WORK INTENSIFICATION, DISCRETION, AND THE DECLINE IN WELL-BEING AT WORK.

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INTRODUCTION

Previous studies have established that work intensification was an important feature of European labor markets during much of the 1990s [Green and McIntosh, 2001; Green, 2001; Burchell, Lapido, and Wilkinson, 2002]. In the UK, this process was the continuation of one of the processes of change at workplaces that had begun at least several years earlier during the 1980s. Following from these findings, three avenues of further research can be suggested: a continual monitoring of work intensification in British and other workplaces, an improvement in our understanding of the origins of intensification, and an investigation of the implications of intensification for workers' well-being. This paper uses representative survey data to make contributions in all three areas.

First, work intensification is, unlike economic growth, inherently a limited process. Just as an extension of the length of the working day is bounded ultimately by the number of hours in the day, so human physical and mental capacities do not allow an endless extension to effort. Thus, to understand the nature of the labor market, and the mode of economic growth at any time, it is important to monitor continually the extent of work intensification. Previous evidence showed effort rising until 1997, but a question arises as to whether this rise has continued to the present. In this paper I bring the story up to 2001.

Second, evidence is only just beginning to accumulate as to the proximate origins of the work intensification that has been identified. In previous work I have suggested that technological and organizational change are probably the most important factors [Green, 2004], but there remain other related institutional changes that have facilitated or promoted work intensification to greater or lesser extents, including new human resource policies by "high-involvement" work organizations, declining unionism, and job insecurity [Burchell, Lapido, and Wilkinson, 2002]. A more thorough empirical understanding of these change processes is called for. The particular contribution I am able to make here is to assess the importance of the introduction of computerized or automated equipment into jobs in the period 1992 to 2001. Consistent with the idea that technological change is "effort-biased," I find that computerized or automated equipment in jobs is associated with higher levels of work effort.

Third, and a major focus for this paper, is the issue of whether and to what extent rising work effort may be substantively detrimental to the well-being of the workforce. There exists an abundance of evidence of links between work pressures and workplace

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mental health in a variety of settings, and a good deal of theory and evidence about the sorts of factors that can mitigate the effects of high work pressures.[1] To what extent, however, is the rise in work effort associated with substantive changes in levels of well-being across the whole of the employed workforce? I present evidence that levels of well-being at work have been declining in Britain, and suggest that this decline is largely associated with a combination of rising work effort and declining task discretion.

These findings are derived through analysis of data from three surveys, carried out in 1992, 1997, and 2001. The next section describes these surveys and the measures of effort available from the responses. Other relevant variables are described in the Appendix. The main, substantive, findings are presented in Section 3.

DATA AND MEASUREMENT ISSUES

The *Employment in Britain Survey* in 1992, the *1997 Skills Survey*, and the *2001 Skills Survey*, mainly the first and last of these, provide the data for the ensuing analysis. Each is a large-scale cross-sectional representative survey of individuals aged between 20 and 60 in Britain in paid work at the time of interview. Random sampling methods were used, with a response rate of approximately two thirds for all surveys. Interviews were conducted face to face in respondents' homes, and the achieved samples of 3,855, 2,467, and 4,470, respectively, were each representative of the British population. Survey details can be found in Gallie et al. [1998], Ashton et al. [1999], and Felstead, Gallie, and Green [2002].

The questionnaires comprise a detailed investigation of the characteristics of the individual's job, with an emphasis on the activities that the job entails. The questionnaires also collected some background demographic information. By design, the three questionnaires contain questions asked in identical ways in two or more surveys and hence it is possible to examine both the distribution and the changes in these variables over time.

Work Effort

While there are immense problems in measuring the absolute level of work effort, under certain assumptions it is possible through survey methods to assess differences in effort levels across time and individuals. Taking effort norms as given, subjective assessments of effort levels (which have been shown to correlate well with objective measures) can be compared across time for similar populations. The most satisfactory method is to compare responses to identical questions from representative samples at different time points [Green, 2001].

To measure effort, I constructed a single indicator from three questions, designed to tap different aspects of the jobholder's perceptions of working hard, and which were asked both in 1992 and 2001. The first question asked: "How often does your work involve working at very high speed?" and elicited answers on a seven-point frequency scale. The other questions measured the strength of agreement or disagreement with the statements: "My job requires that I work very hard," and "I work under a great deal of tension." These variables were entered into a factor analysis, which generated

a single factor with a positive eigenvalue. The score on this factor was then used as the Work Effort Index.

