



## **GenIX discussion paper series**

### **Cooperation and conflict within couples:**

### **A longitudinal analysis of the gendered distribution of entitlement to household income**

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## **Abstract**

This paper uses individual answers on satisfaction with household income to investigate the determinants of individual entitlement to household resources. Following Sen (1990), we decompose an individual's entitlement into a household element reflecting shared interests and a relative element where interests of household members diverge. We use British household panel data to show that the effects of variables on both household and relative entitlements can be gendered: directly through having effects that are asymmetric by gender or indirectly, even when direct effects are symmetric, if those variables are differently distributed by gender.

**Keywords:** gender differences, entitlements, household resources, income satisfaction, perceived contributions, identities and fallback positions

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## INTRODUCTION

This paper uses individual answers to a question on satisfaction with household income to explore the determinants of individual entitlements to household resources, whereby “entitlement” we mean the legitimate access to resources that gives rise to an individual’s set of opportunities or capabilities (Sen 1990). We observe that members of the same couple often have different views about their common income. Moreover, changes in the factors that might affect household resources do not seem to influence individual satisfaction in the same way, indicating the possibility that effects on individual entitlements differ.

Inspired by recent empirical studies that analyse unequal allocation of resources within households through the use of financial satisfaction (e.g. Alessie et al. 2006; Bonke and Browning 2009), this paper provides a complementary framework which allows us to take account of the possibility that the effects of factors on entitlements may be gendered. To do so we base our approach on Sen’s model of cooperative conflicts (1990): household members cooperate to increase total household resources but at the same time have inherently conflicting interests when it comes to the division of those resources. Individual entitlements may therefore be unequal.

Unlike recent bargaining and collective models, which also consider that interests may differ between household members, the main contribution of Sen’s framework is explicitly to account for gender asymmetries through the key role of perceptions in the determinants of entitlements. According to Sen, perceptions can affect the legitimacy of individuals’ claim to household resources and thus their relative entitlements in three broad ways, through i) their *perceived* fallback position if cooperation was to break down<sup>2</sup>, ii) the contribution they are *perceived* as making to the household and iii) the extent to which each partner perceives their own well-being as distinct from that of their family (Sen 1990). Gendered social norms, identities and opportunities inside and outside the household can influence all of these (Sen et al. 2003; Agarwal 1997; Folbre 1997).

By including the influence of perceptions, especially those related to individual interests, Sen’s model allows for the possibility that individuals may adapt to their

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<sup>2</sup> Sen fails to mention the role of perceptions with respect to what he calls the “breakdown” position but we include them for completeness, and because it is surely perceived consequences of marital breakdown rather than the actual consequences that are relevant to the division of resources while the household remains intact.

unequal treatment. In that sense, it explains better the persistence of intra-household gender inequalities than models that assume that the interests that individuals use to inform their actions and their well-being coincide. However, Sen's approach has never been applied in any systematic empirical intra-household analysis. This paper aims to fill this gap by comparing changes in individual responses to questions about satisfaction with household income across couples, using differences in these as evidence of a change in each partner's relative entitlement.

As far as we know, this is the first paper to investigate how a wide range of factors can have effects on individual command over household resources that are asymmetric by gender; that is to allow for perceptions of those factors varying by gender, rather than just assuming that a gendered outcome necessarily implies differences in those factors themselves. The aim is to shed new light on the determinants of individuals' entitlements within households in the UK, including but going beyond the intra-household distribution of income, and to investigate how these determinants can have gendered effects. Another objective is to develop a method easy to replicate on other samples and for other countries.

This study has implications for key policy developments in two senses. First, it could help in promoting greater gender equality per se. Second, the effectiveness of many policy incentives, including those aimed at expanding employment opportunities, redistributing income, and improving family stability, could be enhanced or mitigated by effects on internal household processes, perceptions of roles and consequent allocation of entitlements (Himmelweit 2002).

The plan of this paper is as follows: after a review of the literature, we lay out our conceptual framework that identifies household and relative elements of individual entitlements to household resources and distinguishes symmetric and gendered effects of individual level variables on each of these. The next section turns to the empirical implementation of this framework using data from the British Household Panel Survey, while the following section gives and interprets our results. The last section concludes and reflects in broad outline on the type of policy implications that results from this framework could have.

## A BRIEF REVIEW OF THE LITERATURE AND OUR APPROACH

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 (e.g. Browning et al. 1994; Browning and Chiappori 1998; Fortin and Lacroix 1997; Dauphin and Fortin 2001; Attanasio and Lechene 2002; van Klaveren et al. 2008). The same studies do not reject an alternative “collective” model of household decision-making, first introduced by Chiappori (1992; 1988) and Apps and Rees (1988), whose only restriction is that households arrive at a Pareto-efficient outcome (see Bargain et al. 2006; Browning et al. 2006; Behrman 2003 and Vermeulen 2002, for recent overarching discussions and surveys). Where on the Pareto frontier this outcome lies can be modelled as the result of 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 Pareto-weights can be influenced by prices, household’s total income and “distribution factors”.<sup>3</sup> The latter are variables that can be seen as influencing the outcome through their effects on the relative power of individuals within the household. Variables tested in the literature as potential distribution factors include the relative share of non labour income members bring into the household, differences in their wage rates, age or education as well as “extra-household environmental parameters” (Mc Elroy 1990).

Collective models are a generalisation of earlier “household bargaining” models that were more restrictive by specifying the way in which potential distribution factors affect outcomes (see Himmelweit 2001; Lundberg and Pollak 1996 for surveys). In these models, individuals bargain over the division of the gains to cooperation, gains over and above their utility at a fall back position to which each could unilaterally retreat if cooperation fails: the better off individuals are at their fall back position, the harder they will be able to bargain and the greater their resulting share. Distribution factors in such models are therefore those factors that affect fall back positions, such as relative wage rates (Pollak 2005). There are broadly two types of bargaining models: “divorce threat” models where fall back positions relate to household dissolution and distribution factors are those affecting the well-being of household members living on their own (McElroy and Horney 1981; Manser and Brown 1980).

