

## Is job satisfaction U-shaped in age?

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It is generally believed that job satisfaction increases linearly with age. However, there are persuasive arguments, and some empirical evidence, that the relationship is U-shaped, declining from a moderate level in the early years of employment and then increasing steadily up to retirement. This paper investigates that relationship, using survey responses from a large sample of British employees. For overall job satisfaction, satisfaction with pay, and satisfaction with the work itself, a strongly significant U-shape is observed. Ordered probit techniques, which take account of the ordinality of satisfaction data, are used to analyse the relationship between these forms of satisfaction and a large set of individual and job characteristics. Despite the inclusion of 80 control variables, significant coefficients persist for the age and age-squared variables (the latter representing the non-linear component). The paper thus provides strong evidence for a U-shaped relationship between age and job satisfaction. Furthermore, it is shown that a similar age pattern occurs for employees' context-free mental health, suggesting that both job satisfaction and context-free mental health are affected by non-job factors of life-stage and personal circumstances. The importance of changes in expectations with increasing age is emphasized.

There have been many investigations into the relationship between age and different forms of job satisfaction. Significant variations across age are commonly found, with older employees tending to report higher satisfaction than younger ones (e.g. Doering, Rhodes & Schuster, 1983; Glenn, Taylor & Weaver, 1977; Warr, 1992). Observed age differences in overall job satisfaction are greater than those associated with gender, education, ethnic background or income (Clark, 1993; Weaver, 1980).

However, two questions remain unanswered. First, given that there is a positive relationship between age and job satisfaction, is it simply linear or does it contain a non-linear component? And, second, what underlying variables can account for the pattern of job satisfaction differences between age groups?

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In the first respect, there is a discrepancy between early and more recent findings. Herzberg, Mausner, Peterson & Capwell (1957) suggested that 'in general, morale is high among young workers. It tends to go down during the first few years of employment. The low point is reached when workers are in their middle and late twenties or early thirties. After this period, job morale climbs steadily with age' (pp. 5-6). This U-shaped pattern was interpreted in terms of new entrants to the labour market feeling positively about their novel situation and their transition to adulthood; however, increasing boredom and a perception of decreasing opportunities was thought to lead to some reduction in job satisfaction during subsequent years. In due course, it was suggested, a person comes to terms with his or her occupational role (perhaps having moved out of relatively unrewarding positions), and a subsequent increase in job satisfaction is observed.

This general pattern was also reported by Handyside (1961) using data on the overall job satisfaction of 1000 British men and women, but it has more recently received limited support. Weaver (1980) presented mean overall job satisfaction scores (men and women combined) from seven General Social Surveys in the United States between 1972 and 1978. In all years except one (1974), respondents aged below 20 reported the lowest satisfaction. The same finding was obtained in an Australian study by O'Brien & Dowling (1981). In Hunt & Saul's (1975) data from male Australian white-collar employees, age-squared (representing non-linearity) made no significant contribution to the prediction of overall job satisfaction.

Overall job satisfaction scores obtained during 1977 in the US Quality of Employment Survey were found to be U-shaped with respect to age, but earlier investigations using the same series (data gathered in 1969 and 1973) found particularly low satisfaction among the youngest group (Quinn & Staines, 1979). Janson & Martin (1982), Kalleberg & Loscocco (1983) and Wright & Hamilton (1978) have reported detailed multivariate analyses of the 1973 data (which exhibited no U-shape). The presence of particularly low job satisfaction among young employees appears to be generally accepted (e.g. Doering *et al.*, 1983).

Yet the account provided by Herzberg and colleagues has been supported more recently by Warr (1992). In a study of two axes of job-related well-being (not satisfaction itself), a statistically significant U-shaped pattern was found, with elevated well-being at the youngest ages. It would therefore be valuable to examine in an up-to-date inquiry whether non-linearity is present in respect of job satisfaction itself. That is the first aim of the present paper. We will use ordered probit techniques, which have the advantage of taking into account the ordinality of job satisfaction values.

The second question in need of examination concerns the explanation of any positive age gradient that is found. Why do older employees report greater job satisfaction than younger ones? Six arguments have been presented to account for that tendency.

First, many older people move into jobs which have more desirable characteristics, as a result of which they might be expected to be more satisfied (e.g. Janson & Martin, 1982; Kalleberg & Loscocco, 1983; Wright & Hamilton, 1978). These role transitions are sometimes examined in terms of different career stages. For example, Morrow & McElroy (1987) observed significantly more positive intrinsic job satisfaction in the 'maintenance' stage than in the earlier 'trial' stage of a career. Nevertheless, after statistically controlling for differences in key job attributes, a significant age difference in job-related well-being is typically retained (Glenn *et al.*, 1977; Kalleberg & Loscocco, 1983; Warr, 1992).

Movement into more attractive jobs thus cannot completely account for the positive age gradient.

Second, there is evidence that older employees have specific work values which make more attractive job characteristics that are less desirable to younger people. Wright & Hamilton (1978) and Kalleberg & Loscocco (1983) (in secondary analyses of the same data; see above) found that the rated importance of many job features is stable across ages, but that income and promotion opportunities were of less concern to older employees. If employees in general tend to be relatively dissatisfied with these characteristics, then their greater importance for younger workers will produce a positive relationship between job satisfaction and age.

Several investigators have examined whether differences in measured work values can account for the increase in job satisfaction with age. As with job characteristics, above, differences in values can account for some of the age pattern. However, the independent effect of age is retained in multivariate analyses even after the introduction of controls for work values (e.g. Clark, 1996; Kalleberg & Loscocco, 1983; Warr, 1992).

Third, it seems probable that older workers will come to lower their expectations in some respects. Younger people may have high expectations, which, being modified by the experience of jobs which do not meet their standards, are diminished in later years. Such reduced comparison standards are likely to generate more positive work attitudes, as the perceived gap between actual and ideal work becomes smaller. If older people come to seek less from any possible job, then comparative assessments of their own position relative to other possibilities will give rise to more positive feelings about their own job. Clark & Oswald (1996) and Clark (1994) have provided evidence that this comparative process operates in relation to perceptions of income.

A fourth possible explanation of the positive age gradient is in terms of cohort differences. The members of older generations in a study may, for example, have always been more satisfied with their jobs. In order to examine this possibility directly, it is desirable to compare individuals or surveys over a period of years. Such research is not widely available, but in general the evidence for cohort differences in job satisfaction is not strong (Glenn & Weaver, 1985; Janson & Martin, 1982).

Fifth, some of the observed differences between age groups might be accounted for by varying rates of participation in the labour force. Whereas more than 90 per cent of British men aged between 25 and 55 are economically active at present, only just over two-thirds of those between 55 and 65 are in the labour market; for women, these values are about 70 per cent and 35 per cent (e.g. Department of Employment, 1993). Older employees are therefore somewhat less representative of their age group in comparison with younger ones; it is possible that, through greater self-selection into the sample, they have more positive work attitudes than those who are no longer employed.

Nevertheless, that effect, if it occurs, is unlikely to be large; some older people outside the labour force may in practice have been excluded against their will. Furthermore, the explanation is less relevant to early investigations into age and job satisfaction, since older people's participation rates declined substantially only in the 1970s and 1980s. Differential sample composition was of less concern prior to that period, but a positive age gradient has been found at all times.

A sixth possible explanation of the greater job satisfaction of older employees is in terms of non-job variations. Age differences have been reported, for example, in respect of

general life satisfaction (e.g. Campbell, Converse & Rodgers, 1976) and depression (e.g. Clark & Oswald, 1994; Ryff, 1989), and an age-related U-shape in mental health is known to be present among unemployed men (Warr, Jackson & Banks, 1988). It is possible that job satisfaction scores in part reflect *context-free* variations in mental health, which are not restricted to feelings about a job.

Such differences are presumably associated with variations in family composition (for instance, in respect of dependant children) and in differences in financial position and demands, self-concept, personal and normative expectations, and social roles at different ages. The importance of non-job variables of this kind might be examined by statistically controlling for them in satisfaction regressions. In practice, it is difficult to measure the less public aspects of self-concept and personal aspirations at different ages, and attention has so far been focused on marital status and number of dependant children. Controls for those factors do not remove the significant influence of age (Kalleberg & Loscocco, 1983; Warr, 1992); the age gradient in job satisfaction thus has not been explained through the limited life-stage variables that have been included in analyses to date.

