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Is Job Enrichment Really Enriching?

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Abstract

This study uses a survey of Canadian workers with rich, matched data on job characteristics to examine whether "enriched" job design, with features like quality circles, feedback, suggestion programs, and task teams, affects job satisfaction. We identify two competing hypotheses on the relationship between enriched jobs and job satisfaction. The "motivation hypothesis," implies that enrichment will generally increase satisfaction and the "intensification hypothesis," implies that enrichment may decrease satisfaction by increasing the intensity and scope of work. Our results show that several forms of enrichment, specifically suggestion programs, information sharing, task teams, quality circles and training, raise satisfaction. Therefore we argue that the data support the motivation hypothesis. Partitioning the data by education level or union membership further supports this conclusion, while a direct test of the intensification hypothesis does not support the competing hypothesis.

Job satisfaction has important economic impacts. Low job satisfaction is associated with higher rates of quitting (Freeman 1978; Gordon and Denisi 1995; Clark, Georgellis and Sanfey 1998), higher rates of absenteeism (Clegg 1983; Drago and Wooden 1992) and lower levels of work effort (Mangione and Quinn 1975). Dissatisfaction therefore results in higher labor costs and lower productivity. While economists have made important strides in understanding the demographic factors that influence job satisfaction, they have generally not focused on testing the impacts of enriched job design on satisfaction.

Job enrichment includes a number of different workplace practices, such as quality circles, self-directed teams, job rotation, information sharing and others. One possible motivation for adopting such practices is to challenge and motivate workers, and to encourage them to participate in improving productivity, safety, and the quality of their product. To the extent that workers enjoy the challenge and the autonomy, this will raise job satisfaction and reduce hiring and training costs and increase productivity. An alternative motivation for adopting job enrichment is to enlarge the jobs by encouraging multi-tasking and to adopt peer monitoring. These steps would also improve productivity, but without an accompanying increase in job satisfaction.

This study uses a survey of Canadian workers with rich data on job characteristics to examine whether firms that choose enriched job design and workplace practices have more satisfied workers. It extends the literature in several important ways. First, by focusing on job design, it concentrates on factors that a firm's management might easily control. Second, the data allow us to distinguish between "Taylorist" jobs and "enriched" jobs and to evaluate these two competing hypotheses about the influence of enrichment on satisfaction. Finally, the data

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allow us to better control for several potential sources of bias that have been largely ignored in previous work on job satisfaction.

Background

The literature on job design contrasts "Taylorist" jobs to "enriched" jobs. Fredrick Taylor (1947) viewed job design as a scientific optimization problem, where industrial engineers study the production process and devise the most efficient way to break that process into individual, precisely defined tasks. Typically, a Taylorist job is highly specialized, and workers are not encouraged to experiment, innovate, or otherwise vary the way that tasks are completed. In the 1970's, academics such as Richard Hackman, Edward Lawler and Greg Oldham started to argue that Taylorist job design is sub-optimal (Hackman and Lawler 1971; Lawler 1973; Porter, Lawler and Hackman 1975; Hackman & Oldham 1976, 1980). Enriched jobs, by encouraging workers to learn and innovate at work, increase the motivating potential of work. Motivated workers perform tasks more accurately and are more likely to find productivity innovations that engineers overlook. In the 1980's, firms put the theory into practice by redesigning jobs, adopting self-managed teams and work groups, and creating employee participation programs like quality circles.[1] While enriched jobs have proliferated, it is unclear whether this has increased employee satisfaction. Here we focus on two competing hypotheses about the relationship between enriched jobs and job satisfaction.

The idea that enriched job design motivates effort is central to Hackman, Lawler and Oldham's theory. Their underlying assumption is that Taylorist jobs cannot meet the employees' psychological and social needs (Cappelli and Rogovsky 1994). Job enrichment meets these

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[1] Collectively, Ichniowski, Delaney and Lewin (1989), Delaney, Lewin and Ichniowski (1989), Lawler, Mohrman, and Ledford (1992), and Osterman (1994) document (for US workplaces) that formal use of these new management practices was infrequent in the 1970's and quite common by the 1990's.

needs and increases the motivating potential of work, which simultaneously increases both worker satisfaction and effort. We refer to this hypothesis as the "motivation hypothesis." If the data support the hypothesis, we would expect enrichment to have a positive and significant effect on job satisfaction. The degree that enrichment increases satisfaction may vary, as workers differ in their desire for work that fulfills "higher order needs," like autonomy, intellectual challenge, or seeing projects through to completion. Since education, age, or experience may be correlated to higher order needs, the effect of job design on job satisfaction may vary with these individual characteristics.