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<sup>3</sup> See Browning et al. (2006) for clarification of the distinction, necessary for the identification of a non-unitary collective model, between distribution factors and preference shifters, which do not enter the Pareto weights but are in practice difficult to distinguish from distribution factors.

Alternatively fall back positions capture just the breakdown of cooperation within an intact household, so that distribution factors include current contributions to household resources where these would affect how well each partner would fare in the absence of cooperation within the household (Lundberg and Pollak 1993).<sup>4</sup>

Sen (1990) points out that individual entitlements are determined by *perceptions* of individual contributions, fall back positions and interests rather than their *actual* values, and that such perceptions may be heavily gendered. For example, the value of contributions to the household may be differently perceived either directly according to the gender of the contributor or indirectly according to their source (outside employment versus home-based employment), which is likely to vary by gender. Women may also be perceived to be in a less favourable position than men if cooperation were to break down and to be less likely to perceive themselves as having interests distinct from those of their household. We will therefore consider variables as potential distribution factors if they can be argued to influence perceived contributions, perceived fall back positions or the extent to which the individuals perceive themselves as having interests separate from those of their household. There are a number of possible ways of allowing for the difference between perceptions and the objective factors behind these perceptions; the one that we shall use in this paper is to allow all explanatory variables potentially to have an influence that varies by gender. Thus, for example, our model will allow for the possibility that the man's unemployment might be differently perceived (by either or both members of the couple) from the woman's unemployment, and similarly for other individual level variables.

These perceptions, and thus the relative position of household members, may be influenced not only by variables that pertain to the household or to the individuals within it, but also by "extra-household environmental factors" (McElroy 1990), such as gender specific labour market opportunities, or the relative treatment of married couples, single people and lone parents by the tax-benefit system (Chiappori et al. 2002; Bargain et al. 2006). These factors may also impact in gendered ways, not only through perceptions, but through their impact on norms and opportunities within and outside the household. Folbre (1997) prefers to call such extra-household variables

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<sup>4</sup>More recent dynamic bargaining models in which a non-cooperative solution is the threat point result in inefficient outcomes where binding commitments are not possible (see Lundberg and Pollak, 2003; Andaluz and Molina 2007).

“gender specific parameters” because so many of them are gendered, that is, given dominant gender norms in practice affect men and women differently

Perceptions, according to Sen, influence the relative entitlements of household members. Entitlements encompass the current and potential resources that give rise to an individual’s set of opportunities or capabilities and as such are not directly observable. To overcome this problem we measure entitlements indirectly by answers to questions on satisfaction with household income. Satisfaction measures have been showed by numerous psychological studies to provide a consistent and comparable account of individuals’ subjective assessment of their situation across different periods, beyond just reflecting aspects of mood (Diener et al. 1999; Krueger and Schkade 2008), despite largely constant personality traits being the most significant influence on satisfaction (Argyle 1999; Diener and Lucas 1999).<sup>5</sup> Other things, including such personality traits, being equal, we assume that individual satisfaction with household income is influenced by both the household and relative elements in individual entitlements, that is both by the resources of the household as a whole and an individual’s relative access to those resources.

Satisfaction is also found to depend on expectations formed by comparison with specific reference groups (Ferrer-i-Carbonell 2005; Senik 2004; Stutzer 2004; Clark and Oswald 1996), and also adapt over a relatively long period to persistent conditions such as marriage or divorce, the arrival of a child, but not to unemployment (Clark et al. 2008; Burchardt 2005). Our model is not designed to include factors that would capture this possible long term adaptation (and we focus on stable intact households only). However, other forms of adaptation may be more relevant to our framework: some women, adapting to the limitations of the existing gender order, may be satisfied with highly unequal material conditions and capabilities (Nussbaum 2003; Sen et al. 2003). Thus these gender inequalities may not only be reflected in unequal objective entitlements because of gender differences in interests, perceived contributions and fall back positions, but also in different assessment of their individual situation. We assume these different assessments to be

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<sup>5</sup> There has in recent years been a growing interest in answers to satisfaction questions by economists, aware of the limitations of monetary income and consumption as a measure of well-being (see among others, Layard 2006; Frey and Stutzer 2002; Easterlin 2001; Oswald 1997). However, the debate about whether satisfaction (and subjective well-being) per se is a desirable policy objective is beyond the scope of this paper (see recent discussion introduced by Layard 2008; see also Oswald 1997; Frank 1997 and Ng 1997).

relatively constant over the period studied and for our population of stable couples, and controlled by our model specification.

So far as the present authors are aware, few previous studies have investigated intra-household allocations through their effects on measures of individual financial satisfaction or subjective material well-being. Bonke and Browning (2009) use cross-sectional Danish household data to show that husbands' and wives' satisfaction with their "present financial situation" is related to the proportion of income each brings in to the household, as well as differences in their age, education and employment status. Alessie et al. (2006) use European panel data on the same financial satisfaction question to provide estimates for ten European countries of the influence that income shares within a household have on consumption shares and find that standard household level Gini-coefficients slightly underestimate consumption inequality once intra-household inequality is taken into account. Ahn et al. (2007) use the same panel data for Denmark and Spain to show the impact of male and female partners' relative income and of the source of that income (mainly earnings versus non labour income) on individual financial satisfaction. Kalugina et al. (2006), do not use satisfaction questions as such but instead derive a sharing rule in a collective model with household production from cross-sectional Russian data on self-reported income scales (as an indicator of subjective material well-being).

