Abstract

The issue of worker satisfaction is important both for the sake of individuals themselves and also for employers for whom happy staff should be productive staff. Highly satisfied staff have been shown to have lower propensities to quit and to be absent. Whilst there have been some interesting contributions in this field, the existing studies are weakened by their inability to control for workplace characteristics. Uniquely, our data set, covering three low wage sectors, enables us to do this whilst still providing a wealth of demographic information. Using principal components analysis we examine five measures of workers' satisfaction and find that individuals respond quite differently depending upon the measure of contentment employed. We then examine which of our component forms of satisfaction has the greatest impact on overall satisfaction. Satisfaction with short-term rewards and long-term prospects are found to be far more influential in determining overall satisfaction than contentment with social relationships or work intensity.

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If You're Happy and You Know It... Job Satisfaction in the Low Wage Service Sector

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1. Introduction

Who is the most satisfied in their work, and why do differences in satisfaction levels exist? The answers to these questions should be of interest to workers and employers alike. One of the principal premises of mainstream economics is that of utility maximisation among individuals. Since work is such an important part of most peoples' lives, the satisfaction they derive from work is likely to be a major determinant of their overall utility levels. Mainstream economics has less to say about the internal workings of firms, and the relationships that exist within them. It should be obvious, however, that labour differs from the other factors of production in that the inputs derived from it can rarely be specified exactly, and workers have a discretionary element to their work levels. If it is then accepted that workers' behaviour, and hence their performance levels in terms of productivity, absenteeism, propensity to quit and so on, will be influenced by the satisfaction that they derive from work, then it should be clear why employers should also be interested in the questions asked at the beginning.

A small but expanding economic literature on job satisfaction has attempted to answer these questions. We use the results from a survey carried out amongst employees from three low-wage, service sector companies to add to this literature. We consider our data set to have two clear advantages for this task. First, the survey was conducted in a limited number of workplaces across the three companies. While we acknowledge the drawback of this in terms of the representativeness of the results, it does allow us to control for the working conditions faced by individuals. It seems reasonable to propose that the working conditions experienced by individuals will be a key determinant of their satisfaction levels. Previous studies have been unable to control for such conditions which can seriously bias the results of investigation into job satisfaction.

The literature that does exist on the economics of job satisfaction has found a number of empirical regularities in terms of who is most satisfied in their work. There has been less progress in answering the second question posed above, however; why do such differences exist? We believe that the second advantage of our data set is useful here. As well as a measure of overall job satisfaction, our survey asked respondents to rate their satisfaction with eleven particular aspects of their work. From their answers, we derive four new satisfaction measures using a principal component analysis. Investigating the determinants of each of these factors allows us to understand the particular aspects of their work which make some people more satisfied than others. Then we can use these factors to investigate which is most important in determining overall job satisfaction.

The paper proceeds as follows. After an overview of the existing literature on job satisfaction, Section 2, we describe the data used for our own empirical investigation, Section 3. The results are presented in three main instalments. First the determinants of overall job satisfaction are investigated, and then principal component analysis is used to derive satisfaction measures with four particular aspects of work. Equations are then presented that describe the

determinants of each of these factors in turn. Finally, we investigate which of these factors are the most important in determining overall satisfaction. In Section 5 we summarise our findings and describe some implications.

2. Literature Review

Although a substantial literature on job satisfaction exists within the psychology discipline, economics has considered this concept in much less detail. Locke (1976) offers an extensive summary of the psychological literature on job satisfaction, including the concept, measurement, causes and consequences of job satisfaction. Many of the studies reviewed by Locke offer evidence whereby job satisfaction is correlated with a single variable of interest, rather than using the more formal statistical methods of multivariate regression analysis favoured by economists. However, this work is still useful in that it identifies variables that are likely causes or correlates of job satisfaction, which should therefore be included in economists' models. Such variables include characteristics of individuals themselves, as well as the characteristics of the jobs that they do. Other psychological studies examine the correlation between job satisfaction and a range of outcomes. As well as Locke (1976), Steel and Ovalle (1984) provide an extensive review: their survey reveals that a negative correlation coefficient between job satisfaction and employee turnover is almost always obtained.

Compared to this vast psychological literature, economic attention to job satisfaction has been limited. The work that has been undertaken typically adopts a basic framework, estimating an equation of the form:

$$S_i = f(IC_i, JC_i) \qquad \textbf{(1)}$$

where S_i is a measure of individual i's job satisfaction, expressed as a function of a vector of individual characteristics, IC_i and a vector of job and workplace characteristics, JC_i. Data for S_i always takes the form of self-reported job satisfaction levels, measured on a Likert scale. The list of explanatory variables included in the vectors of individual and job characteristics was presumably originally inspired by the earlier psychological work mentioned above, but increasingly there appears to be consensus on the variables that should be included in an economic job satisfaction equation, in the same way as, for example, the Mincer wage equation has become accepted in the empirical wage literature. Thus, different authors include the same variables in their job satisfaction equations, although they typically make the relationship between job satisfaction and one variable in particular the focus of their study, for example gender (Clark, 1997), age (Clark and Oswald, 1996), race (Bartel, 1981), education (Tsang *et al*, 1991), wages (Cappelli and Sherer, 1988, Clark and Oswald, 1996, Sloane and Williams, 1996, and Watson *et al*, 1996), trade union status (Gordon and Denisi, 1995, Meng, 1990, Miller, 1990, and Schwochau, 1987), and establishment size (Idson, 1990). Additionally, Clark (1996) and Freeman (1978) present job satisfaction results without focussing on one relationship in particular.

The conformity of results across these studies is impressive, and adds weight to the argument that self-reporting provides a valid measure of job satisfaction, and is not just picking up noise. The most consistent result across studies is the relationship between gender and job satisfaction. Every study listed above finds that women are more satisfied with their jobs than men, the majority reporting a statistically significant relationship. Clark (1997) attempts to explain this result in terms of jobs, work values, self-selection or expectations. The arguments are that women do different types of work to men, are more committed to their work, are more likely to

quit work altogether if they are dissatisfied, or expect less from their job. Controlling for job characteristics, work values and self-selection fails to remove the statistically significant gender coefficient. However, Clark notes that there is no significant difference between male and female satisfaction levels, for the young, the well-educated, those in professional occupations, and those working in mainly male workplaces. He argues that women in such groups will have job expectations on a par with those of men, and so report similar satisfaction levels, while women outside these groups expect less from their jobs, and so report higher satisfaction levels than equivalent males doing a similar job.

That the more educated are less satisfied in their job is at first glance a surprising result, but it has been found in all but one[1] of the investigations into job satisfaction listed above, the relationship often being statistically significant. Tsang *et al* (1991) investigate further by obtaining a measure of *required* education for each individual's job, and including a measure of surplus schooling, defined as actual minus required education, in their job satisfaction equation. The results show that *required* education is positively related to job satisfaction, which is consistent with the logical reasoning that jobs for more educated people should be more interesting and stimulating, and hence more satisfying. *Surplus* education, however, is associated with lower job satisfaction, the relationship being statistically significant for males. Thus when individuals are performing jobs that are below them in terms of the skill levels required, they feel unchallenged and unfulfilled, and hence less satisfied. When other studies include only *actual* education levels, and obtain an inverse relationship with job satisfaction, it is presumably such effects that are being picked up.

With respect to age, the most frequently reported result is a positive, usually statistically significant, relationship with job satisfaction. However, recent work, particularly by British authors, suggests that when allowance is made for non-linearities, a U-shaped relationship is obtained. Thus, although job satisfaction increases with age later in life, from the beginning of one's working life, job satisfaction can initially fall over time, perhaps as the first enthusiasm for work wears off.