Critics argue that workers may dislike enrichment for several reasons (Kelly 1982; Pollert 1991). Some employees may prefer Taylorist workplaces. The narrowly defined jobs in a Taylorist workplace allow the employer to easily define performance standards and ensure that an employee will not be asked to do tasks outside of the job's definition. Job enrichment is often accompanied by "intensification of work." For example, most of the examples from a widely cited *Business Week* (1983:100) report on flexibility involve enlarging jobs by adding additional responsibilities (Thompson and McHugh 1990). Furthermore, because success in an enriched job no longer depends on completion of narrowly defined tasks, "employment security is now conditional on market success, rather than assured by [the worker's] status as directly employed personnel" (Whitaker 1991:252). Finally, as economic theorists have long understood, increasing effort levels can also be accomplished by increased monitoring. Enrichment techniques like total quality management, teams and quality circles create incentives for peer surveillance, which can lead to lower job satisfaction (Delbridge, Turnbull and Wilkinson 1992; Sewell and Wilkinson 1992; Garrahan and Stewart 1992). We name these views the

"intensification hypothesis."[2] For support of this hypothesis, we would expect enrichment to be associated with increased job intensity and lower levels of satisfaction.

By distilling a large and nuanced literature into two hypotheses, we obviously simplify. For example, even the proponents of enrichment recognize that the benefits are not universal – some workers may be less satisfied. Conversely, proponents of the intensification hypothesis generally direct their criticisms at the more general move towards "flexibility," which in addition to enrichment also includes a move to a core-periphery model with increased use of temporary workers and decreased job security. In other words, these critics agree that enrichment might benefit some workers but they argue that, as implemented, enrichment is generally detrimental to the employee. Finally, Hamermesh (1977) points out that with perfect certainty, and a continuum of different jobs (offering different combinations of wages and benefits) there should be no difference in satisfaction beyond that due to randomly distributed tastes. Under this theory of compensating differentials, if workers prefer modern job design, then in equilibrium employers with enriched workplaces can offer relatively lower wages. In this case, satisfaction levels will not vary with the degree of enrichment, although differences might be observed after controlling for pay and other variables. Having made these caveats, we believe that our two hypotheses capture the overall tenor of the different viewpoints on the likely links between job enrichment and job satisfaction.

Data Description

Since 1999, Statistics Canada has collected annual nationally-representative data for *the Workplace and Employee Survey* (WES).[3] This survey gathers extensive information on

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[2] For a thorough survey of these arguments, see Thompson and McHugh (1990).

workforce characteristics and job organization. It asks detailed questions about decision-making, quality circles, teams, suggestion programs, feedback, and self-directed work, which match characteristics that Hackman and Oldham use to define enriched jobs. We use pooled cross sections of employees with their matched workplace information from 1999 and 2001. In each year the WES sampled over 6,000 Canadian workplaces with paid employees. At each establishment, one or more contact persons were identified and interviewed for the workplace portion of the survey instrument.[4] In addition, up to twelve employees were randomly selected and interviewed by telephone to complete the employee portion of the survey. The sample includes observations from 43,917 employees.[5] Because full information about work organization practices is limited to workplaces with more than 10 employees, we dropped 7,540 employee observations from small employers. Some of the remaining observations are missing crucial demographic information or responses to the job satisfaction questions. Therefore, our estimations are based on approximately 30,000 observations.

Table 1 reports the proportion of workers who participate in different forms of enrichment. It shows that, a significant fraction of workers participate in each of the enrichment practices identified. At the same time considerable variation exists: only 16% of workers report participation in a task team, whereas 68% of workers participate in employee suggestion programs, and nearly 80% are informed about workplace changes. One quarter of workers participate in quality circles and job rotation. Around 40% of workers receive classroom training or participate in a self-directed workgroup or employee surveys.

