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Struggle over the pie?
The gendered distribution of power and subjective financial well-being within UK households

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Struggle over the pie?
The gendered distribution of power and subjective financial well-being within UK households

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October 2007[1]

Abstract: This paper investigates the ways in which the distribution of power and well-being within couple households is gendered in the sense of having gendered determinants, from inside the household, rather than just gendered outcomes. We model such households, as Sen (1990) suggests, as sites of cooperative conflict, where decision-making has a component reflecting shared views and a component representing a bargain over conflicting views. Using household panel data from the British Household Panel Survey (1996-2003), in which individual answers can be matched across couples, the method takes answers to a question about financial satisfaction to be indicators of (i) the level of current and potential resources of the household, and (ii) intra-household bargaining over the entitlement each individual has to these resources. Individual financial satisfaction can then be decomposed into two elements; the first, the average of a couple's satisfaction scores, represents their shared view; the second is the difference between their answers. Stripping out the effects of unobserved heterogeneity through the use of fixed effects panel methods and carefully chosen controls, the effect of explanatory factors on this difference can then be identified as the result of a perceived difference in entitlements to household income that is the result of unequal power between male and female partners. Our results suggest the co-existence of shared and conflicting views, with a significant gendered pattern. Some policy implications are also discussed.

Keywords: gender differences, household bargaining, income satisfaction, subjective well-being, collective models, perceived contribution, financial autonomy

JEL codes: D13, D60, J16

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Introduction

This paper is about the influence individuals of different genders have on the decisions that their households make and the effect that this has on their individual well-being. Until recently, although economists modelled well-being by a utility function that could in theory depend on anything, in practice they tended to assume that income was the main factor in well-being (or at least that its effects were separable from those of other factors). Recently there has been more attention paid to whether income is adequate as a measure of well-being, and whether the latter could be measured more directly by the answers to satisfaction questions used previously only by psychologists (Diener et al. 1999).

Further, again until comparatively recently, little attention was paid in mainstream economics to how well-being and power is distributed within households. Households were treated by economists and policymakers alike as though they were single decision-making units, within which there is no issue about the distribution of decision-making power. This is rather surprising since economics is so grounded in methodological individualism; so at various times not very plausible justifications were produced for treating the household in this way (Samuelson 1956, Becker 1991). Recently, with the development of first household bargaining and then collective models, household decisions have been treated as determined by the differing preferences of more than one member, and the household modelled as a unit within which decision-making power could be unequally shared and therefore outcomes in terms of well-being might also be unequal (Apps and Rees 1996, Browning et al. 1994, Lundberg and Pollak 1993, Chiappori 1992, McElroy and Horney 1981, Manser and Brown 1980). However, these recent advances have yet to have much impact on the standard economic treatment of the household which is taken by economists and policymakers alike to be a single-decision-making unit concerned above all with maximising its disposable income.

Within such a household the question of unequal power is meaningless and unequal well-being, if it conceptualised at all, must be the result of decisions made for the "benefit of the household". Implicitly, resources are shared in such a way as to equalise well-being. Such equality of outcomes, although not a necessary result of the household being a single decision-making unit is implicit in any idea of a household

having a common standard of living or that poverty and deprivation are measured at the household level.

These are important issues, because despite recent theoretical advances, policy is tending to move in the opposite direction. At least in the UK and other Anglo-Saxon liberal welfare states, there is an increasing tendency to treat economic issues as dominating all others, and the substitution of the relief of poverty for the rectification of inequality as the main aim of social policy, with means-testing at the household level its essential tool. In doing so whether inequality within household is exacerbated or diminished is effectively ignored. These policy trends could be thought surprising, in these more individualistic times, especially given the high rate of family breakdown, in which it is increasingly important that household members look to securing their own individual futures and recognise that their own individual interests may not entirely coincide with any collective interest of the household in which they are currently living.

These are also profoundly gendered issues. The typical household containing more than one adult remains the heterosexual couple with or without dependent children, within which a gender division still persists. Women are more often than not in employment, but for not as much of their time as men, while the amount of domestic work and childcare done by most men has increased only slightly. A more extreme version of such a division of labour lay behind the traditional view of the man as the sole earner representing the whole household (embodied in modern economic theory in Becker's theory of the household as a decision making unit that maximises the man's utility). This view no longer applies universally in a world in which women are frequently significant financial, as well as domestic, contributors to their household, including to the 25% of households in the UK in which the woman earns more than the man. It seems worthwhile therefore to investigate models that incorporate less extreme inequalities of decision making–power within the household and their consequences for the distribution of well-being within such households.

It seems more plausible that the household be modelled, as Sen (1990) suggests, as a site of cooperative conflict, where decision-making has a component reflecting shared views and a component representing a bargain over conflicting views. Both these

components could be gendered: a shared view could treat individuals unequally by gender, as the use of a unitary model to explain the traditional household division of labour demonstrates. For the component where views conflict and bargaining power influences the final allocation, the factors that affect that bargaining power may be symmetrical (either partner's bargaining power may increase with their share of household earnings, for example) and/or may be gendered (if men's earnings counted for more or less than women's, for example, in determining bargaining power)[2]. In this paper, we use individual answers to questions about satisfaction with the income of the household to investigate these matters.

This is not quite the first paper to use the answers to satisfaction questions to examine power in household decision-making – to our knowledge there have been two others[3] (Bonke and Browning 2003, Alessie et al. 2006). However, we believe that this is the first paper to investigate the ways in which these issues are gendered in the sense of having gendered determinants rather than just gendered outcomes. To do so, we develop a new method of analysis that separates out the gendered from the symmetric effects, which should provide a more robust way to assess the determinants of intra-household bargaining power and well-being.

The plan of this paper is as follows: after a review of the literature, we lay out our conceptual framework that identifies the different symmetric and gendered effects on bargaining and well-being. The next section turns to its empirical implementation using British household panel data, while the following section gives and interprets our results. The penultimate section reflects in broad outline on the type of policy implications that results from this framework could have, while the conclusion makes some suggestions for extending our framework's use further.

[2] The distinction between the two is illustrated in the debate between Rosenzweig and Schultz 1982 and Folbre 1984 about the causes of the relatively high death rates of female children in some parts of India. While Rosenzweig and Schulz saw this as the result of girls being of less benefit to the household as a whole than boys, Folbre points out that this could also be a result of mothers, who might identify more with their daughters, having less decision-making power than fathers.

[3] Note that a third recent paper uses individual answers to satisfaction questions to investigate interdependence within household and altruism, but does not focus on the distribution of household bargaining power (Garcia et al. 2007).

A brief review of the literature

This paper bridges a gap between two streams of literature; the first about household bargaining power and decision-making and, the second about subjective well-being and satisfaction with household finances.

Within the first literature numerous empirical studies have rejected the "unitary" model of household decision-making, in which households are modelled as if they were single utility-maximising units. The same studies do not reject an alternative "collective" model of household decision-making, whose only restriction is that households arrive at a Pareto-optimal (or cooperative) outcome (see Vermeulen 2002 for a survey). Where on the Pareto frontier this outcome lies can be modelled as the maximisation of a household social welfare function that is the weighted sum of the utility functions of the individuals that make up the household, in which the weights reflect the relative bargaining power of those individuals within the household. "Distribution factors" are variables that influence bargaining power and thus these weights; variables tested in the literature as potential distribution factors include the relative share of non labour income brought by household members, their wage rates and some other prices. As far as we are aware, there have been no attempts to incorporate gender explicitly into the distribution factors of collective models, that is to test if their effects are asymmetric by gender, although in many papers the outcomes of the empirical applications of models are broken down by gender (Alessie et al. 2006, Couprie 2007). However, the lack of restrictions imposed by the collective model (only that the outcome be Pareto-optimal) means that any variable, internal or external to the household, provided that it has no direct influence on the individual's preferences or the household budget, can be considered as a potential distribution factor.

This lack of restriction is a strength of such models but also means that they have little substantive content. They have had more success in discrediting the unitary model, and specifically its income pooling hypothesis, that the source of any household income is irrelevant to the eventual allocation of resources, than they have had in identifying and generating testable propositions about the magnitude of the effect of different distribution factors.

Collective models are a generalisation of earlier "household bargaining" models that were more restrictive and therefore said more about the range of potential distribution factors (see Himmelweit 2001 for a survey). Bargaining models not only assume that the outcome is Pareto-optimal but also that there is a threat point for the household to which any member of the household can unilaterally retreat; this rules out allocations that are not at least as preferred as the threat point by all members of the household, and means that the role of cooperation is to allocate the gains that can be made in moving beyond the threat point to arrive at a particular allocation on the Pareto-frontier. In these models then, the bargaining power of an individual is determined by their utility at the threat point: the better off an individual is at the threat point, the more bargaining power they have. (Indeed, to determine a unique outcome by the threat point many household bargaining models use the Nash bargaining solution, based on a cardinal notion of utility, which maximises the product of gains above the threat point.) In the language of collective models, the distribution factors in bargaining models are the variables that determine the well-being (utility) of members of the household at the threat point. This is where gender can enter to affect bargaining power.

