Toward the Perfect Workplace? The Experience of Home-Based Systems Developers

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Abstract

This paper compares home-based with office-based systems developers in a British computer firm. 49 home-based and 40 office-based systems developers answered identical questionnaires designed to ascertain the way they do their work and the meaning it has for them. The analysis produced two major patterns of meaning, one predominant in the home-based, the other in the office-based group. Among the home-based the primary involvement with work was intrinsic, in the context of family. It was associated with job/achievement and personal satisfactions. The instrumental involvement of the office-based group - in the context of career - was equally related to job and achievement satisfaction, but was negatively associated with personal satisfactions. There also was evidence of an emergent pattern centered on the use of skills to forge a leisure-oriented life sytle.

Information technology makes it possible to free work from the constraints of location and time. No longer is it necessary to commute daily to a central office place in order to perform one's work. Telecommuting, it has been estimated, could save thousands of barrels of oil a day and significantly reduce the individual stress of the current organization of work (Eder, 1983). But what to some is the hope of the future and the solution to many social ills, to others is the harbinger of a new era of exploitation in an electronic sweatshop (cf. AFL-CIO Resolution on Computer Homework, 1983). The technology alone will not determine these outcomes (Elling, 1985; Olson, 1987b). They will depend on the people and tasks involved, and on the structural, managerial, and cultural context in which the work gets done (Perin, 1987).

Using computers to work from home has been a topic of debate since individual work stations became inexpensive enough to allow wide proliferation of the equipment, and since the oil crisis, when the word "telecommute" was coined (Nilles, et al., 1976). Since then, there has been tremendous interest in and much journalistic attention to this workplace innovation. But the debate has been subject to a number of confusions.

The first relates to the part of the work force and the types of tasks that are under discussion. Routine clerical tasks and data entry, which are subject to repetitive measures of output and are primarily performed by women, harken back to the evils of cottage industry and are subject to similar exploitation (Risman and Tomaskovic-Devey, 1986). But a different situation exists at the upper end of the occupational scale, where technical and professional work is non-routine (cf. Olson and Primps, 1984), and

people are paid for their knowledge and judgment. The danger here is more likely to be workaholism than exploitation, and the constraints are more likely to be cultural (Kraut, 1987; Olson, 1987b; Perin, 1987). It is this part of the work force that is the subject of this paper.

A further confusion relates to the employment relationship of home-based workers. In the US it has been estimated that 90% of home professionals are self-employed or work as freelancers on a contract basis (Castro, 1987), and an early study of telecommuters by McClintock (1984) found only 15% to be company employed. Rank Xerox networkers and F-International in the UK are examples of this independent contractor pattern (see Handy, 1985; Judkins et al., 1985; Kinsman, 1987). But the fastest growing part of the home-based workforce, at least in the US, is the telecommuters - those who are corporate employees (Center for Futures Research as reported in Castro, 1987; ESU as reported in TC Report, August 1987). Such arrangements can be individually negotiated or organized within a specific corporate unit. The Contract Program Services (CPS) business unit of ICL Ltd. is an example of the latter, and serves as the study site for the present paper.

Finally, even within the population of organizational employees who use computers to work from home, there is confusion between those who use the home in addition to a regular work week, as opposed to those who work at home as a substitute for the office during normal working times. For example, Hughson and Goodman (1986), in their survey of Pittsburgh firms, found that most of those companies that report any telecommuting say that it all takes place after hours: only 3 firms had allowed valuable employees - primarily women with children - to make parttime arrangements to telecommute during the regular work week. Kraut (1987), reporting on a

study in 1983-4 of employees in a high tech corporation who work at home, also found that most work at home in addition to their office-based work. And Olson (1985) reports, on the basis of data from the readers of Datamation, that only 10% of these computer users work at home as a regular substitute for office work. Primarily, therefore, telework consists of augmentation, not substitution. But it is the latter pattern, which regularly combines work at home with work on-site, that has the potential for meeting new individual and organizational needs (cf. Bailyn, 1987; Perin, 1987). CPS employees fit into this pattern since they are based at home but spend anywhere from 20% to 70% of their working time at ICL or its customer clients. As their manager says, they are home-based but not home bound. Nor are they the only ones who would like to work in this manner. There is much evidence that when asked for preferences, many people express the desire to combine home-based with office-based work (Kraut, 1987; Olson, 1987b).

Thus, through CPS, we were able to study high-level company employees whose technical work is based at home but who are not confined to home, since they spend part of their working time face-to-face with the people directly involved in their projects. Further, because there is within ICL a highly comparable group, doing the same kind of work but in the traditional office-based manner, ICL provides an unusual opportunity to investigate the differences between home-based and office-based work for employees working under the same corporate umbrella and performing essentially the same tasks.

Previous Research

Most previous attempts to investigate empirically the phenomenon of telecommuting have been based on data from small groups of pioneers (e.g.