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[3] Data are gathered from all parts of Canada except the Yukon, Nunavut and Northwest territories and the survey covers all industries except farming, fishing, hunting, trapping, private households, religious organizations and public administration. For a full description of the development and use of this survey, see Krebs et al (1999).
[4] The primary contact person is typically a human resources manager. 1999 interviews were in person; in 2001 Statistics Canada conducted computer-assisted telephone interviews.
[5] Each cohort also responded to a follow-up survey one year later. For example, of the 25,533 respondents observed in 1999, 20,160 also responded in 2000.

The survey contains two measures of job satisfaction, overall satisfaction and satisfaction with pay and benefits, both measured by a four-point Likert scale, with the four responses being "1: very dissatisfied", "2: dissatisfied", "3: satisfied", and "4: very satisfied". Table 2 reports how overall satisfaction levels vary according to eight characteristics that we associate enrichment: employee surveys, employee suggestion programs, job rotation, teamwork, quality circles, and classroom training.[6] Workers are most likely to report "satisfied", so the mean value is close to three. Without exception, satisfaction is higher among workers participating in any of the enrichment practices, with the largest differences being for those who participate in suggestion programs, task teams and quality circles, and those who are informed about workplace changes.

Empirical Strategy

In order to test the hypotheses on the effect of enrichment on job satisfaction, we follow Clark and Oswald (1996) in treating job satisfaction, *s,* as a function that depends on pay, benefits and a variety of other factors. We therefore define an individual's job satisfaction:

(1) $s = s\ (y,\ h,\ i,\ j)$

where *y* represents a vector of variables describing pay and benefits, *h* is hours of work, and *i* and *j* represent individual and job characteristics, respectively. Job characteristics include the measures of enrichment. Positive coefficients on these variables would support the motivation hypothesis, while negative oneswould suggest intensification. In order to estimate equation (1),

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[6] The appendix (table A1) reports satisfaction by demographic and workplace characteristics. These results are largely consistent with prior literature. One unusual result is that unionized workers report roughly equal levels of satisfaction to other workers.

we must assume that measures of satisfaction are comparable across individuals; this assumption is commonly made in the psychology literature but is uncommon among economists.

Correct estimation of equation (1) poses some specific econometric issues. For example, in order to control adequately for y we estimate equation 1 not only by controlling for wages, but also by controlling for a wide range of benefits, and several forms of incentive pay. Correct estimation of the last two variables, i and j is particularly difficult in a cross section. Although our estimations can control for many characteristics of both workers and workplaces, unobservable characteristics of both might bias these results if correlated with both job satisfaction and the regressors. One such example is management style. It may be that working for an effective manager increases a worker's job satisfaction and that effective managers employ enrichment techniques like job rotation and frequent feedback. Thus, some part of the effect of these variables on job satisfaction might in fact be the effect of management style on job satisfaction, biasing the result.

The unique design of the WES allows us to control for such unobserved workplace characteristics in cross-sectional estimates. The WES consists of matched employee and employer surveys. In one set of surveys, employees are asked about the characteristics of their jobs, including whether they participate in enrichment practices such as suggestion programs, flexible job design, information sharing, etc. Separate surveys ask employers if they use (on a formal basis) these same enrichment practices. The employer responses diverge significantly from employee responses on the same work practices. Even if an employer has a formal program implementing some work organization practice, this does not mean that all surveyed workers will hold jobs employing this practice. It is also possible for particular jobs to have features of enrichment, even if the employer does not have a formal program advocating that

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feature. The employer responses allow us to control for aspects of management style that might be correlated with the enrichment variables. If the effect of a particular workplace feature erroneously captures the unobserved management style, then we would expect the effect to disappear when controlling for the organizational practices of the firm. The employer portion of the survey allows us to control for six characteristics that describe how work is organized and an additional 12 characteristics describing how decisions are made. All 18 of these control variables are described in the appendix, at the bottom of table A3.

After analyzing the effect of enrichment on job satisfaction in the full sample, we get further insight into the intensification hypotheses by separately estimating job satisfaction for enriched and unionized workers. In these subsets, intensification may be more evident. For example, if workers find small amounts of enrichment desirable, but associate larger amounts of enrichment with increased job intensity, then we would expect to see either smaller or negative effects of enrichment on satisfaction in workplaces that apply several different forms of enrichment. If workers who opt to join unions are particularly concerned about job intensity and scope, then we may see strong evidence of the intensification in this sub-sample.