Bargaining models differ in what they see as the threat point. There are broadly two types. The first ones, "divorce threat" models, for which the threat point is household dissolution, see distribution factors as those that affect the well-being of household members living on their own (McElroy and Horney 1981, Manser and Brown 1980). An alternative threat point is the breakdown of cooperation within the household. An example of such a model is the explicitly gendered "separate spheres" model of Lundberg and Pollak (1993), in which at the threat point each partner makes the type of contribution to the household traditionally allocated to their gender but only at the level that is utility maximising for themselves alone. In this situation, the source of current financial resources is important, since money in her own hands directly improves the threat point for the woman. Thus in this type of model, the distribution factors are those variables that affect the *current* position of the partners, including crucially the contributions each currently makes to the household (and could withdraw

to a level that suited them alone)[4]. Sen's cooperative conflict model of household bargaining is closely related to such non-cooperation threat point models (Sen 1990). However, he notes that the value of contributions to the household may be differently assessed according to their source (outside employment versus home-based employment) or the gender of the recipient.

More generally, then, we can talk about the potential distribution factors for this class of models as those that affect "current perceived contributions" in contrast to the distribution factors for divorce threat models are those that focus on "potential individual financial autonomy" the perceived ability of each individual potentially to manage on their own[5]. In both cases, distribution factors can be specific to the individual, such as individually owned assets and human capital, to the household, such as the quantity and distribution of household labour, and they also can be "extra-household environmental factors" (McElroy 1990), such as legislation on the payment of alimony and child support, or the treatment of married men and women, singles and lone parents by the tax-benefit system. Folbre 1997 prefers to call these "gender specific parameters" because so many of them are gendered, that is, given dominant gender norms men and women are in practice differently affected by them. An example for the divorce threat model is legislation on child support which will affect the future financial autonomy of men and women differently within the marriage if it is known that in the case of divorce the woman is more likely to retain custody of any children and the man to have to pay child support. Childcare subsidies could similarly be gender specific parameters in a perceived contributions model, if mothers rather than fathers are expected to pay for childcare out of their earnings (Himmelweit and Sigala 2004).

The other literature to which this paper relates is that on subjective well-being and satisfaction with household income. Although psychologists have long used survey

[4] Lundberg et al. 1997) test this model by showing that a change in policy which resulted in the transfer of state payments for children from fathers to mothers in intact households in the UK in the late 1970s affected the household allocation of resources, which it would not under either the unitary model or the divorce threat model, since on divorce the parent with custody of the child would have received such payments both before and after the change. However other researchers have not found such an effect in Australia (Bradbury 2004) and even in the UK, Lundberg, Pollak and Wales interpretation of their results has been questioned (Hotchkiss 2005).

[5] Referred to subsequently in this paper as "perceived contribution" and "financial autonomy" models respectively.

questions about people's satisfaction with various aspects of their life to measure a notion of subjective well-being, there has in recent years been a growing interest in answers to such questions by economists, aware of the limitations of monetary income as a measure of well-being (Layard 2005, Frey and Stutzer 2002, Easterlin 2001). Many of such studies, as the present one, have a policy interest: the maximisation of satisfaction may be seen as a more well-rounded policy aim and, on the interpretation of satisfaction as a measure of utility, one more in keeping with the prescriptions of welfare economics, than an obsession with the growth of national income. At a macro-level it has been shown that after a certain point, increases in GDP per capita do not raise average levels of satisfaction (Layard 2005, Easterlin 2001, Diener and Suh 1999, Kenny 1999). Once basic needs are met satisfaction with income is relative both to expectations and to aspirations based on the incomes of others. Several authors have found evidence of adaptive expectations at a micro-level, so that increases in income have a reduced effect on increases in satisfaction, because expectations increase (Burchardt 2004, Stutzer 2004). Similarly, satisfaction with income is affected by aspirations conditioned by the income of members of a reference group (of close neighbours, or others seen to be of similar status) (Stutzer 2004). Finally, psychological studies have shown that largely constant personality traits are the most significant influence on satisfaction measures (Argyle 1999, Diener and Lucas 1999).

So far as the present authors are aware, only two previous studies (Bonke and Browning 2003, Alessie et al. 2006) have attempted to link these literatures in order to investigate intra-household bargaining power by looking at its effects on individual satisfaction measures. In particular with these two exceptions, the previous studies that have investigated individual well-being either use equivalised household income or individual income if measured (Schwarze 2003, Stutzer 2004, Burchardt 2004, Easterlin 2001, Ferrer-i-Carbonell and Frijters 2004, Anand et al. 2005) and have not explicitly investigated distribution factors that might influence the intra-household distribution of resources. There is a decided advantage when investigating intra-household bargaining and distribution in using individual answers to the questions about satisfaction with household income rather than expenditure data, as most papers using collective or bargaining models have previously done. Investigating intra-household distribution from household level expenditure data requires the

questionable assignment of expenditures on at least one good to a particular member of the household; there is no choice of such good that is unproblematic[6]. With satisfaction scores in household surveys, on the other hand, we have individual answers matched by household and no assignment problem.

Bonke and Browning (2003) use cross-sectional Danish household data to reject the income pooling hypothesis of the unitary model by showing that husbands' and wives' satisfaction with their "present financial situation" is related to the proportion of income each brings in to the household, so that the larger the wife's share the higher her satisfaction and the lower that of her husband. They also find differences in husband's and wives' satisfaction scores to be significantly influenced by differences in their age, education and employment status suggesting that these factors might also impact on bargaining power.

Alessie et al. (2006) use European panel data on the same financial satisfaction question for people moving in and out of couple households to build a collective model to provide estimates for ten European countries of returns to scale from household formation and of the influence that income shares within a household have on the sharing of consumption. They show the latter to be significant in seven of out their ten countries, again rejecting income pooling. They then use these results to show that taking account of intra-household inequality would result in small increases in the Gini-coefficient for the countries studied.

The present study also uses individual satisfaction data as a more direct measure of bargaining power and well-being than household consumption patterns provide. It improves on the methods of Bonke and Browning by using panel data, to control for unobserved heterogeneity including the significant effects on satisfaction of invariant personality characteristics to which psychological studies of satisfaction measures

[6] The two assignable goods most frequently used in the literature are clothing and leisure time. The former is problematic because clothing is hardly a representative expenditure (and can therefore be expected to generate highly gender-specific expenditure externalities rather than those encompassed by non-commodity specific "caring" preferences, the only inter-personal externalities with which collective models can easily cope). Leisure time is problematic if it is calculated simply as time free from paid employment, since men and women characteristically spend different amounts of time on household production. This could be rectified by using time-use data but few data sets contain both time-use data and enough potential distribution factors (Apps and Rees 2004).

have pointed (Argyle 1999, Diener and Lucas 1999). We also consider a wider range of potential distribution factors than they do, and a much wider range than Alessie et al. (2006), who only consider income shares. Most importantly, we include individual level variables from both individuals and their partners to explain satisfaction scores of men and women in heterosexual couples and explicitly consider that the effects might be asymmetrical by gender, which neither of the above papers does[7]. Rather than looking for a "sharing rule" (which can be derived under certain restrictions on preferences in collective models), we use Sen's (1990) term "entitlement" to mean the resources to which an individual within a household person has agreed and legitimate access. We find this a better way to talk about what bargaining achieves since, like Bonke and Browning (2003) and Alessie et al. (2006), we do not measure shares of expenditure directly and can envisage that an individual's bargaining power and access to resources may be used in other ways than to increase their own share of expenditure.

The satisfaction variable we use is "satisfaction with household income", which requires a slightly different logic to analyse in terms of household bargaining than the less clearly specified question from the European Community Household Panel used in both the above papers and by Garcia et al. (2007): whether "your present financial situation" should be interpreted as the individual's or the couple's financial situation is ambiguous in English and in many other European languages. To analyse our results, we use a conceptual framework which separates any variable's effects on an individual member of a couple's satisfaction with household income into a component common to the partners and one that is due to changes in individual bargaining power and individual entitlements; and then breaks both of these components down into symmetric and gendered effects. In this way our paper brings more content to the understanding of gendered differences in bargaining power and well-being within household relationships that could easily be replicated for other data sets in other countries, albeit with some modification to take account of different formulation of questions.

[7] Garcia et al. (2007) also use panel data to investigate similar variables but they interpret their results misleadingly, in the opinion of the present authors, as indicating the level and direction of altruism within the couple, rather than as being about bargaining power.