In overview, it seems likely that each of these six sets of features can contribute to the positive association between age and overall job satisfaction. The fourth and fifth (a cohort difference and reduced labour market participation by older people) are not readily open to investigation in a cross-sectional study, but reasons one, two and six (role transitions, shifts in values, and non-job changes across the working years) have been examined through multivariate investigations. The variables incorporated to date have often themselves been statistically significant, but they have failed to render non-significant the effect of age; hence, some other variables, not yet identified, appear also to underlie the observed age pattern. Reason three is in terms of changes in aspiration level, suggesting that, as individuals learn more about the costs and rewards of paid work, so they come to expect less and therefore feel more positive about what they have. This issue is difficult to address empirically, since surveys typically obtain no information about individuals' expectations or, more saliently, what those were in the past.

The present investigation includes a large variety of potential explanatory factors, and it differs from previous research in two main ways. First, there is a particular need to examine whether personal characteristics, such as level of education, self-reported health and work values, can account for the overall age pattern in respect of job satisfaction. The set of potential moderators in the present study gives emphasis to those features. Second, we will focus particularly on the fifth issue introduced above: are non-job issues important in the association between age and satisfaction with one's job?

One way to examine this question is through a measure of more wide ranging affect. If, for the same sample of employees, the age pattern for general mental health (without specific reference to job issues) is the same as that for job satisfaction, it is likely that non-job factors (contributing strongly to the context-free measure) are also important for job satisfaction. Conversely, if the job-specific and context-free variables (job satisfaction and mental health respectively) are not associated with employees' age in the same manner, we may suggest that non-job features have little impact on job-related affect. That question will be examined here.

In overview, the investigation aims to provide information in respect of the two unanswered questions introduced above. First, is a U-shaped relationship between age and job satisfaction observed in an up-to-date investigation? Second, in the expectation of an

overall positive age gradient, can that be accounted for in terms of a substantial range of potential moderators, with special reference to demographic and job-related characteristics and a range of work values? And does the age pattern of context-free mental health parallel that for job satisfaction, such that non-job factors are likely to contribute to both?

## Method

The data used in this paper are drawn from the British Household Panel Study funded by the Economic and Social Research Council. The paper uses the first (1991) wave of this survey, which provides information on a random sample of 10 000 individuals, including 5192 employees; the latter are investigated here. Numbers of employees in each age group in the analyses of overall job satisfaction were: 16–19 years, 410; 20–29 years, 1296; 30–39 years, 1301; 40–49 years, 1234; 50–59 years, 724; 60+ years, 227. The large number of teenagers in the sample is particularly noteworthy, in that investigations into U-shaped relationships with age require an adequate subsample in that range.

Information was obtained through interviews in a respondent's home, covering household composition, finances, personal and family backgrounds, employment characteristics, history and attitudes, and feelings of happiness and general mental health. Further details of the BHPS survey are available in Buck *et al.* (1994); see also Clark (1996) and Clark & Oswald (1996).

### Variables and analyses

The dependent variables in the analyses to be reported here concern job satisfaction and general mental health. For the former, a respondent was asked how satisfied or dissatisfied he or she was with specific aspects of his or her job and 'how satisfied you are with your present job overall'. Responses ranged from 1 to 7, where 1 was identified as 'not satisfied at all', 4 was 'neither satisfied nor dissatisfied', and 7 was 'completely satisfied'. Findings are examined here in respect of overall job satisfaction (above), satisfaction 'with the total pay, including any overtime or bonuses' (an aspect of extrinsic satisfaction), and satisfaction 'with the actual work itself' (an example of intrinsic satisfaction). The measure of overall job satisfaction is designed to summarize seven previous questions about specific aspects of satisfaction with work (promotion, pay, relations with management, job security, ability to use initiative, work itself, and hours).

Factor analysis revealed that overall job satisfaction is strongly correlated with the first principal component of the seven individual job satisfaction questions. The three measures of satisfaction used in the analysis (overall, with pay and with work itself) are strongly correlated amongst themselves: a cross-tabulation between any two of them produces a  $\chi^2(36)$  statistic of over 1000. Furthermore, there is a strong correlation between the General Health Questionnaire measure and the measures of job satisfaction, the  $\chi^2(72)$  statistic from the cross-tabulation always being over 100 and thus significant at the 0.1 per cent level.

It is invalid to treat ordinal satisfaction data of this kind as though they were cardinal (e.g. Bryman & Cramer, 1990, pp. 65 ff.). The analyses have therefore been carried out using an ordered probit technique. This is an econometric procedure which permits the analysis of ordered categorical information (such as below average, average, above average, or, as in this paper, numerical categories which respondents choose to reflect their evaluation of some characteristic). Standard econometric techniques for the analysis of continuous dependent variables are not appropriate for ordered categorical data, as, for example, someone with job satisfaction of six is not twice as satisfied as someone with job satisfaction of three.

The ordered probit procedure chooses estimates  $\mathbf{b}$  to maximize  $\sum \ln(p_i)$ , where  $p_i$  is the estimated probability of the observed response and the summation is over all of the observations in the data set. For a seven-level ordered response with outcomes labelled  $i = 1-7$ , the probability of observing level  $i$  is

$$\begin{aligned} p_7 &= F(\mathbf{x}'\mathbf{b}) \\ p_6 &= F(a_2 + \mathbf{x}'\mathbf{b}) - F(\mathbf{x}'\mathbf{b}) \\ p_5 &= F(a_3 + \mathbf{x}'\mathbf{b}) - F(a_2 + \mathbf{x}'\mathbf{b}) \\ &\bullet \\ &\bullet \\ p_1 &= 1 - F(a_6 + \mathbf{x}'\mathbf{b}), \end{aligned}$$

where  $F$  is the cumulative normal distribution. The estimated probabilities sum to 1. The five additional variables  $a_2$ – $a_6$  are estimated by the procedure. Positive coefficients in the ordered probit regressions mean that higher levels of job satisfaction are more likely to be observed (i.e. are estimated to occur with higher probability). Say that an individual  $j$  has characteristics  $x_j$  such that  $x_j'b = -0.7$ . Then the estimated probability that  $j$  reports overall job satisfaction of 7 is  $F(-0.7) = 24.2$  per cent. Another individual,  $k$ , may have different characteristics which are more conducive to reporting higher levels of job satisfaction, for example a lower level of education. Say that  $x_k'b = -0.5$ , then the estimated probability that  $k$  reports overall job satisfaction of 7 is  $F(-0.5) = 30.8$  per cent. Further details of the ordered probit technique are contained in Zavoina & McKelvey (1975); see also Machin & Stewart (1990).

Associated with this general approach to measurement, we describe age patterns not in terms of mean values (which assume cardinality) but as the proportion of high scorers (6 or 7 on the scale described above). The paper appears to be the first in the occupational psychology literature to use ordered probit techniques. It also applies a method, using simple calculus, to allow minima of a U-shape in age (or any other continuous variable) to be calculated from estimated satisfaction equations.

The second dependent variable in this investigation is a person's score on the 12-item General Health Questionnaire (GHQ) (Banks, Clegg, Jackson, Kemp, Stafford & Wall, 1980; Goldberg, 1972). The GHQ is a self-administered screening test for detecting non-psychotic psychiatric disorder, covering feelings of strain, depression and inability to cope, anxiety-based insomnia, and lack of confidence. Responses are made on a four-point scale of frequency of a feeling in relation to a person's usual state, with the two highest values indicating potential ill-health. The number of such 'unusual' feelings is conventionally taken as indicating the probability that a person is a potential non-psychotic medical 'case'. In relation to the 12-item GHQ, a person with three or more responses at the 'unusual' level is conventionally viewed as above the 'case' threshold.

On this basis, for the initial cross-tabulations respondents were defined as either a potential case or as a non-case. The latter individuals may in these terms be described as 'mentally healthy'. In order to maintain consistency of scoring direction between the GHQ and the measures of job satisfaction (where high scores are positive), the proportion of 'mentally healthy' employees at different ages (rather than the proportion of 'cases') will be examined.

