

An author writing in 1957 expressed similar sentiments:

The need to cut costs and to set up controls and the desire to make more profit are the forces behind automation in the office in transition. If automation satisfied any one of these needs, it would merit serious consideration. The fact that it satisfies all three makes its success assured.¹⁷

Little has changed over the past few years in the perception that new technologies are necessary for the improvement of society. Increased output and enhanced competitiveness caused by technological innovation create corresponding increases in demand so that new products may be introduced and the cost of old services will decrease.¹⁸ This view tends on the whole to emphasize the role of market factors on employment levels, rather than the specific employment effects of technology.

Optimists also point out the difficulties in connecting employment figures with the level of technological development. While considerable research has been conducted on the employment effects of new technologies in the manufacturing sector, studies about future female employment in the service area is often speculative, tending to extrapolate from the findings of individual case studies and projecting the results into the future. Optimists criticize such studies for failing to take into account the broader context of the introduction of technology, including product and labour markets, government policies, social attitudes, changes in work organization, different company policies, etc. Baroness Nancy Seear argues that high unemployment in the U.K. is not the result of technology (since employment in those sectors utilizing technology has increased by 20%); it is rather the fault of economic recession and the decline of British competitiveness.¹⁹ Others point out the fact that job creating aspects of new technology are more difficult to measure than job displacing aspects. Although change always involves shifts in employment patterns, they state, displacement need not be the most important result.²⁰ While some sectors may decline, others, such as the high technology industry itself, may expand.

Skeptics of new technology see a very different future for women affected by technological innovation and the expanded use of the chip. In Canada, researchers like Heather Menzies have shown how technological

change can aggravate the reduced growth in clerical jobs in the 1990's.²¹ She sees a consistently declining demand for clerical work, coupled with a continuing tendency for women to expect to work in these female-dominated sectors. Some analysts project a reduction of women's work in manufacturing as microelectronics and robotics are introduced into the assembly line in textile industries, a major employer of women. In this sector women primarily perform unskilled, routine jobs which are easily mechanized. This is true even in high technology industries themselves, where ". . . massive robotization of assembly work might reinforce the marginalization of unskilled women workers, older workers and unemployed youth."²² Martin Carnoy points out that "the labour force in electronics is highly stratified by sex, much more so than the rest of the country's labour force or in traditional manufacturing."²³ This stratification implies that unskilled women workers will be the first victims of technological displacement, and that the high technology industry thus does not promise to be a great employer of women in the future. Similarly, in textiles:

Economic pressures have had more effect on employment levels in clothing where the losses are mainly the result of the downturn in the economy and the industry's inability to compete with imported product lines. But it seems likely that these trends could be further exacerbated by new technology as microprocessor-controlled sewing machines have become available and computer aided design and cutting techniques have been gradually introduced.²⁴

Many studies have also pointed out the 'hidden' nature of women's unemployment, especially in the service sector. Most jobs loss there is due to attrition, in which a high turnover of female workers enables employers to reduce the number of clerical workers without resorting to high-profile layoffs. The rise in female job loss is also hidden by lateral transfer of workers to other departments, and the increased use of part-time labour.²⁵ Service sector unemployment has remained hidden also because of the phenomenon of 'jobless growth' in which productivity improvements aided by technology enable production to increase without increases in employment. Job security for women in these sectors is threatened even more by the lack of unionization and the fact that part-time workers are not protected (in many countries) by legislation. Skeptics of new technology point out that structural unemployment has increased in the past despite increasing productivity, and that unemployment is therefore becoming a permanent feature of our society. Some see a radically altered future:

Driven by the rapidly increasing costs of salaries and fringe benefits, management

will seek to do more business with fewer people, with the actual size of the payroll shrinking through attrition. Like the giant oil tanker run by a skeleton crew and automatic controls, tomorrow's corporate giant will eventually be run by a small group of executives, with expansion occurring only in those sectors where personal contact with the public is required.²⁶