Race is the individual characteristic that has the least consistent relationship with job satisfaction across studies. Bartel (1981) focuses on why blacks are significantly more satisfied than whites in her data set. This is the case, even when earnings and occupational status, which are both generally lower for blacks, are not controlled for. Neither is it the case that less satisfied blacks are more likely than whites to drop out of employment, since the statistically significant coefficient on the race variable remains after controlling for selection into employment. Other authors have replicated this finding without offering an explanation. However, some studies do not find a significant relationship either way, while a few find the reverse relationship, where whites report significantly higher job satisfaction. Expectations could again be responsible for some of these findings.

It would be expected that an individual with higher earnings would report that they were more satisfied in their job, *ceteris paribus*. Such a relationship is usually found in job satisfaction studies, although it is not always statistically significant. One study, by Cappelli and Sherer (1988), actually finds a negative, though statistically insignificant, relationship. However, a number of authors have suggested that individuals gain satisfaction, not from a high level of earnings *per se*, but from a high level of earnings relative to some comparison or expected level.[2]

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1. The exception being Gordon and Denisi (1995).

2. See Cappelli and Sherer (1988), Clark (1997), Clark and Oswald (1996), Meng (1990), Schwochau (1987), Sloane and Williams (1996), and Watson *et al* (1996).

Such studies have therefore included a measure of expected income as well as actual income in their satisfaction equations, or imposed the restriction that the coefficients on the two income measures should be equal in size and opposite in sign, and simply included deviations of actual income from expected income. To obtain a measure of expected income, most studies have estimated a wage equation, and taken the predicted values as an indicator of individuals' expected income, given their personal characteristics such as gender, age, education and experience. Other approaches that have been tried in the literature include setting individuals' expected wages equal to the average for their occupation in the data set (Cappelli and Sherer, 1988), or equal to the gender-specific occupational average in an alternative national data set (Clark and Oswald, 1996). Finally, Sloane and Williams (1996) include in their satisfaction equations dummy variables indicating individuals' subjective opinions as to whether they are over- or under-paid. The results of all of these studies reveal a positive and statistically significant relationship between job satisfaction an individual's income level *relative to* some expected level.[3]

Hours worked is a likely influence on an individual's job satisfaction, although the inclusion of such a variable in an estimated job satisfaction equation can present some econometric problems. The issue is that hours of work may be a choice variable, at least for some individuals, and thus be endogenously determined. Hence, although *ad hoc* reasoning would predict that longer hours of work should reduce job satisfaction, it may be that those who are more satisfied with their jobs choose to work longer hours, leading to a positive relationship between the two variables. This is the likely reason for the conflicting results that have been obtained for hours worked in the job satisfaction literature. A statistically significant, negative effect of hours on job satisfaction is found by Clark (1996, 1997) and Clark and Oswald (1996), while the reverse is sound by Bartel (1981) and Schwochau (1987). Other studies either do not include hours, or find its effect to be statistically insignificant.

The relationship between union status and job satisfaction has attracted considerable interest in the literature. The consistent finding is that union members are less satisfied than non-members in their work, the difference being statistically significant in the majority of cases. The explanation most often advanced is that voice mechanisms allow union workers to express their dissatisfaction. A couple of studies attempt to test this proposition, arguing that individuals with longer tenure should be the ones who voice their dissatisfaction rather than exiting the firm, since they are the ones with the most to lose in terms of acquired firm-specific human capital. However, when Miller (1990) interacts union status with job tenure, this variable attracts a positive coefficient in his job satisfaction equation, rather than a negative one as predicted by the exit-voice model. Schwochau (1987) does find a negative effect of tenure on job satisfaction, but argues that to be consistent with the exit-voice model, this should be found particularly for those who have filed a grievance. She therefore includes a variable interacting tenure with grievances, but again this takes the 'wrong' (positive) sign, suggesting that amongst workers who have filed grievances, those with the longer tenure are the more satisfied. Miller (1990) suggests an alternative explanation of the negative union-satisfaction relationship, arguing that unions are more likely to form where workers are dissatisfied. When he allows for union status being endogenous, by instrumenting the union variable in his satisfaction equation, he finds that the union effect does indeed disappear.

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3. Note, however, that Sloane and Williams (1996) find that overpayment only increases the job satisfaction of males, while Watson *et al* (1996) find that actual minus expected income is only related to job satisfaction for those who expect to be leaving their job. The authors suggest that those who expect to remain in their job cognitively adjust to the dissonance between what they actually earn and what they think they *should* earn, so that perceived over- or under-payment, and hence any related satisfaction or dissatisfaction, is removed.

The previous paragraphs discuss the variables most often analysed in job satisfaction studies. Many more variables have been included by the various authors, according to their theoretical beliefs, or the data available to them. Other statistically significant effects on job satisfaction that have been observed in at least two studies include being married (+), good health (+), urban dwelling (-), commuting time (-), senior occupation (+), job tenure (+ or U-shaped), firm size (-), good promotion opportunities (+) and the availability of training (+).

As mentioned earlier, the majority of studies in the job satisfaction literature have adopted a very similar approach, with few considering modifications or extensions. One issue is raised by Gordon and Denisi (1995), who point out that the working conditions experienced by individuals must be amongst the principal causes of job (dis)satisfaction. To the extent that working conditions are often measured at best imperfectly, at worst not all, and are therefore usually not controlled for, this will bias the coefficients on any variables correlated with them. This is essentially Miller's (1990) point, that unions are associated with poor working conditions, which in turn reduce job satisfaction, and because working conditions are not controlled for, we observe a negative effect of union membership on job satisfaction. The argument generalises to any variable correlated with working conditions. Gordon and Denisi (1995) argue that national, probability sample data sets could well have as many working establishments as individuals in their samples, with each establishment having its own particular conditions. Since such conditions are rarely measured in such national data sets, the omitted variable problem will be present in any analysis. However, if a data set is based upon a sample of individuals who all work in the same establishment, then the analysis of such data would in effect be holding working conditions constant, thus solving the problem. Even if the sample contains workers who work at different, but a limited number of, establishments, by including establishment dummy variables in the estimated equations, working conditions could still be held constant.[4] Thus Gordon and Denisi (1995) depart from the norm and analyse a number of data sets, each drawn from a single working establishment. They find no evidence of any significant effect of union status on job satisfaction, supporting the view that the negative relationship found in national data sets is due to inadequate controls for working conditions, and unions forming where working conditions are worse.

Another innovation that has been adopted by a small number of studies is to consider alternative measures of job satisfaction. In particular, as well as an overall measure of job satisfaction, surveys often ask for a respondent's satisfaction with particular aspects of the job, such as pay, prospects, job content and relations with supervisors. A number of authors have included an equation explaining satisfaction with pay in their results. Some attempt to explain satisfaction with up to eight aspects of the job.[5] Two studies, Gordon and Denisi (1995) and Schwochau (1987), have an even greater number of satisfaction variables at their disposal (14 and 33 respectively). Rather than estimate separate equations for each measure, which would have made interpretation of the results difficult, both studies undertake a factor analysis, to reduce the number of satisfaction variables to manageable proportions. Gordon and Denisi find only one principal component amongst their fourteen variables, and thus estimate one equation with this overall satisfaction measure as a dependent variable. Schwochau, however, finds five factors in her data, and after studying the variables which load most heavily onto each, she names them satisfaction with supervision, co-workers, job content, resource adequacy and pay. Each of these

4. Of course, research based on a small number of establishments cannot always be generalised to the economy as a whole. For this reason, such work should be seen as an addition, rather than an alternative, to research based on national, probability sample data sets.