The later regression analyses also use recoded GHQ responses, such that higher scores represent higher levels of well-being. This recoded score is produced by taking people's answers to the 12 GHQ questions and summing the number of times a person responds at the 'usual' level. With this method, the lowest possible well-being score corresponds to no responses in the 'usual' category; the highest well-being arises if an individual always describes his or her feelings in the 'usual' category.

The potential predictor variables in the study are listed in Tables 2, 3, 4 and 6. The definitions of these are presented in Appendix 1, and means and standard deviations are given in Appendix 2.

## Results

### *Three forms of job satisfaction*

Table 1 describes the distribution of the three forms of job satisfaction for different age groups of employees, in terms of the percentage of respondents who are 'highly satisfied' (reporting the two highest satisfaction scores of 6 or 7). The first three columns show the pattern for overall job satisfaction. Column 1 shows that 59.06 per cent of the youngest age group are overall highly satisfied; this percentage first declines with age before increasing to its maximum of 75.52 at 60 years or above. The same curvilinear pattern is weakly present in data for women alone, but is particularly strong in the results from male respondents; the proportion of men highly satisfied with their job drops substantially after 16–19 years, before increasing in later decades.

Columns 4 to 6 repeat these analyses for extrinsic job satisfaction, using data about satisfaction with pay. For the sample of employees as a whole and for women only, no U-shape is visible between age and satisfaction with pay, when the latter is indexed in terms of 'highly satisfied' responses. However, for men higher pay satisfaction is again

**Table 1.** Age and three forms of job satisfaction: Percentage of employees who are 'highly satisfied' (responses of 6 or 7)

	Overall job satisfaction			Satisfaction with pay			Satisfaction with work itself		
	All	Women	Men	All	Women	Men	All	Women	Men
16-19 years	59.06	59.63	58.59	28.77	25.26	31.62	54.79	54.67	54.88
20-29 years	53.88	58.41	49.61	29.26	30.52	28.06	55.71	59.62	52.02
30-39 years	55.94	64.47	48.56	33.36	40.92	26.80	60.90	65.35	57.06
40-49 years	58.59	65.43	51.31	35.38	39.78	30.69	66.44	67.80	64.98
50-59 years	65.94	73.88	58.68	41.20	47.57	35.38	73.98	79.37	69.03
60+ years	75.52	81.99	70.47	58.28	63.39	54.41	85.05	85.37	84.80
All ages	58.55	64.83	52.73	34.61	38.64	30.88	63.32	66.48	60.38
N	5192	2499	2693	5183	2492	2690	5193	2502	2692

*Note.* These numbers refer to weighted data.

common below 20 years, with an overall U-shape with respect to age. Finally in Table 1, the last three columns show the results for a measure of intrinsic job satisfaction, namely satisfaction with work itself. There is again a U-shape in men's satisfaction, but that pattern is not visible for women nor for the entire sample in the percentages of 'highly satisfied' responses examined in this analysis.

The stronger presence of a U-shape for men than for women might perhaps arise from the fact that the female subsample includes a higher proportion of part-time employees, who may not display that pattern with age. The analyses in Table 1 have therefore been repeated for full-time workers only (those working 30 hours or more each week). For overall job satisfaction, the pattern is barely changed: overall satisfaction values follow closely those in Table 1, except that fewer full-time workers aged 60 and above indicate high overall satisfaction than in the total sample (63.33 vs. 75.22 per cent). For full-time employed women, there is a stronger U-shape in overall job satisfaction than for the total female sample shown in Table 1, but the figures for men (already showing a U-shape for all male employees) are barely changed.

Analyses of satisfaction with pay for full-timers alone confirm the presence of a U-shaped relationship with age for men, but (as for the entire sample) that is not seen for all full-time workers nor for full-time women. In respect of satisfaction with the work itself, for the sample of full-time employees there exists a strong U-shape between age and satisfaction with the work itself, and this is retained for full-time male employees.

The percentages in Table 1 (and outlined above for full-time employees alone) are helpful in summarizing one extreme aspect of the distribution of scores: the percentage who are 'highly satisfied'. However, proper tests of the relationship between age and satisfaction need to be based on the full distribution of responses rather than merely on extreme scores. The complete distribution of scores will therefore be used in formal significance tests of the linear and non-linear components of the age relationship. These tests will also control for other variables. Since many factors other than age influence job satisfaction, it

is possible that any curved relationship with age is an artifact of omitted influences. For example, perhaps income has a U-shaped effect and, being correlated with age, misleadingly gives the impression that there is a curved effect attributable to age. For well-known reasons, multivariate analyses are needed.

Table 2 thus presents the results of ordered probit regressions in which overall job satisfaction is the dependent variable. The first column confirms the significant positive association with age that is visible in Table 1. Column 2 is an equation which has age and age-squared as its only independent variables. Both of these coefficients are highly significant: where  $a$  is age and  $s$  is satisfaction, this equation has the form:  $s = -0.036a + 0.00059a\text{-squared}$ .

The differentiation of the satisfaction function yields the slope of the relationship between job satisfaction and age. From the sign of the estimated coefficients on age and age-squared we know that the relationship between job satisfaction and age takes the form of a U. Hence, if we calculate the point at which the slope of this relationship is zero, i.e. the age at which the differential equals zero, we will have identified the minimum, or turning point, of the age–job satisfaction relationship, that is, the age at which job satisfaction is at its lowest level.

Differentiating the above equation:  $\partial s/\partial a = -0.036 + 0.00118a$ ;  $\partial s/\partial a = 0.0018$ . Thus the slope of the age–satisfaction relationship depends on the level of age itself. At low levels of age the slope is negative, such that overall job satisfaction falls with age. The point at which the age–satisfaction function reaches its minimum is calculated by setting  $(\partial s/\partial a)$  equal to zero. That indicates that satisfaction minimizes where  $-0.036 + 0.00118a = 0$ , namely at  $a = 31$ .

Column 2 of Table 2 implies, therefore, that there is a significant U-shape in age and that the minimum occurs at age 31. This states more precisely the point captured in the earlier cross-tabulations: overall job satisfaction drops initially and rises afterwards.

As noted above, the main issue to be checked is whether this U-shape disappears when a number of other explanatory variables are introduced into the equation. Column 3 of Table 2 incorporates control variables for gender, health, race, education, income, hours of work, whether the employee is a manager or in a trade union, the size of the establishment, and sets of regional, industrial and occupational dummy variables. The U-shape in age is remarkably robust. Both age and its square remain statistically significant at the 0.1 per cent level, and the size of their estimated coefficients is only marginally affected by the extra variables, despite the fact that many of these are themselves significant. As can be checked, the U-shape in age continues to have its turning point at age 31.

Columns 4 and 5 add more variables. The turning point occurs only fractionally higher by the time all 80 variables of column 5 are included. Satisfaction reaches its minimum in column 4 at age 33, and in column 5 at age 36. This slight increase in the age at which job satisfaction is lowest probably occurs because a number of these controls, such as income, rise with age and are positively correlated with overall job satisfaction. Because of its extra controls, column 5 is probably the most reliable estimate of the U-shape.

