

IS UTILITY RELATIVE? EVIDENCE FROM HOUSEHOLD DATA

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ABSTRACT

This paper uses a recent British household survey to contribute to the literature on reference effects in the individual utility function. Two measures of job satisfaction, which are considered as proxy measures of utility from work, are shown to be strongly negatively correlated with both spouse's income and the average income of all other workers in the household. There is evidence of a kink in this relationship, such that a low salary brings about more disutility when it is beneath that of the spouse or beneath the average salary of other household workers. It is argued that these results reflect a comparison effect in well-being, and can not be explained by the standard model of the household.

IS UTILITY RELATIVE? EVIDENCE FROM HOUSEHOLD DATA

Andrew E. Clark*

1. Introduction.

The image of the household as a "black box" has been slowly receding in economics. Various formal models of household behaviour have been developed (see Blundell, Preston and Walker, 1994, and Woolley, 1992) and, empirically, the actions of individuals living within a household have become an important unit of analysis for the economics of consumer and labour market behaviour (see, for example, Chiappori, 1988, Browning, 1992, and Thomas, 1993) and for the evaluation of inequality (Kanbur and Haddad, 1994). This paper continues the tradition of unlocking the household black box, but from a different angle. Rather than analysing the effect of household structure on individuals' labour supply or consumption, the work here considers the relationship between household labour market variables, specifically income and hours, and individuals' reported levels of satisfaction with their job.

Job satisfaction is studied because, as discussed in more detail in section 2, research has shown that workers' subjective evaluations of their jobs are strong predictors of their labour force behaviour. Workers with lower levels of job satisfaction are more likely to quit their job, to be absent from work and to have lower productivity. Thus an understanding of which kinds of workers are satisfied at work will lead to a better understanding of the working of the labour market. Also, as job satisfaction is a proxy measure of utility, the empirical results may give us some hints about the form of a more general utility function. Specifically, this paper addresses the question of whether well-being depends only on absolute levels of variables such as income, or whether processes of comparison are important also, with other workers in the same household providing one of the bases for the relative evaluation of pay.

There is a huge literature devoted to the econometric analysis of measures of individual well-being or satisfaction in social science (see Locke, 1976), to which economists have contributed only little. As Sen (quoted in van Praag, 1991) points out, this may result

from economists' natural mistrust of subjective variables; this scepticism seems much less widespread in other disciplines. In the papers that do exist, a small number have included explanatory household structure variables (such as number and ages of children and household type) when analysing individual well-being, but this has almost never been the primary focus of the analysis.

The broad debate that this work contributes to is that of the existence of interpersonal terms in the individual utility function. Do individuals in a society behave like a society of independent individuals? And, in the context of this paper, do individuals in a household behave like a household of individuals? This latter is something of a straw man: most research has shown that household decisions are taken at least partly collectively. However, the former, more general, question is not so flimsy and its interpretation can have a bearing on our understanding of how individuals in a household behave.

Individuals in a society are not typically thought of as behaving so as to maximise a social welfare function. Interdependencies between individuals in a society are thus not considered as reflecting altruism, but rather imperfect information or relativity/comparison effects. In the first of these cases the actions of others contribute to the individual's information set, which leads to dependencies between non-altruistic agents¹. In this paper we focus on the second cause of interdependencies: those resulting from relative terms in the utility function.

The standard method of thinking about utility, satisfaction or happiness in economics is in terms of absolute levels of variables: my utility increases as I have more of a good or more income. On the other hand, there is now a small body of research in economics (again, inspired by a far greater body in other social science disciplines) which maintains that utility may well instead depend upon consumption or income relative to that of some reference group. The empirical results in section 3 show that the hourly pay of other workers in the household, and particularly the spouse, is negatively correlated with the respondent's reported

¹. A general introduction to the analysis of interactions between agents is given by Kirman (1994).

level of job satisfaction. This result is consistent with the existence of comparison effects in job satisfaction, where other workers in the household form part of the individual's reference group. The composition of the household and the jobs that other household members do contribute significantly to our understanding of which type of worker is satisfied with their job.

2. The study of job satisfaction and the relative utility function

The analysis of job satisfaction is of interest for two reasons. First, being a measure of individual well-being, it provides us with some information about the distribution of welfare amongst workers. The second reason is behavioural: decisions about labour force participation, quitting, and how hard to work once in a job are all likely to depend in part upon the worker's subjective evaluation of work, in other words on their job satisfaction. An understanding of the causes of job satisfaction may therefore shed light on these important labour market phenomena.

The use of cross-section job satisfaction responses as measures of individual well-being is open to the criticism that subjective information cannot be compared across individuals. This assertion can be challenged empirically by reference to the findings of a small body of extant research in economics and psychology which has considered these questions by relating satisfaction scores to subsequent observable labour market behaviour: see Box 1.

BOX 1 ABOUT HERE

There is now a substantial body of econometric research which has related individual job satisfaction scores to various individual and job characteristics; some of the results are summarised in Box 2.

BOX 2 ABOUT HERE

A number of these papers have included household variables in their analysis of individual job satisfaction. For example, Blanchflower and Oswald (1992), Blanchflower, Oswald and Warr (1993), Clark (1995a) and de Vaus and McAllister (1991) conclude that

married workers are generally more satisfied than single workers. Borjas (1979), Clark, Oswald and Warr (1996), Meng (1990) and Weaver (1980) have all analysed the effect of number of children on job satisfaction, with mixed results. De Vaus and McAllister (1991) find that individual job satisfaction is positively correlated with household income (but do not split the latter up into personal income and income from other workers). A separate strand of research has looked at the satisfaction of the household, but not of its individual members (see Easterlin, 1974, and the discussion in Gardes and Combris, 1994)².