5. See for example Clark (1997) and Meng (1990).

factors is then used as a dependent variable in five separate satisfaction equations. Given that the focus of her paper is union–non-union differences, she does not comment on all of the results, but the presented equations reveal that the effects of some variables differ, according to which aspect of the job is being considered. Thus, taking this more disaggregated approach to measuring satisfaction is a potentially fruitful method of finding out why individuals with particular characteristics are satisfied or dissatisfied with their jobs.

A final way in which some job satisfaction studies differ from the norm is through considering the consequences, as well as the causes, of job satisfaction. Indeed, one of the first papers to present an economic analysis of job satisfaction, Freeman (1978), considers the implications for employee turnover, but few subsequent papers have followed this lead. By using a panel data set, Freeman could identify employees who quit their jobs at some point, and he shows that the likelihood of this depends negatively on their reported job satisfaction, the relationship being statistically significant. Perhaps the more frequent availability of cross-sectional rather than longitudinal data is one reason why this relationship has not been examined further by other authors. Gordon and Denisi (1995) use cross-sectional data to show that an individual's reported *intention* to quit is negatively related to their job satisfaction, although the possibility of the two self-reported variables being jointly determined by, say, the individual's psychological state of mind cannot be ruled out, so that this study cannot infer causality as well as Freeman's work can. Finally, Drago and Wooden (1992) use data from fifteen establishments to show that individual-specific annual absence rates are negatively related to reported job satisfaction. The relationship is statistically significant, and is particularly strong when self-reported group cohesion is high.

3. Data

This study relies upon staff questionnaires that provide a range of demographic information along with information about respondents' jobs. These data and matching payroll information were obtained by the Centre for Economic Performance in late 1996 and early 1997, as part of a Rowntree funded study into low wage labour markets. Three national companies are involved: a supermarket chain, a hotel group and a quick service restaurant chain; providing us with information for around one thousand workers over a total of 50 sites.

Previous studies of satisfaction have relied upon national samples which cover workers across a variety of different industries and workplaces. A very important aspect of our data is that there are a limited number of workplaces included, with a number of respondents at each workplace. By including dummy variables for workplaces we are thus uniquely able to control for workplace characteristics, such as size, location and management policies which are likely to impact on workers' contentment. The omission of workplace characteristics that influence satisfaction, and that are also correlated with the included explanatory variables, can lead to biases on the coefficients of those explanatory variables. By including the workplace dummy variables we are therefore able to solve this omitted variable bias problem, thus enabling us to properly determine which demographic characteristics are important in influencing satisfaction. We believe this to be a major advantage of working with these data.

The questionnaire elicits workers' satisfaction with eleven different aspects of the position as well as questioning them about their overall satisfaction with the job. These questions are listed in Appendix A. As usual with satisfaction data the responses are on a five-point scale, with five representing perfect satisfaction and one complete dissatisfaction. The demographic information in the questionnaires reveals the respondents' age, sex, marital status, parental status, ethnicity, level of education and whether currently in education. By matching these questionnaires

to the company payroll we are also able to determine individuals' weekly hours of work, hourly rates of pay, their occupational grade and tenure.

The sites were chosen as regional clusters around the West Midlands, Yorkshire, the Southeast, Southwest and Northwest. The travel to work area of each site was identified which enables us to map in the median wage for each travel-to-work area using the April 1996 New Earnings Survey. Dividing the actual hourly rate by the local median provides us with a measure of the relative wage received by workers. Therefore, following Clark (1997) we can identify how expectations, in this case wage expectations, influence reported satisfaction.[6]

The response rates were respectable, varying from an average of 50% for the hotel chain and 23% at the supermarket chain, to 19% for the quick service restaurants, (QSR). Table 1 contains information on the sample achieved, showing the percentage of respondents falling into various demographic subgroups. If we consider whether the survey respondents were representative of each company's workforce we find some variation. At all three firms women and older workers were more likely to respond than young male employees with short tenure. If we compare the achieved sample in each firm to that of their industry's average using the Labour Force Survey we find that the hotel chain is fairly representative of hospitality, save that tenure is only half as long as the industry average. The quick service restaurant uses far more men and young people, and staff have much shorter tenure than for the hospitality industry as a whole. Looking at the retail chain, it employs more women and slightly younger staff than the retail industry.

4. Results

Table 1 provides the mean overall satisfaction level for some of the demographic groups in our sample, together with a t-test or F-test as appropriate to test for equality of mean satisfaction levels across the various categories of each characteristic.

Remembering that the higher the response on the five point scale the better, it is immediately apparent that women are more satisfied with their overall position than men. Age traditionally plays a role in investigations of satisfaction. Both younger workers and those at the end of their working lifetimes are often shown to be more satisfied than prime age workers. The results here suggest that it is workers aged 45 or younger who appear less satisfied, with the youngest group of workers, those aged 15-25, slightly more satisfied than their immediate seniors. The oldest group of workers are the most satisfied of all.

There are few ethnic minorities in our sample so we simplify the classification into whites and non-whites. There is only a small degree of difference in their mean responses, with whites proving only slightly more positive about their jobs than blacks. However, the attitudes of both groups to their jobs is only slightly more positive than indifferent.

The questionnaires provide detailed information about the highest level of qualification obtained. Respondents are divided into six groups: those with no qualifications, those educated to CSE standard, O level standard, A level standard, to degree level or those with vocational qualifications. Whilst the ranking of those with vocational qualifications is problematic, responses for all other groups suggest that the more educated a worker the less happy they are with their positions. Considering the variation across those who have completed their education and those who are continuing to study, Table 1 shows there is little difference between their average

6. We also tested the effect of employing a measure of local inequality, the 50-10 wage differential, within the travel to work area. Inserting this independent variable along with the worker's hourly rate performed less well than using a measure of the actual wage relative to the local median.

overall satisfaction rates.

Marital status is less frequently used as an explanatory variable. In our study, married and, by our definition, co-habiting employees report exactly the same level of satisfaction as do single employees. The picture becomes more interesting when we consider parental status. Reported overall satisfaction is very similar for those without children and for those with two or more children. However, those workers with just one child appear happier.

Workers employed for 15 hours a week or fewer are slightly more content than employees who work between 16 and 30 hours per week. Full-timers show lower rates of satisfaction than either of the other two groups.

Whilst none of our respondents could be classified as middle management they do cover a range of skill levels. Using the payroll information we have ranked employees into five occupational bands: the unskilled and trainees, semi-skilled, semi-skilled workers with junior level responsibility, skilled workers and supervisory grades, and low level managerial or professional. The more skilled workers, those whom we define as lower management or professional, exhibit the lowest level of overall satisfaction. Whilst the next three skill groups show little variation, the unskilled and trainees display lower levels of contentment than the intermediate strata. It may be that senior workers are less likely to be subjected to tight scrutiny which may in turn explain their greater contentment. This issue can be examined later in the paper when we investigate workers' views on their relations with supervisors.

a) Determinants of Overall Job Satisfaction

We look first at the influences upon workers' overall satisfaction with their current position. As mentioned above, satisfaction is measured using a five point categorical variable. Therefore Ordinary Least Squares is an inappropriate estimation technique, since it assumes the dependent variable is measured on a cardinal scale, and we are required to use ordered probit analysis. This technique assumes there exists some unobserved continuous scale for the dependent variable, satisfaction, s*.

$$s^{*} = \beta x + u \qquad \textbf{(2)}$$

(where x is a vector of all the right-hand side variables, and u is a standard normally distributed error term. The data that are actually observed only put satisfaction into five categories. The category chosen will depend on certain cut-off points on the continuous scale. Therefore observed satisfaction s=1 if $s^{*}<c_1$, s=2 if $c_1<s^{*}<c_2$, s=3 if $c_2<s^{*}<c_3$, s=4 if $c_3<s^{*}<c_4$, and s=5 if $c_4<s^{*}$, where the c's are the cut-off points. Then, the probability that an individual chooses the first satisfaction category, s=1, can be given as:

$$\begin{aligned} Pr(s=1) &= Pr(s^{*}<c_1) \\ &= Pr(u<c_1-\beta x) \qquad \textbf{(3)} \\ &= F(c_1-\beta x) \end{aligned}$$

F is the cumulative normal distribution.