It is clear from Table 2 that age has a robust U-shaped effect upon overall job satisfaction. This is true even after the introduction of a large number of control variables. After those controls men are found to be less satisfied than women (as in Clark, 1993); good reported health is correlated with job satisfaction; highly educated people are less satisfied when other factors are controlled (Clark, 1994 and Clark & Oswald, 1996, discuss



**Table 2.** Equations for overall job satisfaction: Ordered probits, with standard errors in parentheses

	Column 1	Column 2	Column 3	Column 4	Column 5
Age	0.01(0.001)***	-0.04(0.007)***	-0.03(0.009)***	-0.04(0.009)***	-0.05(0.01)***
Age-squared/100		0.059(0.0089)***	0.054(0.01)***	-0.055(0.011)***	0.076(0.013)***
Male			-0.23(0.04)***	-0.20(0.04)***	-0.22(0.04)***
Health excellent			0.38(0.05)***	0.39(0.05)***	0.38(0.05)***
Health good			0.19(0.04)***	0.20(0.04)***	0.19(0.04)***
Race black			-0.05(0.15)	-0.08(0.15)	-0.07(0.15)
Race Asian			-0.07(0.14)	-0.10(0.14)	-0.14(0.14)
Education high			-0.37(0.05)***	-0.35(0.05)***	-0.33(0.05)***
Education medium			-0.25(0.04)***	-0.22(0.04)***	-0.22(0.04)***
Log income			0.04(0.04)	-0.07(0.04)	0.07(0.04)
Log hours			-0.19(0.05)***	-0.21(0.05)***	-0.19(0.06)***
Manager			0.10(0.04)*	0.10(0.04)*	0.10(0.04)**
Union member			-0.10(0.04)*	-0.08(0.04)*	-0.09(0.04)*
Establishment size 1-24			0.14(0.05)**	0.14(0.05)**	0.13(0.05)**
Establishment size 25-199			0.06(0.04)	0.06(0.04)	0.06(0.04)
Region dummies (18)			Yes*	Yes	Yes
Industry dummies (10)			Yes***	Yes***	Yes***
Occupation dummies (9)			Yes*	Yes*	Yes*
Job tenure				-9.8E-6(8.5E-6)	9.5E-6(8.6E-6)
Work values: 1st mention					
Promotion prospects				-0.11(0.11)	-0.12(0.11)
Total pay				-0.30(0.07)***	-0.31(0.07)***
Relations at work				0.26(0.08)**	0.26(0.08)**
Job security				0.19(0.06)**	0.18(0.06)**
Actual work itself				0.06(0.06)	0.06(0.06)
Hours				0.20(0.11)	0.17(0.11)
Work values: 2nd mention					
Promotion prospects				-0.12(0.08)	-0.12(0.08)
Total pay				-0.12(0.05)*	-0.13(0.06)*
Relations at work				0.20(0.06)**	0.20(0.06)**
Job security				0.08(0.06)	0.08(0.06)
Actual work itself				0.06(0.06)	0.07(0.06)
Hours				0.00(0.08)	-0.02(0.08)
Marital status					
Married					0.15(0.06)**
Separated					0.03(0.13)
Divorced					0.11(0.08)
Widowed					0.31(0.15)*
Number of own children in household					
1					-0.03(0.06)
2					-0.05(0.07)
3+					0.26(0.10)*
Number in household					
2					-0.05(0.07)
3					0.06(0.08)
4					0.09(0.08)
5					0.02(0.09)
6+					-0.08(0.13)
Constant	-0.83(0.05)***	-0.05(0.13)	0.41(0.20)*	0.28(0.22)	0.41(0.25)
N	5140	5140	4478	4452	4440
Log-likelihood	-8288.9	-8266.8	-7037.5	-6928.9	-6894.5

\* Significant at the 5% level; \*\* significant at the 1% level; \*\*\* significant at the 0.1% level.

possible 'comparison' effects such as this); high income is not significantly associated with overall job satisfaction; long hours reduce satisfaction; managers are more satisfied and union members less satisfied; and overall job satisfaction is higher in smaller establishments.

As is usually the case in examinations of employee well-being, the industry dummies in Table 2 are statistically significant. These are a set of 10 dummy variables (coded 1 or 0) to represent the 10 one-digit groups of the Standard Industrial Classification (SIC). The omitted group in the analyses is SIC category nine (Other Services). Significantly lower overall job satisfaction relative to Other Services was observed in five industries: metal goods ( $-.31, p < .01$ ), transport and communication ( $-.26, p < .01$ ), other manufacturing ( $-.25, p < .02$ ), distribution ( $-.24, p < .01$ ), and banking, finance and insurance ( $-.15, p < .02$ ).

Job tenure is included in Table 2 to examine the proposition that individuals are more satisfied at older ages because they are more likely to have found a job which matches their needs. An alternative possibility is that longer job tenure leads to boredom and low overall satisfaction, as employees become 'locked into' a routine activity. The estimated coefficient for tenure in Table 2 is always insignificant, seemingly rejecting both hypotheses.

Given that age and job tenure are typically intercorrelated, a subsample was drawn of those with long job tenure. A significant U-shape with age remained even for employees with job tenure of six years or more. This suggests that the positive relationship between age and job satisfaction does not entirely result from a better match of individuals with their jobs, as all employees with job tenure of this length should already be relatively well-matched.

The work values included in columns 4 and 5 of Table 2 are of substantial importance in contributing to differences in overall job satisfaction. The omitted categories for comparisons between work values were 'initiative' and 'something else'. Significant differences relative to these omitted categories were found for employees who indicated that pay, good relations or job security are important: employees who strongly value high pay tend to be less satisfied, whereas those who particularly value good relations and job security exhibit higher overall job satisfaction.

Column 5 of Table 2 indicates that being married and having three or more children in the household also significantly affect job satisfaction. Although these variables are open to different interpretations, they are valuable in this analysis because they control for possible stress associated with the years of child rearing.

If the U-shape in age is being produced by the presence of young children for workers in their 20s and 30s then a regression on the job satisfaction of those with no dependant children should exhibit no age effect. However, when such a regression was run, the U-shape was still present and significant at the 0.1 per cent level. The presence of young children is apparently not the explanation for the nadir in job satisfaction.

A cohort explanation for the U-shape could be that workers born in the 1950s, who at the time of the interview were aged between 31 and 41, have always had lower job satisfaction. This argument (positing a dissatisfied generation) could explain why earlier investigations found a simple positive relationship between age and job satisfaction, because at the time of data collection these workers were the youngest employed group.

To test this, the regressions of Table 2 were rerun, with the age variables being replaced

by a single dummy variable for 'born in the 1950s'. As expected, this variable is consistently significant and negative. (To have found otherwise would have been surprising, given that the estimated ages of minimum satisfaction in Table 2 all fall in the mid-30s, i.e. for people born in the mid-1950s.) However, a log-likelihood test of the relative explanatory power of the 'U-shape' vs. the 'dismal fifties' explanations overwhelmingly prefers the former. This is not to say that there is no truth in the cohort explanation, as its proper testing would require a good number of years of panel data, but that in the choice between the one explanation or the other, the U-shape explanation better fits the present data.

Tables 3 and 4 report results analogous to those in Table 2 for satisfaction with pay and satisfaction with the work itself respectively. In Table 3, the coefficient on age alone is significantly positive, as suggested by column 4 of Table 1. When both age and its square are included as explanatory variables in column 2, age-squared is positive and significant, but age itself is insignificantly negative. However, once the additional control variables of columns 3 to 5 are included, the estimate on age becomes negative and significant, while the age-squared term remains positive and significant. This pattern indicates a strong U-shaped relationship between age and satisfaction with pay once other relevant individual and job characteristics have been held constant. The ages at which this U-shaped relationship minimizes are 19, 35, 36 and 39 for the estimates in columns 2 to 5 respectively.

The estimate on age alone is also positive in Table 4, and again changes sign when age-squared and other terms are introduced. There is a significant U-shaped relationship between age and satisfaction with the work itself in all of the last four columns, with respective minima at ages 19, 23, 25 and 28. The strong age-squared term reflects the distinct non-linearity in the values reported in the seventh column of Table 1.

Thus, once other relevant variables have been controlled, there is a strong and significant U-shaped relationship between age and both extrinsic and intrinsic job satisfaction. The age at which job satisfaction is at its minimum appears to be lower for intrinsic satisfaction than for extrinsic satisfaction.

Several results from the overall job satisfaction regressions (Table 2) are replicated in Tables 3 and 4. After controlling for other factors, good reported health is associated with higher job satisfaction; women report higher satisfaction scores than men; more educational qualifications and larger establishment size are negatively correlated with satisfaction with the work itself; and valuing promotion or pay is associated with lower pay satisfaction, whereas valuing pay and the actual work are associated with work satisfaction that is low and high respectively.