Optimists and pessimists disagree on the timing of the 'microprocessor revolution,' and thus, on the severity of its disruptive effects. While optimists claim that change will be evolutionary and will allow time for adjustment, pessimists point out that displacements are occurring now and at an increasing rate. While it is difficult to predict a catastrophic decline in female clerical work, the 1981-82 recession in the U.S. showed that clerical workers were increasingly subject to unemployment caused by economic downturn, whereas previously such slowdowns had little effect on the steady growth of women's' jobs.²⁷ Growth rates for clerical jobs are unlikely to continue at previous high levels; suggesting that, in the future, technological change may present a more significant obstacle to women's participation in the workforce than it has in the past.

Another point made by pessimists is that technological innovation results in a 'skills gap' which further disadvantages women in the labour market by raising the skill level necessary to enter the job market. If new jobs will likely be created in professional ranks, such jobs will require a higher level of education and training to which women have less access than men. Robert Russel states:

As the number of low-level corporate job openings declines, the principal job-of-entry will be administrative assistant, and employers may expect that candidates have university training and some informed understanding of how business operates. Since these administrative assistants will provide the major base from which the next generation of managers will be chosen, it is not likely that they will be predominantly female.²⁸

There is little evidence that displaced clerical workers move up in the ranks: there is more often lateral movement to similar skill-level jobs in other departments, movement to lower-skilled jobs at lower pay rates, and some straight layoffs.²⁹ Women generally have reduced access to training programs which might prepare them for the technological changes. A higher burden of family responsibilities, lack of mobility and funds to undertake extensive training, and a lack of time all contribute to the skills gap:

For women who are employed, usually at lower-level jobs because of job segregation and have lower wages, it is a question of income. Often they simply cannot

afford to take the necessary time off work in order to get the required training.³⁰

There is a considerable degree of controversy over the extent to which technology can influence the division between professional and technical level jobs, and clerical jobs. Fred Pomeroy puts it bluntly: "... let's look at the facts of life. Can a clerk-typist, become a design engineer of some kind?"³¹ The facts seem to point to an increase in women's segregation to lower-status, lower-skilled occupations as technology advances. Transfers of clerical workers to professional ranks is unlikely, and so women's opportunities to participate in the workforce will be reduced. Simultaneously, the availability of clerical jobs requiring fewer skills is likely to decrease. Pessimists thus point to the possible future reinforcement of a dual labour market, segregated by sex.

The debate over the employment effects of new technologies is hampered by a lack of empirical study which conclusively attributes job losses to microtechnologies. While on the surface it may appear that the findings of Heather Menzies and other researchers make logical sense, such studies have been criticized for taking an overly narrow view, and failing to take into account external influences which affect employment levels. Menzies does mention in her study that government policies, economic recession, union resistance, and competition levels can all influence the introduction of new technologies,³² but she does not take these factors into account when assessing employment effects.

Obviously, it is impossible to predict the future, but based on historical trends it seems obvious that the present 'golden age' of service sector growth is unlikely to continue. To a large degree the pressure from international competition to improve efficiency and lower labour costs in the office will result in a reduced rate of growth of lower-level clerical jobs. While productivity is a concept which is difficult to apply to an office primarily concerned with the handling of information, the high labour content in such jobs will almost certainly be questioned by capital as costs increase. Technology may very well have a role to play in reducing the labour power involved in office work, and redundancies are certain to spread from the factory floor to the office.

The internationalization of capital also enables employers to deter any attempts to soften the blow of technological redundancies through unionization. Companies are increasingly mobile in the international marketplace, while women are generally less willing or less able to relocate due to their greater burden of family responsibilities. In addition to making them less able to compete with men, this makes it easier for companies

to replace labour with technology by a process of attrition. These factors all indicate a reduced rate of growth in employment in the office can be expected over the next few decades.