Similarly,

$$\begin{aligned} Pr(s'2) &= F(c_2 - \beta x) - F(c_1 - \beta x) \\ &= Pr(\beta x + u < c_1) \\ Pr(s'3) &= F(c_3 - \beta x) - F(c_2 - \beta x) \\ Pr(s'4) &= F(c_4 - \beta x) - F(c_3 - \beta x) \\ Pr(s'5) &= 1 - F(c_4 - \beta x) \end{aligned} \quad \textbf{(4)}$$

Taking the log of each probability and summing, with a suitable indicator to show which satisfaction category each observation falls into, gives the log likelihood function. This can then be maximized, using a suitable optimization technique, with respect to the parameters of interest and the cut-off points.

The results from this ordered probit analysis are presented in three specifications in Table 2: the first specification is without site or company controls, the second has company dummies, and the third site dummies. The advantage of the second column over the first is that we can control for company policies, that may affect job satisfaction in a consistent way across individuals. It is interesting to note that employees in the quick service restaurant sector are more satisfied than those in retail or hotels. One possible variation across companies that is not controlled for in our data is the availability of non-wage benefits, which clearly may influence job satisfaction. This does not seem to be the source of the variation in satisfaction across companies observed here, though. As part of the same survey, the managers of our establishments also completed a questionnaire, which included questions about non-wage benefits. An examination of the answers reveals that virtually all the establishments in each of our three companies provide free or subsidised food for their workers, while none at all provide child care. A more promising systematic difference across the three companies for explaining these results is establishment size. Restaurant sites are generally smaller than retail establishments and hotels. It is well established that workers' satisfaction is higher in small establishments[7], and as we fail to control for size, this could be what is driving our results.

As well as knowing the company worked for, we also know at which establishment each of our respondents works. Whereas previous studies have been unable to control for workplace characteristics, we can use site dummies to do this. In order to justify the inclusion of these dummies in our model we perform a likelihood ratio test. The critical value of the likelihood ratio test is 57.84, with 42 degrees of freedom, suggesting that the site dummies are jointly statistically significant. Therefore, specification 3, which includes the site dummies, is indeed preferred to specification 1. The effects of omitting them, and so not adequately controlling for working conditions, are revealed by comparing the coefficients in column 3 with those in column 1. The theory of omitted variable bias would predict that the coefficient on any explanatory variable positively (negatively) correlated with bad working conditions will be biased downwards (upwards) when working conditions are not controlled for. For example, the coefficient on our relative wage variable almost doubles in size when we include the site dummies in our equation. This is also the case when we compare the specification with company dummies,

7. See, for example, Idson (1990).

column 2, to that with site dummies. Wage rates could be positively related to bad working conditions if compensating differentials for those conditions are paid, and when working conditions are not controlled for, wages will then appear to have a negative effect on satisfaction, thus biasing its coefficient downward. Similarly, the coefficient on the female dummy variable increases in size and in its level of statistical significance from 10% to 5% once the site dummies are included. We therefore come to the same conclusion as the Gordon and Denisi (1995) study described above, that not controlling for working conditions can seriously affect the results of a job satisfaction study.

From now on all specifications presented will include site dummies, and so we concentrate here on column 3 of Table 2. Our results are wholly consistent with those found in the job satisfaction literature described above. As in all previous studies, we find that females report significantly higher rates of satisfaction. In order to illustrate our results, we used the estimated coefficients to calculate the probability of an individual with certain characteristics reporting the highest satisfaction level of 5. We then changed the characteristics one by one, re-calculating this probability each time, in order to show the influence of that characteristic on reported satisfaction. Our 'baseline' person was created to reflect the typical characteristics of the individuals in our sample. She is a white female, aged 21, who is single and has no children. She has no qualifications, and is not currently at college. Her job is at the unskilled or trainee level, pays a relative wage of 0.733 and is full time (39 hours). The probability of someone with these characteristics being highly satisfied is estimated to be 0.259. If the person was instead male, holding all other characteristics constant, this probability falls to 0.195.[8]

The results of Clark (1996, 1997) and Clark and Oswald (1996) have suggested that the relationship between job satisfaction and age tends to be a quadratic rather than a linear function and so we employ both age and age squared. The coefficient on age is negative and that on age squared is positive, both being statistically significant. This conforms to our assumption of a quadratic form and to our earlier impression from the mean satisfaction rates in Table 1, that satisfaction falls with age until some critical point, beyond which it begins to increase again.

The coefficient on ethnic status is reasonably large and negative but statistically insignificant. Race plays no role in determining overall satisfaction, nor does it figure in any of the following, more detailed regressions. We defined as single those workers who were neither co-habiting nor married. Whilst there is no difference in satisfaction levels between 'married' or single workers, there is variation by parental status. As was suggested in Table 1, workers with one child are more satisfied than both those without any and those with two or more offspring. This coefficient is sizeable, and suggests that if our 'baseline' person was instead to have one child, then the probability of her reporting the highest satisfaction level would rise from 0.259 to 0.347.

Education proves to be an important influence for those with non-vocational qualifications above CSE standard, dissatisfaction with work increasing monotonically across educational groups. If we again use our 'baseline' person to illustrate the effect of education on job satisfaction, her probability of being highly satisfied falls from 0.259 when she has no qualifications, to 0.164 when her highest qualifications are O-levels or GCSEs, to just 0.048 if she holds a degree. Despite the influence of qualifications on satisfaction levels there appears to be no variation in contentment by current educational status. Those still studying are no less satisfied than those who have completed their education.

Turning to the employment-related characteristics, both the relative wage and work hours play an important role in determining overall satisfaction. Unsurprisingly the relative wage

8. The probability of satisfaction being at the highest level was calculated changing every one of the characteristics of the baseline person in turn, and the results are presented in Appendix B.

rate has a positive, and large, influence upon satisfaction.[9] If the person described above was to earn her local average wage, rather than the sample average relative wage of 0.733, her probability of being highly satisfied would rise from 0.259 to 0.314. The influence of hours of work is negative and also statistically significant. A cut in hours from 39 to 20 would see almost a ten percentage point rise in our typical person's chances of being highly satisfied (0.259 to 0.355). Satisfaction levels across skill groups are measured using those in the unskilled or training category as the default. Those classified as skilled or supervisory are statistically significantly happier than both their unskilled and their professional and low-level management counterparts. An individual working at this grade, who otherwise had the same characteristics as the person described above, is estimated to have a 45.2% chance of reporting satisfaction at the highest level. The coefficient for semi-skilled workers is smaller than that for their skilled and supervisory colleagues, but they are statistically significantly more satisfied than both the top and bottom occupational strata.