We also test the intensification hypothesis directly using two different measures. First, we identify those workers who respond that they would like to reduce their workweek, and also respond that one reason is work-related stress. If enrichment increases the likelihood of a respondent belonging to this group, then we view this as evidence consistent with the intensification hypothesis. Second, some prior studies find a causal relationship between some enrichment variables and workplace hazards or workplace injuries (Askenazy 2001; Brenner, Fairris and Ruser 2004). Therefore, we also regress days of paid sick leave taken as a function of

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the enrichment variables. A positive and significant relationship here would also support the intensification hypothesis.

Our ability to better control for individual-specific and workplace-specific variables makes an important contribution to the empirical literature on job satisfaction. Most large micro data sets of workers do not contain rich information on workplace and job characteristics. Therefore, the best current work has used data sets limited to a small number of workplaces, which allows researchers to better identify job characteristics and also to observe several workers at the same firm or jobsite. Drago, Estrin and Wooden (1992), Gordon and Denisi (1995), and Brown and McIntosh (2003) show that controlling for workplace characteristics *does* qualitatively change conclusions about job-satisfaction.[7]

This work, along with Clark (1999) and Bauer (2004), is among the first to study the relationship between job characteristics and job satisfaction in a broadly representative data set. Therefore, it reveals how well prior results generalize, and allows for a much more precise identification of the effects of different types of job characteristics. In particular, we are unaware of other papers that use matched data, which allows us to effectively control for unobserved management characteristics.[8]

Full-Sample Results

Table 3 reports the effect of job enrichment policies on worker satisfaction. The first three columns show coefficients from ordered probit estimations of equation (1), appropriately weighted to account for the stratified sampling procedure. The fourth column shows coefficients

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[7] Other authors have looked at case studies. See Griffin (1991) or Kato and Jones (2005), for example.
[8] Frijters et al. (2003) show that matched data can be exploited to get significant new insights on the link between discrimination and job satisfaction.

from a fixed effects logit, where the dependent variable has been collapsed from four Likert ordered values to two. Each model also controls for a full set of worker characteristics. The results for these control variables are generally consistent with prior literature and can be found in the appendix, table A3.[9]

The four models in table 3 differ in terms of the control variables used. Model 1 controls only for worker characteristics. The enrichment variables generally have a positive impact. Six of the eight variables--suggestion programs, job rotation, information sharing, teams, quality circles and classroom training--are significant at the 95% level; the remaining two are insignificantly different from zero. Model 1 does not control for either wages and benefits or for workplace practices reported from the employer portion of the survey. The former might affect results if compensating differentials offset the satisfaction (or dissatisfaction) associated with enrichment. The latter matters if unobserved managerial style biases results. Models 2 and 3 add these controls, which are individually listed in appendix, table A4.[10] Very little changes with these formulations. The exact same enrichment practices remain statistically significant and the coefficient estimates remain virtually unchanged. Compensating differentials do not appear to generally equalize satisfaction levels and there is no evidence that the original estimates erroneously captured omitted workplace effects. Model 4 takes advantage of the presence of multiple employees at each establishment to control for any remaining unobservable establishment characteristics that affect a worker's job satisfaction. Under this specification, the

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[9] One unusual result is the coefficient on union membership, which is insignificant and has the opposite sign of prior findings. The control variables also include some variables not typically found in other analyses: having been promoted or frequently working overtime increases satisfaction. Long or undesirable hours, shift work, or an education level that exceeds the level required for the job decreases satisfaction. While table A3 reports only the coefficients from model 3, the coefficient estimates are remarkably stable across models.

[10] With controls for the employer portion of the survey, we would expect to produce more conservative estimates of the benefits of enrichment. Collinearity between the control variable from the workplace survey and the enrichment variable from the employee survey may make the enrichment variables appear less significant. This would be true even if satisfaction depended only on job, not workplace, characteristics.

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six enrichment practices that were significant in models 1-3, remain so. In addition, participation

in a self directed workgroup is now also positively associated with job satisfaction.

Before using this evidence to conclude that enrichment increases satisfaction, we first

explore two alternate explanations for the results. It may be that satisfied employees are more

likely to report the existence of enrichment practices, or that satisfied workers are more likely to

be invited by their employers to participate in activities like job rotation or quality circles.[11] To

check for differences in survey reports, we compared the correlation coefficients between

enrichment measures on the employer survey and enrichment measures on the employee survey

by satisfaction level. If satisfied workers were more likely to accurately report participation,

then we would expect a stronger positive correlation for this subset of workers. Table 4 shows

these correlation coefficients for the full sample, for workers who report being either very

satisfied or satisfied, and for those who report being dissatisfied or very dissatisfied. There are

no systematic differences across groups, indicating that satisfied workers are no more likely to

report the presence of enrichment practices than dissatisfied ones.