III. Quality of Working Life

If the overall employment effects of technological innovation are difficult to measure, the effects on the quality of work life are even more intangible. It is almost impossible to predict the effects of microprocessor technology on the quality of women's working life simply by studying the technology itself. An examination of a word processor reveals certain characteristics which may affect the working life of the employee, but such characteristics must be studied within the context of the work environment and the existing form of work organization. As an OECD report states:

The flexibility offered by computer systems, enabling service enterprises to adapt their 'product' to market fluctuations and to particular client requirements, and so respond to the economic imperatives . . . Like its counterpart in industrial automation, this trend is significant because it breaks with the logic of repetitive mass production and can thus affect work organization.³³

The 'chip revolution' therefore has implications for the future form of work organization in the office. Whether or not Taylorist specialization of tasks will predominate in the office as a result of this new technology is at present a hotly contested debate among researchers. This section will analyze the possible effects of word processors, informatics, and other new technologies on the organization of work (whether there is skilling or deskilling), the relations of control between workers and capital, and the implications for homework.

i. Skilling or Deskilling?

New technologies such as computers and word processors undoubtedly will require changes in the skills used to operate them. Is mechanization more likely to raise or to lower the level of skills necessary for the jobs of clerks, secretaries, typists, or data entry clerks, who are almost exclusively women? Will the introduction of computers make their jobs more or less stimulating? The debate is again polarized between two opposing views. The more pessimistic view expects technology to lead to increased management control, increased speed of work, closer monitoring, deskilling, degrading, higher stress levels, etc. The optimistic view claims that technology can free workers from tedious work, increase productivity, improve intellectual challenges, provide better tools, and retrieve wasted time.³⁴ In

banking and commerce, for example, automated banking machines may make less work for tellers and may make their work easier, leaving them free to perform customer service. On the other hand, machines may make tellers' jobs more routine, entailing fewer skills, or even reduce tellers to part-time employees.³⁵ Jobs which (ironically) may have been produced by older technologies may be entirely phased out by new advances (such as key-punch operators), and new jobs may be created which combine skills from one job with those of another.

Even in the office pool, for example, people already employed in these units may very well find that word processors cut down on repetitive work and make the jobs more interesting — provided, of course, they still have those jobs.³⁶

The types of jobs to which mechanization is most applicable are generally the more routine, repetitive, or boring tasks. The types of tasks which can be automated are copying, maintaining, computing, classifying, storing or relaying information. The types of jobs likely to be affected are thus filing and mailroom clerks, typists, stenographers, accounting assistants, data entry workers, tellers, clerical invoicing, sale and payroll clerks and cashiers.³⁷ Word processing, for example, while requiring an initial acquisition of skills, generally deskills typing by making accuracy less important. The typist can simply correct mistakes as she proceeds. Some authors point out that automation in the office removes workers' ability to maintain their existing skills and makes it more difficult to acquire new skills.³⁸ Mechanization can therefore cause greater standardization of work, making individual experience less important and workers more easily replaceable. Others point out the possibilities for increasing individual skill levels, and thus eligibility for advancement, through acquaintance with new technology.

The question of skilling or deskilling is further complicated by the particular social attitudes which define 'women's work.' Some disturbing hypotheses indicate that the subjective value and skill assigned to work becomes degraded once women begin to dominate the occupation:

Should this trend continue in the commerce and offices sector, it could present serious obstacles to women's career prospects. For example, if technology takes over some of the more routine and repetitive tasks in office work, secretaries would theoretically be more available to assume other functions, which some have predicted would be of a higher-level administrative nature. However, if the functions are to be subsequently undervalued, the occupation would again be characterized by low pay and low status.³⁹

... conventional notions of skill and deskilling cannot be applied to a pre-

dominantly female labour process because the very fact of a job being labeled 'women's work' brings in enormous ideological determinations which enable its skill content 'somehow' to be devalued.⁴⁰

Even if technically more demanding jobs provide a more pleasant work environment for women, such work may become economically devalued as women take over such jobs.