b) Principal Components Analysis

The survey used contained a further 11 aspects of respondents' jobs with which they were asked to rate their satisfaction. Rather than attempt to examine the determinants of each, we decided to run a principal component analysis on the 11 items, to find out whether they could be reduced to a small number of composite factors. The objective of principal component analysis is to find the unit-length linear combinations of the variables with the greatest variance. In practice, what this means is that linear combinations of the variables are found that contain most of the information in those variables. With 11 items, 11 components are presented. In keeping with common practise, we kept only those components with eigenvalues above unity, regarding the others as simply representing sampling noise in the data. This procedure resulted in four principal components that between them contained over 60% of the information contained in the 11 satisfaction variables.[10] Examining the items that loaded most heavily onto each of these principal components, with the anticipated sign, allowed us to formulate an idea as to what each was representing. Four variables loaded most heavily onto the first component: satisfaction with promotion opportunities, finding the job challenging, liking the business and considering the job to be a job for life. This component we termed satisfaction with the long-term rewards available from the job. The second component was dominated by satisfaction with fellow workers and with supervisors, and so seemed to reflect the social aspects of the job. Two variables loaded most heavily onto the third component: satisfaction with pay and with the employer. This component seemed to be picking up satisfaction with the short-term rewards available from the job. Finally, satisfaction with the hours of work, and the level of tiredness at the end of the working day were the key variables in the fourth component, the latter having a negative sign. This component was therefore measuring satisfaction with the workload or effort required in the job. A final satisfaction variable, relating to commuting time, did not seem to relate to any of the interpretations we had placed upon them, and this variable was omitted from the subsequent analysis. Applying

9. We investigated whether wages were endogenous by removing the quick service restaurant from the sample. This firm allows for site-based discretionary wage setting, unlike the other two companies. Therefore, satisfaction may lead to extra effort, which in turn may lead to a higher wage. Our other two companies employ nationally standard wage scales, so any improvement in performance is reflected in job grade rather than wage rates. When we focus solely on the retail and hotel chain we find that our results are unchanged.

10. Further details of the principal component analysis are provided in Appendix C.

the loading weights on each variable then allowed us to construct our four composite satisfaction variables, based on these four principal components, as follows:

$$(\textit{satisfaction with long\&term prospects}) = 0.385((\textit{job for life}) + 0.348((\textit{like business})$$

$$+ 0.337((\textit{job challenging}) + 0.316((\textit{good promotion opportunities})$$

$$(\textit{satisfaction with short\&term rewards}) = 0.533((\textit{good pay}) + 0.347((\textit{good employer})$$

$$(\textit{satisfaction with social aspects}) = 0.502((\textit{like co\&workers}) + 0.411((\textit{like supervisor})$$

$$(\textit{satisfaction with workload}) = 0.277((\textit{good hours}) - 0.823((\textit{tired})$$

Once the various weights have been applied to individuals' satisfaction scores on the various items, we are left with four continuous variables. We therefore have to treat these new variables as cardinal and estimate the equations by Ordinary Least Squares. The results should indicate the particular aspects of their jobs that make individuals with certain characteristics either satisfied or dissatisfied.[11]

(i) Satisfaction with Short-term Rewards

Column 1 of Table 3 reports the results for a regression of satisfaction with short-term rewards on the independent variables. Whilst women still report that they are more satisfied than men, there is no longer any significant distinction between the two sexes. Previous authors, for example Clark (1997), have queried why women should be more satisfied with their work when they typically receive lower immediate rewards than men in similar positions. The result presented here reveals women to be no more satisfied than men with their short-term rewards, and that the source of their satisfaction lies elsewhere.

Marital status does however prove to be influential. Those who are married or co-habiting are 0.12 points less satisfied than single workers. This may reflect their difficulty in balancing work and home commitments, and their dissatisfaction with the rewards on offer when they try. Whilst we might expect the same logic to dictate that parents would be less satisfied, parental status proves to be unimportant. Perhaps this is due to selection bias. It may be that women with children, in particular, choose not to work if the immediate gains do not compensate for the difficulty of juggling work and home.

The coefficient on age is negative, whereas that on age squared is strongly positive, both being statistically significant. Setting the partial derivative with respect to age equal to zero we can determine that the age at which the quadratic age function turns is 40 years. It may be that workers are initially happy or perhaps naïve on joining the workforce due to their limited alternative experience. As workers get older, however, they will expect more money as they become more experienced and become aware of alternatives, leaving them less satisfied with their current short-term rewards. Beyond the age of 40, satisfaction with such rewards seems to rise again. We must assume that workers have become more realistic and self-select into jobs that they

11. Appendix C tabulates descriptive statistics relating to the four composite satisfaction variables, to aid the interpretation of their estimated coefficients.

are happy with. Given the growth in workers taking early retirement, another selection problem may be evident. It may also be that older workers who were employed in these generally low skill, low paying industries have self-selected into inactivity. Those older workers who might have exhibited low rates of satisfaction may therefore have left the labour force.

The pattern of dissatisfaction increasing with education levels is also repeated. As before, coefficients for those with CSEs and vocational qualifications are negative but statistically insignificant. At higher education levels dissatisfaction is statistically significant and increasing. This finding may result from the higher aspirations that are exhibited by the more highly educated. Particularly in the companies that we are studying, individuals with good qualifications may not feel that they are receiving adequate remuneration for the skills that they are offering, and so express dissatisfaction with the short-term rewards on offer. College students are less satisfied than those who have left education: this difference may reflect the students' higher aspirations and their greater difficulty in maintaining work. However, the difference is not statistically significant: perhaps this is because students lower their expectations of a part-time job.

As anticipated, the influence of relative wages is statistically significant in determining satisfaction with short-term rewards. Whilst the coefficient seems large, at 1.11, relative wages would have to increase by one point in order to boost short-term satisfaction by this amount on its scale. Such a jump in relative wages is extremely unlikely. The influence of hours is smaller for any possible change in the number of hours worked, but the coefficient is again statistically significant. As we would expect, for a given relative wage, an increase in the number of hours worked will reduce the satisfaction associated with that wage. An increase in the wage would thus be necessary to offset an increase in hours worked and keep satisfaction at a constant level. These results therefore suggest that individuals have an upward-sloping labour supply curve.[12]

The results by occupational strata are different to those in Table 2. We see that the only group who are more satisfied with their immediate position than the unskilled default group are those classified as semi-skilled. As with education levels we may find that more highly skilled groups have higher expectations of employers that are neither achieved nor compensated for. Similarly, the unskilled and trainees may feel that their pay does not compensate for the tedium of the job, or perhaps they are typically not well treated by employers.

(ii) Contentment with Long-term Prospects.

As we would expect, the influences on short- and long-term satisfaction vary to some degree. The second column of Table 3 examines the influences that determine satisfaction with long-term rewards.

Most studies in the area of satisfaction have identified that women are more satisfied than men. Whilst we found no significant difference in short-term satisfaction, this is not the case when we look at long-term satisfaction. Women are likely to rate their satisfaction with long-term prospects one fifth of a point higher than men. We follow previous authors in suggesting that this result is due to the lower expectations of women. Given the constraints on mobility and on their hours, that many women face if they have caring responsibilities, it is perhaps not surprising that their expectations of their long-term prospects are lower.

The coefficients on race and parental status remain positive, but do not attain

12. The use of the relative, rather than the absolute, wage level in the regressions precludes the possibility of calculating the monetary value necessary for individuals to work one more hour and remain equally satisfied.

statistical significance. Marital status also has a statistically insignificant effect, though the coefficient is positive rather than negative. The influence of age and age squared remain important, though as the coefficient on age falls to just -0.05, and that on age squared to 0.07, the U-shaped age relationship is flatter for long-term than for short-term satisfaction. The minimum is at a similar point, at 36 years of age.

Education is obviously important in determining long-term aspirations. Again if we limit our comments to workers of GCSE standard or above, we identify a monotonically decreasing relationship between qualifications and satisfaction with long-term prospects. Indeed workers with degrees are likely to report satisfaction with long-term prospects almost one point lower than workers with no qualifications. This may reflect the limited demand for talent and opportunities facing well-qualified workers in these companies. As noted in the literature review, Tsang *et al* (1991) found that it was surplus education, above the level required to do the job, that reduced job satisfaction. It is likely that well-educated individuals will feel over-educated in our three companies, and thus the results obtained here are consistent with those of Tsang *et al*. With respect to current students, it appears that they are instrumentally motivated, and their lack of identity with the company means that their satisfaction with long-term prospects is no lower than that of non-students.