². Woittiez and Theeuwes (1994) find that happiness levels of spouses are strongly positively correlated but do not investigate the relationship between individual happiness and spouse's personal or job characteristics.

BOX 1. CROSS-SECTION ANALYSIS OF A SUBJECTIVE VARIABLE.

Any survey question that asks an individual for their evaluation of some characteristic elicits a subjective response. Subjective individual data may apply to both non-quantifiable phenomena (eg, "do you consider yourself to be in good health or bad health?") or to some measurable amount (eg, "would you say that your current wage is high, medium or low, given the type of job you do?"). Equally, questions may pertain to individual phenomena ("on a scale of 1 to 7, how satisfied are you with your job overall?") or to something external to the individual ("would you say that the government is doing a good job in managing the economy or a bad job?").

Although some subjective measures have gained wide acceptance in economics (for example, self-reported health), measures of well-being, satisfaction or happiness have met with greater resistance³. Despite this reluctance, many researchers would admit that it is of interest to examine changes in an individual's subjective level of satisfaction over time. With panel data one can be reasonably sure that an individual who reported satisfaction of 5 last year and 6 this year has actually experienced some increase in utility, as their idiosyncratic use of language has been controlled for. However, with cross-section data this is not the case: how do we know that an individual who reports job satisfaction of 6 is really more satisfied than another who reports job satisfaction of 5?

One test of this criticism lies in the correlation between cross-section satisfaction responses and subsequent labour market behaviour. If individual responses cannot be compared then behaviour cannot be predicted from cross-section subjective data, as there is no way of ranking different workers' levels of job satisfaction.

Perhaps the most obvious expected correlation is with quits: workers who say that they are dissatisfied should be more likely to quit, if indeed satisfaction is comparable between individuals. Freeman (1978) uses American panel data to show that job satisfaction is a significant predictor of quits, with an effect which is, in two of the three datasets examined, at least as powerful as that of wages. Akerlof, Rose and Yellen (1988) and McEvoy and Cascio (1985) reach the same conclusions; some earlier references are given in Clegg (1983). Other research has found that job satisfaction is negatively correlated with absenteeism (Clegg, 1983) and non-productive and counter-productive work (Mangione and Quinn, 1975). Recently Tsuru and Rebitzer (1995) have shown that job satisfaction is negatively correlated with the support for union representation amongst non-union workers. Again, if satisfaction scores were to be non-comparable between individuals then this correlation should not be found.

Further support for the usefulness of job satisfaction data comes from their correlation with other measures of individual well-being. In the dataset which this paper examines, job satisfaction is found to be strongly negatively correlated with the GHQ-12 measure of minor psychiatric disorder or stress, a well-established psychological index of overall well-being (see Goldberg, 1972). Also, job satisfaction is strongly positively correlated with the individual's subjective evaluation of their own health (Clark, 1996).

These results show both that there are common patterns in cross-section responses to job satisfaction questions, i.e. that different individuals answer these questions in a similar way, and that job satisfaction has observable labour market consequences.

³. Methodological defences of the concept of cardinal utility are provided in van Praag (1991) and Tinbergen (1991); the former provides a useful synopsis of the development of the cardinal and ordinal utility measures. See also the introduction in Woittiez and Theeuwes (1994).

BOX 2. JOB SATISFACTION: ECONOMETRIC RESULTS.

Most of the econometric work on job satisfaction has found that women report higher levels of job satisfaction than men (for example, Blanchflower and Oswald, 1992; Meng, 1990; Kalleberg and Loscocco, 1983; and Clark, 1995a). This finding runs counter to the large body of research documenting sex discrimination against women in the labour market (see Wright and Ermisch, 1991) and the finding that, when life satisfaction/subjective well-being scores are analysed, women are under more stress than are men (see Clark and Oswald, 1994). Older workers are typically more satisfied than younger workers (Warr, 1992 and Kalleberg and Loscocco, 1983), with some evidence from the BHPS dataset of a U-shaped relationship between job satisfaction and age, minimising in the mid-thirties (Clark, Oswald and Warr, 1996). Good self-reported physical health is strongly associated with both job satisfaction and a less-specific measure of psychological well-being (Clark, 1996, and Clark and Oswald, 1994 respectively). In addition, satisfaction with health is found to be positively correlated with job satisfaction (Lévy-Garboua and Montmarquette, 1994).

One of the more surprising findings from this research is that workers with higher levels of education report lower levels of job satisfaction (see Clark and Oswald, 1996; Morris and Villemez, 1992; and Sloane and Williams, 1994). Clark and Oswald (1996) suggest that this finding can be explained by the correlation between education and individuals' expectations with respect to what their job should be like, although the direction of causality must remain ambiguous in the light of the lack of panel data measuring both variables.

Finally, for the individual characteristics, Lévy-Garboua and Montmarquette (1994) find that, in the old and young age groups, religiosity is associated with higher levels of job satisfaction, and Blanchflower, Oswald and Warr (1993), Freeman (1978) and Morris and Villemez (1992) all find that Blacks report lower levels of job satisfaction than Whites, although Bartel (1981) finds the opposite result.