Social valuation also has implications for women's individual and collective opportunities for advancement up the career ladder. If work is devalued once women begin to dominate a particular occupation, this puts a considerable limit on women's fight for equality with men. If technology produces more jobs opportunities in the professional and technical levels, women will be generally underqualified and considered 'unfit' for such non-traditional work. Some researchers see the formation of a more 'barrel-shaped' employment graph, in which middle-status jobs integrate the upper and lower extremes:

... as word processors give way to personal computers and workstations, more far-reaching effects may occur: the lines between secretarial and professional/managerial work may blur as secretaries increase their access and ability to manipulate information, allowing them to generate analytic reports; the equipment and telephone access to centralized data bases; and a reduced need for paper record-keeping may alter work organization dramatically.⁴¹

Other researchers see a tendency toward an 'hourglass shaped' graph in which few transfers occur between the lower status female clerical workers and the higher-status (largely male) professional and technical workers. Entry-level jobs will require better education and experience, which generally cannot be obtained at the clerical and secretarial levels, and so new workers will be recruited from outside the company. Heather Menzies' study illustrates this tendency very well, and she predicts a much higher level of female structural unemployment as a result of a reduced opportunity for career advancement. Clerical work will continue to remain 'dead end' work in this view as technological diffusion proceeds. Whether or not the barrel scenario or the hourglass one is more likely will depend on the form of work organization which accompanies the introduction of new technologies.

Skill levels, advancement opportunities, and general quality of working life will be determined by the uses to which new technology is put. It is the question of workplace control and the interaction of work organization with technology which will largely determine its deskilling effects, the next section will address this aspect of the debate.

ii. *Work Organization and Workplace Control*

The debate over workplace organization and technology, whether in the service sector or elsewhere, centres around two prevalent views about the role of technology as a cause of deskilling and job degradation. One view emphasizes the technology itself, its design, the assumptions built into the design, and the subsequent consequences for quality of work life. This view tends to view technology as an element in the active formation of a particular system of work organization, specifically Taylorist. This 'activist interpretation' emphasizes the organizational effects of informatics, word processing, and microchip technology in the office, the company, and the society. Marxists in this category argue that job fragmentation and routinization occur as a result of the inherent conflicts of interest between capital and workers.

Another view tends to emphasize the 'passive' nature of technology and the importance of decisions surrounding its use as the primary determinants of workplace organization. This 'passivist interpretation' sees technology as a neutral factor, and views the organization of the work process as independent of the machinery used. Analysts on this side contend that job fragmentation is a bureaucratic response caused by the internationalization of markets and the growth in size of organizations, and not as a necessary consequence of the technology's design.⁴² There are many combinations and permutations of these two 'ideal types,' and both employers and workers tend to utilize aspects of both arguments to strengthen their own claims to control over decisions about technology in the workplace.

To a large degree, because the effects of technology are so difficult to quantify, its negative effects on quality of work life can be overlooked or downplayed. Most Marxist authors, however, present critical analyses of the design, implementation, and work organization effects which new technologies make possible, seeing innovations as the instruments of capitalist control. The extent to which managers and workers have influence over the forms of work organization which result is equally as contentious. In contrast to the more 'pessimistic' Marxist analyses, most studies lean toward the opinion that the negative effects of technology can be socially or organizationally modified, and that the diffusion of technology allows for sufficient preparation on the part of organizations to adjust to detrimental changes. For this reason the solutions presented often take the form of education, retraining programs, consultation with labour, and other programs to make the implementation of new technology easier. If

we include those who see technology as a necessary evil, for which adjustments must be made, the range of opinions about the effects of technology on work organization relations of control in the office is surprisingly varied. The role of technology in changes to work organization depends on the particular cause which the researcher sees underlying the introduction and diffusion of technology.

The pioneering work on the side of the 'activist interpretation' is, of course, Braverman's *Labour and Monopoly Capital*. Much of the debate surrounding technology in the office has been centred around Braverman's thesis that the introduction of technology allows the rationalization and fragmentation of work which reduces its skill requirements, and thus lowers labour costs.⁴³ The technology therefore consolidates control of the work process in the hands of the manager, leaving the worker with a more routinized, manual, boring job.