We use panel data to control for unobserved heterogeneity, including invariant personality characteristics. We consider a similar range of potential distribution factors to Kalugina et al. (2006), but wider than Bonke and Browning (2009) and Ahn et al. (2007), and much wider than Alessie et al. (2006), who only investigate income shares. Further, we include individual level variables pertaining to both partners in male-female couples and explicitly consider that their effects might be asymmetrical by gender (through gendered perceptions, norms or opportunities), which none of the above papers does. Finally, we use a different theoretical framework. Rather than looking for a "sharing rule" with respect to expenditure, we use answers to satisfaction questions to investigate the influence of variables, directly or through perceptions, on individual entitlements, the access to resources that gives rise to each person's opportunities and capabilities.



## CONCEPTUAL FRAMEWORK

### *Entitlements*

We assume that in a couple, individuals' entitlement to their household's resources depend on both a household element,  $E_s$  (which results from the partners' shared interests in cooperating to increase overall household resources), and a relative element,  $E_d$  (which may be due to conflicting interests as to how to allocate those resources between household members), so that, measuring the latter from the man's point of view, we have for the man's individual entitlement,  $E_m$  :

$$E_m = (E_s + E_d)/2$$

and for the woman's individual entitlement,  $E_f$  :

$$E_f = (E_s - E_d)/2$$

Conversely,  $E_s$  is the sum of the man's and the woman's entitlements (household entitlements) while  $E_d$  is the difference in individuals' entitlements (relative entitlements), measured positively for the man and negatively for the woman.

In a linear framework, let  $\mathbf{H}$  be a vector of extra-household or household level variables that influence entitlements,  $\mathbf{C}_m$  and  $\mathbf{C}_f$  be vectors of the individual level variables that do so, and  $\boldsymbol{\beta}$  and  $\boldsymbol{\lambda}$  with appropriate subscripts signify vectors of their respective coefficients, where  $\nu_s$  and  $\nu_d$  are error terms that are independent over time and across households (though possibly correlated across equations) we have:

$$\begin{aligned} E_s &= \alpha_s + \boldsymbol{\beta}_s \mathbf{H} + \boldsymbol{\lambda}_{sm} \mathbf{C}_m + \boldsymbol{\lambda}_{sf} \mathbf{C}_f + \nu_s \\ E_d &= \alpha_d + \boldsymbol{\beta}_d \mathbf{H} + \boldsymbol{\lambda}_{dm} \mathbf{C}_m + \boldsymbol{\lambda}_{df} \mathbf{C}_f + \nu_d \end{aligned} \quad (1)$$

Gender specific norms and opportunities are allowed for at the extra-household and household-level by letting the variables in  $\mathbf{H}$  affect not only  $E_s$  but  $E_d$  too. For example, the number of young children may affect not only a couple's overall entitlements, but may differentially impact on the man's and the woman's entitlements through influencing their perceived contributions (depending on the couple's division of labour and how childcare and any impact on earnings are perceived) and perceived

fall-back positions (depending on who in the fallback position would care for the children and the financial consequences of doing so).

Gendered norms and opportunities may also structure the effect of individual level variables in  $\mathbf{C}_m$  and  $\mathbf{C}_f$ . For such individual variables, letting  $\mathbf{C}_m$  and  $\mathbf{C}_f$  have different coefficients within each equation allows for perceptions of men's and women's contributions, fall-back positions and interests to have effects that are asymmetric by gender. Thus the effects of woman's human capital on earnings may be *perceived*, rightly or wrongly, as of more or less benefit to the household than the man's (if she is perceived as having a less certain future in the labour market, for example). Finally the constant term in the equation for  $E_d$  allows for any unobserved differences between partners that might affect entitlements (such as personality traits), including those that are gender specific. In Sen's model these would also include any tendency for women and men to differ in the extent to which they see their own well-being as separate from that of their family.

We can make the symmetric and the gendered effects of individual variables more explicit by expanding equations (1) as:

$$\begin{aligned} E_s &= \alpha_s + \boldsymbol{\beta}_s \mathbf{H} + (\lambda_{sm} + \lambda_{sf})(\mathbf{C}_m + \mathbf{C}_f)/2 + (\lambda_{sm} - \lambda_{sf})(\mathbf{C}_m - \mathbf{C}_f)/2 + \nu_s \\ E_d &= \alpha_d + \boldsymbol{\beta}_d \mathbf{H} + (\lambda_{dm} + \lambda_{df})(\mathbf{C}_m + \mathbf{C}_f)/2 + (\lambda_{dm} - \lambda_{df})(\mathbf{C}_m - \mathbf{C}_f)/2 + \nu_d \end{aligned} \quad (2)$$

If the  $j$ th individual variable has no gendered effect on household entitlements  $E_s$ , then that variable's effect will be identical whether it pertains to the man or the woman, so that  $\lambda_{sm}^j = \lambda_{sf}^j$ . Variables in  $\mathbf{C}_m$  and  $\mathbf{C}_f$  that have gendered effects on  $E_s$  are therefore those  $j$  for which  $\lambda_{sm}^j - \lambda_{sf}^j \neq 0$ , so that changes in the difference in the partners' levels of variable  $j$ ,  $C_m^j - C_f^j$ , have an influence on  $E_s$ . This is captured by the fourth term of the equation for  $E_s$ . The third term captures any symmetric non-gendered effect on  $E_s$ , which exists whenever  $\lambda_{sm}^j + \lambda_{sf}^j \neq 0$ , whereby changes in the sum of the partners' levels of variable  $j$ ,  $C_m^j + C_f^j$ , influence household entitlements.