McClintock, 1984; Pratt, 1984) or from pilot projects and other isolated informal and formal work-at-home arrangements (e.g. Olson, 1983, 1987b; Ramsower, 1985). These early studies confirmed the segmented nature of the work-at-home option. Pratt identified three types of telecommuters: clerical women; managerial and professional mothers of young children; and male managers and professionals. Olson found that formal programs, which primarily involved women doing clerical work, represented a trade-off with not being able to work at all, and were vulnerable to exploitation. In contrast, informal arrangements in hi-tech companies usually involved professional men with scarce skills for whom working at home was based on free choice and a privilege. Ramsower found one group of full time telecommuters, primarily female, who were less satisfied with their jobs, who were more monitored and controlled, but who had higher productivity - hence were somewhat exploited by their employers. In contrast, there was a group of parttime telecommuters, men who worked at home 2-3 days/week, for whom the arrangement was very satisfactory. Olson and Primps (1984), found that for the clerical group they studied there was decreased autonomy, for the professionals autonomy increased.

The distinction between clerical and professional work blurs somewhat among the self-employed. Gerson and Kraut (as reported in Telecommuting Review, January 1987) report results of a study based on a sample of 297 clerical workers from secretarial firms, 30% of whom worked at home. They conclude that the home-based workers benefitted psychologically, but it was not possible to determine whether it was location of work or the hours of work (less for the home-based) and the nature of the work relationship with the firm (more of the home-based owned their own businesses), that accounted for these differences. Further, Christensen (1985) reports that women who have home businesses for word processing no longer consider

their work to be clerical, but think of themselves as professionals. For these self-employed women, the main problem is the provision of medical care, and they have to deal with isolation, lack of separation of work and home, and the consequent danger of workaholism. But they have high autonomy and flexibility. The externally employed who work at home, in contrast, face a different set of issues. They find that time is not fully under their control, since it is subject to employer demands, and that they cannot combine their work with childcare. They tend to be paid by the hour with no benefits, but they accept this "exploitation" because they want to be home and they compare their situation to not being able to work at all. If compared to office-based regular employee status, however, it is clearly disadvantageous, and the danger of exploitation is very real (Risman and Tomaskovic-Devey, 1986).*

The role of telecommuting in the relation between work and family has been of interest for a long time (e.g. Gordon, 1976; Risman and Tomaskovic-Devey, 1985). In an analysis of 1980 census data, Kraut and Grambsch (1985) show that homeworkers earn less and have fewer options, and that those who do it tend to represent a balance between less need for income and more need for flexibility: e.g. white married women with children. But the general consensus confirms the Christensen finding that telecommuting and child care can only be combined with difficulty. Olson

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*At Cal-West (California-Western States Life Insurance Company in Sacramento) a group of telecommuters have sued their company because of excessive increase in quota requirements on a piece basis (Telecommuting Review, February, 1986). The legal issue rests on the definition of employee as opposed to independent contractor, since only employees are covered by federal laws. A report by a US House of Representatives Committee (Home-Based Clerical Workers Open to Exploitation), released on July 21, 1986, recommends that laws be revised so that employers will no longer be able to treat their off-site workers as contractors, and thus will have to provide minimum wage, social security and unemployment, and other benefits such as health, vacation, and pension.

and Primps (1984) also found that it is not the answer to the problem of how to combine work with motherhood. The male professionals they studied, who entered the arrangement by choice, had better relations with their children, less stress, and more leisure. For the women, in contrast, who had replaceable skills, the relation to stress was negative. Working at home is not the ideal way to care for children, and this is explicitly stated in the suggestions to new recruits at CPS:

> Although CPS provides the chance to combine a career and children, we do not recommend that they be mixed at the same time/in the same place for long periods. Everyone's views and arrangements are different but the rosy picture of a cherub playing at the feet of a mother happily keying in her program is what the press always asks for and most of us never experience for any useful period of time!

The picture therefore is complex, and it is unlikely that the electronic cottage will soon be with us. The pros and cons are summarized in Schlosberg (1985), in Shamir and Salomon (1985), in a BNA Special Report (The Changing Workplace, 1986, 67-73), and in Olson (1987b), where they are augmented by data from 3 pilot projects comparing telecommuters to office based controls. The pilot projects consisted of very small numbers of volunteers, and in general were short lived. They did indicate that remote work requires a different form of supervision, and thus represents a dramatic organizational change (see also McClintock, 1984; Handy, 1985; Bailyn, 1987; Perin, 1987). Such change comes only with difficulty, which may explain, in part, why the advantageous potential of telecommuting is not easily being translated into reality.

A question arises as to whether national differences affect these results. For example, there are more highly celebrated success cases in Britain (including ICL) than exist in the US (see Kinsman, 1987). And,

within Europe, a comparative survey by Empirica (Trends and Prospects of Electronic Home Working, 1985) indicates more English interest in telework than continental European. But there is also concern about exploitation in Britain (cf. Deakin and Rubery, [1986]), and the distinctive character of professional as opposed to routine clerical work pertains there to the same extent (cf. Huws, 1984).

To sum up, research findings indicate that working at home with computers as an occasional but regularized substitute for office-based work, is more theoretically useful than actually available, despite the many champions that exist for this workplace innovation (e.g. Gordon and Kelly, 1986). And there is consensus, also, on the distinction between professionals with scarce skills who make informal arrangements to spend some days at home, and women performing routine clerical or data entry tasks, paid at piece rates with no benefits.