Job characteristics are important also. Hours of work are negatively correlated with job satisfaction (in the BHPS dataset they are negatively correlated with six out of the eight measures of job satisfaction collected: see Clark, 1995a). Income is found to be a strong predictor of satisfaction with pay (Cappelli and Sherer, 1988, Clark and Oswald, 1996) and to be positively correlated with overall job satisfaction also (Akerlof, Rose and Yellen, 1988; Blanchflower, Oswald and Warr, 1993; Borjas, 1979; Freeman, 1978; Kalleberg and Loscocco, 1983; Morris and Villemez, 1992; Tsuru and Rebitzer, 1995; Sloane and Williams, 1994; and Witte and Kalleberg, 1993).

One of the main focuses of the econometric research has been the union effect on job satisfaction, which is typically found to be negative (Borjas, 1979; Clark, 1996; Freeman, 1978; Meng, 1990; and Miller, 1990). Union status is endogenous, and the most likely interpretation of this result is that dissatisfied workers seek union representation (see Tsuru and Rebitzer, 1995).

There is also a negative correlation between job satisfaction and establishment size (Clark, 1996; Idson, 1990; and de Vaus and McAllister, 1991) and a positive correlation with promotion opportunities (Clark, 1996, and Sloane and Williams, 1994). Lastly, Blanchflower and Oswald (1992) show that the self-employed are more satisfied than the employed.

Almost all of these results come from the cross-section analysis of satisfaction data. Work on panel changes in satisfaction is in its infancy (see Clark *et al*, 1994, Winkelmann and Winkelmann, 1995, and Witte and Kalleberg, 1993) despite the advantages it offers in controlling for unobserved fixed effects. These advantages are likely countered by the serious econometric problem of estimating changes in ordinal, bounded data.

The majority of this empirical work has related job satisfaction to absolute levels of variables such as income and hours. However, there is a long history of research which has suggested that well-being or utility may depend on some process of comparison. For example, if income is evaluated relative to some comparison level⁴, y^* , then the standard utility function from working,

$$u = u(y, h, \underline{z}), \quad (1)$$

(where y is income, h is hours of work, and \underline{z} is a set of taste parameters) is replaced by

$$u = u(y, y^*, h, \underline{z}), \quad (2)$$

The higher is comparison income in equation (2), the lower is the worker's relative income, and hence the lower is utility. A brief summary of research into models of relative utility and comparisons is given in Box 3.

BOX 3 ABOUT HERE

⁴. Comparisons could take place over any number of job characteristics other than income, such as hours, promotion, autonomy, authority, size of office and so on. Survey data on many of these variables are typically not available, which is one reason for their exclusion from this analysis. Another is that income is typically thought to be one of the most important aspects of a job for the worker, and hence income comparisons seem a natural starting point from which to test the idea of a relative utility function.

BOX 3. RELATIVE UTILITY AND INCOME COMPARISONS.

The concept of relative well-being in economics dates back to Smith, and later Veblen (1949)⁵ and Duesenberry (1949), the latter arguing that individual direct utility is a function not of the level of goods consumed but of the individual's own consumption relative to the consumption of some reference group. The idea that individual well-being is partly driven by comparisons with others has also heavily influenced other social science disciplines, such as social psychology (Adams, 1963; Argyle, 1989; Homans, 1961; and Stouffer, 1949) and sociology (Runciman, 1966 and Pollis, 1968).

In recent years there has been a growth of interest amongst economists in models of relative utility, with contributions including Agell and Lundborg (1992), Frank (1984), Johansen and Strøm (1994), Kapteyn and Van Herwaarden (1980), Oswald (1983), Solow (1990) and Scitovsky (1976)⁶. A number of authors (see Akerlof and Yellen, 1990; Boskin and Sheshinski, 1978; Frank, 1985; and Layard, 1980) have argued that optimal economic policy changes significantly once such relativities are taken into account. However, the task of providing empirical evidence for theories of relative deprivation is a difficult one, as, considering income comparisons for example, the researcher almost never has information on how the individual's y^* is calculated, i.e. of whom does this reference group consist? Hence, any empirical test of relative utility always involves a joint hypothesis: that y^* is important and that the specification used to calculate it is the correct one.

Perhaps the main body of research investigating relativities in the utility function was carried out by the research team at Leiden University in their work on the Welfare Function of Income (WFI). This project involved asking individuals to assign income levels (per period) to nine different verbal labels (such as excellent, good, sufficient and bad) and then, based on the values given, estimating for each individual a lognormal WFI. The resulting estimated mean and variance were then used as dependent variables in regressions which sought to explain which types of individuals need a higher level of income to be satisfied and which individuals have valuations which are more sensitive to changes in income⁷. The contribution to the relative utility debate comes through the addition of reference group income as a right-hand side variable in these latter regressions, with reference group income being typically defined as the average income of other respondents with the same age, education and certain other individual or job characteristics. The empirical results (see, for example, Hagenaars, 1986; van Praag and Kapteyn, 1973; and van de Stadt *et al*, 1985) show that the higher is the reference group's income, the larger are the income levels assigned by individuals to the nine verbal labels, as relative utility theory would imply.