Conceptual framework

Why should satisfaction with household income depend on anything other than the amount of household income? The literature review above suggests a number of reasons:

1) personality traits are known to influence the way people respond to all satisfaction surveys;

2) household costs may vary - that is why some studies use equivalised household income, but costs may vary in other respects than just according to household membership;

3) expectations may influence satisfaction measures. Burchardt (1994) allows for this by examining the effect of previous levels of income, on the assumption that expectations adapt to existing levels of income. But, other factors may also influence expectations. In particular the income of households in similar circumstances (reference group households) may influence how satisfied people are with their own household income. Alternatively, and in the opposite direction, expectations for future household income might influence satisfaction today. In particular, a low household income today might be considered more acceptable if individuals expect it to increase in the future[8];

4) the entitlement of an individual member of a household to use household income may influence their satisfaction with it. The literature on household bargaining suggests that factors may influence relative entitlements in two ways:
    i) by affecting individuals' perceived contributions to their current household or
    ii) by affecting individuals' potential autonomy – their financial and other expectations for future well-being if their household dissolved

Factors that influence any of the above could then in turn influence individuals' satisfaction with their household income. The satisfaction of members of the same household with their common household income may differ because they subjectively

[8] Bonke and Browning (2003) find that being out of labour force and unemployment, both of which could be expected to impact negatively on expectations for future household income, negatively influence satisfaction with "present financial situation". However they do not interpret these findings as being about future expectations.

assess either it or their household's costs differently, or because they have different expectations and/or personalities. But above all, satisfaction levels can be expected to differ systematically between members of a household when entitlements to use household income differ because of differences in bargaining power within the household. Nevertheless, given that members of a household share a common household income (albeit unequally) there should also be a common element to members of a household's satisfaction with their household income. It is these two aspects of household relations that led Sen to refer to households as sites of "co-operative conflict" (Sen 1990).

Leaving aside the question as to how these common and bargaining elements of satisfaction with household income can be identified, for the moment we simply examine the different possible effects that variables at different levels can have. Factors external to the household may impact on both the common element and on the bargaining element. Thus, for example, an increase in tax rates that impacts on higher earners but not lower ones might be expected, given current gender norms, to impact on men's earnings more than women's. Thus as well as a common effect on satisfaction with household income, which is likely to be negative, there could be an additional effect on bargaining power, that would be favourable to the woman and unfavourable to the man. The net effect on their satisfaction with household income would therefore be negative for men, but for women could, in theory, go either way.

Similarly for factors impinging at the household level, such as the number of children, who may bring emotional benefits but certainly result in financial costs to the household as a whole. These costs may impact differently on the entitlements of men and women: if, for example, women are expected to pay for childcare so that their perceived financial contribution to the household is only their earnings net of childcare costs. On the other hand, if mothers do more caring for children than fathers, and this is recognised, this might increase women's perceived contribution to their household and thus their bargaining power. Either way, there would be a gendered bargaining effect (positive or negative for the woman compared with the man) as well as a symmetric common effect (assumed to be negative) on satisfaction with household income.

In general then, both extra-household and household level variables can have both a gender-neutral common effect and a bargaining effect that, given current gender norms, increases the bargaining power of one gender more than the other. The situation is somewhat more complicated for individual level variables whose effects can be symmetric and/or gendered on both the common element and the bargaining element in satisfaction. For example, both the man's and the woman's earnings might have an effect on the common element of satisfaction with household income. These effects would be purely symmetrical if they are equal for the man's and the woman's earnings. However, it could be that the common component in satisfaction with household income is greater the larger is the share of that income that the man brings in. This might be the case if both partners believe the man's earnings to be more important to the financial security of the household if his earnings are less likely to be interrupted by episodes out of the labour market looking after small children. Or it might simply be that both are happier with a pattern of earnings that conforms more to traditional gender norms. In this case, as well as the symmetric effect on the common component in satisfaction that all earnings have, there would be another effect (on the same common component) that is gendered: positive for the man's earnings and correspondingly negative for the woman's. This effect would capture both partners' greater satisfaction with earnings from the man's than from the woman's. This is additional to any, presumably positive, symmetrical effect on the common component.

And as well as having symmetrical and/or gendered effects on the common component in satisfaction, individual level variables might give one partner or the other greater bargaining power. To continue with the example of individual earnings, individuals may have more entitlement to use household income (greater bargaining power) the greater the share of total household income they earn. This bargaining effect of earnings on entitlements might be purely symmetrical so that each partner gained the same additional entitlement from a given increase in their share of household income. However, additional to any such symmetrical effect there could also be a gendered effect on bargaining power. For example, a man whose proportion of household earnings fell below that of his partner might lose entitlement, because, by current gender norms women are expected to earn less and to contribute in other ways to the household. Again this asymmetric gendered effect would be additional to

any symmetric effect by which a factor affected the bargaining power of household members. Thus both partners might lose bargaining power through earning a smaller share but the woman might lose less from doing so than the man. Again gender norms are key, either directly or indirectly, in forming the expectations on which entitlements are based.

The range of potential effects of variables are summarised in Table 1:

Table 1. Different types of effects that variables can have on components of satisfaction with household income

	Effect on common component of satisfaction with household income	**Effect on bargaining component of satisfaction with household income**
Household and extra-household variables		
	Symmetric common effect	Gendered bargaining effect
Individual variables		
Symmetric	Symmetric common effect	Symmetric bargaining effect
Gendered	Gendered common effect	Gendered bargaining effect

Note that the four effects we have considered for individual variables: symmetric and gendered common effects and symmetric and gendered bargaining effects are not alternatives. An individual variable can have up to all four effects. Similarly, for household or extra-household variables, their two potential effects are not alternatives. Such a variable can have both a bargaining effect, which is necessarily gendered, and a symmetric common effect.

Empirical design

Method of analysis

To exclude the influence on reported satisfaction levels of fixed personality traits and possibly other time-invariant unobserved individual factors, we used a fixed effects

linear regression. If we used a cross-sectional approach, our regression coefficients would be biased by these omitted variables (see Ferrer-i-Carbonell and Frijters 2004).

We treat satisfaction with household income as a continuous variable, even though the data that we have is ordinal. If we used a latent response model, the usual statistical treatment of ordinal response variables, there would be no simple first-difference estimator for fixed effects. We use a fixed effects linear model rather than a cross-sectional ordered probit or logit model because allowing for fixed effects seems more important than allowing for ordinal responses when using satisfaction data. Ferrer-i-Carbonell and Frijters (2004) experimented by applying a range of different types of econometric techniques to estimate a simple model using panel data on satisfaction, and concluded that "assuming cardinality or ordinality of the answers to general satisfaction questions is relatively unimportant to results. What matters to estimates is how one takes account of the invariant unobserved factors" (Ferrer-i-Carbonell and Frijters 2004: 655). We see no reason not to assume that the same applies to the particular satisfaction measure in which we are interested, especially since we are only interested in identifying the sign and significance of regression coefficients, and not in calculating marginal effects.

Decomposition of the dependent variable

To disentangle what we have called above the "bargaining" and "common" effects of explanatory variables on the levels of satisfaction with household income of a couple living together, we decompose each partner's level of satisfaction into two components:

$$S_{it}^{m} = \frac{S_{it}^{m} + S_{it}^{f}}{2} + \frac{S_{it}^{m} - S_{it}^{f}}{2} \quad \text{for the man}$$

$$S_{it}^{m} = \frac{S_{it}^{m} + S_{it}^{f}}{2} - \frac{S_{it}^{m} - S_{it}^{f}}{2} \quad \text{for the woman, for i=1, … , N households and t=1,…, T periods (years).}$$

If there was total agreement between partners on the effect of a variable there would be nothing to bargain about and so no bargaining effect. In that case S_{it}^{m} and S_{it}^{f}

would vary together and there would be no effect on $S_{it}^{m} - S_{it}^{f}$. So the second term in each of the above equations, $\frac{S_{it}^{m} - S_{it}^{f}}{2}$, can be identified as the "bargaining component" in satisfaction, leaving the first term, $\frac{S_{it}^{m} + S_{it}^{f}}{2}$, as the "common component"[9].

We could therefore estimate the following two equations:

$$Y_{it}^{1} = \frac{S_{it}^{m} + S_{it}^{f}}{2} = \alpha^{1} + \beta^{m1} X_{it}^{m} + \beta^{f1} X_{it}^{f} + \beta^{h1} X_{it}^{hh} + u_{i}^{1} + v_{it}^{1} \quad (1)$$

$$Y_{it}^{2} = \frac{S_{it}^{m} - S_{it}^{f}}{2} = \alpha^{2} + \beta^{m2} X_{it}^{m} + \beta^{f2} X_{it}^{f} + \beta^{h2} X_{it}^{hh} + u_{i}^{2} + v_{it}^{2} \quad (2)$$

where X_{it}^{m} and X_{it}^{f} are vectors of individual characteristics for the man and woman respectively, X_{it}^{hh}, is a vector of household and extra-household characteristics, Y_{it}^{1} gives the common component in the man's and woman's satisfaction with household income, while Y_{it}^{2} gives the bargaining component, u_{i}^{1} and u_{i}^{2} are the individual fixed effects that capture the effects of unobserved variables, and v_{it}^{1} and v_{it}^{2} are random error terms (i.i.d.).