Not only is the U-shape found for all three of these measures of job satisfaction, the pattern persists when the sample is restricted to full-time employees, thus avoiding any possible anomalies arising from employees with part-time (and often more intermittent) jobs. In overall satisfaction equations for full-time workers, the minima in the equivalent of columns 2 to 5 in Table 2 are 34, 36, 37 and 38 years. For full-time employees' satisfaction with pay, there is no convex relationship with age in the absence of control variables. However, when controls are added, a significant U-shaped relationship emerges, with minima at ages 38, 39 and 40 corresponding to columns 3, 4 and 5 of Table 3. For full-time employees' satisfaction with the work itself, the minima are at 24, 27, 28 and 30 years; in almost every case the estimated coefficients on age-squared are significant at the 0.1 per cent level, and those for age are typically significant at the 1 per cent level

Table 3. Equations for satisfaction with pay: Ordered probits, with standard errors in parentheses

	Column 1	Column 2	Column 3	Column 4	Column 5
Age	0.009(0.001)***	-0.009(0.007)	-0.05(0.008)***	-0.05(0.008)***	-0.06(0.01)***
Age-squared/100		0.023(0.0086)**	0.064(0.011)***	0.067(0.011)***	0.08(0.013)***
Male			-0.27(0.04)***	-0.23(0.04)***	-0.25(0.04)***
Health excellent			0.20(0.05)***	0.20(0.05)***	0.20(0.05)***
Health good			0.13(0.04)**	0.13(0.04)**	0.13(0.04)**
Race black			-0.11(0.15)	-0.13(0.15)	-0.13(0.15)
Race Asian			0.05(0.14)	0.04(0.14)	0.04(0.14)
Education high			-0.08(0.05)	-0.09(0.05)	-0.08(0.05)
Education medium			-0.09(0.04)*	-0.08(0.04)	-0.08(0.04)
Log income			0.59(0.04)***	0.60(0.04)***	0.60(0.04)***
Log hours			-0.86(0.05)***	-0.86(0.05)***	-0.85(0.05)***
Manager			-0.06(0.04)	-0.06(0.04)	-0.07(0.04)
Union member			-0.06(0.04)	-0.03(0.04)	-0.03(0.04)
Establishment size 1-24			0.06(0.04)	0.04(0.04)	0.04(0.04)
Establishment size 25-199			-0.02(0.04)	-0.01(0.04)	-0.01(0.04)
Region dummies (18)			Yes***	Yes***	Yes**
Industry dummies (10)			Yes*	Yes*	Yes*
Occupation dummies (9)			Yes***	Yes***	Yes***
Job tenure				-1.4E-5(8.3E-6)	-1.5E-5(8.4E-6)
Work values: 1st mention					
Promotion prospects				-0.27(0.10)*	-0.27(0.10)**
Total pay				-0.21(0.06)**	-0.21(0.06)**
Relations at work				0.10(0.08)	0.10(0.08)
Job security				0.04(0.06)	0.04(0.06)
Actual work itself				-0.01(0.06)	-0.01(0.06)
Hours				0.20(0.10)*	0.18(0.10)
Work values: 2nd mention					
Promotion prospects				-0.27(0.08)**	-0.28(0.08)***
Total pay				-0.21(0.05)***	-0.21(0.05)***
Relations at work				0.04(0.06)	0.04(0.06)
Job security				-0.14(0.06)*	-0.13(0.06)*
Actual work itself				-0.01(0.06)	-0.01(0.06)
Hours				-0.07(0.08)	-0.07(0.08)
Marital status					
Married					0.18(0.06)**
Separated					0.05(0.12)
Divorced					0.07(0.08)
Widowed					0.13(0.15)
Number of own children in household					
1					-0.06(0.05)
2					-0.08(0.06)
3+					0.01(0.10)
Number in household					
2					-0.18(0.07)*
3					-0.06(0.07)
4					-0.05(0.08)
5					-0.13(0.09)
6+					-0.23(0.13)
Constant	-1.17(0.05)***	-0.85(0.12)***	-0.90(0.20)***	-0.84(0.28)***	-0.57(0.24)**
N	5131	5131	4471	4445	4433
Log-likelihood	-9559.5	-9555.8	-8132.6	-8045.3	-8013.0

\* Significant at the 5% level; \*\* significant at the 1% level; \*\*\* significant at the 0.1% level.

**Table 4.** Equations for satisfaction with the work itself: Ordered probits, with standard errors in parentheses

	Column 1	Column 2	Column 3	Column 4	Column 5
Age	0.02(0.001)***	-0.02(0.007)*	-0.02(0.009)*	-0.02(0.009)*	-0.03(0.01)**
Age-squared/100		0.041(0.0092)***	0.042(0.011)***	0.041(0.011)***	0.053(0.013)***
Male			-0.19(0.04)***	-0.16(0.04)***	-0.18(0.04)***
Health excellent			0.28(0.05)***	0.28(0.05)***	0.28(0.05)***
Health good			0.14(0.04)**	0.14(0.04)**	0.14(0.04)**
Race black			0.06(0.15)	0.08(0.16)	0.07(0.16)
Race Asian			0.35(0.15)*	0.34(0.15)*	0.27(0.15)
Education high			-0.37(0.05)***	-0.37(0.06)***	-0.36(0.06)***
Education medium			-0.25(0.04)***	-0.24(0.04)***	-0.24(0.04)***
Log income			0.02(0.04)	0.02(0.04)	0.03(0.04)
Log hours			-0.07(0.06)	-0.07(0.06)	-0.05(0.06)
Manager			0.15(0.04)***	0.15(0.04)***	0.15(0.04)***
Union member			-0.12(0.04)**	-0.12(0.04)**	-0.12(0.04)**
Establishment size 1-24			0.24(0.05)***	0.22(0.05)***	0.22(0.05)***
Establishment size 25-199			0.08(0.04)	0.08(0.04)	0.07(0.04)
Region dummies (18)			Yes	Yes	Yes
Industry dummies (10)			Yes***	Yes***	Yes***
Occupation dummies (9)			Yes***	Yes***	Yes***
Job tenure				1.3E-5(8.9E-6)	1.4E-5(9.0E-6)
Work values: 1st mention					
Promotion prospects				-0.12(0.11)	-0.13(0.12)
Total pay				-0.26(0.07)***	-0.26(0.07)***
Relations at work				0.21(0.08)*	0.20(0.08)*
Job security				0.10(0.06)	0.10(0.06)
Actual work itself				0.16(0.06)*	0.17(0.06)**
Hours				0.12(0.11)	0.10(0.11)
Work values: 2nd mention					
Promotion prospects				-0.06(0.08)	-0.05(0.08)
Total pay				-0.06(0.06)	-0.06(0.06)
Relations at work				0.16(0.06)*	0.16(0.06)*
Job security				0.10(0.06)	0.08(0.06)
Actual work itself				0.12(0.06)	0.12(0.06)
Hours				-0.07(0.08)	-0.10(0.08)
Marital status					
Married					0.02(0.06)
Separated					-0.10(0.13)
Divorced					0.06(0.08)
Widowed					0.49(0.17)**
Number of own children in household					
1					-0.02(0.06)
2					0.05(0.07)
3+					0.22(0.10)*
Number in household					
2					-0.03(0.07)
3					0.05(0.08)
4					0.06(0.08)
5					0.01(0.10)
6+					0.24(0.14)
Constant	-0.80(0.05)***	-0.26(0.13)*	-0.33(0.21)	-0.40(0.23)	-0.43(0.26)
N	5142	5142	4478	4452	4440
Log-likelihood	-7841.6	-7831.6	-6710.6	-6628.4	-6592.4

\* Significant at the 5% level; \*\* significant at the 1% level; \*\*\* significant at the 0.1% level.

or better. There is thus a strong and robust U-shaped relationship between the three measures of job satisfaction and age, both for the complete sample and for full-time employees only.

### *Context-free mental health*

How closely do age differences in GHQ scores match those for job satisfaction? If the relationship between age and context-free mental health is similar to that between age and job satisfaction, then non-job factors may be important in explaining the U-shape reported in the previous section. Table 5 presents age distributions in the same form as those for job satisfaction earlier; high percentages in this analysis indicate more people with good mental health. Results are very similar to those considered earlier. For the sample as a whole, there is a U-shaped association in the raw data between age and context-free mental health; this is stronger for male employees than for female employees.