For  $E_d$ , relative entitlements, the interpretation of the coefficients is the other way around. If the effects of the  $j$ th individual variable is not gendered but purely symmetric on  $E_d$ , then its effect will be equal and opposite for the man and the

woman, so that  $\lambda_{dm}^j = -\lambda_{df}^j$ . Variables in  $\mathbf{C}_m$  and  $\mathbf{C}_f$  that have gendered effects on  $E_d$  are therefore those  $j$  for which  $\lambda_{dm}^j + \lambda_{df}^j \neq 0$ , so that changes in the sum of the partners' levels of characteristic  $j$ ,  $C_m^j + C_f^j$ , influence  $E_d$ . These effects are captured by the third term in the equation for  $E_d$ . The fourth term captures any symmetric non-gendered effect on  $E_d$  that exists whenever  $\lambda_{dm}^j - \lambda_{df}^j \neq 0$ , so that changes in difference of the partners' levels of variable  $j$ ,  $C_m^j - C_f^j$ , influence relative entitlements.

Using a notation where, for any variable or coefficient  $\theta$  for which  $\theta_m$  and  $\theta_f$  are defined,  $\theta_s = \theta_m + \theta_f$  and  $\theta_d = \theta_m - \theta_f$  (including when there are previous subscripts so that  $\theta_{.s} = \theta_{.m} + \theta_{.f}$  and  $\theta_{.d} = \theta_{.m} - \theta_{.f}$ ) we can rewrite equations (2) as:

$$\begin{aligned} E_s &= \alpha_s + \boldsymbol{\beta}_s \mathbf{H} + \boldsymbol{\lambda}_{ss} \mathbf{C}_s / 2 + \boldsymbol{\lambda}_{sd} \mathbf{C}_d / 2 + \nu_s \\ E_d &= \alpha_d + \boldsymbol{\beta}_d \mathbf{H} + \boldsymbol{\lambda}_{ds} \mathbf{C}_s / 2 + \boldsymbol{\lambda}_{dd} \mathbf{C}_d / 2 + \nu_d \end{aligned} \quad (3)$$

and summarise the effects in which we are interested in Table 1:

<<< Insert Table 1 near here >>>

### *Satisfaction with household income*

Neither individual entitlements, nor their components (household and relative entitlements,  $E_s$  and  $E_d$ ), are observable. We therefore use individual measures of “satisfaction with household income” to infer effects on  $E_s$  and  $E_d$ .

Why should satisfaction with their common household income differ between members of the same household? Our hypothesis is that satisfaction with household income will depend not only on what that household income entitles the household as a whole to do or to be (the household element) but also on an individual's access to the resources made possible by that household income (the relative element).

Formally, we assume an individual's satisfaction with their household income depends on:

- Household entitlements,  $E_s$
- Relative entitlements,  $E_d$  (positively for men, negatively for women, given the way we measure  $E_d$ )
- Some other extra-household or household levels factors  $\mathbf{G}$
- Some individual level factors for both self and partner, thus  $\mathbf{D}_o$  and  $\mathbf{D}_p$  (where subscripts  $o$  and  $p$  refer to self and partner); these can also be written as  $\mathbf{D}_m$  and  $\mathbf{D}_f$ .

For example, to allow for the partners' satisfaction with household income being affected by the (potentially different) weights each puts on their own and the other's subjective well-being,  $\mathbf{D}_o$  and  $\mathbf{D}_p$  may respectively include own overall satisfaction (to allow for any spillover effects from aspects of satisfaction not directly related to entitlements to household resources), and partner's overall satisfaction (to allow for identification with/concern for their partner in ways other than through household entitlements). Assuming a linear specification of the determinants of  $S_m$  and  $S_f$ , and allowing for extra-household, household and individual level variables to have gendered effects,<sup>6</sup> gives:

$$\begin{aligned} S_m &= \varphi_m + \gamma_s(E_s) + \gamma_d(E_d) + \delta_m \mathbf{G} + \varepsilon_{mm} \mathbf{D}_m + \varepsilon_{mf} \mathbf{D}_f + v_m \\ S_f &= \varphi_f + \gamma_s(E_s) + \gamma_d(-E_d) + \delta_f \mathbf{G} + \varepsilon_{ff} \mathbf{D}_f + \varepsilon_{fm} \mathbf{D}_m + v_f \end{aligned} \quad (4)$$

where the error terms  $v_m$  and  $v_f$  are potentially correlated for members of the same household, but independent over time and across households.

Summing and differencing equations (4) gives equations (5):

$$\begin{aligned} S_s &= S_m + S_f = \varphi_s + 2\gamma_s E_s + \delta_s \mathbf{G} + \varepsilon_{sm} \mathbf{D}_m + \varepsilon_{sf} \mathbf{D}_f + v_s \\ S_d &= S_m - S_f = \varphi_d + 2\gamma_d E_d + \delta_d \mathbf{G} + \varepsilon_{dm} \mathbf{D}_m + \varepsilon_{df} \mathbf{D}_f + v_d \end{aligned} \quad (5)$$

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<sup>6</sup> We do not allow for gender differences in the effects of relative and household entitlements on satisfaction, since this would cause identification problems, having already allowed in equations (3) for gender effects in the determinants of these entitlements. We thus effectively assume that men and women value their household and relative entitlements similarly, except in so far as constant personality differences or other unobserved time invariant factors in this evaluation are captured by gender differences in the constant term in equations (4). This limitation in modelling Sen's approach to the influence of gender differences in perceptions could only be overcome by a dynamic model in which the relative importance individuals put on household and relative entitlements was endogenous.