Generally, those who follow Braverman tend to see more negative results as a consequence of management's desire for workplace control. Those researchers who question Braverman tend to emphasize the role of other environmental factors on the form of work organization in which the technology is situated. Following the activist interpretation, Evelyn Glenn and Roslyn Feldberg attempt to explain the increasing specialization of office work, examining not only social attitudes, but specifically the role of technology itself in changing work organization within the office. They see the word processor as the means by which clerical work is made more Taylorist and secretarial work becomes deskilled and degraded. As they put it:

Proletarianization is said to occur as clerical work loses the features that have traditionally placed it among middle class, white collar occupations; as narrow, largely manual skills displace complex skills and mental activity; as close external control narrows the range of worker discretion; and as impersonal relationships replace social give and take.⁴⁴

The modern office, as they describe it, is characterized by an increasing specialization of tasks aggravated by the use of electronic data processing and pooling arrangements. In effect, the qualities associated with the industrial assembly line are increasingly incorporated into the service sector and loss of autonomy, increased emphasis on speed in work rather than skill, and greater external controls become the norm. Under earlier forms of control, supervision was carried out on a more personal basis and paternalistic relationships developed between managers and workers. As hierarchy becomes formalized, more distant relationships between su-

supervisors and workers predominate, there is a greater separation between higher status secretaries and other staff, and relationships between lower level workers become less interdependent.⁴⁵ The cumulative effect of increasing subdivision and specialization of tasks is a decreased quality of working life in the office, since an emphasis on speed, manual skills, lack of knowledge of the broader aims of the work, and a decreased ability to move up in the ranks all make clerical work less appealing:

... work throughout the organization is structured by the requirements of the computer. Although the clerk may be less directly supervised, she does not gain autonomy; the requirements of the machines replace the directives of an immediate supervisor. Her mental choices are limited to predetermined categories. She has little discretion to do the work as she sees fit or to set her own pace, since her work has to feed into subsequent stages. As these changes occur the worker is proletarianized . . .⁴⁶

Also seeing technology as a significant determinant of work organization, Jane Barker and Hazel Downing develop Glenn and Feldberg's themes further in their study of word processing and relations of control in the office. Taking an historical approach, they trace the history of women's work in the office and the role of technology in that progression. According to them, new technology such as the typewriter facilitated the division of office work into specialized departments, each performing separate tasks. They see the introduction of the word processor as part of the capitalist strategy of reproducing control in the office sector during an economic crisis.⁴⁷ The diffusion of word processing technology helps to restructure the work process in the office, an area in which a major bottleneck has developed as the acquisition, storage, transformation and presentation of information becomes more important. Word processors actually make this division of tasks easier by separating out the actual composition of a document from the printing stage. They also lead to more standardized documents, removing the necessity for the operator to have skills which improve the neatness and appearance of a document.⁴⁸ The authors perceive this technological offensive as focused specifically on female work, noting that it is accompanied by the resurgence of an ideology which seeks to place women back in the home.⁴⁹

The scenario of a more specialized, 'proletarianized' form of Taylorist work organization in the office is generally accepted by most researchers as being one which is closely associated with the 'chip revolution.' While capital sees these innovations as a means of lowering labour costs and reducing some of the waste and inefficiency of paperwork, workers asso-

ciate them with an extension of managerial control over the work process and point to increasing direct supervision and closer monitoring of quantitative output. Whatever the motivation for new technology, ". . . it is important to note the managerial ideology that rationalization of work and formal control ensure profitability. Managers consider the work process and the worker the means—and sometimes the obstacles—to realization of this goal. Both need to be controlled."⁵⁰

For optimists, who tend to see technology as having a benign influence on work structure, (i.e., as passive) the need for technological rationalization in the service sector is real and demanding. Even unions often recognize the necessity for technological innovation in order to improve the competitiveness of the country in an increasingly cutthroat international economy. In contrast to those who see the microprocessor as an instrument of control developed and designed for the purpose of reproducing the capitalist relations of production in the office, there are many researchers who take the view that technology itself is secondary to the ways in which it is utilized. The point for many authors who oppose the present mode of technological innovation is the way in which the technology is being used (i.e., to further specialize and divide the work process). In other words, while some schools of thought see technology as an inherently negative influence on the quality of working life; others take the view that the major cause of a deterioration in working life quality is not the technology itself but the way in which it is being implemented. Both the activist and the passivist interpretations agree that the introduction of technology will create changes in work life quality. They disagree, however, on the extent to which technology and its design implications, rather than other contextual factors, are the cause of problems.