What is particularly interesting about the sample in this study is that it combines elements from each of these occupational spheres. On the one hand the home-based Contract Programming Service (CPS) unit of ICL consists primarily of women who are working parttime from home for reasons of family; on the other hand, their work is professional and their skills are high and in high demand. Further, they are full employees of ICL with all benefits and with the option to move back into the regular ICL structure at any time. And within CPS itself, there is a managerial and technical hierarchy that is available to them. So they have benefits, they have career paths, and they have other options. They are, however, paid by the hour for the time they actually work, and though there is a small base pay for times between projects, they are subject to some irregularity of pay based on availability of work. In some ways, this

method of pay can be seen as a fall back to more traditional modes, since a fee for output would seem to be more logical (Bailyn, 1987). But the system also indicates the level of trust that has built up between these workers and their managers. Many home-based employees are moved to piece rates because it is too difficult to monitor the length of time they are actually working when they are not visible to their management. In the case of CPS, self reports of time put in are accepted as the basis for pay, because of the high level of trust that exists within the group.

Study Site and Sample

CPS was started in 1969 in order to permit women with scarce computer skills to continue to serve the company parttime, and to keep up their skills and their involvement with work, while at the same time raising a family (see also Handy, 1985; Kinsman, 1987). Initially they formed an hourly work force with no employment benefits and did mainly body-shop work, taking small programming jobs home to work on in isolation. Now, this part of the company has been turned into a business unit in its own right and is making a profit. It is managed by a fulltime home-based manager, has its own career structure with both a management and a technical track, and is involved in a variety of projects developing systems for both internal and external applications. The work force is still paid by the hour (though this is not true of its managers) and many still work parttime, but they are now eligible for all employee benefits. The unit has approximately 180 people in it, including its management, with about 35 technical authors.

Out of this group, we targeted 55 people clearly in systems development who could be compared with 51 systems developers from the Group Information Systems units of ICL, who are office-based. This latter group consisted of both employees and contractors, but all were working at

company office sites. In the spring of 1987, we sent everyone in each of these groups a detailed questionnaire, based on intensive pre-test interviews, which dealt with the way they do their work and the meaning that it has for them. The response rate was good: 89% of the home-based group; 78% of those who are office-based. It is the data from these 49 home-based and 40 office-based respondents that are analyzed in this paper.

Table 1 shows that there are other factors besides the base location of work that differentiate these groups. The home-based group (CPS) has

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insert Table 1 about here

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more women, who are more likely to be married and to have children - a group that fits the vision of the unit when it was started. But it means that in the analysis of differences, it will be important to separate location from gender as an influencing factor. Similarly, the difference in role will need to be taken into account, since there are many fewer managers among the home-based group than there are at GIS, where all employees are based in their company offices. The design of the analysis, therefore, is based on analysis of variance with three independent variables: gender and role as well as employment relationship.

It is of interest, further, that the home-based group seems to be somewhat more experienced, both in years of computer work and in the variety of areas covered. The differences are not large, but at least they indicate that the home-based group is not behind the office-based employees in terms of technical skills. The fear that home-based workers will not be able to keep up technically is a frequently cited concern when telecommuting is discussed.

TABLE 1

Characteristics of the Sample

	CPS	GIS		
		Total	ICL	free-lance
# of respondents	49	40	26	14
sex:				
male	4	30	20	10
female	45	10	6	4
# currently married	42	24	15	9
# with children	43	16	11	5
# graduates	23	19	15	4
mean age	36.8	32.0	32.5	30.9
role:				
technical	42	25	13	12
business/managerial	7	15	13	2
mean years of computer experience	14.8	10.2	9.6	11.4
average # of areas with high competence[a]	3.1	2.8	2.1	4.1
relation to ICL:[b]				
company loyal	32	16	15	1
expect to go out on one's own	3	12	4	8

[a]Based on a question asking respondents to indicate the extent of their knowledge of eleven different computer skills, from programming to UNIX and C.

[b]Based on an analysis of the organization respondents realistically expect to be in 5 years from now, and where they would ideally most like to be.

Another frequently voiced issue is the concern over the company loyalty of workers based at home. Particularly for professional work, it is argued that the commitment is to the work and not to the company that provides it - the frequent job jumping in Silicon Valley being cited as an example. In the present case, however, this does not seem to be an issue. On the contrary, more of the CPS workers expect and would like to be working for ICL five years from now than of those who are office-based, even when the freelancers are excluded. And fewer of the home-based expect to be in a business of their own at that time. Since the main determining factor of this difference is gender, there is the question whether the home-based women are loyal to ICL only because they perceive that they have no other choices available to them, which is one of the aspects of exploitation feared by critics of telecommuting. Structurally, of course, they do have choice, since they are eligible at any time to return to the regular ICL hierarchy, and they have skills that could be marketed in a number of different ways. But most seem to have become enamored of the control over time that the CPS arrangement permits:

> I don't think I would like to leave CPS, I don't think I would like to go back full time in an office. I would look to working full time if it were home-based...I don't want to be tied to 9 till 5.