(Where again for any variable or coefficient  $\theta$ , for which  $\theta_m$  and  $\theta_f$  are defined,  $\theta_s = \theta_m + \theta_f$  and  $\theta_d = \theta_m - \theta_f$ , now including when there are subsequent subscripts so that  $\theta_{s.} = \theta_{m.} + \theta_{f.}$  and  $\theta_{d.} = \theta_{m.} - \theta_{f.}$ )

Substituting from equations (3) in equations (5) gives:

$$\begin{aligned} S_s &= a_s + 2\gamma_s \boldsymbol{\beta}_s \mathbf{H} + \gamma_s \boldsymbol{\lambda}_{ss} \mathbf{C}_s + \gamma_s \boldsymbol{\lambda}_{sd} \mathbf{C}_d + \boldsymbol{\delta}_s \mathbf{G} + \boldsymbol{\varepsilon}_{sm} \mathbf{D}_m + \boldsymbol{\varepsilon}_{sf} \mathbf{D}_f + u_s \\ S_d &= a_d + 2\gamma_d \boldsymbol{\beta}_d \mathbf{H} + \gamma_d \boldsymbol{\lambda}_{ds} \mathbf{C}_s + \gamma_d \boldsymbol{\lambda}_{dd} \mathbf{C}_d + \boldsymbol{\delta}_d \mathbf{G} + \boldsymbol{\varepsilon}_{dm} \mathbf{D}_m + \boldsymbol{\varepsilon}_{df} \mathbf{D}_f + u_d \end{aligned} \quad (6)$$

where  $a_s = \varphi_s + 2\gamma_s \alpha_s$ ,  $a_d = \varphi_d + 2\gamma_d \alpha_d$ ,  $u_s = 2\gamma_s v_s + v_s$  and  $u_d = 2\gamma_d v_d + v_d$ .

We then rearrange the terms in  $\mathbf{D}$  in equations (6), using an equivalent process to that we used to get equations (3) from equations (1), to give as the reduced form equations that we estimate:

$$\begin{aligned} S_s &= \pi_{s0} + \boldsymbol{\pi}_{s1} \mathbf{H} + \boldsymbol{\pi}_{s2} \mathbf{C}_s + \boldsymbol{\pi}_{s3} \mathbf{C}_d + \boldsymbol{\pi}_{s4} \mathbf{G} + \boldsymbol{\pi}_{s5} \mathbf{D}_s + \boldsymbol{\pi}_{s6} \mathbf{D}_d + u_s \\ S_d &= \pi_{d0} + \boldsymbol{\pi}_{d1} \mathbf{H} + \boldsymbol{\pi}_{d2} \mathbf{C}_s + \boldsymbol{\pi}_{d3} \mathbf{C}_d + \boldsymbol{\pi}_{d4} \mathbf{G} + \boldsymbol{\pi}_{d5} \mathbf{D}_s + \boldsymbol{\pi}_{d6} \mathbf{D}_d + u_d \end{aligned} \quad (7)$$

With

$$\begin{array}{ll} \pi_{s0} = a_s & \pi_{d0} = a_d \\ \boldsymbol{\pi}_{s1} = 2\gamma_s \boldsymbol{\beta}_s & \boldsymbol{\pi}_{d1} = 2\gamma_d \boldsymbol{\beta}_d \\ \boldsymbol{\pi}_{s2} = \gamma_s \boldsymbol{\lambda}_{ss} & \boldsymbol{\pi}_{d2} = \gamma_d \boldsymbol{\lambda}_{ds} \\ \boldsymbol{\pi}_{s3} = \gamma_s \boldsymbol{\lambda}_{sd} & \text{and} \quad \boldsymbol{\pi}_{d3} = \gamma_d \boldsymbol{\lambda}_{dd} \\ \boldsymbol{\pi}_{s4} = \boldsymbol{\delta}_s & \boldsymbol{\pi}_{d4} = \boldsymbol{\delta}_d \\ \boldsymbol{\pi}_{s5} = \boldsymbol{\varepsilon}_{ss} / 2 & \boldsymbol{\pi}_{d5} = \boldsymbol{\varepsilon}_{ds} / 2 \\ \boldsymbol{\pi}_{s6} = \boldsymbol{\varepsilon}_{sd} / 2 & \boldsymbol{\pi}_{d6} = \boldsymbol{\varepsilon}_{dd} / 2 \end{array}$$

The interpretation of the coefficients in  $\mathbf{D}_m$  and  $\mathbf{D}_f$  is as follows: for instance, if we are examining the coefficients on overall satisfaction, then if  $\varepsilon_{ss} \neq 0$ , both men and women report some spill-over effects between income satisfaction and satisfaction in other domains of life. If  $\varepsilon_{ss} > \varepsilon_{ds} > 0$ , then partners are concerned with the other's subjective well-being though value more their own. In addition, if  $\varepsilon_{sd} \neq 0$ , there is evidence that this concern is asymmetric with respect to gender ( $\varepsilon_{sd}$  is positive if more concern for man's subjective well-being, and negative if more concern for woman's).

### *Identification*

Structural coefficients in  $\beta_s$  and  $\beta_d$  give the effects of extra-household and household level variables on household and relative entitlements respectively, while those in  $\lambda_{ss}$  and  $\lambda_{sd}$  give the symmetric and gendered effects of individual variables on household entitlements and those in  $\lambda_{dd}$  and  $\lambda_{ds}$  give symmetric and gendered effects of individual variables on relative entitlements.

From the reduced form equations, the coefficients in  $\beta_s, \lambda_{ss}, \lambda_{sd}$  and in  $\beta_d, \lambda_{dd}, \lambda_{ds}$  can be identified up to the multiplicative constants  $\gamma_s$  and  $\gamma_d$ , respectively. We have good reason to assume that  $\gamma_s$  and  $\gamma_d$  are positive, i.e. that people are more satisfied the greater their household entitlements and more satisfied the greater their relative entitlements. This means that we can assess the relative size of the effects of extra-household, household and individual characteristics, and for each individual characteristic, the relative size of the gendered and symmetric components, both on household and relative entitlements. Because  $\gamma_s$  and  $\gamma_d$  may differ, we cannot compare the size of effects across household and relative entitlements, though we can note their respective signs. The coefficients  $\delta_s, \epsilon_{ss}, \epsilon_{sd}$  and  $\delta_d, \epsilon_{ds}, \epsilon_{ss}$  can be fully identified.