The results by occupational status reveal that all groups report long-term satisfaction rates which are higher than those of the unskilled. The satisfaction of those in supervisory and skilled grades is higher than for other groups. This may reflect the fact that they have not reached the top of the establishment hierarchy. The motivation behind short and long-term satisfaction is thus quite different. It is clear from these differences across columns in Table 3 that the reason those in more senior occupations were found to be more satisfied with their overall jobs in Table 2 is that they feel they have some sort of career plan and long-term prospects with the company.

The influence of the relative wage remains positive but becomes insignificant, suggesting that individuals on lower wages are no less satisfied with their long-term prospects than their more highly paid colleagues and perhaps that people are prepared to make short-term sacrifices to achieve their long-term aims. Perhaps more surprising is the significantly positive coefficient on weekly hours. It may be that choice of hours is endogenous and we are observing a reverse causality here, whereby workers who are motivated by their long-term aspirations decide to work longer hours.

(iii) Social Relations

There are far fewer influences on contentment with what we label the social relations of work, including relations with supervisors as well as other workers. This may be because such satisfaction is determined more by psychological indicators, which are not captured amongst our explanatory variables. Women report significantly higher rates of satisfaction with social relations, over one tenth of a point higher than that of men. This seems to be one of the reasons why, in general, women are more satisfied with their overall jobs than men. Again we must consider the self-selection issue, however. It may be that women choose to leave the labour force rather than work in less friendly environments.

The only other influence of note is occupational category. Those of supervisory or skilled rank report higher levels of contentment with other workers and supervisors. Workers who are highly skilled or of supervisory standing may experience less antagonism from supervisors than those at lower grades, as was suggested when discussing why those higher up the occupational hierarchy rated their overall satisfaction more highly.

(iv) Work Levels

Becker (1985) argued that women have a comparative advantage in household work over men, and so they will focus their energies on such tasks. Those women who do paid work, according to Becker, should accept easy, non-tiring jobs that will not deplete their energies too much for their 'natural' tasks of housework. If this argument is correct, then we should see women expressing a greater satisfaction with their work levels than men, and presumably Becker would argue this is one reason why women are more satisfied in their jobs overall. The results in column 4 of Table 3, however, find no evidence in favour of such a hypothesis. Women are if anything less happy than men with their work levels, although the lack of statistical significance on this coefficient suggests that there is little difference in such satisfaction between the sexes. This rejection of Becker's hypothesis is consistent with the empirical effort literature, which typically finds that women, holding other things constant, exert more effort than men in their jobs (see, for example, Bielby and Bielby, 1988).

Parents of two or more children do, however, report that they are less happy than non-parents with the demands of work. This may be due to the hours of work being unsuitable for parents, or to the physical demands of childcare on top of the effort expended at work.

If we examine satisfaction with the demands of work by education level we find that degree holders are over half of one point less happy than all other groups. This may be due to the choice of companies under study, where manual skills and physical labour may be more in demand than their brain power. Again, this therefore appears to be a Tsang *et al* (1991) problem, whereby over-education in our companies is reducing satisfaction derived from working there. We also note that those who are still studying are less satisfied with their hours and the level of fatigue they experience. This is to be expected, for although as we discussed it is possible for them to lower their demands from part-time work whilst studying, there will still be physical demands on them.

Looking at work characteristics, weekly hours of work shows a negative coefficient. As hours increase, workers report a small, 0.01 point per hour, fall in their satisfaction with work demands. This suggests that they would prefer to work fewer hours. Workers who are classified as skilled with junior responsibility are happier with their workload than all other occupational groupings. They report being three tenths of a point more satisfied than their unskilled colleagues. It is not apparent why this is the case. Perhaps their jobs are not too onerous and not too boring.

c) The Impact of the Components of Satisfaction on Overall Satisfaction

In this section we detail how the four dimensions of satisfaction impact upon overall satisfaction. Workers' overall satisfaction with their positions is the most likely form of satisfaction to impact on their performance. Therefore, estimating the determinants of overall satisfaction should be of value both for academic reasons and because it may enable employers to better devise working conditions that will satisfy their staff. The results from Table 3 revealed that certain demographic groups might be happy with their long-term opportunities but not their short-term rewards, and vice versa. Therefore it is worth investigating which of the four derived measures of satisfaction bears most heavily on overall satisfaction. As we return to an examination of an ordinal variable, we must again rely upon ordered probit analysis. The results of the regression are presented in Table 4.

We of course recognise that the overall satisfaction variable is likely to be highly correlated with each of the four component variables, and this is indeed the case when the data are examined. If respondents answer all of the satisfaction variables with respect to a consistent reference group, then we would expect them to consistently report satisfaction or dissatisfaction

across all of the items. Thus their responses to each satisfaction variable will be strongly related to each other. We are therefore not surprised that the estimated coefficients on the component variables are strongly statistically significant in the overall satisfaction equation of Table 4, and we do not to make anything of the fact that they are. However, the fact that there are differences in the estimated coefficients, and the accompanying marginal effects as described below, suggests that some components weight more heavily in the respondents' calculation of overall satisfaction than others. We believe that it is of interest to establish which components are the most important factors in determining overall satisfaction.

It is also of no surprise that almost all of the coefficients on the other explanatory variables in Table 4 are statistically insignificant. We would expect this, if each of them has an effect on overall satisfaction through one of the satisfaction components, which are held constant in the estimated equation. It would appear that the influences of having one child and working long hours on overall satisfaction work independently of the four components, since these two variables maintain their statistically significant coefficients.

We cannot compare the coefficients on the four satisfaction components in Table 4 directly, as they are measured on different scales. We therefore resurrect our 'baseline' person from an earlier section to illustrate their effects. Giving this person exactly the same characteristics as before, and in addition setting her satisfaction levels with short-term rewards, long-term prospects, social relations and work levels at their sample means, the probability of her being highly satisfied is 0.072. We then increase satisfaction with each factor in turn by one standard deviation above its mean, and re-calculate this probability. If short-term satisfaction is one standard deviation higher on its scale, the probability of our person being highly satisfied rises to 0.232, with the similar probabilities for extra long-term, social relation and work level satisfaction being 0.225, 0.122 and 0.106 respectively. Thus, it appears that the short-term rewards and long-term prospects that a firm offers are the key determinants of an individual's overall job satisfaction, with these two aspects being of almost equal importance. While good social relations and acceptable work levels can also affect overall satisfaction, their importance is secondary relative to the two factors identified above. Perhaps individuals are willing to sacrifice such benefits for more instrumental gains.

5. Conclusions

This study has used data from individuals in three low-wage service sector companies to investigate the determinants of job satisfaction. Our results are consistent with previous empirical investigations, in that women, non-prime age workers, the less-well educated and those in more senior occupations are more satisfied in their work.

Our study then extended this earlier work by examining four components of overall satisfaction, derived by principal component analysis. Investigating the determinants of each component revealed the following statistically significant results. Female workers were more satisfied than their male counterparts with both their long-term prospects and the social relations at work. Higher long-term satisfaction was also reported by those in more senior occupations, while the higher the relative wage received, the greater was employees' satisfaction with their short-term rewards. Significantly lower satisfaction, with both short-term rewards and long-term prospects, was found amongst the well-educated. Similarly, individuals who were married or living as married, and those who worked longer hours, were more likely to be dissatisfied with their short-term rewards, as were employees who had two or more children or who were still at college, with respect to satisfaction with their work levels. Finally a U-shaped relationship in age was found for both short-term and long-term satisfaction.