Though there undoubtedly are exceptions to this point of view, it would seem that these women are working from home out of choice, not because of an unwelcome necessity - at least within the context of the world as they know it.* The extent to which this choice is constrained by organizational, cultural, or national constraints (cf. Risman and

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*Gerson and Kraut (as reported in Telecommuting Review, January 1987) found that home-based workers perceive themselves as having considerable choice in work location. Nonetheless, besides business ownership, the best predictors they found of working at home were the presence of young children, age, and being married.

Tomaskovic-Devey, 1985; Perin, 1987), is an important question and will be touched on in the conclusion to this paper.

In general, it seems that the control over time, rather than location, is the key differentiating characteristic between home-based and office-based work. If given free rein, this autonomy results in greater satisfaction and greater productivity (cf. The Changing Workplace, 1986; Bailyn, 1987). But it also represents the most serious barrier to the diffusion of this work option to the general professional work force, since being visibly at work between 9 and 5 on weekdays is such an integral part of our cultural assumptions about work (Perin, 1987). And yet, as Table 2 indicates, more than a quarter of the systems developers in this study who work in an ICL office report that their most productive work times fall outside the traditional office day. Hence individual

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insert Table 2 about here

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control over the timing of work could have a significant potential for increasing productivity. Further, the ability of the home-based to allocate work over all time periods - including weekends - seems to be associated with a greater perception of regularity of work, with less of a problem about its distribution. Table 2 also shows the high proportion of both home-based and office-based employees who need quiet and privacy for their work, a condition that is not easy to find in the open office plan of the GIS office space at ICL. There are also complaints there of too much smoke and too little ventilation - both of which can be adjusted at home.

From Table 2 it is clear that differences in location of work change the communication patterns of these systems developers. The data show

TABLE 2

Spatial and Temporal Characteristics of Productive Work

	CPS (N=49)	GIS (N=40)
% who say their most productive time does NOT coincide with the traditional office day	17%	26%
% who work weekends	46%	18%
of those with "off-time" productivity	62%	20%
of those with "office day" productivity	45%	18%
% who say their workload is irregular	20%	42%
% for whom the distribution of work is a problem	15%	27%
% who mention home as a productive location of work	54%	18%
% who mention quiet and privacy as necessary conditions for productive work	91%	74%
% who say that almost all of their work requires uninterrupted concentration	31%	15%
% who say that daily communication is necessary	18%	88%
main communication is face-to-face	4%	49%
main communication is by telephone	71%	8%

that it is possible to solve the communication needs of home-based employees, and that there is a high potential for gain by means of allocating work according to individually optimal times. But the fact that ICL has a profit-making unit that has been able to benefit from this arrangement has not meant that the option is generally available throughout the company. Indeed, one manager who tried a number of times to make an individualized arrangement with some of his most trusted employees to spend a day or so a week at home, was told by his personnel office that it was against ICL policy.

And so, the differences outlined in the rest of this paper do exist at ICL, at least as they apply to the company's special home-based unit. They are important because they point to potential advantages of using computers to work from home as an option for the independent and cognitively intensive tasks associated with high-level technical work. But the possibility of benefitting from these advantages depends less on the technology than on changes in management practices that must accompany the different ways of working (cf. Kochan, 1988). There is some evidence that remote work might itself be a catalyst in encouraging these organizational changes (Bailyn, 1987). Without them, the CPS model is unlikely to diffuse more widely, and may, in fact, be unique. But the systematic analysis of data, even if from a unique case, may, one hopes, contribute to this process of change.

It is in this vein that the paper addresses two questions: first, whether there are differences in the way the work of systems development is performed by home-based and office-based workers; and second, whether this work-place option changes the meaning and the satisfactions associated with the work.

RESULTS

Broadly speaking, the two groups do the same kind of work, since they were selected in this way. But, as is evident from Table 3, there are

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insert Table 3 about here

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differences within this general similarity. All respondents were asked to describe the last completed project on which they had worked, on the assumption that the details for this project would be relatively easy to remember and that in the aggregate this information would provide a valid basis for comparison. Table 3 shows that the home-based group is as likely to be working on applications for micros as for mainframes, whereas the office-based systems developers are primarily assigned to mainframe projects. And, even when the comparison is limited to mainframe projects, the home-based group works on smaller assignments: fewer people, shorter duration. Thus, there seems to be in the system a selective bias toward allocating smaller more self-contained projects to the home-based unit. Such biases are highly functional. They fit into the pattern under discussion here which combines home-based with office-based work, and which assumes that the allocation is based on characteristics of the task. Cognitive as opposed to social tasks is a first distinction. And within cognitive tasks, there are further important distinctions based on size, on highly specific needs of interdependence and support (Bailyn, 1987), and on the level of creativity required (Garden, 1987).