However, it would be useful to identify the symmetric and gendered effects of individual characteristics on both the common and bargaining components. To start with the common component, Y_{it}^{1} in equation (1): if an individual characteristic *j* has no gendered effect then the effect of that characteristic will be identical whether it applies to the man or the woman i.e. its coefficients in the vectors β^{m1} and β^{f1} will be equal, so that $\beta_{j}^{m1} = \beta_{j}^{f1}$. Characteristics that have gendered common effects are therefore those j for which $\beta_{j}^{m1} \neq \beta_{j}^{f1}$. For the bargaining component, Y_{it}^{2} in equation (2) the interpretation of the coefficients is the other way around: if the bargaining effect of an individual characteristic *j* is not gendered but purely

[9] Different appreciation of household costs within a couple, or different expectations and/or reference groups, might also give rise to variables having effects on the difference in partners' levels of satisfaction. However, we have no way of distinguishing all these effects from bargaining effects. We will refer to all such effects as bargaining effects, but in the later discussion of individual explanatory variables will note cases where we consider that there may be other reasons behind the effects.

symmetric, then its effect will be equal and opposite for the man and the woman i.e. its coefficients in the vectors β^{m2} and β^{f2} will be equal and opposite, so that $\beta_j^{m2} = -\beta_j^{f2}$. Characteristics that have gendered common effects are therefore those j for which $\beta_j^{m2} + \beta_j^{f2} \neq 0$.

To identify the gendered and symmetric effects on the common component in satisfaction, we decompose equation (1) into:

$$Y_{it}^1 = \frac{S_{it}^m + S_{it}^f}{2} = \alpha^1 + \beta^{m1} X_{it}^m + \beta^{f1} X_{it}^f + \beta^{h1} X_{it}^{hh} + u_i^1 + v_{it}^1$$
$$= \alpha^1 + \left(\beta^{m1} + \beta^{f1}\right)\left(\left(X_{it}^m + X_{it}^f\right)/2\right) + \left(\beta^{m1} - \beta^{f1}\right)\left(\left(X_{it}^m - X_{it}^f\right)/2\right) + \beta^{h1} X_{it}^{hh} + u_i^1 + v_{it}^1 \quad (3)$$

The third term of equation (3) captures any gendered effect of individual variables on the common component in satisfaction. Characteristics that have gendered common effects are those j for which $\beta_j^{m1} - \beta_j^{f1} \neq 0$, so that changes in the difference in the partners' levels of characteristic j have an influence on Y_{it}^1. The second term in equation (3) captures any symmetric non-gendered effect on the common component of satisfaction; this exists whenever $\beta_j^{m1} + \beta_j^{f1} \neq 0$ so that changes in the sum of the partners' levels of characteristic j influence Y_{it}^1.

Similarly, to find the gendered and symmetric effects on the bargaining component, we decompose equation (2) into:

$$Y_{it}^2 = \frac{S_{it}^m - S_{it}^f}{2} = \alpha^2 + \beta^{m2} X_{it}^m + \beta^{f2} X_{it}^f + \beta^{h2} X_{it}^{hh} + u_i^2 + v_{it}^2$$
$$= \alpha^2 + \left(\beta^{m2} + \beta^{f2}\right)\left(\left(X_{it}^m + X_{it}^f\right)/2\right) + \left(\beta^{m2} - \beta^{f2}\right)\left(\left(X_{it}^m - X_{it}^f\right)/2\right) + \beta^{h2} X_{it}^{hh} + u_i^2 + v_{it}^2 \quad (4)$$

Any gendered bargaining effect of individual variables is captured by the second term in equation (4). Characteristics that have gendered common effects are those j for which $\beta_j^{m2} + \beta_j^{f2} \neq 0$ so that changes in the sum of the partners' levels of characteristic j have an influence on Y_{it}^2. Any symmetric non-gendered effects on the bargaining component of satisfaction are captured by the third term in equation (4)

whenever $\beta_j^{m2} - \beta_j^{f2} \neq 0$; then changes in difference of the partners' levels of characteristic *j* influence Y_{it}^2.

For household or extra-household variables in X_{it}^{hh} the situation is simpler. There are only two potential effects to consider: a bargaining effect on Y_{it}^2, which is necessarily gendered, if $\beta_j^{h2} \neq 0$ in equation (4), and a symmetric common effect on Y_{it}^1, if $\beta_j^{h1} \neq 0$ in equation (3).

Table 2 summarises the interpretation of the coefficients.

Table 2. Interpretation of effects of variable j in equations (3) and (4)

	Effect on common component of satisfaction with household income, Y_{it}^1	**Effect on bargaining component of satisfaction with household income,** Y_{it}^2
Household and extra-household variables		
	$\beta_j^{h1} \neq 0$ Symmetric common effect	$\beta_j^{h2} \neq 0$ Gendered bargaining effect
Individual variables		
Symmetric	$\beta_j^{m1} + \beta_j^{f1} \neq 0$ Symmetric common effect	$\beta_j^{m2} - \beta_j^{f2} \neq 0$ Symmetric bargaining effect
Asymmetric/ Gendered	$\beta_j^{m1} - \beta_j^{f1} \neq 0$ Gendered common effect	$\beta_j^{m2} + \beta_j^{f2} \neq 0$ Gendered bargaining effect

Data

We use data from the British Household Panel Survey. This survey started in 1991 when it selected a representative clustered sample of British households[10] and followed the individuals in those households, interviewing both them and any members of the households they lived in every year subsequently. Detailed questions at both household and individual level are asked, covering a wide range of areas, including income by source, employment status and occupation, health, education home ownership and social attitudes. Many are asked every year but some specific

[10] South of the Caledonian Canal, to exclude a large area of exceptionally low population density.

modules vary each year, including the questions asked in a self-completion questionnaire which respondents fill in after their main interview.

The variable of interest – satisfaction with household income – is asked in the self-completion questionnaire every year from 1996 except in 2001. More precisely, individuals are asked the following question: "How dissatisfied or satisfied are you with the income of your household?" to answer on a 7 point scale from "not satisfied at all" (1) to "completely satisfied" (7).

Since we are interested in gender differences in power and well-being in bilateral decision-making between couples of working age, we investigate co-resident couples over time, so long as they stay together, excluding:

- Couples with incomplete interviews
- Same-sex couples
- Couples who share a household with any others besides their own children
- Couples whose total household income differs by more than £1000 from the sum of their individual incomes (since this would indicate the possible influence on decision-making of a non dependent child with significant individual income)
- Couples in which one partner is above retirement age (women over sixty or men over sixty-five) or one partner is a full-time student (to concentrate on couples in the period between education and retirement)

Explanatory variables

We choose as explanatory variables those that have been shown to have effects in the literature on financial satisfaction or household bargaining. In particular we use a series of individual variables that might capture the factors that influence relative perceived contributions and/or potential financial autonomy for the two partners. See Appendix, Table A.2 for summary descriptive statistics for the explanatory variables.

At household and extra household level, X_{it}^{hh}, is a vector composed of the following variables:

- The log of total real annual household income (total household income received within the twelve months preceding the interview in 2005 prices [11]).
- A dummy variable for a household receiving any state benefits in the year prior to the interview, and another variable for the proportion of household income so received
- A dummy variable for the household receiving any transfer income and another for receipt of any investment income in the year prior to the interview, and another variable for the proportion of household income received in any form other than earnings or benefits (almost entirely transfer or investment income)
- A dummy variable indicating that none of the partners earns any income; another dummy indicating that none of the partners receives non labour income.
- Dummy variables for housing tenure (one each for owned on mortgage or owned outright, with reference category rented home or shared ownership)
- Five variables giving the number of children aged 0-2, aged 3-4, aged 5-11, aged 12-15, and dependent children aged 16-18 years
- Dummy variables for each year (reference year 1996) to capture country-wide extra-household factors (e.g. policy changes)

At the individual level, X_{it}^{f} and X_{it}^{m}, are vectors composed of the following variables for each of the partners:

- A dummy variable for being the only natural parent of one or more children living in the household. This may reduce perceived contributions (net of costs) and also potential financial autonomy if it is assumed that such children would go with their natural parent if the household dissolved
- A dummy variable indicating a high (75-100%) share of the household's earned income. These variables are relevant to an individual's perceived contribution to the household and also to their potential financial autonomy.
- A dummy variable indicating a high (75-100%) share of non labour income of the household[12]. These variables are also relevant to an individual's perceived contribution to the household (but perhaps less than earned income) and also

[11] We use log of income because studies have shown that the effect of increases in satisfaction diminishes with increases in income (Easterlin 2001, Burchardt 2004, Bonke and Browning 2003).
[12] Computed as the total individual income minus individual earnings.

to their potential financial autonomy (but perhaps more than earned income, which might be a function of current partnership status e.g. for women not currently in employment because contributing in other ways to their household)