The other main empirical work has focussed on individual responses to survey questions on well-being, and specifically job satisfaction. The specification of y^* in this work has been varied: Hamermesh (1977), Clark and Oswald (1996), Lévy-Garboua and Montmarquette (1994) and Sloane and Williams (1994) use an econometrically predicted "going rate" for the job, i.e. the wage that workers like you get in a job like yours; Cappelli and Sherer take a measure of the market wage; and Clark (1995b) takes a slightly different tack and considers that y^* may be partly determined by the income that the individual has

⁵. "Relative success, tested by an invidious pecuniary comparison with other men, becomes the conventional end of action." T. Veblen (1949), p.33.

⁶. A number of other references are contained in Clark and Oswald (1996).

⁷. This approach has recently been sharply criticised by Seidl (1994), whose criticisms are replied to by van Praag and Kapteyn (1994).

earned in the past⁸.

Lastly, Kosicki (1987) has shown that, holding income constant, income rank within the individual's census region is a very strong predictor of the average savings rate, and Stark and Taylor (1991) have found evidence of relative income effects in migration decisions.

⁸. The idea that individuals become used to the level of income which they receive was used by Easterlin (1974) to explain the empirical insensitivity of well-being over time to changes in income; this claim is critically reviewed by Veenhoven (1991). Gardes and Combris (1994) also refer to this idea, but use data on the income needed to reach a certain level of well-being (similar to those used by the Leiden group), rather than job satisfaction, as their dependent variable.

This paper attempts to fill in a gap in the empirical analysis of well-being by relating individual job satisfaction scores to the income of other workers in the household. The standard well-being function, as in equation (1), implies that the income of other household members should affect the individual's job satisfaction positively: higher income from other household members will, *ceteris paribus*, lead to more income, and therefore more goods, for the individual. In addition, a participation argument implies that the greater is the income of other household members, the lower is the financial pressure on the individual to work. If the participation decision is related to satisfaction at work, then individuals in households with higher income should report higher job satisfaction on average by a simple selection argument.

Once relativities are considered, household variables may not work in this simple manner. There is likely to be some discourse within the household which supplies an individual with a reference level against which to evaluate their own job. Higher income of other household members, despite the higher levels of household consumption that it brings in its wake, may reduce an individual's job satisfaction if it contributes to a higher level of y^* in equation (2). One simple test, therefore, is to examine the relationship between individual job satisfaction and the labour income of other household workers. The next section carries out such a test: the results are consistent with the existence of a relative utility function, where one's own income is compared to that of other household workers.

3. Empirical evidence of household comparison effects

Data

The data used in this investigation come from wave 1 of a recent British survey, the British Household Panel Study (BHPS), which contains information on 10 000 individuals (including over 5000 workers) in 5 500 households. This data set includes a wide range of information about individual and household demographics, health, employment, values and finances; for more details see Buck *et al* (1994). The data were collected in late 1991. The BHPS contains interviews with every adult (aged 16 or over) in the household and is thus ideally suited for this investigation as the job characteristics of other workers in the same

household can be matched to the individual's reported job satisfaction.

All employees in the BHPS are initially asked to rate their satisfaction levels with seven specific facets of their job: promotion prospects, total pay, relations with supervisors, job security, ability to work on their own initiative, the intrinsic nature of the work, and hours of work. Each of these was to be given a number from one to seven, where one corresponded to "not satisfied at all", seven corresponded to "completely satisfied", and the integers from two to six represented intermediate levels of satisfaction. Finally, after they had rated their levels of contentment with the list of topics, individuals were asked a final question, worded as:

"All things considered, how satisfied or dissatisfied are you with your present job overall using the same 1-7 scale?"

This paper studies the responses to the overall job satisfaction question and that for satisfaction with pay. The first is a useful summary measure of a worker's subjective evaluation of their job⁹, and the latter concerns an observable, and important, characteristic of the job, and one for which income comparisons are likely to be pertinent: its financial reward.

Job satisfaction data are available for 2930 workers who are in households with at least one other worker (and in which the other workers were interviewed and supplied information on their labour income and hours). In addition, 2330 workers have working spouses or partners in the same household and who gave income information in their survey interview.

Crosstabulations

The distribution of job satisfaction responses is given in Table 1. The pattern of responses is very similar between workers who have working spouses or partners and workers in households in which there are other working respondents. The modal response for

⁹. Factor analysis confirms this statement: a regression of overall job satisfaction on the first principal component of the seven individual job satisfaction questions yields a t-statistic on the latter of around 60, with a P^2 -statistic of over 3000.

overall job satisfaction is 7, the highest, whereas that for satisfaction with pay is 4, with median responses of 6 and 5 respectively. There are substantial tails of dissatisfied workers, especially for pay satisfaction: roughly 10% of workers report overall job satisfaction of three or less, with the respective figure for pay satisfaction being over 25%.

Table 2 summarises the bivariate relationships between individual job satisfaction and the job characteristics of other workers in the household. The mean level of the satisfaction score is reported for each characteristic, as is the percentage who are "highly satisfied" (that is, reporting satisfaction of 6 or 7 on the 1-7 scale). Two sets of crosstabulations are reported. The first, at the top of Table 2, shows the relationship between the worker's job satisfaction and the hourly income of the their spouse or partner (HP_s). The first crosstabulation in each case is with a five-level variable reflecting the quintiles of spouse/partner's hourly income, which is simply calculated as monthly income divided by usual monthly hours of work¹⁰. In order to pick up the idea of a comparison between incomes, the second crosstabulation shows the correlation between job satisfaction and whether the worker's own hourly earnings (HP_i) are greater than those of their spouse/partner (HP_s). The second set of bivariate measures, in the lower half of the table, repeat this analysis using a broader measure of comparison income: the average hourly income of all other workers in the household (HP_{roh} ; where 'roh' refers to 'rest of household').