A further distinction between the way the work is done in the two groups stems from a series of questions detailing the particular stages in the development of a system (from proposal through implementation) and asking who has primary responsibility at each stage, how much involvement

TABLE 3

Nature of Projects
(based on information on last completed development)

	CPS	ICL[a]
system developed for:		
mainframe	19	20
mini	9	2
micro	19	1
Mainframe Projects Only		
mean # of people[b]	4.2	12.9
mean # hours/week on project[b]	21.8	34.0
mean length (in months)[b]	23.4	16.4
mean # project hours	8,570	28,772

[a]Because this information refers to the last completed project, the data in this table are based only on ICL employees, since the freelancers might well be describing a project completed in another organization.

[b]The number of people on a project ranged from 1 to 35; the number of hours per week on the project varied from 16 to 45; and the number of months from beginning to completion ranged from 2 to 72.

in each stage the technical people have, and the main location for each stage. Generally, there are few differences between the groups. The few that do exist may be summarized as follows:

1. Program managers at CPS (the home-based group) are more involved in system testing and in training than is true at GIS: over a third of the CPS respondents report that the project manager is primarily responsible for system testing and training in contrast to less than 1 in 6 who give this response at GIS.

2. At the same time, home-based respondents in clearly technical roles, as contrasted to their office-based counterparts, report more personal responsibility for certain aspects of the task, particularly estimation of cost and time, link testing, and training. For example, over half of the technical CPS respondents claimed full responsibility for link testing, whereas among the technical office-based an almost equal percentage reported no responsibility at all.

3. Finally, as to location, the CPS group by definition did most of its development tasks at home, the GIS group were at their offices for these tasks. They were also primarily at their offices for system testing, first level support, and system maintenance, whereas almost half of the home-based workers used user sites for these tasks.

These differences are small, but they seem to indicate that there is less differentiation in roles in the home-based group than in the office-based systems developers. And, when the question turns to discretion and control over how the work is done, one finds that the difference between those in managerial and technical roles is much larger for those who are based in offices than at CPS, where technical people are much closer in control to managers. Further, these technical home-based employees perceive more discretion and control than do their office-based counterparts, as is evident in Table 4. It is a mode of working, therefore,

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insert Table 4 about here

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that can help bring control to the working level in organizations (cf. Bailyn, 1987). But this same possibility is one of the key constraints to

TABLE 4

Perceived Discretion and Control Over Work[a]
(technical roles only)

	CPS	GIS		
		Total	ICL	free-lance
Mean score on control[b]	4.2	3.0	2.8	3.3[c]
Average of maximum length of time working on own without formally reporting progress to anyone - in weeks:	2.4	1.5	1.4	1.6[c]

[a]By far the most significant effect on these variables is role: those in business/managerial roles report a great deal more control and discretion than do those in technical roles. This difference is much greater at GIS than it is in CPS. The table, however, presents the figures only for those in technical roles.

[b]This index ranges from 1 (minimal control) to 7 (full control) and consists of two parts: the first is based on the extent to which the respondent has control over setting deadlines, weighted by the perceived importance of deadlines, and the extent to which pre-set procedures are NOT used; the second part consists of the extent of control over the main stages of the development process in which one is engaged, weighted by the degree of one's involvement.

[c]Aspects of these variables depend on assessments based on the last development project in which one was involved. Hence freelancers may be responding on the basis of a non-ICL project.

its wide diffusion, since management's fears of losing control have been found to be a key barrier to the idea of allowing high level employees to spend some of the regular work week working out of their homes (Perin, 1987).

Thus we see that there are some differences between the home-based and the office-based in the way the work of systems development gets done. The differences are not large, but they indicate that even relatively minor aspects of tasks can be used in considering the optimal location of work. Much larger differences, however, are evident when one considers the meaning and satisfactions of work for these two groups of systems developers. And it is here that the most interesting results of the analysis emerge.

The Meaning of Work

A number of items in the questionnaire are relevant to the meaning that work has in the lives of these respondents. Based on a series of factor analyses, a set of items were identified that differentiated between two factors, each of which represents a different pattern of meaning. The items are listed in Table 5, along with the results of analyses of variance based on the three independent factors of gender, role, and employment relationship. As is evident in that table, being

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insert Table 5 about here

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home-based or office-based has a significant effect on a number of items, even when gender and work role are controlled. In particular, the office based group places a greater emphasis on income, on success as defined by pay and promotion, and on leisure, whereas the home-based group is more

TABLE 5

Items Used in Analysis of Meaning of Work[a]

A.[b] To help explain what working means to you, please assign a total of 100 points, in any combination you desire, to the following seven statements. The more a statement expresses your thinking, the more points you should assign to it. Please read all the statements before assigning points.

working gives me status and prestige
working provides me with an income that is needed [GIS][c]
working itself is basically interesting and satisfying to me [CPS; female]
working allows me to keep up my skills [CPS; technical]

B.[d] Please assign a total of 100 points to indicate how important the following areas are in your life at the present time. The more important a particular area is, the more points you should assign to it:

my leisure (like hobbies, sports, recreation, and contacts with friends [GIS; male; technical]
my work/career
my family [female]

C.[e] When you think of your working life, which of the following aspects of working seem most significant and important to you? Please rank the items from 1=most significant, to 6=least significant:

the task I do while working [female]
the money I receive from my work

D.[f] How important is it to you that your work life contains the following? Please assign a number between 1 and 7 to each attribute, where 1=not at all important, and 7=extremely important.

success: good opportunity for upgrading or promotion; good pay [GIS]
flexibility: convenient work hours; convenient work location; flexible working arrangements (e.g. when and where to work) [CPS; female]

E.[g] In general, how important and significant is working in your total life? (from 1=one of the least important things in my life, to 7=one of the most important things in my life)

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[a]Only those items that differentiated between the two emergent meaning factors are included in the table. The response categories are listed in the order in which they appeared on the questionnaire, categories that did not differentiate are briefly mentioned in the footnotes. I, and others, have used many similar items in previous research. Their present form, however, is based on Harpaz (1986).