Groups which strongly favour the implementation of new technology go even further in their assessments and tend to downplay the implications of the design of microprocessors for the organization of work. These groups suggest that the technological revolution is benign and that the worst effects of technological change can easily be borne once the rewards of expansion begin to be felt. As one writer put it: ". . . we would rather examine the ways and means of making . . . industry more competitive instead of dealing with ghosts and shadows of alleged problems that might exist at some future time."⁵¹ This school challenges the assumption that technological change inevitably has negative effects on the quality of working life:

... microprocessing has been related both to the growth of new services (in banks

and insurance) and the decline of others (sales help in retailing). More generally, the flexibility of the new white-collar technologies suggests that their uses and effects will be influenced by concurrent social changes and by social decisions rather than by any inexorable technological determinism.⁵²

This passivist view, then, suggests that technology can be introduced in both job-enriching and job-degrading ways. The identical hardware and software introduced into different settings can cause different effects, depending on management practices and the existing form of work organization within the firm.⁵³ In this case, social choices about technology are real, genuine, and possible; and require a great deal of consideration before new technologies are introduced. As one study states:

We do not believe . . . that this decline is necessarily an inevitable outcome of automation. If the new technology is implemented humanely, with worker participation, it may well be possible to improve the working conditions for many service workers. This would allow them to reap some of the benefits of the new technology rather than to suffer from its negative effects.⁵⁴

One important study which seeks to reexamine the Braverman thesis that technology necessarily causes a reduced quality of work life for employees, was conducted by Valerie J. Carter. She contends that Braverman's analysis needs to be modified when applied to the office, since automation in this area is more complicated than for manufacturing workers. Carter approaches the question from the point of view of the bureaucratic theory of control in the office, which sees the major form of workplace control in the office today as embedded in the social structure of the organization rather than in patriarchal or capitalist domination. Her study found great variation in the reactions to new office technology, and indeed found that many workers believed Video Display Terminals had improved their skill levels, removed tedious tasks, improved access to professional ranks, and generally had made their work easier and more pleasant. Her explanation is that factors such as size and level of decentralization of organizations, the level of unionization, and the diversity of clerical workers may affect the changes which technology brings. As she states:

Most of the research thus far has failed to look at the conditions under which new office technology is introduced. This issue, is, I believe, a crucially important one, and one that bears directly on the notion of technological determinism, which often characterizes many of these analyses at least implicitly. Are deskilling and greater workplace control over employees necessary consequences of the introduction of new office technology?⁵⁵

For Carter, then, the emphasis is on the structural setting of the orga-

nization in which the technology is introduced rather than the design of the machine itself. Smaller decentralized offices will be less adversely affected than large, centralized ones. Small offices with more work autonomy, more technical expertise, a less pronounced division of labour, and a greater reliance on employee knowledge and resources are more likely to see an improved quality of work life as a result of the installation of data processing equipment.⁵⁶

This thesis is the one most accepted by government and industry studies which seek to address the worst effects of new technologies while still managing to improve productivity in the office. Most emphasize the importance of employee consultation and involvement in the introduction of new technology in the office, the need for retraining, education, and help for employees displaced from their jobs. As one study put it:

. . . it is generally acknowledged that the answer depends on the degree to which the technology actually performs tasks previously done by employees and how their work is subsequently reorganized . . . It has also been argued that the machine will lessen the monotony of the job because it will do the typing; however, this will be true only if the typist is subsequently given more varied tasks to perform. If she (or he in some countries) is only required to enter data on the word processor the extent of monotony may actually increase.⁵⁷

The effects of technology therefore depend primarily on the organization of work, size of the office, and other aspects of the work environment, rather than the technology itself.