Well-Being at Work

A range of measures of psychological well-being has been developed in recent years, in response to evidence that one-dimensional measures are often inadequate. Here I use two major indicators. First, I examine responses to a conventional question about overall job satisfaction. Second, I make use of a measure of work strain, derived from a three-item question: "Thinking of the past few weeks, how much of the time has your job made you feel each of the following?"

- After I leave my work I keep worrying about job problems.
- I find it difficult to unwind at the end of a workday.
- I feel used up at the end of a workday.

Each item was answered on a six-point frequency scale. I constructed a Work Strain Index defined as the sum of responses to the three items.[2]

FINDINGS

Trends in Work Effort and in Well-Being

TABLE 1
Work Effort in Britain, 1992, 1997, and 2001

	All	Private Sector	Public Sector
Proportion for whom job involves working at very high speed "around half the time," or more frequently.			
1992	46.2	48.6	40.3
2001	63.1	63.0	63.5
Proportion who "agree" or "strongly agree" that they "work under a great deal of tension."			
1992	48.4	45.8	54.0
2001	58.4	56.9	62.7
Proportion who "strongly agree" that "my job requires that I work very hard."			
1992	31.6	31.7	32.0
1997	39.9	38.3	44.4
2001	38.3	36.7	43.2
Change in Mean Level of *Work Effort Index*[a] *1992-2001*	0.26	0.24	0.32

a. The Work Effort Index is the estimated factor score of the first and only factor from a factor analysis of the three items. The rise in the mean Work Effort Index between 1992 and 2001, and the difference in the intensification of effort between sectors, were each statistically significant at the 1 percent level.

Table 1 describes a consistent picture of work intensification in Britain during the 1990s. According to each of the three separate items measuring effort, the levels were substantially higher in 2001 than in 1992. For example, the proportions who agreed or strongly agreed that they worked "under a great deal of tension" rose from 48 to 58

percent. The Work Effort Index shows an overall work intensification which was greater in the public sector (0.32) than in the private sector (0.24).

Note, however, that according to the third item—the proportion who strongly agree that the job "requires that I work very hard"—this work intensification had run its course by 1997. The period between 1997 and 2001 showed no significant change in this proportion. See Burchell and Fagan (this volume) for a similar story but using different data and instruments.

Table 2 describes a remarkable tale of decline in the two indices of worker well-being between 1992 and 2001. The proportions who were very or completely satisfied with their jobs fell by nearly 9 percentage points.[3] The Work Strain Index rose by 0.25, reflecting rises in each of its constituent items, which occurred in both private and public sectors.

TABLE 2
Well-Being at Work in Britain, 1992 and 2001

	All	Private Sector	Public Sector
Proportions "very satisfied" or "completely satisfied" with their job			
1992	51.8	50.6	54.3
2001	43.1	43.2	42.7
Change in mean level of overall job satisfaction[a] 1992-2001	–0.23	–0.21	–0.26
Proportions who, as a result of their job, for "most of the time" or "all of the time:"			
"keep worrying about job problems after leaving work"			
1992	5.5	5.6	5.4
2001	8.6	8.2	9.8
"find it difficult to unwind at the end of a workday"			
1992	7.0	6.9	7.4
2001	8.7	8.3	9.6
"feel used up at the end of a workday"			
1992	10.5	9.8	11.9
2001	13.4	12.9	14.9
Change in mean level of Work Strain Index 1992-2001[b]	0.25	0.24	0.34

[a]Overall job satisfaction was coded from 1 (completely dissatisfied) to 6 (completely satisfied). The fall in job satisfaction was statistically significant at the 1 percent level in both sectors and overall.
[b] The Work Strain Index is the sum of the three previous items, each of which were coded 1 (never) to 6 (all of the time). The rise in work strain was statistically significant at the 1 percent level in the private sector and overall, and at the 5 percent level in the public sector. The rise in work strain was significantly greater in the public sector.

Accounting for the Change

I now examine the extent to which the decline in well-being is associated with work intensification, and how far both changes are accountable in terms of other changes in job features over the period. To do so, I pool the data sets and estimate models of the determinants of work effort, work strain, and job satisfaction.

Table 3, column 1, in effect restates the findings from Table 1. The significant positive coefficient on the 2001 year dummy shows the presence of work intensification, and the coefficient on the interactive term "Public Sector in 2001" shows that intensification was greater in the public sector. These coefficients are no more than descriptors of change.