To check whether satisfied workers are more likely to participate in enriched jobs, we use

the fact that each worker is observed for two years. We compare the initial period job

satisfaction of workers who begin participating in one of the enrichment practices by the

following year to the satisfaction of those who do not begin participating. Initial job satisfaction

is not statistically different for most of the enrichment variables, with the exception of those who

begin participating in a job rotation program—those workers have lower job satisfaction prior to

participating. Thus it does not appear that those who participate are initially more satisfied.

Results for Enriched and Unionized Worker Subsamples

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[11] We thank David Levine and Edward Lazear respectively for pointing out these possibilities.

In aggregate, the results support the motivation hypothesis. Suggestion programs, job rotation, information sharing, quality circles, and task teams have consistently positive and statistically significant impacts on enrichment. None of the results support the intensification hypothesis: except for self-directed workgroups in model 3, even the insignificant variables have positive coefficients. We now explore the possibility that the intensification hypothesis, while not valid in the full sample, holds for certain sub-samples. To do this, we estimate separate equations by enrichment level and union membership. These results are presented in tables 5 and 6.

In order to define an "enriched" worker, we use the 18 control variables for work organizational practices and combine them with the 8 measures of enrichment to derive 26 characteristics of an enriched job-workplace combination. A worker is designated as working at an enriched workplace if the job-workplace combination has at least 7 of the 26 characteristics.[12] Estimating an ordered probit separately for enriched workers allows us to investigate the possibility that enrichment has non-linear effects. For example, it is possible that both the motivation hypothesis and the intensification hypothesis have some validity. Small amounts of enrichment might increase satisfaction, while increasing enrichment further simply increases the intensity and scope of work. Table 5 presents no evidence for this, however. The effect on satisfaction is the same in enriched workplaces as in the full sample, in both size and significance. Furthermore, in some cases the effects of enrichment practices appear to be smaller and less statistically significant in the unenriched sample, suggesting complementarities between workplace practices. Ichniowski, Shaw and Prennushi (1997) find similar complementarities in the productivity benefits of adopting such practices.

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[12] The cutoff value is arbitrarily chosen, but results are not sensitive to choosing a slightly higher or lower threshold.

A second partition of the data, reported in table 6, considers a separate estimation for unionized workers. Unions have a history of opposing the types of changes that accompany enrichment. It is possible, therefore, that those workers who are most averse to job intensification and job enlargement may choose to join a union or be a member of a workplace that is governed by a collective bargaining agreement. There is no evidence that enrichment, in general, decreases satisfaction for this group, although several of the enrichment practices have smaller and less significant effects on satisfaction. Three of the enrichment variables, suggestion programs, information sharing and quality circles remain positive and significant with coefficients that are qualitatively similar to the full sample. In contrast to the full sample, classroom training and task teams become insignificant, while participation in employee surveys becomes significant. No enrichment variable decreases satisfaction.

A Direct Test of the Intensification Hypothesis

Thus far, the results give strong support for the motivation hypothesis and no support for the intensification hypotheses. With respect to the latter, none of the eight estimations finds a single negative and statistically significant effect of a job enrichment measure on job satisfaction. We note however, that job satisfaction is not a direct test of the intensification claim. Critics argue that job design, as it has been implemented, has led to "job enlargement," and "effort intensity" (Pollert 1991, pp. 3, 12). The WES identifies workers who would prefer shorter working hours in part because of work-related stress and also includes information on the number of paid sick-leave days taken during the past year. We use these two measures as dependent variables and test the effect of enrichment, including the same set of control variables as in the third column of Table 3. If enrichment practices intensify jobs and increase stress, we

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would expect to find that these practices increase the probability of workers preferring shorter hours and increase the number of sick days taken. The results are reported in Table 7. In aggregate, these data give very little support for the intensification hypothesis. In column 1, only membership in a quality circle increases our measure of work-related stress, while one enrichment variable, information sharing, decreases work-related stress. Only participation in employee surveys is positively correlated with paid sick leave days at a statistically significant level.