- Variables giving an individual's "Essex score" and its square. The Essex score was developed by Gershuny 2002 and further refined by Gershuny and Kan 2006. It is the log of an estimated hourly wage based on the individual's educational level, employment status for each of the last four years, and the average occupational wage of their most recent occupation. Essex scores have so far been computed for all waves up to 2003 of the BHPS. We include this variable as an indicator of individual earning potential, relevant to financial autonomy, but it can also be interpreted as a proxy for the income of a reference group for social comparison.
- Dummy variables indicating employment status: one each for being employed part-time, unemployed, inactive or long-term disabled (reference category: full-time employment). Employment status may affect perceived contributions and potential financial autonomy, although the Essex score, should account fully for individuals' labour market potential, though not necessarily for any difficulties in changing their employment status. We give results for two different models (B and C), respectively without and with the inclusion of these dummies.
- A dummy variable for providing care for any sick, disabled or elderly person (whether co-resident or not). This could affect perceived contributions, positively (especially care for co-resident), and financial autonomy, negatively.
- A dummy variable for reporting poor health, which could be expected to reduce financial autonomy. Health status should not affect perceived contributions, since the variables through which it might do so, such as current earnings and employment status, have already been included (in model C),.
- A variable giving the score for an "overall satisfaction with life" question (same scaling as our dependent variable, again treated as continuous) added to take partial account of some time-varying unobserved factors, those that affect overall satisfaction as well as satisfaction with household income. It may also be that answers to satisfaction questions are contaminated by being asked

together; adding in overall satisfaction as an explanatory factor may control for such contamination. We compare two models A and C respectively without and with the overall satisfaction score as a benchmark.

Our final sample is composed of 14596 observations across the waves, corresponding to 4576 households across all waves of the BHPS for which the above variables are available, that is those from 1996 to 2003 (excluding 2001).

Table 3 summarises the symmetric and gendered effects that might be expected of different individual level variables[13] on bargaining power within the household according to the "perceived contribution" and "financial autonomy" models. Predicting gendered effects requires knowledge of the gendered norms and practices. We use just three stylised assumptions to derive the predictions below:

1) that women are more likely than men to take time out of employment to contribute to their household in other ways
2) that women's (less than full-time) employment status is more likely than men's to be related to their current partnership status
3) that men who are carers are most likely to be caring for their partner, while women care for a wider variety of people both within and beyond their household

Table 3. Expected impact of individual level variables on bargaining power within the household according to the "perceived contribution" and "financial autonomy" models

	Perceived contribution	Financial autonomy
Share of earnings	Positively, and more than share of non labour income	Positively, but less than share of non labour income
	Gendered impact:	Gendered impact:
	- for man/ + for woman since woman's lower share of earnings may be due to greater contribution in other ways to household	- for man/ + for woman since a woman's low share of earnings is more likely to be related to current partnership status

[13] Except overall satisfaction which is included as a control for unexplained variation rather than as a factor potentially affecting bargaining power.

Share of non labour income	Positively, but less than share of earnings	Positively, and more than share of earnings
	Gendered impact: neutral	Gendered impact: neutral
Essex score	Not necessarily	Positively
	Gendered impact: neutral	Gendered impact: neutral
Less than full-time employment	Unclear (given share of income controlled for) depending on whether employment itself is seen as a contribution or if time not in employment is used to make a non-financial contribution to the household	Negatively in so far as there are difficulties in changing employment status if need to be financially autonomous
	Gendered impact: - for man/ + for woman since woman more likely to be making contribution in other ways to household with time not spent in employment	Gendered impact: - for man/ + for woman since a woman's less than full-time employment status more likely to be related to current partnership status
Being a carer	Positively if the person being cared for is a member of the household	Negatively if constrains future labour market potential
	Gendered impact: + for man/ - for woman since he is more likely to be caring for another household member (partner)	Gendered impact: + for man/ - for woman since her caring duties more likely to continue after household dissolves (i.e. not for partner)
Poor health	Not necessarily	Negatively
	Gendered impact: neutral	Gendered impact: neutral

Results

Tables A.1 and A.2 in Appendix give the results of equations (1) and (2) for different sets of explanatory variables. Model C includes the control for overall satisfaction with life, whereas Model A omits it. The differences are very small. Including the control for overall satisfaction reduces the impact of some variables on the common factor in satisfaction with household income, notably health and home ownership,

both factors that one would expect to have a direct impact as well as through their financial effects. The inclusion of the control for overall satisfaction has little impact on the bargaining component in satisfaction with household income. However, it is interesting to note that the R^2 of the model has greatly improved in Model C for both components. Therefore, we use Model C, including the control for general overall satisfaction with life, in our subsequent discussion[14].

A comparison between Model C and Model B (excluding employment status of the partners) helps in the interpretation of the effect of some of our variables. Adding employment status improves the overall quality of the model, and it also reduces the impact of benefit income, share of earnings and Essex score in the estimation of effects on the common component in satisfaction. These effects are not unexpected: some benefits are directly linked to employment status (mainly unemployment or disability), the Essex score by construction partially reflects current employment status and the share of earnings is affected by the employment status of both partners. In particular, a woman earning more than 75% is likely to have a male partner who is unemployed or inactive. This may explain why controlling for employment status in model C changes the coefficient on the variable indicating a woman earning more than 75% of household income from negative to positive (albeit insignificant effects in both directions, presumably because of the small number of cases). By adding employment status in Model C, we control for these relationships making the effects we obtain for the remaining variables easier to interpret.

Table 4 shows the results of our estimations for the common component, Y_{1i}, and the bargaining component, Y_{2i}, of satisfaction with household income, based on equations (3) and (4) of Model C.

[14] Alternative dependent variables have been used to tackle this issue and this lead to similar results: (i) the residuals of a regression of satisfaction with household income on other satisfaction measures as dependent variable; (ii) the difference between an individuals' income satisfaction scores and the average of all their other satisfaction measures.

Table 4. Estimation results for the common and bargaining components of satisfaction with household income.

	Common component (Y1) (Model C)			Bargaining component (Y2) (Model C)		
	Coeff	Std err		Coeff	Std err	
Household variables						
Log of household income	0.189	0.027	***	0.023	0.021	
HH receives benefit income	-0.107	0.038	***	0.011	0.030	
Proportion of benefit income	-0.096	0.111		0.127	0.087	
HH receives investment income (I)	0.084	0.026	***	-0.023	0.021	
HH receives transfer income (T)	-0.070	0.042		-0.041	0.033	
Proportion of other income (I+T)	0.097	0.139		0.135	0.109	
No earnings from partners	0.177	0.093	*	-0.057	0.073	
No non lab. inc. from partners	-0.078	0.046	*	-0.029	0.036	
Home owned on mortgage	0.026	0.045		-0.031	0.036	
Home owned outright	0.106	0.067		-0.026	0.052	
No of children aged 0-2	-0.101	0.028	***	0.042	0.022	*
No of children aged 3-4	-0.050	0.026	*	0.050	0.021	**
No of children aged 5-11	-0.014	0.022		-0.004	0.017	
No of children aged 12-15	-0.015	0.028		-0.021	0.022	
No of dep children aged 16-18	0.076	0.047		0.003	0.037	
1997	0.183	0.028	***	0.007	0.022	
1998	0.170	0.029	***	-0.021	0.023	
1999	0.179	0.029	***	-0.045	0.023	*
2000	0.094	0.030	***	-0.032	0.023	
2002	0.141	0.033	***	-0.028	0.026	
2003	0.281	0.035	***	-0.046	0.027	
Constant	1.014	0.185	***	-0.336	0.145	**
Individual variables						
Symmetric effect						
Own exclusive child	-0.303	0.206		0.109	0.158	
Share of earnings 75-100%	0.109	0.060	*	0.066	0.043	
Share of non lab. inc. 75-100%	-0.028	0.043		0.008	0.024	
Essex score	0.147	0.034	***	0.017	0.028	
Essex score sq	-0.005	0.002	***	0.000	0.001	
Working part-time	-0.394	0.059	***	-0.107	0.046	**
Inactive (care or other)	-0.560	0.077	***	-0.102	0.060	*
Unemployed	-1.444	0.087	***	-0.233	0.071	***
Long term disabled	-0.550	0.130	***	-0.316	0.104	***
Providing care for others	-0.069	0.041	*	0.011	0.040	
Reporting poor health	-0.209	0.057	***	-0.104	0.045	**
Overall satisfaction	0.423	0.013	***	0.253	0.011	***
Gendered effect						
Own exclusive child	0.044	0.202		0.058	0.162	
Share of earnings 75-100%	-0.002	0.054		-0.084	0.047	*
Share of non lab. inc. 75-100%	-0.047	0.031		-0.032	0.034	
Essex score	-0.015	0.036		0.034	0.027	
Essex score sq	0.001	0.002		-0.001	0.001	
Working part-time	-0.101	0.059	*	-0.078	0.046	*
Inactive (care or other)	-0.202	0.077	***	0.037	0.060	
Unemployed	-0.566	0.091	***	-0.055	0.068	
Long term disabled	-0.442	0.132	***	-0.065	0.102	
Providing care for others	0.077	0.051		0.062	0.032	*
Reporting poor health	-0.018	0.057		-0.015	0.045	
Overall satisfaction	0.048	0.014	***	0.018	0.010	*
*** p<0.01; ** p<0.05; * p<0.1						
R-sq within	0.186			0.061		
R-sq between	0.411			0.130		
R-sq overall	0.366			0.124		
No of obs.	14596			14596		
No of groups	4576			4576		

Discussion

Impact of income

As expected, log household income has a strongly significant positive effect on the common component, average satisfaction. The effect on their individual scores is similar for both partners, so the overall level of income has no significant impact on the bargaining component, the difference in their satisfactions.