One remaining comment needs to be made about identification. We have assumed up to now that variables affect satisfaction with household income either through their effect on entitlements or directly i.e. they are in **H** and **C** or in **G** and **D**, but not both. If this is not the case then, by assuming a variable to be in **H** or in **C** alone, we will over(under)estimate any effect on entitlements, if any corresponding direct effect on satisfaction with household income is in the same (opposite) direction. Although there is no way to test for this, we will comment later on particular variables where our results (and the literature) suggest that such ambiguity might be possible.

### *Method of analysis*

We estimate our reduced form equations (7) using fixed effects linear regression to exclude the influence of time-invariant unobserved individual factors (such as fixed

personality traits). We treat satisfaction with household income as a continuous variable, even though the data that we have is ordinal and discrete. If we used a latent response model, the usual statistical treatment of ordinal response variables, there would be no consistent straightforward first-difference estimator for fixed effects. Ferrer-i-Carbonell and Frijters (2004) experimented by comparing the results of different types of econometric techniques to estimate a simple model using panel data on satisfaction, using as a benchmark a form of ordered logit model with both fixed individual effects and individual specific thresholds, 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” (p. 655). We see no reason not to assume that the same applies to the particular satisfaction measure in which we are interested; we recognise though that the summing and differencing used to create our equations may render our results somewhat more sensitive to the distortions involved in treating ordinal variables as though they were cardinal. For robustness, we therefore compare our results with those obtained from a pooled ordered logit estimation procedure where the unobserved heterogeneity is assumed to have a known relationship with the observed covariates, following a Mundlak transformation of the Chamberlain method (Mundlak 1978).<sup>7</sup>

The errors in the two equations are likely to be correlated, so these are only “seemingly unrelated regressions”. However, where exactly the same set of independent variables appear in two linear equations, the best linear unbiased estimator of the two equations together is the single-equation least squares estimator of each of them separately, even if the disturbance terms in the two equations are correlated (Zellner 1962). Zellner’s result applies to fixed effects linear regression, which is a form of least squares regression.<sup>8</sup>

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<sup>7</sup> We include the individual-specific averages of time-varying explanatory factors in the pooled estimation (see also Alessie et al. 2006). Results are reported in the Appendix.

<sup>8</sup> Note that with discrete response models, the gain in efficiency from jointly estimating seemingly unrelated equations that have the same set of explanatory variables is not as large as when the sets of variables differ (Zellner and Lee 1965). With only such a relatively small efficiency gain from doing otherwise, we estimate our equations separately in our pooled ordered logit estimation too for ease and comparability.

## *Data*

We use data from the British Household Panel Survey, which follows individuals from a representative clustered sample of British households<sup>9</sup> in 1991, annually interviewing them and all adult members of the households in which they subsequently lived. Questions are asked at either household or individual level, covering a wide range of areas; many are asked every year but some specific modules vary. The question “How dissatisfied or satisfied are you with the income of your household?”, to be answered on a 7-point scale from “not satisfied at all” to “completely satisfied”, was asked through a self-completion individual questionnaire administered after the main interview every year from 1996, except 2001.

Since we are interested in symmetric and gendered effects in both household and individual entitlements, including those of employment status, we select a sample of co-resident male-female couples of working age, with and without children, following them through time, so long as they stayed together.<sup>10</sup>

Table 2 gives some initial descriptive results of how change in individual answers to satisfaction with household income may indicate something that may impact on household and relative entitlements. It shows transition from one period to another in two main areas, employment status (from not employed full-time to employed full-time and vice versa) and presence of young children (under the age of 5).

<<< Insert Table 2 near here >>>

If we look at male transitions, for both partners movement to full-time employment improves both partners’ satisfaction with household income (and fairly symmetrically movement away from full-time employment decreases satisfaction with household income by a similar amount). Men’s satisfaction increases slightly more than

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<sup>9</sup> South of the Caledonian Canal, to exclude a large area of exceptionally low population density.

<sup>10</sup> We therefore exclude 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), as well as couples who share a household with others besides their own children (if any), and couples whose total household annual income differs by more than GBP 1000 from the sum of their individual incomes (since this could indicate the possible influence on decision-making of a non dependent child with significant individual income). Our sample is the original BHPS sample as first constituted in 1991.



women's. Note as well the relative stability in satisfaction scores when no change in employment status is observed.

Women changing their employment status has different effects. First the impact on either partner's satisfaction is smaller than in the case of a male transition, and second men seem to be much less affected by any change in their partner's situation (in or out of full-time employment) than she is herself. Finally, the presence of children also suggested a gendered picture. Women's satisfaction with household income seems to be more affected by the arrival of a young child (and conversely women are more financially relieved when children grow up – though to a lesser extent) than their male partners.

Our full model provides more structure for understanding these differences as well as enabling us to tests the significance of specific changes.

#### *Explanatory variables*

We choose explanatory variables that the literature on intra-household allocation models and Sen's approach to perceptions suggests could have effects on household and relative entitlements. These are variables that are expected to influence current or future economic prosperity of the household on the one hand, and the relative positions of each partner on the other (through perceived contributions and fall-back positions). See Appendix, Table A.1 for summary descriptive statistics for the explanatory variables.

At household and extra household level, **H** is composed of the following variables:

- log of annual real household income over the year prior to interview (in 2005 prices);<sup>11</sup>
- whether the proportion of state benefits in household income was more than 0%, 50% or 95% (three dummy variables, with reference category being no benefits at all)
- whether the household received any investment income;
- whether the household received any transfer income from other households;

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<sup>11</sup> We use log of income because previous studies have shown income to have a diminishing effect on satisfaction (Easterlin 2001; Burchardt 2005; Bonke and Browning 2009).