The analysis then proceeded by investigating the components of the job that are most related to overall job satisfaction. We found that satisfaction with immediate factors and satisfaction with long-term prospects were the key determinants of overall job satisfaction. Satisfaction with social relations and with work levels played less important roles. This result suggests that it is more important for employers in these sectors to satisfy workers' short- and/or long-term demands, than to consider whether they are happy with the physical demands or social relations of work. If we consider the individuals who reported the highest levels of satisfaction with their short-term rewards and long-term prospects, we can then determine who will be the most satisfied, and hence motivated, by such policies, and can derive the following implications from our analysis.

Individuals in more senior occupations were clearly more satisfied with their career prospects than those in more lowly positions. While a company obviously cannot promote all of its staff to senior levels, it seems that offering good prospects to the employees it does promote is a useful means for keeping them satisfied.

A higher relative wage did not appear to be necessary to boost satisfaction with long-term prospects, although, as expected, it did made workers more satisfied with their short-term rewards. The fact that those with a lower current relative wage were no less satisfied with their long-term prospects than their better paid counterparts suggest that individuals may be willing to concede short-term gains, if they can see a long-term future with their company. Also as expected, forcing longer hours at a given relative wage level reduced the satisfaction derived from the immediate rewards on offer. Companies must be prepared to pay for extra demands they make of their workers.

Finally, and perhaps most importantly for the companies in our sample, the results in Table 3 made it clear that the more highly educated individuals were less satisfied with both their short-term rewards and their long-term prospects. If a company is going to hire well-qualified individuals, it is important to provide them with both the immediate rewards and the career prospects that they feel their skills merit, otherwise they will become dissatisfied and de-motivated. The fact that we have observed such dissatisfaction among the well-educated in our data set could be due to the focus of the study being on low-status service sector companies. Hiring well-qualified individuals into jobs demanding lower skill levels is a surefire route for creating job dissatisfaction. Our results add to earlier work, by showing that over-qualified employees are dissatisfied with both their short-term rewards and their long-term prospects in such jobs, both of which are the key determinants of overall job dissatisfaction.

Table 1
Mean Overall Satisfaction Levels

Variable	Categories	Sample means (%)	Mean satisfaction	T-test/ F-test
Sex	female	72.5	3.621	-2.04**
	male	27.5	3.470	
Age	15-25 years old	81.5	3.530	4.78***
	26-45 years old	10.5	3.492	
	46-55 years old	3.4	3.795	
	56+ years old	4.7	3.802	
Race	white	88.8	3.593	1.10
	non-white	11.2	3.477	
Highest education level	no qualifications	26.0	3.737	5.69***
	CSEs	12.5	3.617	
	vocational qualifications	11.1	3.654	
	O-levels/GCSEs	35.4	3.504	
	A-levels	11.3	3.491	
	degree	3.7	2.813	
Student status	currently at college	30.8	3.595	-0.38
	not currently at college	69.2	3.568	
Marital status	married or living as married	44.4	3.580	-0.01
	single	55.6	3.580	
Number of children	none	58.5	3.549	2.33*
	one	13.7	3.757	
	two or more	27.8	3.558	
Weekly hours of work	less than 15 hours	21.0	3.675	3.52**
	15-30 hours	37.1	3.633	
	more than 30 hours	41.9	3.480	
Occupation	unskilled & trainees	12.9	3.461	2.21*
	semi-skilled	47.7	3.627	
	semi-skilled with junior responsibility	21.4	3.615	
	skilled workers & supervisors	10.3	3.647	
	low level management & professional	7.7	3.303	
Firm	hotel chain	32.4	3.533	1.05
	retail chain	51.0	3.580	
	quick service restaurant	16.6	3.673	

The Table lists sample means and mean self-reported satisfaction levels of different demographic groups. Employees' characteristics are derived from staff questionnaires which are mapped into payroll data for the same calendar period.

Table 2
Overall Satisfaction

Variable	1	2	3
Female	0.174*	0.195**	0.213**
	(0.089)	(0.090)	(0.094)
Age	-0.065***	-0.063***	-0.057**
	(0.023)	(0.023)	(0.024)
(age squared)/100	0.086***	0.085***	0.078**
	(0.029)	(0.030)	(0.031)
Ethnic minority	-0.086	-0.116	-0.116
	(0.120)	(0.121)	(0.128)
CSEs	-0.116	-0.115	-0.112
	(0.168)	(0.168)	(0.172)
Vocational qualifications	0.010	0.006	-0.009
	(0.121)	(0.122)	(0.125)
O-levels/GCSEs	0.334***	-0.339***	-0.334***
	(0.110)	(0.110)	(0.113)
A-levels	-0.435***	-0.474***	-0.510***
	(0.151)	(0.152)	(0.157)
Degree	-0.926***	-0.927***	-1.017***
	(0.226)	(0.226)	(0.233)
Currently at college	-0.003	-0.001	0.049
	(0.101)	(0.101)	(0.108)
Married/living as married	-0.002	0.016	0.016
	(0.091)	(0.091)	(0.094)
1 child	0.276**	0.285**	0.252**
	(0.118)	(0.119)	(0.121)
2 or more children	-0.037	-0.030	-0.096
	(0.106)	(0.107)	(0.110)
Relative wage rate	0.309	0.349	0.605*
	(0.319)	(0.321)	(0.349)
Weekly hours of work	-0.013***	-0.013***	-0.014***
	(0.004)	(0.004)	(0.004)
Semi-skilled	0.313***	0.295**	0.323***
	(0.118)	(0.121)	(0.123)
Semi-skilled with junior responsibility	0.366***	0.284**	0.242
	(0.137)	(0.145)	(0.149)
Skilled workers & supervisors	0.504***	0.495***	0.525***
	(0.173)	(0.173)	(0.177)
Low level management & professional	0.193	0.172	0.077
	(0.211)	(0.212)	(0.220)
Hotels	-	-0.231*	-
		(0.130)	
Retail establishments	-	-0.254**	-
		(0.127)	
Establishment dummies	no	no	yes
Number of observations	842	842	842
Pseudo R^2	0.031	0.033	0.056
Log likelihood	-1146.6	-1144.5	-1117.6
LR test	-	-	57.9**

Satisfaction data came in the form of self-reported rankings on a scale of 1 for very unsatisfied to 5 for very satisfied. Estimation is by ordered probit. Standard errors in parentheses. LR test is a test of the joint significance of the establishment dummies.