(continued on next page)

(Table 5 continued)

[b]Based on a question that fell into Harpaz's category of valued work outcomes. Based on pre-test interviews I added the item on skills to Harpaz's list, which also included that working keeps one occupied; permits one to have interesting contacts with other people; and is a useful way to serve society.

[c]Characteristics in brackets indicate those factors that were found to have significant main effects on the item in question. The group that had the highest score on the item is given in the brackets. So, for example, in terms of income, employment relation had a significant main effect, and the GIS (office-based) group gave more points to this item than did the home-based CPS group.

[d]Based on a question that fell into Harpaz's category of centrality of work as a life role. Other items were community and religion. The leisure item is the only one that had a significant set of 2-way interactions: male technical employees where unusually high on this item; female CPS employees were unusually low.

[e]Based on a question that fell into Harpaz's category of work role identification. Other items were my company or organization; the product or service I provide; the type of people with whom I work; the type of occupation or profession I am in.

[f]Based on a question that fell into Harpaz's category of importance of work goals. Based on the concerns in this paper I added convenient work location and flexible working arrangements. Items not mentioned in the table: opportunity to learn new things; good interpersonal relations; interesting work; a lot of autonomy; good job security; good match between job requirements and abilities and experience; good physical working conditions; a lot of variety. A separate factor analysis of these 13 items yielded the flexibility and success factors that were used in the analysis of meanings.

[g]Based on a question that fell into Harpaz's category of centrality of work as a life role.

concerned with interesting work, with keeping up theirs skills, and with flexibility. These differences are caught by the two meaning factors that emerged from an analysis of these items.

Table 6, which presents these two factors as defined by the loadings of the items, shows that Factor 1 is centered on interesting work, significance of the task, keeping up skills, and the importance of family and

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insert Table 6 about here

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flexibility. It is also defined by the LACK of concern with income and success, and the LOW importance attributed to leisure activities. The meaning of work embodied in this factor consists of an intrinsic involvement in the actual tasks, in the context of family.

Factor 2, in contrast, is centered on work and career as a key aspect of one's life role, on the importance of status and prestige and of success as defined by promotion and pay, and is defined also by a LOW concern with family and flexibility and with keeping up one's skills. It embodies a meaning of work based on an instrumental involvement in the context of career.

Analysis of variance was performed on scores formed from these factors, with gender, work role, and employment relation as the independent variables. The analysis shows significant main effects for both factors, but the results are much more dramatic for Factor 1, where the multiple correlation coefficient is .65. Two of the independent variables account for this effect: employment relation and gender. CPS employees score much higher on this factor than do the office-based systems developers (beta=.40), with the freelancers being lower than

TABLE 6

Personal Meaning of Work
(loadings on two emergent factors[a])

	Factor 1	Factor 2
Meaning of Work: income	-.80	
Meaning of Work: interesting work	+.76	
Important Life Area: leisure	-.72	
Ranking on Significance: money	-.43[b]	
Ranking on Significance: task	+.36[b]	
Important Life Area: family	+.52	-.51
Meaning of Work: keep up skills	+.50	-.33
Importance: success factor	-.38	+.33
Importance: flexibility factor	+.35	-.41
Meaning of Work: status and prestige		+.46
Work's Importance in Total Life		+.63
Important Life Area: work/career		+.83

[a]Based on a principal components analysis specifying two factors (as indicated by the scree test) which account for 41% of the total variance. Factors are rotated orthogonally with a varimax rotation since an oblique rotation yielded an insignificant correlation between the factors. Loadings <.25 are eliminated from the table.

[b]The signs on these loadings have been reversed so that a positive loading means an attribution of great significance, and a negative loading indicates little significance.

office-based ICL personnel. And women are higher than men (beta=.32), independent of employment relation and work role.*

On Factor 2, the overall main effects are significant (P=.037), and the multiple correlation coefficient is .35. But no individual variable is independently significant. Gender is the most predictive (beta=.30), with men higher than women, followed by work role (beta=.14) with managerial employees higher than those who are technical. The large difference between ICL employees who are office-based (mean=+.42) and those who are home-based (mean=-.22), attentuates when gender and work role are controlled. The means on both of these factor scores, for groups defined by employment relation, work role, and gender are given in Table 7.

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insert Table 7 about here

The table makes clear that the CPS women are the embodiment of Factor 1. It is among the home-based ICL employees that one finds the meaning of work in its intrinsic character within the context of family. Thus, almost twenty years after its beginning, CPS still seems to reflect the values on which it was founded. Factor 2, in contrast, which represents a career-centered instrumental approach to work, is most typical of the men who are employed by ICL in standard office-based positions, particularly when they are in managerial roles.