Table 6 summarizes the ordered probit analysis of GHQ scores, recoded so that higher values indicate higher levels of mental health. The estimated relationship between age and context-free mental health is similar to those between age and job satisfaction described earlier. The recoded GHQ score is increasing in age when that is the only explanatory variable. When age-squared is added, the coefficient on age is negative and that on age-squared is positive, both strongly significant, implying a U-shaped relationship between age and mental health. This relationship is robust to the inclusion of the same controls as used previously in the analyses of job satisfaction. After including all of these control variables, the relationship is of the following form:  $b = -0.028a + 0.00037a$ -squared. Employee mental health is a convex function of age which reaches its minimum level at age 38. The turning points in the same analyses as in columns 3, 4 and 5 of Tables 2, 3 and 4 are at ages 34, 37 and 37 respectively.

The findings in Table 6 are thus similar to those for overall job satisfaction in Table 2 (where the minimum after introducing controls was found to be 36 years). However, fewer additional variables have significant independent effects on this context-free measure, with most job-related variables (income, hours, managerial status, union membership, establishment size, and the occupation and industry dummies) being insignificant. Male

**Table 5.** Age and context-free mental health: Percentage of employees defined as 'non-cases' in terms of the General Health Questionnaire

	All	Women	Men
16-19 years	72.33	66.72	77.07
20-29 years	69.17	65.18	72.97
30-39 years	68.25	65.46	70.69
40-49 years	68.04	64.36	71.96
50-59 years	76.51	74.04	78.69
60+ years	79.63	72.75	84.67
All ages	70.35	66.66	73.79
N	5016	2379	2556

*Note.* These numbers refer to weighted data.

Table 6. Equations for context-free mental health (GHQ): Ordered probits, with standard errors in parentheses

	Column 1	Column 2	Column 3	Column 4	Column 5
Age	0.004(0.001)**	-0.03(0.008)***	-0.03(0.01)***	-0.3(0.01)***	-0.03(0.01)*
Age-squared/100		0.041(0.01)***	0.046(0.012)***	0.047(0.012)***	0.038(0.014)**
Male			0.18(0.05)***	0.18(0.05)***	0.17(0.05)***
Health excellent			0.74(0.05)***	0.73(0.05)***	0.73(0.05)***
Health good			0.46(0.05)***	0.46(0.05)***	0.45(0.05)***
Race black			0.05(0.17)	0.14(0.17)	0.20(0.17)
Race Asian			-0.08(0.16)	-0.10(0.16)	-0.08(0.16)
Education high			-0.11(0.06)	-0.09(0.06)	-0.09(0.06)
Education medium			-0.07(0.05)	-0.05(0.05)	-0.04(0.05)
Log income			0.06(0.04)	0.07(0.05)	0.06(0.05)
Log hours			-0.12(0.06)	-0.11(0.06)	-0.11(0.06)
Manager			-0.05(0.04)	-0.05(0.04)	-0.05(0.05)
Union member			0.04(0.04)	0.03(0.04)	0.04(0.04)
Establishment size 1-24			0.003(0.05)	0.009(0.05)	0.01(0.05)
Establishment size 25-199			0.01(0.04)	0.02(0.04)	0.02(0.05)
Region dummies (18)			Yes	Yes	Yes
Industry dummies (10)			Yes	Yes	Yes
Occupation dummies (9)			Yes	Yes	Yes
Job tenure				7.2E-6(9.4E-6)	6.1E-6(9.5E-6)
Work values: 1st mention					
Promotion prospects				-0.04(0.12)	-0.04(0.12)
Total pay				-0.06(0.07)	-0.06(0.07)
Relations at work				0.07(0.09)	0.06(0.09)
Job security				0.14(0.07)*	0.15(0.07)*
Actual work itself				0.05(0.07)	0.04(0.07)
Hours				0.05(0.11)	0.05(0.11)
Work values: 2nd mention					
Promotion prospects				0.03(0.09)	0.05(0.09)
Total pay				0.005(0.06)	0.02(0.06)
Relations at work				0.008(0.07)	0.02(0.07)
Job security				0.02(0.07)	0.05(0.07)
Actual work itself				0.03(0.06)	0.05(0.07)
Hours				0.06(0.09)	0.07(0.09)
Marital status					
Married					0.12(0.06)
Separated					-0.27(0.13)*
Divorced					-0.21(0.09)*
Widowed					-0.06(0.16)
Number of own children in household					
1					-0.17(0.06)**
2					-0.10(0.07)
3+					0.04(0.11)
Number in household					
2					-0.01(0.08)
3					-0.07(0.08)
4					-0.00(0.09)
5					-0.07(0.10)
6+					-0.24(0.15)
Constant	0.01(0.05)	0.58(0.15)***	0.07(0.25)	0.05(0.27)	0.05(0.29)
N	4892	4892	4264	4238	4227
Log-likelihood	-7623.8	-7615.3	-6489.9	-6440.6	-6401.5

\* Significant at the 5% level; \*\* significant at the 1% level; \*\*\* significant at the 0.1% level.

employees have higher levels of mental health, which contrasts with the opposite finding for male job satisfaction (e.g. Table 2 and Clark, 1993). Individuals reporting excellent or good general health also have better mental health, as do employees who value job security. Being separated or divorced is associated with poorer mental health. Employees with only one child have significantly lower levels of mental health than those with no children.

As a result of this similarity between the job satisfaction–age and mental health–age relationships, it is tempting to suggest that the observed U-shape in the former entirely reflects the latter; perhaps the U-shape has nothing to do with a job, but merely mirrors the way in which mental health changes with age. To test this possibility, the GHQ score was introduced into the fullest (column 5) specification of the job satisfaction regressions. If the hypothesis is correct, then controlling for mental health should entirely remove any U-shaped relationship between job satisfaction and age.

The results show that mental health is indeed a strong predictor of job satisfaction, the  $\chi^2$ -statistic for the inclusion of the 12 mental health dummy variables being significant at the 1 per cent level for all three measures of job satisfaction. However, in every case the age and age-squared variables remain significant at the 0.01 per cent level; a U-shaped relationship persists between job satisfaction and age, with a minimum barely changed from those of Tables 2, 3 and 4. Hence it seems that, even though the same type of U-shape in age occurs for both job satisfaction and context-free mental health, there must be some work-related factors which uniquely explain the former.

#### *Male and female well-being*

Tables 1 and 5 provided some initial evidence that the relationship between age and well-being may differ between men and women. However, those tables summarized merely the 'highly satisfied' responses, and the complete distribution of scores needs to be examined in each case. This is done in Table 7, which goes beyond previous analyses in presenting separate estimates of the age variables for men and women corresponding to those in Tables 2, 3, 4 and 6. For all specifications, there is a strongly significant relationship between age and well-being when age is the only explanatory variable.

When age-squared is added (in column 2 of Table 7), a significant U-shape emerges for both men and women in overall job satisfaction and context-free mental health, but only for men in satisfaction with pay and satisfaction with the work itself. For women's satisfaction with the work itself, age is insignificant in column 2, although age-squared is positive and significant.

As more controls are added (identical to those used in the previous tables), the correlation between age and well-being tends to become stronger. In column 5 of Table 7 there is a significant U-shaped relationship in all measures of job satisfaction for both men and women. There is also a U-shaped relationship between age and women's context-free mental health; but, although the estimates for men are signed correctly, there is (after all the controls listed in Table 6) no significant association between age and the mental health of male employees.

The estimated minima in column 5 of Table 7 turn out to be very similar for men and women. For the four measures of well-being considered, the minima for men are, in turn, 38, 40, 30 and 38; for women these values are 36, 38, 29 and 38.