Both partners care about the source of income, with their satisfaction being reduced if the couple receives any benefit income. This effect is not due to the cause of benefit receipt, since the main causes, unemployment status, disability and the presence of children, are controlled for. Since 66.5% of our couples receive some benefit income, and its negative effect does not change significantly with the proportion of income received in this form, it seems more accurate to say that having an income that does *not* depend on benefits is a source of financial satisfaction to both men and women. Investment income works in the opposite direction with both partners' satisfaction being increased if the couple receives any investment income. In neither case are there any significant effects on the bargaining component, implying that neither its level nor the form in which it arrives seems to affect relative entitlements to household income.

The distribution of income between the partners also has an effect. Either partner earning more than 75% of total household earnings increases average satisfaction relative to a more equal distribution of earnings. In terms of bargaining power, only a woman is significantly empowered by contributing more than 75% of total earnings herself relatively to her partner. There is no significant non-gendered effect on bargaining power for the higher earner. Nor does the distribution of non-labour income have any effect on bargaining power.

Though this gives additional evidence of the rejection of the income pooling hypothesis for which the distribution of earnings should be a matter of indifference (see also Bonke and Browning 2003), these results are rather unexpected, with only a gendered bargaining effect and a common preference for inequality of earnings Further research is needed to understand this better. A possible interpretation is that women (but not men) who earn a small proportion of household income are making a higher perceived contribution than their earned income alone registers, so that a low

income share is not as disempowering to women as to men. This effect may be affected by picking up selection effects of women having reduced their share of earnings by giving up employment to look after children only if they perceive their household income to be high enough without their earnings[15].

We do not test whether there is adaptation to changing income levels in this model, as for example Burchardt (2004) and Stutzer (2004) found. In an alternative model to Model C, the log of last year's real household income was added as an additional dependent variable but proved not to be significant (results not shown) and other coefficients were not significantly affected. We have not included this variable in our main model because to do so required observations in two consecutive years, reducing our sample by 25 percent. Again further careful analysis, as suggested by Burchardt (2004), may be needed to capture any adaptation effect which could be more long term.

Impact of Essex score

Both partners' Essex score, our measure of earning potential, has a positive impact on average satisfaction, with a slight decreasing marginal effect (significant for woman's score). This suggests that the Essex score is acting more as a measure of discounted future earnings than as the income of a reference group, which should have a negative effect[16]. There is no significant gendered common or bargaining effect of the Essex score (nor any symmetric bargaining effect) which suggests that couples may have a less traditionally gendered view of their roles when thinking about the future than they seem to for the present.

Impact of employment status

Compared to being in full-time employment, any other employment status for either partner reduces average satisfaction. This effect is heightened for the man (especially for unemployment and disability), and correspondingly weakened for the woman. These results are consistent with a shared view of the traditional gendered division of contributions to the household being desirable. However, there is also a symmetric

[15] Our model does not allow for such selection effects.
[16] In further analysis, we intend to test different types of reference group, made possible by the rich set of variables available in the BHPS.

effect on bargaining power of employment status; both partners are disempowered relatively by not working full-time. The only status showing a somewhat gendered bargaining effect is working part-time, which is more disempowering for a man.

Impact of children

The number of children up to 4 years old has a negative effect on average satisfaction and a much stronger effect for women. This could be because mothers bear the greater costs (Himmelweit and Sigala 2004) or that women are more aware than men of the costs of the young children. This result could also arise because women know that children would be their responsibility in the case of divorce and that lone mothers in practice fare badly financially compared with non-custodial fathers.

Impact of health and care

Providing care by either partner has a negative symmetric effect on the common component of partners' financial satisfaction. However the only significant effect of providing care on the bargaining element in gendered: the female carer is disempowered while the male carer is empowered by doing so. This may be an effect of for whom they are caring, whether their partner, another member of their household or someone outside their household. This needs further investigation.

Finally, reporting poor health impacts negatively on both the common and the bargaining element symmetrically. Health does not illustrate any gendered pattern of effects.

Comparing perceived contributions and financial autonomy theories

The evidence we have found lends some support to both the perceived contributions and financial autonomy models of the determinants of bargaining power, but does not clearly allow us to reject one in favour of the other. Comparing our results in Table 4 with the predicted effects in Table 3, we find that the individual level variables for which we have found significant symmetric effects on the bargaining component all lend support to the financial autonomy model rather than the perceived contributions model. This is because the former, but not necessarily the latter, predicts negative effects for less than full-time employment and for poor health.

On the other hand, the empirical results for the gendered effects on the bargaining component support both the perceived contributions theory and the financial autonomy theory. Women are more likely than men to be in the position of earning less than 25% of household income, because they are making other contributions to the household. This may explain a woman contributing less than 25% of household income does not suffer the negative bargaining effects that her partner would. Similarly, that the woman is more likely than a man to be working part-time in order to contribute in other ways to the household could explain for the perceived contributions model why a part-time job has a gendered effect that compounds the symmetric negative effect that it has on bargaining power for a man, but counteracts it for a woman. However, both these results are also consistent with the financial autonomy model, since women's low earnings and/or part-time status are more likely to be a temporary effect of her having chosen to contribute in another ways to the household and are therefore somewhat less likely to persist after household dissolution than for a man in that position.

And finally that providing care has a negative gender bargaining effect for the woman but a positive one for the man again is consistent with the perceived contributions model given that men who are carers are usually caring for their spouse, a member of the same household, which will add to their perceived contribution to the household, while the majority of those who provide care for others outside their household are women. However, this could be said to provide support for the financial autonomy model too, since if their household dissolves someone caring for a spouse will presumably not continue to do so, while those caring for others are likely to retain those caring responsibilities thus restricting their labour prospects and their potential financial autonomy.

Discussing policy implications

The policy implications of this analysis depend on the goals of policymakers. If they are trying to raise the average level of financial satisfaction, this analysis tells them to concentrate on the factors that improve the common element of financial satisfaction (extra-household and household level variables and the individual level variables in the left hand column of Table 4). If they are concerned however to improve the bargaining position of those with insufficient power within households, it is to the

factors that affect the bargaining component in household income satisfaction that they must look (extra-household and household level variables and the individual level variables in the right hand column of Table 4).

But suggesting measures for change is not straightforward even within the framework provided by our results. For example, if policymakers are primarily interested in enhancing overall satisfaction with household income, our results suggest that they should do what they can to increase income, wherever possible in such a way that a higher proportion comes in the form of investment income and a lower proportion in the form of benefits. They should also promote training and education and encourage full-time employment.

Moreover, they should also do what they can to discourage people caring for others, reduce the birth rate, encourage couples to have unequal incomes and ensure that, above all, the man is in full–time employment. Similarly, if policymakers are instead wishing to improve the bargaining position of women, they would implement measures such as shifting care activities between partners, and make women earn much more than their partners, who in turn should be encouraged to work, but part-time rather than full-time.

The measures proposed in the last paragraph point to what is wrong with an overly simplistic interpretation of our results. A feminist would argue that it is not those potentially undesirable factors themselves that should be encouraged; rather it is the general social and cultural environment in which those are the factors that lead to greater satisfaction that needs to be changed. Thus this analysis also points to the broader environmental factors on which policymakers need to focus if things that they might otherwise want to support – such as couples having young children and a more equal gender division of labour – do not in practice make people more miserable.

A third type of policy implication comes from interpreting the knowledge gleaned of the determinants of satisfaction with household income as an indication of what couples will do in various situations, treating the dependent variable as a measure of utility. Households would therefore act to increase the factors that improve the common component in satisfaction with household income and, given unequal

decision making power, would also have a tendency to act to increase the relative satisfaction of the members with greater bargaining power. This might either frustrate or reinforce any policies that aim to work by changing the incentives on households to act in particular ways. Such policies will have indirect effects on the balance of power and well-being within households that can enhance or undermine their effectiveness. For example, if the goal is to increase full-time employment attachment for all individuals, as proposed by the European Employment Strategy, our results suggest that work incentives provided at the household level (such as paid parental leave to be shared between parents) will be less efficient for women, as the intra-household decision-making process will promote man's employment over woman's. Understanding what determines the distribution of power and well-being within households may in this way be important for a number of policy areas.