Conclusion

This study uses a unique, rich, matched data set to investigate the relationship between enriched jobs and employee satisfaction. We identify two competing hypotheses about this relationship. The motivation hypothesis argues that enrichment satisfies employees' psychological and social needs and will therefore increase satisfaction. The intensification hypothesis, on the other hand, argues that enriched jobs require workers to do more types of tasks and work more intensely, and reduces job security. Therefore, enrichment should decrease satisfaction.

We carefully control for employee and workplace characteristics, including unobserved establishment characteristics that might be correlated with both employee satisfaction and the choice of enrichment practices. Additionally, we control for the employee's wages to account for the possibility of compensating differentials. Our results produce strong support for the motivation hypothesis and no support for the intensification hypothesis. Suggestion programs, job rotation, information sharing, teams, quality circles and classroom training all are positively associated with job satisfaction. The same results hold for the specific subset of unionized

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workers. Even among workers who are in highly enriched jobs, the enrichment practices are positively related to job satisfaction. These results strongly support the motivation hypothesis, and neither these results nor direct tests of work-related stress show support for the intensification hypothesis.

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Table 1. Use of enrichment practices in 1999 and 2001 WES

	Mean
Participate in employee survey	.4593
Participate in suggestion program	.6838
Participate in job rotation	.2669
Informed about workplace changes	.7850
Participate in task team	.1612
Participate in quality circle	.2580
Part of self-directed workgroup	.3713
Received classroom training	.3919
Number of observations	32,047

Note: weighted means from pooled 1999 and 2001 data.

Table 2. Satisfaction rates in 1999 and 2001 WES, by whether or not job is enriched

All workers		3.202
Job enrichment	*Yes*	*No*
Participate in employee survey	3.261	3.169
	(.005)	(.005)
Participate in suggestion program	3.276	3.063
	(.004)	(.007)
Participate in job rotation	3.268	3.179
	(.007)	(.004)
Informed about workplace changes	3.268	3.029
	(.004)	(.009)
Participate in task team	3.387	3.170
	(.008)	(.004)
Participate in quality circle	3.369	3.145
	(.007)	(.004)
Part of self-directed workgroup	3.270	3.165
	(.006)	(.005)
Received classroom training	3.295	3.158
	(.005)	(.005)

Note: weighted means from pooled 1999 and 2001 data. Standard errors in parentheses. The satisfaction variable takes values 1 (very dissatisfied), 2 (dissatisfied), 3 (satisfied), 4 (very satisfied).

Table 3. Effect of job enrichment policies on worker job satisfaction in pooled 1999 and 2001 WES

	Model 1	*Model 2*	*Model 3*	*Model 4*
Participate in employee survey	.0332	.0427	.0317	.0040
	(.029)	(.032)	(.032)	(.033)
Participate in suggestion program	.1618***	.1707***	.1757***	.3047***
	(.031)	(.033)	(.034)	(.035)
Participate in job rotation	.0642**	.0620*	.0717**	.1311***
	(.033)	(.035)	(.035)	(.034)
Informed about workplace changes	.2669***	.2807***	.2682***	.2806***
	(.037)	(.040)	(.040)	(.042)
Participate in task team	.1466***	.1582***	.1628***	.2240***
	(.041)	(.044)	(.044)	(.042)
Participate in quality circle	.1481***	.1476***	.1408***	.2535***
	(.037)	(.039)	(.039)	(.038)
Part of self-directed workgroup	.0115	.0036	-.0102	.0782**
	(.034)	(.035)	(.035)	(.033)
Received classroom training	.0945***	.1040***	.0872***	.1558***
	(.031)	(.032)	(.033)	(.032)
Worker Characteristics controls	YES	YES	YES	YES
Wage control?	NO	NO	YES	YES
Establishment workplace organization controls?	NO	YES	YES	YES
Establishment fixed effects?	NO	NO	NO	YES
Pseudo R^2	.0489	.0531	.0567	.0002
Number of observations	32,047	29,272	29,272	26,094

Notes: Columns 1-3 report ordered probit coefficients (dependent variable takes on four possible values). Fourth column reports fixed effects logit coefficients (collapsing dependent variable into two values). Standard errors in parentheses. *** - $p<.01$, ** - $p<.05$, * - $p<.10$.