One shortcoming of studies that assume a benign nature of technology is a failure to examine more closely the context in which the technology itself is designed and implemented. Because the word processor is designed with a given purpose and a given form of work organization in mind, its effects will tend to lean toward that purpose. There is a need to change the context in which new technologies are introduced, and to improve consultation with workers about the effects of technologies, but these steps are not at present being taken, since managers fear it will counter the improved productivity expected from the installation of microprocessors. For this reason, more far-reaching and comprehensive changes are needed in the system of work relations in order to ensure that the benefits are distributed fairly.

iii. Homework

Another aspect to the debate over microprocessing technology which bears directly on the concerns of women is the improved capacity for 'telework-

ing' or homework, which microchips make possible. This debate has direct consequences for the women's movement, since the thrust of the last few years has been to free women from the confines of the home and family and to enable them to participate freely in the workforce. Homework is one of the areas which reveals a great deal of differential treatment between men and women caused by social attitudes. Some view teleworking as a great opportunity for women with families to gain income and advance careers, staying in touch with the work world while still being able to raise children. Others see homework as a regressive step back to isolation, and the exploitation of women in the home.⁵⁸ Studies have shown that homebased male workers generally retained the benefits and security which they enjoyed working away from home, while homebased female workers experienced decreased pay, and benefits, and were paid on a piecework basis.⁵⁹ Because employers do not seem to regard homeworkers as employees, women (and men) who worked at home generally earned only 76% as much as conventional workers.⁶⁰ Others see homework simply as a means of increasing the workload of women who must then hold two jobs: homemakers and workers. As Lynda Yanz put it:

... everybody who has had children knows that it's impossible to combine taking care of kids and working at the same time. And why should it be easier because the terminal is computerized.⁶¹

Furthermore, homeworkers find it more difficult to unionize, experience increased isolation and loneliness, and are more difficult to protect under labour legislation. Tom Forester's article, "The Myth of the Electronic Cottage," presents some of the unrecognized psychological problems of homework which are generally overlooked by futurists who see great advances in the possibilities of cheaper home computers connected to centralized systems. At present, homework holds little overall promise for the freer, less monitored, more pleasant work life for which it has been touted in the past.

IV. Solutions and Conclusions

Most of the recommendations put forward by various government bodies in Canada and throughout the world to alleviate the negative impact of new technologies in the office reflect the attitude that the technology does not necessarily determine the forms of work organization which result. However, it should also be recognized that technologies are often designed to enhance or reduce particular choices that managers and workers can make about the form of work organization. Technologies do not

have isolated origins, but arise from within the context of pre-existing assumptions about the work process. It should be stressed that the forms of work organization which arise from technological innovations are flexible enough to allow for humane decisionmaking, and that it is possible for workers and managers to have the opportunity and the capability to participate equally in these types of decisions.

Many studies emphasize the need for legislation to protect part-time workers, the majority of which are women, and to shorten the work week so that all may benefit from technology without large displacements. Increased productivity holds the possibility for an improved economic performance, from which all of society may benefit. But at present the drive for cost-cutting and efficiency seems to counter the desire to distribute these benefits more fairly. To compensate, many emphasize the need for better consultation with workers before new systems are installed, to ensure that changes in work organization reflect the interests of workers who will be affected.