The crosstabulations of both measures of job satisfaction with the level of spouse's hourly pay (from now on "spouse" is understood to mean "spouse or partner") show little evidence of a comparison effect, there being some evidence that job satisfaction increases with the level of spouse's hourly income, apart from the high satisfaction of those whose spouses are in the first quintile of the income distribution. In addition, those earning more than their spouse report slightly lower levels of overall job satisfaction. However, the strongest correlation is between pay satisfaction and hourly income relative to that of the

¹⁰. The comparison could take place over just the amount earned, irrespective of hours. The use of hourly income avoids the potentially erroneous classification of a worker as being high paid simply because of high monthly hours of work. It is likely that income comparisons are actually made with some correction for the number of hours worked.

spouse: those who have hourly earnings less than those of their spouse report average pay satisfaction of 4.41 while those who earn more than their spouse report average pay satisfaction of 4.49. Thus there is some initial evidence of a kinked relationship between satisfaction with pay and spouse's income: in general satisfaction rises, although weakly, with spouse's hourly income, but it is more satisfying to earn more than your spouse. This kinked relationship will be further analysed in the multivariate analysis.

This story is repeated for comparisons with the average hourly earnings of other workers in the household. The crosstabulations between individual satisfaction and the level of these earnings show little evidence of any relationship, either positive or negative. However, when a simple dummy variable is calculated showing whether a worker's hourly pay is greater than the average hourly pay of other household workers, some evidence of a comparison effect emerges. Although those with hourly pay higher than the rest of household average report only slightly higher levels of overall job satisfaction, there is a strong positive correlation, significant at the 0.1% level, between satisfaction with pay and having hourly pay above the rest of the household's average level. Again, there does not seem to be a simple correlation between others' income and pay satisfaction, but rather a relationship with a kink at the level of the individual's own hourly pay.

Regression Analysis

The level of the worker's own hourly pay is correlated with many personal characteristics, such as sex and education, and it is known that both males and the higher-educated report lower levels of job satisfaction (see Box 2). Thus a full picture of the relationship between job satisfaction and household measures of comparison income requires multivariate analysis for the usual reasons. As the dependent satisfaction variable is ordinal (i.e. job satisfaction of 6 is not twice as high as job satisfaction of 3) Ordered Probit techniques are used (see Zavoina and McKelvey, 1975). The regression results are reported in Table 3 for comparisons with spouse's pay and in Table 4 for the more general comparison with the average pay of all other workers in the same household. The regressions in these tables control for a wide range of standard individual and job characteristics¹¹. The effects of

¹¹. For expositional purposes the age-squared variable has been multiplied by a factor of

these control variables on job satisfaction are similar to those found in other recent studies. Women and those in good health report higher levels of job satisfaction, and there is a convex relationship between job satisfaction and age (with a U-shaped relationship for overall job satisfaction in Table 4). Those with higher levels of education report lower levels of overall job satisfaction although there is no effect of education on satisfaction with pay. For the job characteristics, workers in smaller establishments report higher job satisfaction, as do those with promotion opportunities. As is typically found, union members are less satisfied at work. The greater are the number of hours worked, holding hourly pay constant, the lower is job satisfaction.

The results in both tables are consistent with the presence of income comparison effects in the job satisfaction function, with some evidence of a kink at the level of the individual's own hourly pay. In the first column of Table 3, there is a significant negative relationship between an individual's own job satisfaction and the hourly pay of their spouse, the estimate on the latter variable being significant at the 1% level. Column 4 shows an equivalent relationship between spouse's hourly pay and the individual's reported satisfaction with pay, again significant at the 1% level. Once other variables are controlled for, there is thus a strong negative correlation between an individual's evaluation of their job and how much their spouse or partner earns.

The remainder of the table investigates the evidence for a kink in this relationship. In columns 2 and 5 a dummy variable indicating whether the respondent's hourly pay is higher than that of their spouse is added to the regression. For both measures of job satisfaction the estimate on this additional kink variable is positive and insignificant, and drives the estimate on the level of spouse's hourly pay to insignificance. This idea is further developed in columns 3 and 6, which include variables measuring both spouse's hourly pay and an interaction term measuring spouse's hourly pay when the respondent earns less than their spouse. These estimates are not significant, although those on the interaction terms have t-

1000. Apart from the income measures, variables and sets of dummies have been dropped at the 5% level in both tables.

statistics of over 1.8, but the signs are consistent with a kink in the comparison process at the level of the individual's own hourly pay, with the relationship between job satisfaction and spouse's pay being more strongly negative when the individual earns less than their spouse.

Table 4 repeats this analysis, with comparison income now being the average hourly pay of all other workers in the household¹². Again, there is a strongly significant negative correlation between both measures of job satisfaction and comparison income. There is evidence of a kinked relationship between overall job satisfaction and other household worker's average income, as indicated by the significant estimates on the dummy variable in column 2 and the interaction term in column 3. The signs on the income variables in columns 5 and 6 are consistent with the presence of a similar kink for satisfaction with pay, but do not attract significant estimates¹³.

Alternative Explanations

It is wise to bear in mind other interpretations of this result, especially since there is very little economic research on how well-being is determined within the household. First, could these empirical results be explained by a model of household production (see Becker, 1981, and Gronau, 1977), based on comparative advantage? According to this model, as other household worker's income goes up, then the respondent's comparative advantage at work falls, and consequently will spend more time in household production. Could this reduced time at work, made up for at the household level by the higher hours of work of other household members, be behind respondents' lower levels of job satisfaction?