Table 4. Correlation between responses on employee and workplace surveys for enrichment and work organization variables.

Item from workplace survey	Item from employee survey	All workers	Satisfied workers	Dissatisfied workers
Employee suggestion programs	Asked to completes employee surveys	.107	.109	.106
Employee suggestion programs	Employee suggestion program	.079	.086	.037
Flexible job design	Job rotation	.015	.011	.049
Information sharing	Information sharing	.130	.126	.154
Problem-solving teams	Task teams or labor-management committee	.046	.043	.067
Problem-solving teams	Quality circle or team	.053	.056	-.003
Labour-management committees	Task teams or labor-management committee	.046	.043	.084
Labour-management committees	Quality circle or team	.003	.003	.003
Self-directed groups	Self-directed groups	.061	.066	.005

Notes: Correlation coefficients between employer response to survey item in column one and employee response to survey item in column two. Satisfied workers respond being "very satisfied" or "satisfied" with their job overall, dissatisfied workers responded being "dissatisfied" or "very dissatisfied".

Table 5. Effect of enrichment policies on job satisfaction in high- and low-enrichment establishments

	Full sample	Enriched sample	Unenriched sample
Participate in employee survey	.0317	.0614	.0095
	(.032)	(.043)	(.044)
Participate in suggestion program	.1757***	.1656***	.1971***
	(.034)	(.046)	(.044)
Participate in job rotation	.0717**	.1063***	.0166
	(.035)	(.042)	(.058)
Informed about workplace changes	.2682***	.3626***	.2320***
	(.040)	(.074)	(.047)
Participate in task team	.1628***	.1891***	.1079
	(.044)	(.052)	(.073)
Participate in quality circle	.1408***	.1458***	.1189*
	(.039)	(.051)	(.062)
Part of self-directed workgroup	-.0102	-.0059	-.0245
	(.035)	(.046)	(.054)
Received classroom training	.0872***	.0888**	.0931*
	(.033)	(.043)	(.051)
Pseudo R^2	.0567	.0537	.0538
Number of observations	29,272	14,142	15,130

Notes: Ordered probit coefficients (dependent variable takes on four possible values). The models control for worker characteristics, wages and establishment workplace organization as in the third column of Table 3. Standard errors in parentheses. *** - p<.01, ** - p<.05, * - p<.10.

Table 6. Effect of enrichment policies on job satisfaction in union and non-union establishments

	Full sample	Union sample	Non-union sample
Participate in employee survey	.0317	.1035**	.0008
	(.032)	(.044)	(.041)
Participate in suggestion program	.1757***	.1458***	.1889***
	(.034)	(.052)	(.042)
Participate in job rotation	.0717**	.0494	.0765*
	(.035)	(.048)	(.045)
Informed about workplace changes	.2682***	.2581***	.2769***
	(.040)	(.063)	(.051)
Participate in task team	.1628***	.0595	.2294***
	(.044)	(.068)	(.056)
Participate in quality circle	.1408***	.1108*	.1523***
	(.039)	(.060)	(.048)
Part of self-directed workgroup	-.0102	-.0113	-.0202
	(.035)	(.055)	(.043)
Received classroom training	.0872***	.0212	.1281***
	(.033)	(.043)	(.044)
R^2	.0567	.0537	.0666
Number of observations	29,272	10,477	18,795

Notes: Ordered probit coefficients (dependent variable takes on four possible values). The models control for worker characteristics, wages, and establishment workplace organization as in the third column of Table 3. tandard errors in parentheses. *** - $p<.01$, ** - $p<.05$, * - $p<.10$.

Table 7. Effect of enrichment policies on job-related stress

	Prefer fewer hours due to stress	Days paid sick leave taken
Participate in employee survey	.0003	.4962**
	(.001)	(.244)
Participate in suggestion program	.0010	-.7876
	(.001)	(.664)
Participate in job rotation	-.0009	-.2093
	(.001)	(.185)
Informed about workplace changes	-.0038**	.5638
	(.002)	(.509)
Participate in task team	-.0018	-.3138
	(.001)	(.320)
Participate in quality circle	.0028**	-.1432
	(.002)	(.275)
Part of self-directed workgroup	.0001	.1939
	(.001)	(.317)
Received classroom training	.0001	-.3161
	(.001)	(.345)
R^2	.2670	.0311
Number of observations	29,371	29,371

Notes: Column 1 reports probit marginal effects. Column 2 reports OLS coefficients.   The models control for worker characteristics, wages, and establishment workplace organization as in the third column of Table 3. Standard errors in parentheses. *** - p<.01, ** - p<.05, * - p<.10.