Conclusion

This paper has developed a method for identifying the determinants of satisfaction with household income which shows that factors can have a range of different effects. These effects can be common to the two partners of a couple, and on top of that there can be bargaining effects. The analysis has shown that the latter effects are significant, putting yet another nail in the coffin of the unitary model of household decision-making. Further it has shown which factors universally affect bargaining power, notably employment and health status.

It has also added a new way of looking at both the common and the bargaining elements in satisfaction with household income, that is showing that on top of any symmetric effects, some of the determinants can have gendered effects, in the sense of working in one direction for the man and in the opposite direction for the woman. Thus less than full-time employment status has a gendered effect on the common element of satisfaction in that both men and women in a couple are more dissatisfied when it applies to the man rather than the woman. Similarly with bargaining effects: young children diminish the bargaining power of the woman and increase that of the man. Only the woman gains bargaining power from earning more than her partner; the man loses more bargaining power from working part-time; the woman loses but the man gains bargaining power from being a carer.

This addition of specifically gendered effects we believe to be a significant methodological and empirical addition to the literature. Our results show some support for the ideas behind both perceived contribution and financial autonomy bargaining models. The symmetric non-gendered effects seem to be better explained by the factors affecting financial autonomy, while factors that have gendered effects on bargaining power are consistent with either model.

Areas for further research include: further investigation of *environmental factors* that affect satisfaction with household income, if only to understand why people were more satisfied in some years (the early years of New Labour government) than others, and why women were particularly satisfied in 1999. A comparison with other European countries, to isolate whether this is a policy effect or seeing if regional environmental variables add explanatory power, would be interesting routes to follow. Additional *individual level variables* could also be included, such as some indicators of aspirations as well as adaptation to recent changes, following Burchardt (2004) and Stutzer (2004), gender role attitudes and alternative contributions to the household from time-use data. Finally, *different groups of households* could be investigated to see how these effects vary by class, education, couples with and without children, etc. By providing a simple replicable conceptual framework for such work and some preliminary results, this paper is an initial contribution to further investigation of the within-household decision-making process and its gendered components.

Table A.1. Estimation results for the common component in satisfaction (Y_1) – Eq. (1)

	Common effect (Y1)					
	(A)		(B)		(C)	
	Coeff	Std err	Coeff	Std err	Coeff	Std err
Log of household income	0.198	0.029 ***	0.203	0.028 ***	0.189	0.027 ***
HH receives benefit income	-0.132	0.040 ***	-0.167	0.038 ***	-0.107	0.038 ***
Proportion of benefit income	-0.128	0.116	-0.364	0.111 ***	-0.096	0.111
HH receives investment income (I)	0.088	0.028 ***	0.091	0.027 ***	0.084	0.026 ***
HH receives transfer income (T)	-0.088	0.045 **	-0.063	0.043	-0.070	0.042
Proportion of other income (I+T)	0.166	0.145	-0.015	0.141	0.097	0.139
Home owned on mortgage	0.051	0.048	0.012	0.046	0.026	0.045
Home owned outright	0.167	0.070 **	0.077	0.068	0.106	0.067
No of children aged 0-2	-0.097	0.029 ***	-0.117	0.028 ***	-0.101	0.028 ***
No of children aged 3-4	-0.055	0.028 **	-0.049	0.027 *	-0.050	0.026 *
No of children aged 5-11	-0.005	0.023	-0.007	0.022	-0.014	0.022
No of children aged 12-15	-0.006	0.030	0.004	0.029	-0.015	0.028
No of dep children aged 16-18	0.037	0.050	0.105	0.048 **	0.076	0.047
Man having own exclusive child	-0.097	0.178	-0.125	0.175	-0.129	0.172
Woman having own exclusive child	-0.207	0.116 *	-0.221	0.112 **	-0.173	0.110
Man's share of earnings 75-100%	0.057	0.029 *	0.034	0.027	0.054	0.028 *
Woman's share of earnings 75-100%	0.017	0.052	-0.043	0.050	0.056	0.050
No earnings from partners	0.156	0.097	0.031	0.093	0.177	0.093 *
Man's share non lab. inc. 75-100%	-0.047	0.031	-0.056	0.030 *	-0.037	0.029
Woman's share of non lab.inc. 75-100%	0.014	0.024	0.025	0.023	0.009	0.023
No non lab. inc. from partners	-0.068	0.048	-0.076	0.047	-0.078	0.046 *
Man's Essex score	0.061	0.024 **	0.104	0.023 ***	0.066	0.023 ***
Woman's Essex score	0.075	0.028 ***	0.099	0.027 ***	0.081	0.026 ***
Man's Essex score sq	-0.002	0.001	-0.003	0.001 ***	-0.002	0.001 *
Woman's Essex score sq	-0.003	0.001 **	-0.004	0.001 ***	-0.003	0.001 **
Man working part-time	-0.268	0.054 ***			-0.247	0.051 ***
Woman working part-time	-0.147	0.031 ***			-0.147	0.029 ***
Man inactive (care or other)	-0.430	0.069 ***			-0.381	0.066 ***
Woman inactive (care or other)	-0.207	0.041 ***			-0.179	0.039 ***
Man unemployed	-1.119	0.061 ***			-1.005	0.058 ***
Woman unemployed	-0.505	0.071 ***			-0.439	0.068 ***
Man long term disabled	-0.671	0.103 ***			-0.496	0.099 ***
Woman long term disabled	-0.064	0.090			-0.054	0.085
Man providing care for others	-0.017	0.036	0.021	0.027	0.004	0.034
Woman providing care for others	-0.081	0.032 **	-0.080	0.024	-0.073	0.031 **
Man reporting poor health	-0.225	0.045 ***	-0.120	0.034 *	-0.113	0.043 ***
Woman reporting poor health	-0.196	0.039 ***	-0.096	0.029	-0.096	0.037 **
1997	0.178	0.030 ***	0.196	0.029 ***	0.183	0.028 ***
1998	0.183	0.030 ***	0.180	0.029 ***	0.170	0.029 ***
1999	0.152	0.030 ***	0.198	0.029 ***	0.179	0.029 ***
2000	0.041	0.031	0.114	0.030 ***	0.094	0.030 ***
2002	0.088	0.035 **	0.154	0.033 ***	0.141	0.033 ***
2003	0.233	0.036 ***	0.291	0.035 ***	0.281	0.035 ***
Man's overall satisfaction			0.244	0.010 ***	0.235	0.010 ***
Woman's overall satisfaction			0.193	0.009 ***	0.188	0.009 ***
Constant	3.316	0.181 ***	0.547	0.186 ***	1.014	0.185 ***
R-sq within	0.093		0.155		0.186	
R-sq between	0.243		0.419		0.411	
R-sq overall	0.209		0.365		0.366	
No of obs.	14596		14596		14596	
No of groups	4576		4576		4576	
Prob>F	0.000		0.000		0.000	
Corr (u_i,xb)	0.006		0.119		0.073	
sigma_u	1.051		0.927		0.929	
sigma_e	0.788		0.760		0.746	
Rho (Fraction of var due to u_i)	0.641		0.598		0.608	
Prob>F (all u_i=0)	0.000		0.000		0.000	

*** p<0.01; ** p<0.05; * p<0.1

Table A.2. Estimation results for the bargaining component in satisfaction (Y_2) – Eq. (2)