It is also clear from the table that CPS men and GIS women deviate from the expected pattern of being high on one factor and low on the other. Disaggregation of the factors into their components shows that GIS women share with their male colleagues the concern with money, but they

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*There is no significant difference between technical and managerial employees on this factor, once the other independent variables are controlled.

TABLE 7

Mean Factor Scores[a]

	CPS	GIS		
		Total	ICL	free-lance
Factor 1: intrinsic involvement in the context of family				
	+0.54	-0.67	-0.56	-0.87
men	-0.52	-0.76	-0.63	-1.02
women	+0.63	-0.39	-0.29	-0.52
technical men		-0.91		
managerial men		-0.56		
technical women	+0.66			
managerial women	+0.46			
Factor 2: instrumental involvement in the context of career				
	-0.22	+0.27	+0.42	+0.01
men	-0.18	+0.34	+0.60	+0.18
women	-0.22	-0.31	-0.24	-0.39
technical men		+0.23		
managerial men		+0.76		
technical women	-0.25			
managerial women	-0.04			

[a]Factor scores were computed by Bartlett's method. Across the total population, they have means of 0 and standard deviations of 1; the correlation between them is 0.0.

do not give work such an important place in their lives. They are somewhat younger, more likely to be childless, and less experienced than are the men at GIS. Family seems to be a more critical concern for the freelance women; for those employed by ICL, it is the task itself that has greatest significance.

CPS men, though very few in number, point to a pattern that has been found also among US telecommuters. These men share with their female colleagues a non-instrumental orientation (they are relatively little concerned with money, status, or success), and are equally interested in keeping up their skills and in flexibility. But they do not have the same interest in the task itself, and their emphasis is much more on leisure and considerably less on family. They tend to be single and are older and more experienced than their female colleagues. It is as if they use their skills to forge a leisure-oriented life style. They may represent the forerunner of an emergent pattern of work, based at home or in an office as the task demands, centered on the development of skills and on autonomy, and concerned less with career and advancement than with balance, leisure, and physical fitness. But these are speculative conclusions, and depend on an analysis of the relation between the meaning of work and life satisfactions.

Satisfactions

The final question in the questionnaire was as follows:

> Most generally, at this time, how satisfied are you with the following aspects of your life? Please circle the number between 1 and 5 that best indicates your level of satisfaction with each of the following (1=not very satisfied; 5=very satisfied):
>
> your job
> your personal relations
> the balance between work and non-work in your life
> the amount of time available for your family
> your health/physical fitness
> your sense of achievement
> the amount of fun and pleasure in your life
> your success at work
> your success in the non-work parts of your life

Analyses of variance with the same three independent variables show that the only statistically significant mean differences on satisfaction scores occur on personal relations, balance, and the two success ratings. Women are more satisfied than men with their personal relations, especially the freelance women; CPS men score lowest on this measure. Managerial respondents are more satisfied with balance than are technical employees; this difference is particularly evident among women. On success, CPS respondents are least satisfied (with both work and non-work) and freelancers are most satisfied on both; CPS men are lowest on feelings of success with non-work aspects of their lives. On success at work there are complicated interactions between sex and role, and between role and employment relation: within CPS and ICL, the managerial women are most satisfied; among freelancers, the most satisfied with their work are the managerial men and the technical women.

These first order differences, however, are less interesting than is the relation between meaning of work and satisfactions. Overall, Factor 1 and Factor 2 scores are not correlated, by definition. Factor 1 correlates significantly with job satisfaction (r=.44) and both factors are significantly correlated with a sense of achievement (r=.30 for Factor 1; r=.27 for Factor 2). But these results hide a more interesting pattern of correlations when the sample is disaggregated, as is evident in Table 8.

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insert Table 8 about here

It is the pattern of these results, rather than any of the individual figures, that is significant. The following points emerge from this table:

TABLE 8

Satisfactions Related to Factor Scores[a]

	Factor 1 (intrinsic)		Factor 2 (instrumental)
CPS (N=49)[b]	job (.43)*** success/work (.35)** time for family (.31)**	[-.04][c]	
GIS (N=40)	achievement (.44)*** job (.37)** persl rel's (.36)** balance (.32)**	[+.39]**	achievement (.34)** NOT health (-.32)** job (.31)**
ICL (N=26)	persl rel's (.49)**	[+.29]	job (.43)** achievement (.42)** NOT health (-.39)** NOT time for family (-.32)
[freelance] (N=14)	achievement (.65)** job (.49)* balance (.35) success/non-work (.31)	[+.49]*	NOT persl rel's (-.33)*
Women (N=55)	job (.49)***	[-.01]	
CPS women (N=45)	job (.49)*** success/work (.41)*** balance (.31)** fun (.30)** time for family (.30)**	[-.06]	
Men (N=34)	achievement (.38)**	[+.50]***	achievement (.48)*** job (.43)** NOT health (-.32)**
GIS men (N=30)	achievement (.40)** persl rel's (.34)*	[+.54]***	achievement (.49)*** NOT health (-.46)** job (.45)**