In Sweden, the Act on Equality Between Women and Men in Working Life established an Ombudsman for Equality which examines the differential effects of new technologies on women's working lives. The Act on Co-Determination at Work and the Act on Democracy at the Workplace forced trade unions and employers to negotiate any important changes which affect working conditions, including new technologies.⁶² These types of legislation offer alternatives to the present monopoly on decisions about technology which are held in most Western countries by the employers. Some studies emphasize the need to protect workers' ability to reject electronic monitoring, homework, and shift work, which result from new technologies.⁶³

In contrast, Canada's present legislation is inadequate for providing advance notice to workers of new technology introduction. Federal legislation applies only to those workers who fall under the Canada Labour Code, and then only if a 'significant number' of workers are affected.⁶⁴ Legislation to address problems of new technologies for women has been similarly lacking in other countries as well. Given the marginalized position of women in the workforce and their segregation to low-status jobs within the service sector, women need to be diverted from clerical work into more non-traditional occupations, particularly technical and professional fields which might prepare them better to deal with technological changes. Structural unemployment and a future skills gap are likely to result from technological innovations, and women are at present not adequately prepared for future participation in a changed job market.

There are also pressures on private industry to take responsibility for adjustment. Because technologies are being developed by private companies primarily for the purpose of expanding profits and remaining competitive in the world market, these companies need to at least examine the effects of these technologies on the working lives of their employees in greater detail. Changes to work organization can either improve efficiency or impair it. An increased emphasis on external control and more specialized division of tasks is likely to prove even more costly to capital. Changes to work organization must take into account the human needs of those using the new equipment; otherwise, it is likely that any productivity gains which might be expected will be reduced due to a lack of employee motivation and enjoyment of work. This is even more true in the office setting than on the factory floor, since the quality of work and the productiveness of information handling is much more heavily dependent on the "human factor." Employees should have a greater level of input into restructuring the forms of work organization which result, and should retain control of the work process so that maximum benefit can be gained from new technologies.

For women, the coming decades will prove to be particularly difficult since their jobs will likely be the targets of pressures for technological innovation. Such pressures are likely to bring about increased segregation, deskilling and job degradation in women's occupations, and therefore may put forward additional obstacles to women's search for equality. Efforts to change social attitudes so that women's jobs do not become undervalued must be linked with efforts to change legislation and company policies which are presently insufficient to protect women from such changes.

Finally, women need to become familiar with the potentials of these new microchips, and to exercise a greater degree of power in the workplace to ensure that their interests are represented throughout any period of transition. In many ways, the applications of microchip technologies need to be recognized as women's issues. The social consequences of the microchip revolution will be broad and difficult to predict, but if employers, governments and workers don't act now to modify the present course of technological innovation in the service sector, the costs of such innovation may ultimately prove to be too high.

... society is not likely to give full support, nor is the economy likely to sustain, a drive for productivity-based growth, unless benefits of increased productivity are clearly seen to be shared by the workers in the affected industry, and to have positive consequences for all . . .⁶⁵

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Intersubjectivity and Regimes: A Case Study of Détente

Grant Littke

The period between the end of the Second World War and the beginning of the 1970s is commonly referred to as the Cold War era in relations between the United States and the Soviet Union. While there is much disagreement as to what the term 'Cold War' signifies, and to whether it is accurately used to describe the entire 1945-1970 period, there is general consensus that Soviet-American relations throughout this period were characterized by intense rivalry and conflict on both ideological and geopolitical planes. Incidents like the Berlin crises and the Cuban missile crisis brought the two nations close to nuclear war, and the relationship outside of specific crisis periods was marked by high tension, mutual suspicion and entrenched hostility.

During the first term of U.S. President Richard Nixon, the relationship began to change. Efforts were intensified by both sides to search out bases for a new relationship of relaxed tensions amid ongoing rivalry and conflict. This era, commonly referred to as that of 'détente,' was marked by very frequent contacts between the two states at all bureaucratic levels, a series of consultations and agreements in previously under- (or un-) explored issue areas like trade and the environment, and an unprecedented set of negotiations and agreements (like SALT I and the Agreement on the Prevention of Nuclear War) that sought to define a new, less hostile and more collaborative relationship on issues of geopolitics and military strategy.

Détente was not seen as a condition of harmony and friendship between the United States and the Soviet Union, but instead as one in which each state recognized that its own foreign policy and security interests were best served by a less confrontational bilateral relationship. Détente was not seen as ending Soviet-American conflict and rivalry, but instead as