Table 7. Job satisfaction and mental health ordered probit regressions by sex: Estimated coefficients on age

	Column 1	Column 2	Column 3	Column 4	Column 5
<i>Overall job satisfaction</i>					
Men					
Age	0.007***	-0.05***	-0.07***	-0.07***	-0.08***
Age-squared/100		0.07***	0.09***	0.09***	0.10***
Women					
Age	0.01***	-0.03**	-0.02	-0.02*	-0.05***
Age-squared/100		0.05***	0.04*	0.04**	0.07***
<i>Satisfaction with pay</i>					
Men					
Age	0.007***	-0.02*	-0.10***	-0.10***	-0.10***
Age-squared/100		0.04**	0.10***	0.12***	0.13***
Women					
Age	0.01***	-0.002	-0.02	-0.02*	-0.04**
Age-squared/100		0.02	0.04*	0.04**	0.05**
<i>Satisfaction with work itself</i>					
Men					
Age	0.02***	-0.02*	-0.03*	-0.03*	-0.04*
Age-squared/100		0.04***	0.06***	0.05**	0.06***
Women					
Age	0.02***	-0.02	-0.02	-0.03*	-0.04*
Age-squared/100		0.05***	0.05**	0.05**	0.06**
<i>Context-free mental health</i>					
Men					
Age	0.004***	-0.03*	-0.03	-0.03	-0.03
Age-squared/100		0.04**	0.04*	0.04*	0.03
Women					
Age	0.004***	-0.02*	-0.04**	-0.04**	-0.03*
Age-squared/100		0.04*	0.05**	0.05**	0.05*

\*Significant at the 5% level; \*\*significant at the 1% level; \*\*\*significant at the 0.1% level.

## Discussion

This paper has provided new information about two key issues. First, we have demonstrated in a recent large-sample study that overall job satisfaction is U-shaped in relation to age. With no other control variables, it declines on average until the age of approximately 31 and rises thereafter. Second, ordered probit equations have been estimated in which a large number of control variables for personal characteristics, aspects of jobs and work values are included. The existence of a robust and statistically well-determined U-shaped curve in age continues to be visible in the data. In the fullest specification, with approximately 80 control variables, the strongly-significant U-shape between age and overall job satisfaction has a minimum at age 36.

This result persists for ordered probit analyses of both extrinsic and intrinsic job satisfaction (satisfaction with pay and satisfaction with work itself). The age at which in-

trinsic satisfaction minimizes is found to be lower than the minimum for extrinsic satisfaction. It was also shown that a U-shape in all the measures of job satisfaction exists for both men and women separately, and that the minima are at similar ages across the sexes. The findings suggest that the curved relationship proposed by Herzberg *et al.* (1957) is a deep structural correlation that is not due to the links between age and variables like income, health, family characteristics or job tenure.

Separate analyses have indicated that the U-shape is particularly strong for full-time employees only, in comparison with the sample of full-time and part-time employees together. It is also somewhat stronger for men than for women. Why might these differences occur?

Full-time (rather than part-time) employment is more likely to be viewed in terms of progress in a continuing career, so that a person's assessments of his or her current full-time position are more likely to include judgements relative to previous and future roles. Those comparative judgements might give rise to declines in satisfaction after an initial period in the work force (as a job becomes seen as repetitive and restrictive) and an increase in later years (as a current position is compared favourably with earlier ones). A stronger positive association with men's (rather than women's) age may also be expected because men are more likely to be promoted as they age to more senior jobs, with attractive characteristics such as autonomy, authority, increased income and status. In addition, men's withdrawal from unsatisfying jobs is more concentrated in later life, whereas women's may be spread out more evenly over the age distribution; the stronger U-shape for men may thus be partly explained by a differential participation effect.

The present findings are based on single-item measures of job satisfaction, and it is important to examine the appropriateness of that procedure. Whereas multi-item measures are likely to be more reliable, most research with national samples has used single indicators in order to meet tight constraints on interview time. There is considerable evidence that single-item measures are acceptably reliable and valid in this setting.

Findings from comparisons between single-item and multi-item measures have been shown to be extremely reliable and stable (e.g. Scarpello & Campbell, 1983). Validity evidence has been provided in terms of strong associations between single-item scores and those from longer scales. For example, Warr, Cook & Wall (1979) reported a correlation of .70 between a single-item response and a 15-item scale of overall job satisfaction. In addition, correlations with job and other factors are found to be similar whether multi-item or single-item measures are used (e.g. Scarpello & Campbell, 1983). That similarity is illustrated in the present investigation, where the pattern of associations between variables is entirely consistent with results from multi-item instruments.

#### *Interpretation of findings*

The U-shape found here was not observed in several studies reported during the 1970s (see the Introduction), although it has recently been found in an investigation of other aspects of occupational well-being (Warr, 1992). How might this inconsistency between findings at the younger ages be explained?

One possibility is in respect of study dates. Before the 1960s and after the late 1980s a curvilinear pattern has been reported. It might be the case that during the cultural conditions in developed countries during the 1960s and 1970s young employees were gen-

erally disenchanted with their new jobs, such that their early roles in the labour market were not accompanied by high job satisfaction. Alternatively, a national difference might be important; very low levels of job satisfaction among young employees have typically been observed in USA, whereas recently observed U-shapes have come from the UK. Perhaps differences in the labour market in the two countries affect the job attitudes of young adults in a differentiated manner.

Another possible interpretation is in terms of sampling at young ages. It is likely that some investigations have studied few employees below the age of 20. This would reduce the probability of identifying a statistically significant curvilinear pattern. In some studies, the youngest age groups exclude all those remaining in education, so that the jobs held by the youngest age groups may lack attractive qualities available at older ages. More generally, the present results indicate that male full-time employees are especially likely to demonstrate a U-shaped relationship with job satisfaction; hence, differences between studies in the gender composition of samples may have influenced the nature of findings.

Whatever the explanation for this inconsistency in the literature, the present findings demonstrate that the conventional account of age differences in job satisfaction (a continuous increase from very low levels at young ages; e.g. Doering *et al.*, 1983) is not generally valid. There is now a need to focus attention specifically on the factors which are associated with either positive or negative associations between age and job satisfaction among employees below the age of about 30. Under what circumstances is each relationship found? For instance, in cases where young employees progress through career stages into progressively more attractive jobs, a positive rather than negative association with age in the lower band would be expected. But when school leavers move into jobs which they at first enjoy but later discover provide little intrinsic or extrinsic rewards, it may be envisaged that positive well-being associated with initial novelty would gradually decline, leading to a negative association with age of the kind envisaged by Herzberg *et al.* (1957). The more pronounced U-shapes for male employees and for full-time employees also deserve investigation; what is it about their jobs and careers that tends towards a decline in each form of job satisfaction across the earlier years?

The Introduction presented six possible explanations of age differences in job satisfaction. As discussed there, two of these, sample selection (such that older people have a greater choice about whether to work or not, and a tendency for the potentially more satisfied to decide to do so) and the cohort explanation, have not been directly tested. However, the findings show that job satisfaction typically rises from the early 30s, and withdrawal from the labour force (normally at later ages) can at best only account for part of this increase. Moreover, the presence of a group of dissatisfied workers born in the 1950s as an explanation for the low satisfaction of workers who are currently mostly in their 30s was found to be inferior to a general U-shaped relationship between age and job satisfaction, with satisfaction falling smoothly until the mid-30s and then rising continuously thereafter.

The analysis has allowed a direct test of three of the other explanations: job characteristics, work values and non-job variables. The inclusion of a wide range of potential explanatory variables in the ordered probit analyses has failed to remove the statistically significant impact of age. This is particularly notable since the control variables were themselves often independently important in predicting job satisfaction and they covered a wide range of personal and occupational features. For example, self-reported health was

found to make an independent positive contribution to overall job satisfaction (Table 2), as did education (negative, after controlling for other factors) and managerial status (positive, as usually found). Attention was particularly directed at the role of key work values; although several of those were found to affect job satisfaction in the ordered probit analyses, the significant contribution of age itself was retained. Hence, the U-shaped relationship between age and job satisfaction is not accounted for by the job attributes which we have measured, nor by individuals' work values, their level of education or other personal characteristics.

By examining the age distribution of context-free mental health (measured by the GHQ), it was possible to make inferences about the influence of non-job variables on individual well-being. For this sample of employees, the pattern of reversed GHQ scores was found to parallel that for job satisfaction, with significant non-linearity revealed in an ordered probit analysis. On the other hand, analyses revealed that the U-shape between age and job satisfaction remains strongly significant after controlling for mental health. These two findings suggest that wider personal and family developments which determine context-free mental health are also important determinants of job-related satisfaction, but also that some factors independent of mental health cause job satisfaction first to decline and then to rise with age.