	Bargaining effect (Y2)					
	(A)		(B)		(C)	
	Coeff	Std err	Coeff	Std err	Coeff	Std err
Log of household income	0.015	0.022	0.019	0.021	0.023	0.021
HH receives benefit income	0.011	0.030	0.011	0.029	0.011	0.030
Proportion of benefit income	0.096	0.089	0.092	0.085	0.127	0.087
HH receives investment income (I)	-0.029	0.021	-0.022	0.021	-0.023	0.021
HH receives transfer income (T)	-0.047	0.034	-0.040	0.033	-0.041	0.033
Proportion of other income (I+T)	0.146	0.111	0.128	0.109	0.135	0.109
Home owned on mortgage	-0.034	0.037	-0.031	0.036	-0.031	0.036
Home owned outright	-0.023	0.054	-0.030	0.052	-0.026	0.052
No of children aged 0-2	0.049	0.022 **	0.047	0.021 **	0.042	0.022 *
No of children aged 3-4	0.058	0.021 ***	0.054	0.021 ***	0.050	0.021 **
No of children aged 5-11	-0.006	0.018	-0.004	0.017	-0.004	0.017
No of children aged 12-15	-0.026	0.023	-0.020	0.022	-0.021	0.022
No of dep children aged 16-18	-0.007	0.038	0.005	0.037	0.003	0.037
Man having own exclusive child	0.204	0.137	0.089	0.135	0.083	0.135
Woman having own exclusive child	-0.032	0.089	-0.030	0.087	-0.026	0.087
Man's share of earnings 75-100%	-0.025	0.022	0.008	0.021	-0.009	0.022
Woman's share of earnings 75-100%	-0.080	0.040 **	-0.101	0.039 ***	-0.075	0.039 *
No earnings from partners	-0.079	0.075	-0.066	0.072	-0.057	0.073
Man's share non lab. inc. 75-100%	-0.010	0.024	-0.016	0.023	-0.012	0.023
Woman's share of non lab.inc. 75-100%	-0.020	0.018	-0.016	0.018	-0.020	0.018
No non lab. inc. from partners	-0.023	0.037	-0.028	0.036	-0.029	0.036
Man's Essex score	0.020	0.019	0.033	0.018 *	0.026	0.018
Woman's Essex score	0.014	0.021	0.001	0.021	0.009	0.021
Man's Essex score sq	0.000	0.001	-0.001	0.001	-0.001	0.001
Woman's Essex score sq	-0.001	0.001	0.000	0.001	-0.001	0.001
Man working part-time	-0.100	0.041 **			-0.093	0.040 **
Woman working part-time	0.014	0.024			0.015	0.023
Man inactive (care or other)	-0.052	0.053			-0.032	0.052
Woman inactive (care or other)	0.090	0.032 ***			0.069	0.031 **
Man unemployed	-0.165	0.047 ***			-0.144	0.045 ***
Woman unemployed	0.118	0.054 **			0.089	0.053 *
Man long term disabled	-0.280	0.079 ***			-0.191	0.078 **
Woman long term disabled	0.160	0.069 **			0.126	0.067 *
Man providing care for others	0.034	0.028	0.041	0.027	0.036	0.027
Woman providing care for others	0.028	0.025	0.025	0.024	0.026	0.024
Man reporting poor health	-0.098	0.035 ***	-0.071	0.034 *	-0.059	0.034 *
Woman reporting poor health	0.068	0.030 **	0.049	0.029	0.044	0.029
1997	0.010	0.023	0.009	0.022	0.007	0.022
1998	-0.017	0.023	-0.019	0.023	-0.021	0.023
1999	-0.045	0.023 *	-0.041	0.023 *	-0.045	0.023 *
2000	-0.025	0.024	-0.027	0.023	-0.032	0.023
2002	-0.023	0.027	-0.023	0.026	-0.028	0.026
2003	-0.041	0.028	-0.042	0.027	-0.046	0.027 *
Man's overall satisfaction			0.137	0.008 ***	0.136	0.008 ***
Woman's overall satisfaction			-0.117	0.007 ***	-0.117	0.007 ***
Constant	-0.199	0.139	-0.337	0.144 ***	-0.336	0.145 **
R-sq within	0.011		0.059		0.061	
R-sq between	0.010		0.139		0.130	
R-sq overall	0.012		0.127		0.124	
No of obs.	14596		14596		14596	
No of groups	4576		4576		4576	
Prob>F	0.000		0.000		0.000	
Corr (u_i,xb)	-0.050		0.132		0.107	
sigma_u	0.660		0.618		0.620	
sigma_e	0.604		0.586		0.586	
Rho (Fraction of var due to u_i)	0.544		0.527		0.528	
Prob>F (all u_i=0)	0.000		0.000		0.000	

*** p<0.01; ** p<0.05; * p<0.1

Table A.3. Regression results for male and female satisfaction

Dependent variable	Male satisfaction		Female satisfaction	
	Coeff	Std err	Coeff	Std err
Log of household income	0.214	0.034 ***	0.167	0.035 ***
HH receives benefit income	-0.099	0.047 **	-0.117	0.049 **
Proportion of benefit income	0.024	0.138	-0.220	0.143
HH receives investment income (I)	0.058	0.033 *	0.108	0.034 ***
HH receives transfer income (T)	-0.112	0.053 **	-0.029	0.055
Proportion of other income (I+T)	0.251	0.174	-0.028	0.177
Home owned on mortgage	-0.004	0.057	0.059	0.058
Home owned outright	0.084	0.084	0.133	0.086
No of children aged 0-2	-0.060	0.035 *	-0.141	0.036 ***
No of children aged 3-4	-0.001	0.033	-0.099	0.034 ***
No of children aged 5-11	-0.017	0.028	-0.008	0.028
No of children aged 12-15	-0.035	0.035	0.005	0.036
No of dep children aged 16-18	0.079	0.059	0.073	0.061
Man having own exclusive child	-0.105	0.214	-0.212	0.221
Woman having own exclusive child	-0.204	0.137	-0.147	0.142
Man's share of earnings 75-100%	0.045	0.035	0.062	0.036 *
Woman's share of earnings 75-100%	-0.018	0.063	0.131	0.065 *
No earnings from partners	0.128	0.116	0.233	0.120 *
Man's share non lab. inc. 75-100%	-0.050	0.037	-0.025	0.038
Woman's share of non lab.inc. 75-100%	-0.011	0.028	0.029	0.029
No non lab. inc. from partners	-0.111	0.058 *	-0.048	0.059
Man's Essex score	0.093	0.029 ***	0.040	0.030
Woman's Essex score	0.089	0.033 ***	0.072	0.034 **
Man's Essex score sq	-0.003	0.001 *	-0.001	0.001
Woman's Essex score sq	-0.004	0.002 **	-0.002	0.002
Man working part-time	-0.341	0.064 ***	-0.157	0.066 **
Woman working part-time	-0.131	0.037 ***	-0.162	0.038 ***
Man inactive (care or other)	-0.411	0.083 ***	-0.345	0.085 ***
Woman inactive (care or other)	-0.111	0.049 **	-0.250	0.051 ***
Man unemployed	-1.147	0.072 ***	-0.866	0.074 ***
Woman unemployed	-0.350	0.085 ***	-0.528	0.087 ***
Man long term disabled	-0.693	0.124 ***	-0.308	0.128 **
Woman long term disabled	0.072	0.107	-0.179	0.110
Man providing care for others	0.040	0.043	-0.034	0.044
Woman providing care for others	-0.047	0.038	-0.099	0.040 **
Man reporting poor health	-0.172	0.054 ***	-0.054	0.056
Woman reporting poor health	-0.053	0.046	-0.140	0.048 ***
1997	0.190	0.035 ***	0.176	0.036 ***
1998	0.149	0.036 ***	0.191	0.037 ***
1999	0.132	0.036 ***	0.223	0.037 ***
2000	0.060	0.037	0.128	0.039 ***
2002	0.110	0.041 ***	0.169	0.043 ***
2003	0.233	0.043 ***	0.327	0.045 ***
Man's overall satisfaction	0.370	0.012 ***	0.100	0.012 ***
Woman's overall satisfaction	0.069	0.011 ***	0.304	0.012 ***
Constant	0.681	0.232 ***	1.355	0.239 ***
R-sq within	0.157		0.129	
R-sq between	0.359		0.333	
R-sq overall	0.324		0.283	
No of obs.	14596		14596	
No of groups	4576		4576	
Prob>F	0.000		0.000	
Corr (u_i,xb)	0.056		0.093	
sigma_u	1.094		1.140	
sigma_e	0.934		0.962	
Rho (Fraction of var due to u_i)	0.578		0.584	
Prob>F (all u_i=0)	0.000		0.000	

*** p<0.01; ** p<0.05; * p<0.1

Table A.4. Mean and Standard deviation of the explanatory variables used in the regressions

	Mean	Std. Dev.
Real household income (*1000)	32.552	18.552
HH receives benefit income	66.5%	0.472
Proportion of benefit income	11.4%	0.234
HH receives investment income (I)	56.4%	0.496
HH receives transfer income (T)	5.8%	0.234
Proportion of other income (I+T)	3.6%	0.099
Woman's share of earnings 75-100%	5.9%	0.236
Man's share of earnings 75-100%	40.4%	0.491
No earnings from partners	4.7%	0.212
Woman's share non lab. inc. 75-100%	50.5%	0.500
Man's share of non lab.inc. 75-100%	16.8%	0.374
No non lab. inc. from partners	10.3%	0.303
Man's Essex score	8.05	3.446
Woman's Essex score	6.23	2.869
Man working part-time	3.5%	0.184
Man inactive (care or other)	2.1%	0.143
Man unemployed	4.0%	0.197
Man long term disabled	4.5%	0.207
Woman working part-time	29.1%	0.454
Woman inactive (care or other)	19.9%	0.400
Woman unemployed	2.0%	0.138
Woman long term disabled	3.2%	0.176
No of children aged 0-2	0.15	0.378
No of children aged 3-4	0.15	0.371
No of children aged 5-11	0.51	0.796
No of children aged 12-15	0.23	0.526
No of dep children aged 16-18	0.04	0.210
Man having own exclusive child	0.7%	0.084
Woman having own exclusive child	8.3%	0.276
Man providing care for others	11.0%	0.313
Woman providing care for others	15.7%	0.364
Man reporting poor health	6.2%	0.241
Woman reporting poor health	7.4%	0.261
Home owned on mortgage	68.9%	0.463
Home owned outright	9.6%	0.295
Man's overall satisfaction	5.22	1.146
Woman's overall satisfaction	5.27	1.207

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