Table A1. Sample means and satisfaction rates in 1999 and 2001 WES for select demographic characteristics

	Mean	Satisfaction Rate	Standard Error
All workers		3.202	.004
Age < 25	.0764	3.104	.018
Aged 25-34	.2235	3.137	.008
Aged 35-44	.3210	3.242	.006
Aged 45+	.3792	3.243	.006
Female	.4938	3.226	.006
Male	.5062	3.180	.005
Married	.5932	3.249	.005
Unmarried	.4068	3.141	.006
With disability	.0200	3.075	.024
Without disability	.9800	3.205	.004
Covered by union	.3326	3.181	.006
Not covered by union	.6674	3.207	.005
High school only	.2844	3.203	.007
Some college	.5121	3.203	.005
Bachelor's degree	.1385	3.183	.011
Advanced degree	.0650	3.238	.016
Overeducated	.3533	3.165	.006
Not overeducated	.6467	3.222	.005
Part-timer	.1458	3.227	.012
Full-timer	.8542	3.197	.004
Prefers ± 5 hours	.1872	3.044	.009
Hours within 5 of optimal	.8128	3.240	.004
Home language not work language	.0999	3.066	.012
Home language is work language	.9001	3.217	.004
Promoted in past year	.4198	3.267	.005
Not promoted in past year	.5802	3.156	.005
Establishment < 25 employees	.1933	3.224	.010
Establishment 25-99 employees	.3062	3.174	.006
Establishment 100-249 employees	.1506	3.187	.008
Establishment ≥ 250 employees	.3498	3.269	.006

Note: weighted means from pooled 1999 and 2001 data. The satisfaction variable takes values 1 (very dissatisfied), 2 (dissatisfied), 3 (satisfied), 4 (very satisfied).

Table A2. Effect of worker characteristics on job satisfaction

Tenure	-.0033
Experience	-.0073
Experience^2/100	.0351***
Female	.0771**
Married	.0585*
Has children	.0699**
Covered by union	-.0194
High school only	.1140**
Bachelor's degree	-.1493***
Advanced degree	.0462
Home language not work language	-.1357***
Disability that limits work activities	-.0249
Education exceeds that required for job	-.0544
Hours per week	-.0086***
Would prefer ± 5 hours	-.2962***
Overtime hours	.0900**
Uses a computer on the job	.0207
Works late shift	-.0825
Promoted within the last year	.1540***
Manager	.1197
Professional	-.1001
Technical/trade worker	-.0214
Marketing/sales worker	--
Clerical/administrative	.0450
Production worker with no trade	-.0610
Natural log of hourly wage	.2829***
Year 2001	-.0660**

Notes: Ordered probit coefficients from model in column 3 of Table 3.
* - p<.01, ** - p<.05, *** - p<.10.

Table A3. Effect of workplace characteristics on job satisfaction

Number of employees/100	.0012
Vacancy rate	-.0989
Many competitors	-.0509
Incentive pay available	.0145
Gainsharing pay available	-.1240***
Profit sharing pay available	.0818*
Merit pay available	.0211
Workers help decide planning of daily individual work	-.0210
Workers help decide planning of weekly individual work	.0269
Workers help decide on follow-up of results	.0503
Workers help decide on customer relations	-.0466
Workers help decide on quality control	-.0161
Workers help decide on purchase of necessary supplies	.0355
Workers help decide on maintenance of machinery and equipment	.0218
Workers help decide on setting staffing levels	.1468*
Workers help decide on filling vacancies	.0030
Workers help decide on training	-.0136
Workers help decide on choice of production technology	-.0160
Workers help decide on product/service development	.0755
Workplace has employee suggestion program	-.0460
Workplace has flexible job design program	.0192
Workplace has information sharing program	-.0332
Workplace has problem-solving teams	.0681*
Workplace has joint labor-management committees	-.0772**
Workplace has self-directed work groups	-.0181

Notes: Ordered probit coefficients from model in column 3 of Table 3.
 * - p<.01, ** - p<.05, *** - p<.10.