Table 3
Satisfaction Components

Variable	Satisfied with short-term rewards	Satisfied with long-term prospects	Satisfied with social relations	Satisfied with work levels
Female	0.095	0.192**	0.119**	-0.035
	(0.063)	(0.098)	(0.057)	(0.085)
Age	-0.082***	-0.047*	-0.004	0.008
	(0.016)	(0.026)	(0.015)	(0.022)
(Age squared)/100	0.102***	0.065*	0.009	-0.010
	(0.021)	(0.034)	(0.019)	(0.028)
Ethnic minority	0.045	0.095	0.111	-0.111
	(0.088)	(0.137)	(0.080)	(0.117)
CSEs	-0.159	-0.235	-0.116	-0.181
	(0.116)	(0.176)	(0.105)	(0.158)
Vocational qualifications	-0.115	0.043	0.039	0.009
	(0.084)	(0.129)	(0.076)	(0.114)
O-levels/GCSEs	-0.213***	-0.298**	-0.066	-0.035
	(0.076)	(0.117)	(0.069)	(0.102)
A-levels	-0.270**	-0.491***	-0.028	-0.188
	(0.105)	(0.164)	(0.097)	(0.143)
Degree	-0.507***	-0.852***	0.030	-0.573***
	(0.156)	(0.243)	(0.143)	(0.212)
Currently at college	-0.071	-0.054	0.053	-0.197**
	(0.072)	(0.113)	(0.066)	(0.098)
Married/living as married	-0.123*	0.112	0.077	-0.043
	(0.064)	(0.099)	(0.058)	(0.086)
1 child	0.063	0.154	0.044	0.025
	(0.082)	(0.128)	(0.075)	(0.110)
2 or more children	0.023	0.127	-0.033	-0.169*
	(0.074)	(0.116)	(0.068)	(0.101)
Relative wage rate	1.110***	0.569	-0.021	0.084
	(0.233)	(0.359)	(0.215)	(0.317)
Weekly hours of work	-0.015***	0.013***	-0.002	-0.011***
	(0.003)	(0.004)	(0.003)	(0.004)
Semi-skilled	0.155*	0.351***	0.113	0.125
	(0.084)	(0.130)	(0.076)	(0.113)
Semi-skilled with junior responsibility	0.114	0.370**	0.149	0.318**
	(0.101)	(0.158)	(0.092)	(0.136)
Skilled workers & supervisors	0.063	0.827***	0.224**	0.071
	(0.119)	(0.183)	(0.108)	(0.160)
Low level management & professional	-0.148	0.540**	-0.052	0.261
	(0.149)	(0.231)	(0.137)	(0.202)
Constant	4.187***	4.118***	4.164***	-0.387
	(0.570)	(0.872)	(0.522)	(0.774)
Establishment dummies	yes	yes	yes	yes
Number of observations	820	789	827	832
R^2	0.287	0.219	0.079	0.089
RSS	382.7	848.3	324.3	720.6

These four satisfaction terms were derived from the original questions using principal components analysis (see Appendix C for details). The derived terms are continuous variables, and so estimation is by OLS. Standard errors in parentheses.

Table 4
Impact of Specific Areas of Satisfaction on Overall Satisfaction

Variable	1
Short-term	0.899***
	(0.072)
Long-term	0.601***
	(0.050)
Social relations	0.455***
	(0.072)
Work demands	0.220***
	(0.046)
Female	0.104
	(0.105)
Age	-0.022
	(0.029)
(Age squared)/100	0.039
	(0.037)
Ethnic minority	-0.163
	(0.149)
CSEs	0.278
	(0.195)
Vocational qualifications	0.035
	(0.140)
O-levels/GCSEs	-0.143
	(0.125)
A-levels	-0.207
	(0.178)
Degree	-0.346
	(0.257)
Currently at college	0.162
	(0.120)
Married or living as married	0.086
	(0.106)
1 child	0.352**
	(0.139)
2 or more children	-0.180
	(0.125)
Relative wage rate	-0.199
	(0.396)
Weekly hours of work	-0.015***
	(0.005)
Semi-skilled	0.094
	(0.141)
Semi-skilled with junior responsibility	-0.018
	(0.171)
Skilled workers & supervisors	0.222
	(0.201)
Low level management & professional	-0.095
	(0.247)
Establishment dummies	yes
Number of observations	765
Pseudo R^2	0.323
Log likelihood	-727.2

The dependent variable represents an ordinal variable, so estimation is by ordered probit. Standard errors in parentheses.

Appendix A

The staff questionnaire asked the following twelve question relating to different aspects of satisfaction:

(i) The pay is good
(ii) The hours suit me
(iii) I feel I could stay in the job forever
(iv) My promotion prospects are good
(v) I get along well with my supervisor
(vi) When I get home from this job I am tired
(vii) I find the job challenging
(viii) I am interested in this type of business
(ix) I get on well with the other workers
(x) The company is a good employer
(xi) Getting to work is not a problem
(xii) All in all I am satisfied with the job

The final category relates to overall satisfaction and as such is treated separately. Using principal components analysis, the remaining eleven aspects of satisfaction were grouped into four categories: satisfaction with short-term issues, long-term features, the social relations of work and work demands.

Appendix B

This appendix aims to illustrate the magnitudes of the effects of the various explanatory variables on overall satisfaction, associated with the estimated ordered probit coefficients in Table 2, column 3. We first defined a 'baseline' person, giving her the following characteristics designed to reflect the typical characteristics of the individuals in our sample. She is a white female, aged 21, who is single and has no children. She has no qualifications, and is not currently at college. Her job is at the unskilled or trainee level, pays a relative wage of 0.733 (the sample mean) and is full time (39 hours, the modal number of hours in the sample). She works at site number 108, chosen at random. The probability of a person with these characteristics being highly satisfied (overall satisfaction = 5) is estimated to be 0.259, as shown in the first row of the table below, labelled 'baseline.' The subsequent rows in the table change one characteristic at a time, leaving all other characteristics the same as for the baseline person. Thus, the second row of the table, labelled 'male', shows that, based on the coefficients in Table 2, column 3, a male who otherwise has all the characteristics of the baseline person, has an estimated probability of 0.195 of being highly satisfied. The third row reverts back to a female who has all the other characteristics of the baseline person, except that she is 36 years old, and so on for all rows in the table.

Characteristic changed from the baseline person	**Estimated probability of a person with the given characteristics being highly satisfied**
Baseline	0.259
Male	0.195
Age 36	0.205
Belongs to an ethnic minority	0.223
Highest qualification = GCSEs	0.164
Highest qualification = degree	0.048
Currently at college	0.275
Married or living as married	0.265
Has 1 child	0.347
Semi-skilled employee	0.374
Skilled worker or supervisor	0.452
Works 20 hours per week	0.355
Relative wage =1	0.314

Appendix C

This appendix describes how the various satisfaction items described in Appendix A were combined into the four principal components described in the text. Principal component analysis on the eleven satisfaction measures (excluding overall satisfaction) produced four components with eigenvalues greater than 1. The factor loadings on each satisfaction variable for each of these four principal components are given in the table below.

Satisfaction variable	Component 1	Component 2	Component 3	Component 4
Satisfied with pay	0.190	-0.375	0.533	0.364
Satisfied with hours	0.269	0.142	0.179	-0.277
Do job for life	0.385	-0.254	-0.118	-0.177
Good promotion opportunities	0.316	-0.357	-0.064	0.110
Satisfied with supervisor	0.351	0.411	-0.008	0.057
Tired when get home	0.020	0.226	-0.227	0.823
Find job challenging	0.337	-0.099	-0.467	0.048
Like the business	0.348	-0.116	-0.400	-0.126
Like fellow employees	0.297	0.502	0.046	0.058
Good employer	0.347	-0.167	0.347	0.146
Transport to work	0.225	0.352	0.336	-0.154

Each satisfaction variable was then assigned to the principal component on which it loaded most heavily with the correct sign, with the exception of the transport variable, which did not seem to be consistent with the interpretations we put on any of the components. We thus had the four composite satisfaction variables described in the text, calculated as the sum of the variables assigned to each component multiplied by their factor loadings. In the above table, the first component is the long-term satisfaction variable, the second the satisfaction with social relations variable, the third the short-term satisfaction variable, and the fourth the satisfaction with work levels variable. The table below provides some descriptive statistics for each of these variables, together with the eigenvalue associated with the relevant component, and the proportion of the total variance in the eleven satisfaction variables captured by each.

Principal component	Mean	Standard dev.	Min. value	Max. value	Eigenvalue	Proportion explained (%)
Long-term prospects	3.963	1.173	1.387	6.933	3.061	27.82
Social relations	3.939	0.654	0.913	4.564	1.292	11.75
Short-term rewards	2.772	0.803	0.880	4.401	1.257	11.42
Work levels	-2.079	0.985	-3.841	0.560	1.036	9.42
Total					-	60.42

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