To account for these coefficients, I include in column 2 several job features that theory and previous evidence suggest will require higher effort levels. First, jobs involving higher skill levels, in which job tasks are likely to be more complex, are likely to require greater effort [Gallie et al., 1998]. Of four indices of skill requirements, two are insignificant. Jobs requiring greater learning time, and that have a requirement to keep learning, are found to require higher effort, however. Second, consistent with the idea of "effort-biased technological change" and with broader arguments linking technological change to intensification [Green, 2004], I find that jobs that require the use of computerized or automated equipment lead to significantly higher effort levels. Third, following efficiency wage theory [Akerlof, 1982] I entered the variable "fair wage," which is the residual from a conventional human capital wage equation for each year. Those paid above what they might expect, given their education and work experience, would be predicted to devote more effort in return. This variable had an insignificant effect, however.[4] Finally, trade union coverage was included, but this too had no significant impact on effort.

TABLE 3
Determinants of Work Effort

	(1)	(2)
2001 Year Dummy	0.235	0.193
	(0.019)***	(0.021)***
Public Sector	0.022	–0.048
	(0.024)	(0.029)
Public Sector in 2001	0.087	0.075
	(0.034)***	(0.036)**
Required Qualification Level		0.002
		(0.006)
Training Time Index		–0.002
		(0.004)
Learning Time Index		0.035
		(0.005)***
Required new learning[a]		0.326
		(0.020)***
Job uses computerized equipment		0.068
		(0.019)***
Fair wage		0.004
		(0.020)
Union coverage		0.028
		(0.019)
Constant	–0.153	–0.376
	(0.014)***	(0.025)***
Observations	8,135	6,166
R^2	0.04	0.11

a. Job requires respondents to keep learning new things.
* significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.
Columns 1 and 2 estimated by OLS.

The net effect of including these variables is to reduce both the year dummy and the interactive coefficients by only small amounts. Thus, although skill and technology are relevant, the variables observed consistently across these two surveys are unable to account for most of the changes in work effort.

Table 4, column 1, describes again the decline of well-being, in showing a trend increase in work strain. While strain is greater for public sector workers, there is no significant difference between sectors. In column 2, a strong connection is shown between work effort and work strain. Unsurprisingly, harder work unambiguously increases work strain. Moreover, the Work Effort Index more than accounts for the rise in the Work Strain Index over time, in the sense that, for constant effort levels, work strain is lower in 2001 than in 1992.

In column 3 I introduce several further indicators of the work environment, which theory and previous evidence has associated with affective well-being [Warr, 1987]. Unsurprisingly, longer hours, like intensive work effort, contribute to generate more work strain. Other results show that strain is greater in jobs with fewer opportunities for participation in decision making, in jobs that require greater skill levels and oblige jobholders continually to learn new things, in small establishments, and where the jobholder has a higher qualification level than required. From the personal point of view, strain is reported to be greater for females than males, and greater for prime-age workers than for younger or older workers. All these conditional correlations are consistent with earlier studies. The coefficient on the 2001 Year dummy, however, is not greatly altered by the introduction of these additional variables. I conclude that the rise in work strain is associated with the rise in work effort. Conditional on a given level of work effort, however, work strain decreased over the period.

In column 4 of Table 4, I allow for simultaneous determination of work effort and work strain, because it is possible that unobserved factors are associated with both variables. The classic way to do this is through a three-stage least squares (3SLS) regression. The instruments for work effort are those used in the analysis of Table 3. Identification of the work strain equation is mainly achieved by the inclusion of the "computerized job" variable in the effort equation. This variable is not normally included among the theoretical determinants of strain, though one might concoct arguments for its inclusion. If included, its coefficient turns out to be small and insignificant. As can be seen, the result of instrumenting work effort in this way is to raise the magnitude of both the coefficients and the standard errors for the year dummy effects and for the Work Effort Index. The pattern of findings is otherwise unchanged, except that the obligation to learn new things is now not associated with work strain. The corresponding finding for the effort equation obtained as part the 3SLS regression left the pattern of coefficients unchanged from those shown in Table 3.

Table 5 attempts to account for the decline in job satisfaction noted in Table 2. Column 1 confirms the fall in job satisfaction, and shows also a larger decline in the public sector. Column 2 introduces work effort, which, as expected, is negatively associated with job satisfaction. The Work Effort Index on its own, however, accounts for very little of the decline in job satisfaction: the coefficient on the 2001 Year dummy changes only from –0.17 to –0.14 between the first two columns.