- housing tenure (dummy variables for whether owned on mortgage or owned outright, with reference category rented or shared ownership);
- the number of children in the following categories: aged 0-4, aged 5-11, and aged 12 and over;
- year (dummy variables with reference year 1996).

Variables for source of income are included to investigate whether different types of income matter to entitlements.<sup>12</sup> Housing tenure is included as an example of household assets that might influence future resources, children as an example of a source of household costs (and potential benefits), capturing both direct and indirect effects on adults' financial situation (Browning and Lechene 2003), and years to control for cross-sample extra-household factors (e.g. policy changes or macro-economic conditions).

Variables making up  $C_s$  and  $C_d$  are computed from individual characteristics for each of the partners, which are:

- whether earns high (75-100%) share of the household's earned income.<sup>13</sup>
- whether has high (75-100%) share of non-labour income of the household (individual income minus earnings);
- their "Essex score", a measure of individual earning potential,<sup>14</sup>
- employment status: dummy variables for being employed part-time, unemployed, inactive or long-term disabled (reference category: full-time employment);
- whether reports being in poor health;

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<sup>12</sup> Different types of income may restrict or enhance access to external opportunities for the household as a whole or give indication of potential resources from assets (such as investment income). They can also affect relative entitlements if such income would be paid to one particular member (such as child support payments to the mother) are likely to be perceived as theirs.

<sup>13</sup> Put in this non-linear dummy form because preliminary investigation by non-parametric methods suggested that only large differences in share of earnings had any effect. This form also allows for effects to be asymmetric by gender.

<sup>14</sup> The Essex score, developed and computed by Gershuny (2002) and Gershuny and Kan (2006), 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. We include this variable as an indicator of earning potential, but it could also be interpreted as a proxy for the income of a reference group for social comparison.

- whether provides care for any sick, disabled or elderly person within or outside the household (two dummy variables);
- hours of housework (not including care) reported as done per week and square of those hours.

In  $\mathbf{D}_s$  and  $\mathbf{D}_d$ , we include “overall satisfaction with life” (treated as a continuous variable along same scale as our dependent variable) – another question asked on the self-completion questionnaire after the ones about satisfaction in particular domains (including household income). These allow us to control for spill-over effects between satisfaction with income and with other domains of life (such as leisure, health or social life), and for concern for partner’s subjective well-being beyond any shared interest in household entitlements.

Our final sample has 11818 observations of 2314 couples observed at least twice between 1996 and 2005 (excluding 2001).

## RESULTS

Table 3 gives the results of estimations of equations (7).

<<< Insert Table 3 near here >>>

Recall that our model allows us to identify the sign and the relative size of the coefficients of the explanatory variables on entitlements within each equation but only to compare the sign of coefficients across equations.

### *Impact on household entitlements*

#### a) Income

Household income has a significant positive effect on household entitlements, and so does the source of income (state benefits and transfers from other households reduce, while investment income increases household entitlements). The negative impact of

benefits and transfers is not due to the reason for receipt of these income types, since most such reasons (unemployment, disability, housing tenure and the presence of children) are controlled for.

The distribution of earnings between the partners also has an effect on household entitlements, with significant gendered effects: the female partner earning more than 75% of total household earnings increases household entitlements, while male partner doing so does not, compared with a more equal distribution of earnings. Note that couples in which the woman's share of earnings is higher than 75% are mainly low income households.

The distribution of non-labour income has a small significant symmetric effect on household entitlements, and a small additional gendered effect (less than half the gendered effect of earnings), which increases household entitlements if the woman receives more than 75% share of the household's non labour income.

b) Employment status and the Essex score (earning potential)

Compared to being in full-time employment, any other employment status for either partner reduces household entitlements significantly, and being unemployed has a larger negative effect than any other status. This distressing effect of unemployment is in line with other findings at the individual level (e.g. Clark 2003; Clark and Oswald 1994) but since we are controlling for both household income and overall satisfaction, our results indicate a specific effect on household entitlements of the employment status of either partner. Our results also show that this effect is heightened for the man (significantly for inactivity, unemployment and disability), and correspondingly weakened for the woman. This gendered difference in the effect of employment status has on household entitlements could be due to the expectation that the woman's employment career might be interrupted for other reasons. Alternatively, these differences in the effects of men's and women's inability to find or take a job might signal the persistence of traditional ideas about gender roles. Even if such roles are not in practice the basis of a couple's financial arrangements, factors that make it impossible to revert to them, such as the man's unemployment or long-term disability, might be particularly unsettling to the couple's joint view of their household's financial security and entitlements.

However, either partner's Essex score, our measure of earning potential, has a positive impact on household entitlements, with no significant gender difference, suggesting that couples may have a less traditionally gendered consideration of their roles when anticipating the future than they do for the present.<sup>15</sup> Note however, the slightly significant gendered effect, favouring the man, of the Essex score in the pooled ordered logit (Appendix, Table A.2).

c) Children and housework

The number of pre-school children has a negative effect on household entitlements, which also differs significantly from the effect of children older than five. This suggests that children reduce household entitlements through their costs (not surprisingly since the household income we control for is not equivalised) and it is childcare costs, in money or time, that influence household entitlements more than consumption costs, which should be higher for older children.

Finally, those couples who do more housework have lower household entitlements; this may indicate a selection effect (against our implicit assumptions that our regressors are exogenous), in which lower entitlements restrict the scope for using income to reduce housework time. It makes no difference whether it is the man or the woman doing the housework.

d) Other controls

Poor health reported by either partner impacts negatively on household entitlements, without any gendered pattern of effects.