(table continued on next page)
(footnotes on next page)

(Table 8 continued)

	Factor 1 (intrinsic)		Factor 2 (instrumental)
Technical (N=67)	job (.41)***	[+.05]	achievement (.33)***
CPS technical (N=25)	job (.40)**	[-.06]	
GIS technical (N=25)	achievement (.48)** persl rel's (.42)** job (.37)*	[+.44]**	achievement (.48)** NOT health (-.40)** job (.36)*
technical women (N=45)	job (.40)***	[-.07]	
CPS technical women (N=38)	job (.47)*** success/work (.45)*** fun (.40)**	[-.07]	
technical men (N=22)	achievement (.44)** persl rel's (.33)	[+.55]***	achievement (.66)*** job (.53)** NOT health (-.38)*
Managerial (N=22)	job (.57)*** achievement (.54)*** balance (.48)**	[-.06]	NOT persl rel's (-49)** NOT success/work (-.41)*

* P<.10
** P<.05
*** P<.01

[a]Listed in the table are all satisfactions that correlate > .3 with the factor scores. They are listed in the order of the size of the correlation coefficient, which is given in parentheses next to the verbal description of the item. With the exception of the initial freelance listing, only those groups with Ns>20 are listed in the table.

[b]Reduced, where necessary, by those not answering a particular item.

[c]These figures indicate the correlation between the scores for Factor 1 and those for Factor 2.

1. For the women and those at CPS, the two factors are not correlated with each other. For the men, at GIS and mainly when technical, there is a fairly sizeable positive correlation. For these employees, the two patterns of meaning are by no means contradictory; rather they go together. Their opposite, most likely, is a form of alienation from work in general.

2. Both factors are correlated with satisfaction with job and with achievement. In other words, job and achievement are important and satisfactory whether one is involved with work through its intrinsic tasks in the context of family, or instrumentally in the context of career.

3. Beyond that, there are clear differences between the two patterns of meaning. An intrinsic involvement with work is positively correlated with a number of other satisfactions: personal relations, balance between work and non-work, time for family, fun and pleasure in life. Not so for the instrumentally involved, where there is a NEGATIVE correlation with one's satisfactions with personal relations, time for family, and health/physical fitness.

CONCLUSION

These results, when combined with the findings from research in the US, indicate that the CPS model represents what one might call a traditional home-based pattern. It is traditional because it is anchored in the traditional view that women's priorities center on their families and homes. As such, it may represent an example of mutual exploitation. The women involved, despite their level of skills, assess their situations as highly favorable when compared to not working at all, but admit that there are disadvantages in terms of position and pay when compared to working in the office-based mode:

> I would not want to go back to a 9-5 job, yet I am aware that my salary is considerably lower than it would have been had I stayed on. I am properly paid for the tasks I am doing, but not for my experience and career stage...But of course that was my choice.

Nonetheless, they value this opportunity, and, as already indicated, they choose to stay with the arrangement even when the primary motivating circumstances are no longer present. But the same assumptions are no

longer evident among women of comparable skills in the US, and hence it is not a pattern that is prevalent there. American women with equivalent skills are likely to be much more career oriented, and are not likely to want to give up the visibility that office presence provides. It is relevant, for example, that the experiment by F International to start a group in the US was not successful.

Thus the fact that Britain has more successful examples of work forces that use computers to work partially from home, may depend on the more traditional sex-role expectations that are still prevalent there. The arrangement, therefore, may be seen as reinforcing the gender structure of society (cf. Risman and Tomascovic-Devey, 1986). And this fact may also account for the observation, above, that the principles underlying CPS are not filtering back into general ICL policies. In contrast, the presence of the independent home-based networkers at Rank Xerox, who are primarily male, are said to have greatly influenced, or at least to have been part of, a general change in managerial strategy throughout the company (Hornby, 1986; Judkins, personal communication).

And yet, when compared with the GIS pattern, primarily among men, where work is viewed instrumentally in the context of career advancement up an organizational hierarchy (the modal office-based pattern of work), there are clear personal advantages in the home-based model. For the GIS pattern, which is the prevalent one in the US, is negatively associated with satisfactions of a personal nature. These results provide empirical corroboration of the personal costs associated with the way high level work is characteristically approached.

But if the modal CPS model is constrained by national differences in gender roles, the few men in CPS point to an emergent pattern that is also evident among high level telecommuters in the US. Here are people with

scarce skills, hired for their innovative potential, for whom life style and balance are more important than the single-minded emphasis on career advancement. For them, location and timing of work are important to the extent that they allow them to meet their personal needs. And for the organizations that need their services, the provision of this kind of autonomy is necessary to insure their productive commitment. Thus working from home with computers for part of the regular work week may, under the right conditions, provide the perfect working conditions for highly skilled employees whose skills and energies are needed for a productive society, but who are unwilling to have their lives controlled by the organizations that employ them. But these high-level employees must not be managed in the traditional mode, or the advantages will be undone. Organizations must learn to value their contribution and to trust their commitment, and must resist the urge to dictate when and how they do the work.

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