The results in Tables 3 and 4 do not easily admit such an explanation as individuals'

¹². The comparison income estimates are for the most part less significant in Table 4, when the average income of all other household workers is used, than in Table 3, which considers spouse's income only. This suggests that a working spouse is a more important member of an individual's reference group than are the other (non-spouse) workers in the household.

¹³. Separate regressions (unreported) showed that the comparison effect of spouse or household income is actually stronger for women than for men. Hence the male-female difference in job satisfaction does not come about because men are more envious than women, at least as far as household comparisons are concerned (see Clark, 1995a, and Hakim, 1991).

hours of work have been controlled for¹⁴. As a check, spouse's hours of work were added into the regressions in Table 3 as a further control variable. The resulting estimated coefficients on spouse's hours were insignificant, and the estimate on spouse's hourly pay remained negative and significant. As a further check, information about the household division of labour¹⁵ was also included in the regressions of Tables 3 and 4: these extra variables attracted largely insignificant coefficients and their inclusion did not change the strong negative correlation between the hourly pay of other household workers and the individual's satisfaction with their job.

The above explanation considers that there is perfect mobility in the labour market: an individual with low pay relative to that of their spouse, and who thus has a relative advantage in non-market production, is able to reduce the number of hours worked, or even to stop working altogether. If this perfect mobility does not exist, then this individual could be frustrated, and thus report lower job satisfaction. To test this hypothesis, two dummy variables were created from the information contained in the BHPS survey about whether the individual, holding their current hourly wage constant, would prefer to work more hours than they currently do, or less hours (preferring to keep the current level of hours is the third, omitted, category). These dummies attract strong negative coefficients when included in tables 3 and 4. However, most of the spouse of household income variables which were significant in tables 3 and 4 remain so after the introduction of these frustration variables.

Thirdly, the dependence of individual utility on the earnings of other household workers may not reflect relative utility, but rather the presence of a household sharing rule (see Bourgignon and Chiappori, 1994) which is dependent on relative earnings. It is then possible that an increase in spouse's labour income may result in the individual receiving less income, through the change in bargaining power¹⁶. Distinguishing between relative utility

¹⁴. Also, lower hours of work are almost always found to be correlated with higher, rather than lower, levels of job satisfaction: see the discussion in Box 2.

¹⁵. These additional variables were dummies showing who is responsible for cooking, cleaning, shopping and washing in the household: the respondent; both the respondent and their partner; or only the partner or somebody else.

¹⁶. For such an effect to dominate in the regressions, either a large proportion of respondents

and a household sharing rule which depends on relative income would require a dataset with good information on transfers between spouses, if not between all household members. Such a test is beyond the scope of this paper.

A last alternative explanation relies on the presence of an omitted variable which is correlated with both individual job satisfaction and the individual's rank in the household income distribution. One candidate for such a variable is the income which the worker has received in the past. Clark (1995b) has shown, using the BHPS dataset, that labour income one year ago is strongly negatively correlated with current job satisfaction. Also those who have poor income relative to what they have earned in the past are more likely to have a lower position in the household income distribution.

To test this hypothesis pay one year ago was added as an additional regressor into the equations reported in Tables 3 and 4. The results, which are unreported here, show that past income is negatively correlated with current job satisfaction, but that the effect of both spouse's income and the average income of other household workers remains correlated with job satisfaction in the manner outlined above. These results suggest that income comparisons are multi-dimensional. Inter-personal comparisons take place with the income of other workers and, at the same time, current labour income is compared with the wages which the individual has earned in the past.

4. Conclusion

This paper has presented some evidence consistent with the existence of income comparison or relativity effects in a measure of individual subjective well-being, job satisfaction. Using data on individuals within the same household, it has been shown that job satisfaction falls as the pay of other workers in the household rises, which is the opposite of the prediction of the standard microeconomic model. Further, there is evidence of a kink at

would have to be in households where higher income from their spouse or from other household workers means a lower level of income for themselves, or the size of these absolute income (and thus satisfaction) effects for a smaller number of respondents must be very strong. Most research into the economics of the household considers a sharing rule which is independent of relative incomes.

the level of the individual's own pay in this comparison process. It has been argued that these striking results are consistent with the relative evaluation of income by workers and the importance of rank, where other workers in the same household, especially spouses, form part of the worker's reference group.

The implications of relative utility functions for microeconomic models of behaviour are considerable. In particular, they are able to provide the basis for theories of emulative behaviour which do not rest upon imperfect information. The results presented in this paper throw some doubt upon the use of standard well-being functions, which are defined over the absolute level of goods, to describe behaviour within the household. In addition to the usual positive correlation between income and well-being, there also seem to be comparison and ranking effects at work within the household (and probably outside of it also). The development of models which include such externalities may yield rich insights into household behaviour.