The last of the possible explanations posited in the Introduction concerned the role of the individual's expectations about his or her career. Both job satisfaction and general mental health are likely to be influenced by an employee's current perception of his or her job relative to expectations of what a job should entail. (Clark, 1994 and Clark & Oswald, 1996, find evidence that comparisons such as these, with respect specifically to income, significantly influence job satisfaction.) If this study has adequately measured all of the relevant aspects of individuals and their jobs, then the U-shape in age might be largely explained by changing expectations or comparisons across time.

In order to explain the U-shaped relationship between job satisfaction and age, two processes of expectation may be important. First, young employees may feel satisfied with their job not only because of the novelty of their situation but also because the youth unemployment rate is high and they feel pleased to have a job in comparison with their unemployed peers. However, their expectation may rise towards middle age, as more of their peer group find attractive jobs, with a consequential decline in their level of job satisfaction. Also, as workers gain labour market experience, they also acquire information about the nature of work to compare against their prior expectations regarding their own job, and this later comparison may be dissatisfying.

Very young workers may not have enough information about the world of work to know whether their job is good or bad in relation to others; it is only with experience in the labour market that they can make such firm judgements. In this sense it is more satisfying to have hopes at the age of 20 about what one's job will be like at the age of 30 than to realize that these expectations were too optimistic once that age is reached. This process may underlie the downward slope of the U-shaped relationship between job satisfaction and age.

A second process concerns the relation of workers and their expectations in the later working years. The rise in job satisfaction at these ages, the upward sloping part of the U-shape, could come from reduced aspirations, due to a recognition that there are few alternative jobs available once a worker's career is established, as outlined in the Introduction.

Alternatively, aspirations themselves could remain the same but older workers might put less weight on such comparisons, after realizing that their initial expectations have not been met.

Herzberg *et al.* (1957) suggested that the increases in job satisfaction from the low 30s results from older workers' transition to more rewarding jobs. However, given the robustness of the age relationship after including income and job and demographic characteristics (a U-shape in age is retained despite the inclusion of many controls), it may be that older workers are more satisfied not only because they are better rewarded but also because they expect less or because they care less about such comparisons. The investigation of age differences in expectations and comparisons would seem a fruitful area for further research.

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## Appendix 1: Variables and definitions

*Overall job satisfaction*: Scaled 1–7 where 7 is the highest category

*Job satisfaction with pay*: Scaled 1–7 where 7 is the highest category

*Job satisfaction with work itself*: Scaled 1–7 where 7 is the highest category

*Age*: Age of respondent at date of interview

*Male dummy*: Respondent is male

*Health dummies (3)*: Respondents classify their own health, compared with people of their own age. Categories: excellent, good, and fair to very poor. Omitted category: fair to very poor

*Indian dummy*: Respondent considers that they belong to the Indian, Pakistani or Bangladeshi racial group

*Black dummy*: Respondent considers that they belong to the Black Caribbean, Black African or Other Black racial group

*Education dummies (3)*: 'High'—degree, teaching qualification or other higher qualification; 'Medium'—nursing qualification, A-levels, O-levels or equivalent; 'Low'—neither of the above. Omitted category: 'Low'

*Log income*: Natural log of usual monthly gross pay from respondent's main job

*Log hours*: Natural log of usual weekly hours (excluding overtime)

*Manager dummy*: Respondent has some managerial or supervisory duties

*Union member dummy*: Respondent is a member of a recognized union at their workplace

*Establishment size dummies (3)*: Number of workers at establishment is <25; 25–199; 200+. Omitted category: 200+

*Region dummies (18)*: Standard regions plus seven metropolitan areas

*Industry dummies (10)*: Agriculture, forestry and fishing; energy and water supplies; extraction of minerals and ores other than fuels, manufacture of metals, mineral products and chemicals; metal goods, engineering and vehicles industries; other manufacturing industries; construction; distribution, hotels and catering; transport and communication; banking, finance, insurance, business services and leasing; other services. Omitted category: other services

*Occupation dummies (9)*: Managers and administrators; professional; associate professional and technical; clerical and secretarial; craft and related; personal and protective service; sales; plant and machine operative; other. Omitted category: other

*Job tenure*: Number of days that respondent has been in current job

*Work values dummies (8)*: Respondent chooses the important aspects of a job from the following categories: promotion prospects; total pay; relations with supervisor or manager; job security; being able to use initiative; actual work itself; hours; something else. Omitted categories: initiative and something else

*Marital status dummies (5)*: Married; separated; divorced; widowed; never married. Omitted category: never married

*Number of own children in household dummies (4)*: Number of the respondent's natural, adopted or stepchildren, under the age of 16, living in the same household as the respondent. Categories: 0, 1, 2, 3+. Omitted category: 0

*Number in household dummies (6)*: Number of individuals in the household in which the respondent lives. Categories: 1, 2, 3, 4, 5, 6+. Omitted category: 1

## Appendix 2: Means and standard deviations

Overall job satisfaction	5.496	1.518
Satisfaction with pay	4.477	1.954
Satisfaction with the work itself	5.661	1.549
GHQ 'unusual' responses	1.433	2.328
Age	36.968	12.653
Age-squared	1526.707	996.033
Male	.518	.500
Health-excellent	.331	.471
Health-good	.483	.500
Health-fair to poor	.186	.389
White/Chinese/other	.968	.176
Black	.016	.125
Indian/Pakistani/Bangladeshi	.016	.127
Education-high	.272	.445
Education-medium	.399	.490
Education-low	.326	.469
Log income	6.548	.888
Log hours	3.422	.529
Manager	.351	.477
Union member	.347	.476
Establishment size: 1-24	.351	.477
Establishment size: 25-199	.349	.477
Establishment size: 200+	.297	.457
<i>Region</i>		
Inner London	.051	.220
Outer London	.075	.263
Rest of south east	.207	.405
South west	.081	.273
East Anglia	.031	.175
East Midlands	.071	.256
W Midlands conurbation	.041	.198
Rest of West Midlands	.049	.216

## Appendix 2 (continued)

Greater Manchester	.047	.211
Merseyside	.024	.152
Rest of north west	.043	.204
South Yorkshire	.023	.151
West Yorkshire	.040	.196
Rest Yorks. & Humberside	.033	.180
Tyne and Wear	.024	.152
Rest of north	.036	.185
Wales	.045	.207
Scotland	.080	.271
<i>Industry</i>		
Agriculture	.012	.107
Energy	.023	.150
Extraction	.029	.167
Engineering	.105	.306
Other manufacturing	.104	.305
Construction	.034	.182
Distribution	.189	.391
Transport	.060	.238
Finance	.111	.314
Other services	.327	.469
<i>Occupation</i>		
Managers	.104	.306
Professionals	.092	.289
Associate professionals	.100	.300
Clerical	.196	.397
Craft	.124	.329
Personal	.101	.302
Sales	.078	.268
Plant operative	.106	.308
Other	.095	.294
Job tenure	1787.146	2319.449
<i>Work values—first choice</i>		
Promotion prospects	.030	.172
Total pay	.163	.370
Relations with manager	.077	.266
Job security	.292	.455
Initiative	.085	.279
Work itself	.292	.455
Hours	.034	.181
Something else	.022	.145
<i>Work values—second choice</i>		
Promotion prospects	.054	.226
Total pay	.244	.429
Relations with manager	.141	.348
Job security	.172	.378
Initiative	.134	.341
Work itself	.167	.373
Hours	.066	.248
Something else	.016	.124



**Appendix 2 (continued)**

<i>Marital status</i>		
Married	.602	.489
Separated	.019	.135
Divorced	.058	.234
Widowed	.014	.119
Never married	.305	.460
<i>Number of own children in household</i>		
0	.667	.471
1	.142	.349
2	.142	.349
3+	.048	.215
<i>Number in household</i>		
1	.077	.267
2	.296	.457
3	.236	.424
4	.259	.438
5	.106	.308
6+	.027	.162

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