TABLE 4
Determinants of Work Strain

	(1)	(2)	(3)	(4)
2001 Year Dummy	0.253	–0.248	–0.263	–0.388
	(0.087)***	(0.079)***	(0.097)***	(0.316)
Public Sector	0.359	0.270	0.230	0.272
	(0.113)***	(0.102)***	(0.122)*	(0.127)**
Public Sector in 2001	0.127	–0.005	–0.095	–0.160
	(0.156)	(0.140)	(0.156)	(0.190)
Work Effort Index		2.043	1.788	2.490
		(0.046)***	(0.057)***	(1.380)*
20–30 hours per week			0.486	0.496
			(0.151)***	(0.303)
31–35 hours per week			0.454	0.436
			(0.164)***	(0.365)
36–40 hours per week			0.500	0.504
			(0.124)***	(0.375)
41–45 hours per week			0.789	0.805
			(0.160)***	(0.487)*
46–50 hours per week			0.965	0.990
			(0.169)***	(0.597)*
51–100 hours per week			1.369	1.418
			(0.172)***	(0.770)*
Task discretion			–0.013	–0.018
			(0.062)	(0.078)
Participation			–0.066	–0.072
			(0.036)*	(0.038)*
Required Qualification Level			0.291	0.281
			(0.028)***	(0.031)***
Training Time Index			0.003	0.006
			(0.017)	(0.017)
Learning Time Index			0.083	0.060
			(0.024)***	(0.043)
Required new learning[a]			0.165	–0.076
			(0.089)*	(0.440)
Overqualified			0.378	0.361
			(0.092)***	(0.110)***
Fair wage			0.108	0.083
			(0.102)	(0.117)
Large workplace[b]			–0.169	–0.184
			(0.082)**	(0.103)*
Male			–0.390	–0.425
			(0.087)***	(0.290)
Age			0.059	0.056
			(0.027)**	(0.028)**
Age^2			-0.072	–0.068
			(0.033)**	(0.034)**
Constant	7.230	7.560	5.134	5.475
	(0.066)***	(0.060)***	(0.532)***	(0.756)***
Observations	8,001	7,957	5,784	5,665
R^2	0.01	0.20	0.25	

a. Job requires respondents to keep learning new things.
b. 25 or more workers at establishment.
* significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.
Columns 1–3 estimated by OLS, column 4 by 3SLS.

Column 3 introduces the index of Task Discretion. Jobs that permit high levels of task discretion are associated with high job satisfaction. Since at least 1986, though, there has been a decline in task discretion in all sectors of the economy [Felstead, Gallie, and Green, 2002]. The finding here is that, together with work intensification, all of the decline in job satisfaction within the private sector is accounted for, in the sense that, conditional on given levels of work effort and task discretion, job satisfaction is unchanged. This finding remains true when other determinants of job satisfaction are introduced as controls (column 4). Job satisfaction is least for those working 30 to 40 hours per week. Therefore, despite the extra work strain experienced by long-hours (more than 45 hours) workers, such workers report higher levels of job satisfaction than those working more normal hours. Other findings are that job satisfaction is higher when there is more participation in decision making; when jobs require greater learning time and the continual learning of new things; in small establishments; and when the jobholder is female, not of prime age, and not holding qualifications above those required for the job. These findings broadly confirm those in previous studies.

Finally, column 5 reruns the same specification using 3SLS to account for the potential endogeneity of work effort. As can be seen, the findings imply a greater negative association of work effort with job satisfaction than with the OLS regression, while the pattern of other coefficients is little changed.

CONCLUSIONS

Several main findings have emerged:

- In contrast to continued rises in average real pay, there has been a decline in two important aspects of job quality: the overall level of job satisfaction and the extent of work strain. Although there are other aspects of job quality whose movements in Britain are unknown, the deterioration of these two elements deserves serious investigation.
- The rise in work strain is associated with work intensification, while the fall in job satisfaction is associated partly with work intensification but also with the falling extent of discretion that workers have in their daily tasks. Felstead, Gallie, and Green [2002] show that discretion fell across all occupations and industries, but especially for professional workers.
- Work intensification during the 1990s has been reconfirmed with these new data. The indications are, however, that work intensification may have slowed down or come to a halt after 1997. The link between effort and computerized jobs is also reconfirmed, but nothing in these data sets is capable of explaining the extent of work intensification. Other studies implicate work organization changes, which are hard to capture in individual-level data.

These findings confirm the weight owing to work intensification as a source of change in job quality. They also implicate the remarkable decline in task discretion, suggesting that this too should be the focus of further research on job quality.