Footnotes

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TABLE 1. DISTRIBUTION OF REPORTED JOB SATISFACTION LEVELS

Individuals with working spouse

	<i>Overall satisfaction</i>		<i>Pay satisfaction</i>		
	N	%	N	%	
1	81	3.5	288	12.4	
2	45	1.9	106	4.6	
3	93	4.0	213	9.1	
4	298	12.8	493	21.2	5
5	455	19.5	410	17.6	
6	665	28.5	337	14.5	
7	693	29.7	482	20.7	
	<u>2330</u>	<u>100.0</u>	<u>2329</u>	<u>100.0</u>	

Individuals with other workers in the household

	<i>Overall satisfaction</i>		<i>Pay satisfaction</i>	
	N	%	N	%
1	98	3.3	378	12.9
2	56	1.9	136	4.6
3	121	4.1	297	10.1
4	376	12.8	605	20.7
5	591	20.2	533	18.2
6	821	28.0	409	14.0
7	869	29.6	570	19.5
	<u>2932</u>	<u>100.0</u>	<u>2928</u>	<u>100.0</u>

Note: These numbers are based on weighted data.

TABLE 2. JOB SATISFACTION MEANS

	Overall Job Satisfaction		Satisfaction with Pay	
	<i>Mean</i>	<i>% very satisfied</i>	<i>Mean</i>	<i>% very satisfied</i>
OVERALL	5.48	58.3	4.53	35.2
<i>Spouse/partner's hourly pay (HP_s)</i>				
1st quintile	5.50*	58.2	4.44	34.0
2nd quintile	5.39	57.4	4.46	34.8
3rd quintile	5.47	56.5	4.50	34.4
4th quintile	5.47	59.6	4.60	36.4
5th quintile	5.57	60.1	4.59	36.8
<i>Hourly pay higher than that of spouse/partner (HP_i > HP_s)</i>				
No	5.51	58.9	4.41***	34.4
Yes	5.48	58.1	4.49	34.6
OVERALL	5.47	57.6	4.46	33.4
<i>Average hourly pay of other household workers (HP_{roh})</i>				
1st quintile	5.52**	59.4	4.50**	35.8*
2nd quintile	5.37	55.2	4.27	31.8
3rd quintile	5.52	59.4	4.58	35.0
4th quintile	5.43	54.6	4.40	30.0
5th quintile	5.47	58.2	4.54	35.3
<i>Hourly pay higher than average hourly pay of other household workers (HP_i > HP_{roh})</i>				
No	5.48	57.5	4.30***	30.8***
Yes	5.50	58.5	4.55	36.1

Notes: "Very satisfied" denotes job satisfaction of 6 or 7 on the 1-7 scale. The asterisks in the means column denote the degree of significance of the chi-squared statistic from the crosstabulation between job satisfaction (all seven levels of job satisfaction in columns 1 and 3; and satisfied/not satisfied in columns 2 and 4) and the respective characteristic. * denotes significance at the 5% level, ** significance at the 1% level, and *** significance at the 0.1% level. All figures refer to weighted data.

**TABLE 3. ORDERED PROBIT JOB SATISFACTION REGRESSIONS
WITH SPOUSE/PARTNER'S INCOME**

	Overall Job Satisfaction			Satisfaction with pay		
Log hourly pay: $\ln(HP_i)$	0.111 (0.060)	0.039 (0.068)	0.060 (0.066)	(0.059) 0.570	0.508 (0.057)	0.519 (0.065)
Log Hours	-0.251 (0.061)	-0.246 (0.061)	-0.250 (0.061)	-0.408 (0.060)	-0.404 (0.060)	-0.409 (0.060)
Log spouse's hourly pay: $(\ln(HP_s))$	-0.121 (0.044)	-0.056 (0.052)	-0.047 (0.059)	-0.140 (0.042)	-0.084 (0.050)	-0.068 (0.057)
Dummy: $HP_i > HP_s$	---	0.171 (0.074)	---	---	0.147 (0.073)	---
Log spouse's hourly pay (when $HP_s > HP_i$)	---	---	-0.069 (0.037)	---	---	-0.067 (0.036)
Male	-0.388 (0.064)	-0.325 (0.066)	-0.415 (0.065)	-0.451 (0.065)	-0.480 (0.067)	-0.474 (0.066)
Age-squared (/1000)	0.126 (0.031)	0.126 (0.031)	0.128 (0.031)	0.078 (0.029)	0.078 (0.029)	0.079 (0.029)
Health Excellent	0.382 (0.068)	0.378 (0.068)	0.379 (0.068)	0.246 (0.067)	0.244 (0.067)	0.244 (0.067)
Health Good	0.212 (0.063)	0.213 (0.064)	0.214 (0.064)	0.146 (0.063)	0.148 (0.063)	0.149 (0.063)
Education: Higher	-0.327 (0.070)	-0.327 (0.070)	-0.326 (0.070)			
Education: A/O/Nursing	-0.200 (0.060)	-0.201 (0.060)	-0.198 (0.060)			
Renter	0.148 (0.069)	0.146 (0.069)	0.144 (0.069)			
Establishment size: 1-24	0.250 (0.064)	0.253 (0.064)	0.254 (0.065)			
Establishment size: 25-199	0.124 (0.057)	0.126 (0.057)	0.125 (0.057)			
Union	-0.111 (0.053)	-0.112 (0.053)	-0.113 (0.053)			
Manager	0.119 (0.054)	0.111 (0.054)	0.112 (0.054)			
Promotion opportunities	0.260 (0.052)	0.265 (0.052)	0.265 (0.052)	0.175 (0.050)	0.177 (0.049)	0.178 (0.050)
Industry dummies Occupation dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.065 (0.252)	-0.006 (0.254)	0.101 (0.253)	-0.226 (0.234)	-0.278 (0.236)	-0.184 (0.235)
Mu (2)	0.801 (0.029)	0.803 (0.029)	0.802 (0.028)	0.457 (0.024)	0.457 (0.024)	0.457 (0.024)
Mu (3)	1.392 (0.036)	1.393 (0.036)	1.393 (0.036)	0.937 (0.031)	0.938 (0.031)	0.938 (0.031)
Mu (4)	1.978 (0.045)	1.980 (0.045)	1.979 (0.045)	1.541 (0.037)	1.542 (0.037)	1.542 (0.037)
Mu (5)	2.295 (0.052)	2.298 (0.053)	2.296 (0.053)	1.887 (0.041)	1.809 (0.041)	1.888 (0.041)
Mu (6)	2.520 (0.060)	2.524 (0.060)	2.523 (0.060)	2.106 (0.044)	2.109 (0.044)	2.108 (0.044)
N	2135	2135	2135	2151	2151	2151
Log-Likelihood	-3339.7	-3337.0	-3337.9	-3876.0	-3873.9	-3874.3

(Standard Errors in parentheses)

TABLE4. ORDERED PROBIT JOB SATISFACTION REGRESSIONS WITH HOUSEHOLD INCOME

	Overall Job Satisfaction			Satisfaction with pay		
Log hourly pay: $\ln(HP_i)$	0.072 (0.050)	-0.009 (0.058)	-0.008 (0.057)	0.525 (0.049)	0.495 (0.057)	0.493 (0.056)
Log hours	-0.145 (0.048)	-0.159 (0.047)	-0.160 (0.047)	-0.293 (0.047)	-0.293 (0.047)	-0.294 (0.047)
Log ROH average hourly pay: $\ln(HP_{roh})$	-0.095 (0.042)	-0.037 (0.053)	0.015 (0.063)	-0.116 (0.041)	-0.084 (0.051)	-0.061 (0.062)
Dummy: $HP_i > HP_{roh}$	---	0.130 (0.064)	---	---	0.065 (0.063)	---
Log ROH average hourly pay (when $HP_{roh} > HP_i$)	---	---	-0.077 (0.036)	---	---	-0.041 (0.035)
Male	-0.307 (0.049)	-0.325 (0.050)	-0.325 (0.050)	-0.351 (0.050)	-0.357 (0.050)	-0.357 (0.050)
Age	-0.036 (0.011)	-0.036 (0.011)	-0.035 (0.011)	-0.038 (0.011)	-0.038 (0.011)	-0.037 (0.011)
Age-squared (/1000)	0.600 (0.155)	0.600 (0.154)	0.587 (0.154)	0.565 (0.147)	0.571 (0.147)	0.565 (0.147)
Health: Excellent	0.314 (0.059)	0.317 (0.059)	0.317 (0.059)	0.198 (0.058)	0.198 (0.058)	0.199 (0.058)
Health: Good	0.155 (0.055)	0.150 (0.055)	0.151 (0.055)	0.098 (0.054)	0.100 (0.054)	0.100 (0.054)
Education: Higher	-0.319 (0.063)	-0.315 (0.062)	-0.316 (0.062)			
Education: A/O/Nursing	-0.211 (0.052)	-0.208 (0.052)	-0.206 (0.052)			
Renter	0.170 (0.055)	0.172 (0.054)	0.171 (0.054)	0.105 (0.053)	0.105 (0.053)	0.105 (0.053)
Establishment size: 1-24	0.252 (0.057)	0.254 (0.057)	0.255 (0.057)			
Establishment size: 25-199	0.082 (0.051)	0.087 (0.050)	0.088 (0.050)			
Union	-0.128 (0.048)	-0.119 (0.048)	-0.119 (0.048)			
Promotion opportunities	0.309 (0.045)	0.313 (0.045)	0.314 (0.044)	0.168 (0.043)	0.169 (0.043)	0.169 (0.043)
Manager				-0.108 (0.050)	-0.111 (0.050)	-0.112 (0.050)
Travel time to work (minutes per day)	-0.0021 (0.001)	---	---			
Temporary worker	-0.172 (0.078)	-0.178 (0.077)	-0.176 (0.077)			
Industry dummies	Yes	Yes	Yes			
Occupation dummies	Yes	Yes	Yes			
Constant	0.495 (0.265)	0.465 (0.264)	0.520 (0.263)	0.139 (0.239)	0.117 (0.239)	0.146 (0.239)
Mu (2)	0.775 (0.024)	0.778 (0.024)	0.778 (0.024)	0.455 (0.021)	0.456 (0.021)	0.456 (0.021)
Mu (3)	1.379	1.379	1.379	0.949	0.949	0.949

	(0.031)	(0.031)	(0.031)	(0.027)	(0.027)	(0.027)
Mu (4)	1.961	1.964	1.964	1.527	1.527	1.528
	(0.039)	(0.039)	(0.039)	(0.032)	(0.031)	(0.032)
Mu (5)	2.280	2.285	2.286	1.891	1.891	1.891
	(0.045)	(0.045)	(0.045)	(0.036)	(0.036)	(0.036)
Mu (6)	2.497	2.502	2.503	2.100	2.100	2.100
	(0.051)	(0.051)	(0.051)	(0.038)	(0.038)	(0.038)
N	2815	2839	2839	2866	2866	2866
Log-Likelihood	-4429.4	-4466.9	-4466.6	-5221.7	-5221.2	-5221.0

(Standard Errors in parentheses)

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