TABLE 5
Determinants of Overall Job Satisfaction

	(1)	(2)	(3)	(4)	(5)
2001 Year Dummy	–0.167	–0.138	–0.002	–0.062	–0.005
	(0.032)***	(0.033)***	(0.034)	(0.040)	(0.122)
Public Sector	0.107	0.114	0.137	0.207	0.188
	(0.041)***	(0.042)***	(0.042)***	(0.050)***	(0.052)***
Public Sector in 2001	–0.128	–0.124	–0.103	–0.134	–0.099
	(0.058)**	(0.058)**	(0.058)*	(0.064)**	(0.078)
Work Effort Index		–0.106	–0.152	–0.190	–0.494
		(0.019)***	(0.019)***	(0.023)***	(0.538)
20-30 hours per week				0.032	0.014
				(0.062)	(0.120)
31-35 hours per week				–0.178	–0.189
				(0.067)***	(0.144)
36-40 hours per week				–0.218	–0.234
				(0.051)***	(0.146)
41-45 hours per week				–0.156	–0.165
				(0.066)**	(0.189)
46-50 hours per week				0.017	–0.003
				(0.070)	(0.231)
51-100 hours per week				–0.054	–0.090
				(0.071)	(0.300)
Task discretion			0.472	0.322	0.329
			(0.021)***	(0.026)***	(0.032)***
Participation				0.202	0.204
				(0.015)***	(0.015)***
Required Qualification Level				–0.073	–0.069
				(0.012)***	(0.012)***
Training Time Index				0.008	0.007
				(0.007)	(0.007)
Learning Time Index				0.018	0.025
				(0.010)*	(0.017)
Required new learning[a]				0.246	0.350
				(0.037)***	(0.172)**
Overqualified				–0.220	–0.218
				(0.038)***	(0.044)***
Fair wage				0.163	0.179
				(0.042)***	(0.047)***
Large workplace[b]				–0.085	–0.089
				(0.034)**	(0.042)**
Male				–0.114	–0.107
				(0.036)***	(0.111)
Age				–0.028	–0.026
				(0.011)**	(0.011)**
Age^2				0.037	0.035
				(0.014)***	(0.014)**
Constant	4.391	4.371	3.175	4.107	3.975
	(0.024)***	(0.025)***	(0.057)***	(0.219)***	(0.307)***
Observations	8,151	8,104	7,649	5,852	5,731
R^2	0.01	0.01	0.07	0.13	

a. Job requires respondents to keep learning new things.
b. 25 or more workers at establishment.
* significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.
Columns 1–4 estimated by OLS, column 5 by 3SLS.

APPENDIX

Variable	Description	Mean	Range
20-30 hours per week	Usual (2001) or actual (1992) hours worked	0.095	0/1
31-35 hours per week	"	0.082	0/1
36-40 hours per week	"	0.370	0/1
41-45 hours per week	"	0.105	0/1
46-50 hours per week	"	0.090	0/1
51-100 hours per week	"	0.102	0/1
Task Discretion Index	Average score for items measuring personal influence over deciding: what tasks to do, how to do them, the quality standard and how hard to work.	2.32	0 to 3
Participation	Extent of say in decisions about the way job is done.	0.99	1 (none) to 4 (a great deal)
Required Qualification Level	Level of qualification that would be required if applying now for job.	2.15	0 (none) to 5 (degree or above)
Training Time Index	Total amount of past training for type of work currently done.	2.19	0 (none) to 6 (over two years)
Learning Time Index	Time needed to learn to do this type of job well.	3.54	1 (less than one month) to 6 (over two years)
Required new learning	Respondent "strongly agrees" that job requires him/her to keep learning new things.	0.279	0/1
Overqualified	Qualification Level held is greater than Required Qualification Level.	0.344	0/1
Fair wage	Residual log real wage in earnings equation for each year.	0	
Large workplace	25 or more workers at establishment.		0/1
Male		0.524	0/1
Age		39.2	20–60
Age^2		1,645	400–3,600
Job uses computerized equipment	Job involves use of computerized or automated equipment	0.63	0/1
Union coverage		0.52	0/1

NOTES

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1. Included among these are the opportunity for participation in workplace decisions and to have disretion and control over work tasks, and the availability of some form of social support. See Wichert [2002] for a review.
2. The items scaled with a Cronbach's alpha of 0.79 in each survey. The question is a reduced form of a four-item measure of work strain taken from Warr [1987] and utilized in Gallie et al. [1998].
3. The fall in job satisfaction in the 1990s is also tracked through members of the *British Household Panel Study* [Oswald and Gardner, 2001].
4. The residual wage will also reflect unobserved skills or attributes, so the individual's expected wage could differ from that predicted by observed human capital variables.

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