*Effects on relative entitlements*

Some variables also affect each partner's relative entitlements (right column of Table 3):

a) Income

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<sup>15</sup> Our results show that the Essex score is acting more as an indicator of future earnings, more in line with an effect that Senik (2004) calls "information" – what one could expect to gain in the future, which could affect the use of current resources and hence entitlements – than with what Stutzer (2004) calls "social comparison" – what one should be getting – which would be expected to have a negative effect on satisfaction, for a given level of income, and thus be an effect that works not through entitlements but through social comparison. In this case the Essex score would be included in **D** rather than **C** in our reduced form equations (7)

Receiving income in the form of a transfer from another household, mainly child support to the woman, increases the woman's relative entitlements; this could be because such payments affect either her perceived contributions or her perceived fallback position, as money that she would continue to receive if the household dissolved.

Contributing more than 75% of household earnings gives either partner a greater relative entitlement to household income, a symmetric effect (significant only in the pooled ordered logit specification), and there is also a gendered effect (significant only in the linear specification) so that a woman gains more from being the higher earner than a man does. In both specifications, taking account of both effects leaves no significant overall change in relative entitlements when the man is the higher earner and a strong effect when the woman is.

b) Essex score and employment status

The larger the difference in Essex score, the greater the relative entitlements. This takes place in symmetric ways, each partner gains from being the one with higher earning power. This result is in line with other findings that use relative wage rates to investigate bargaining power in different models of intra-household allocation (e.g. Friedberg and Webb 2006; Pollak 2005; Vermeulen 2002; Fortin and Lacroix 1997). There is a symmetric effect on entitlements of relative employment status; both partners lose relative entitlement by not working full-time, particularly by being unemployed or disabled when their partner is not.<sup>16</sup> These two statuses also have a negative, though not significant, gendered effect, reducing the man's relative entitlement more than the woman's.

c) Children and housework

The number of children under 5 reduces the mother's relative entitlement (and increases the father's); this is consistent with the finding that childcare costs, in time and money, which are borne primarily by women (mainly as a deduction of their own earnings, net of the receipt of child benefits which are controlled for), reduce their perceived contributions to household resources (Himmelweit and Sigala 2004).

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<sup>16</sup> The negative symmetric effect of disability is significantly different from that of all other "employment" statuses (tests available from the authors).

Hours of housework reduce either partner's relative entitlement presumably because housework is not valued in itself as a contribution to household resources and may reduce the perceived value of a person's other contributions, as Sen (1990) suggests.

d) Other controls

Those reporting poor health have reduced relative entitlements (over and above the negative impact of disability), which could be due to ill health reducing perceived contributions (through lower home production or market work), given that we control for overall subjective well-being.

*Effects of overall satisfaction*

In our model, we have put in overall satisfaction as a direct explanatory factor for satisfaction with household income, in order to control for spill-over effects from other satisfaction domains that are not due to effects on entitlements and to capture concern for partner's subjective well-being beyond household entitlements.

Results confirm the existence of both such effects. There are significant spill-over effects, so that individual satisfaction with household income is correlated with overall satisfaction and therefore is determined by more than just household and relative entitlements. There are also smaller, but still significant effects of concern for partner's overall satisfaction, which has a gendered aspect too, so that the woman puts more weight on the man's overall satisfaction than the man does on hers.

If we remove overall satisfaction from our model, we do not observe large differences in the coefficients (results available from the authors). Excluding this variable magnifies some of the effects on the sum of satisfactions, notably widening the negative impact of poor health and less than full-time employment statuses. This suggests that these factors cause dissatisfaction with life in themselves and not just through their impact on entitlements. Hence the use of control for overall satisfaction to isolate more clearly the effects of our explanatory variables on entitlements.<sup>17</sup>

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<sup>17</sup> In order to isolate the impact of altruism and spill-over from other domains of satisfaction, we also tried alternative dependent variables: (i) the residuals of a regression of satisfaction with household income on other satisfaction measures as dependent variable; (ii) the difference between an individual's income satisfaction score and the average of all their other satisfaction measures. The results were qualitatively similar

## CONCLUSION

This paper has developed a method for identifying the factors that affect household and individual entitlements. Taking the household to be site of both cooperation and conflict we have examined effects on both the household component of individual entitlements that is due to the shared interest in cooperation of members of a couple, and on the relative component that differs between them, that we have taken to be a measure of the conflict of interest arising from how to divide the fruits of cooperation between partners. The analysis has shown that the latter effects are significant, putting yet another nail in the coffin of the unitary model of intra-household allocation. Further it has shown which factors symmetrically affect relative entitlements, notably employment, Essex score, housework and health status.

This paper has also developed a way of examining whether the factors that affect either household or relative entitlements to household income do so in symmetric or gendered ways or both. We have shown that on top of any symmetric effects, some factors can have gendered effects, in the sense of working in one direction for the man and in the opposite direction for the woman. Thus being out of the labour market, unemployment and disability have additional gendered effects that reduce further household entitlements when they apply to the man and decrease it less when they apply to the woman. Our results also showed particularly interesting gendered effects of transfers, children and earnings inequality on relative entitlements: a woman gains more entitlement than a man from receiving transfers and loses relative entitlement for any additional child under the age of 5. She also gains relative entitlement from earning more than 75% of the household's earnings, while a man does not.

This addition of specifically gendered effects we believe to be a significant methodological and empirical contribution to the literature on intra-household allocation, in particular in implementing Sen's framework of gendered perceptions in cooperative conflicts, which opens the way to new and promising empirical developments, such as making cross-national comparisons.

The policy implications of this analysis depend on the goals of policymakers. If they are trying to increase household entitlements, this analysis tells them to concentrate on the factors that improve what both partners value as increasing overall resources. If they are concerned however to improve the relative position of women or men within



households, it is to the factors that affect the relative entitlements that they must look. If they are attempting to improve gender inequalities it is important to be aware that some of these factors have directly gendered effects. It is also important to be aware that an unequal distribution by gender of some factors that improve household entitlements, such as full-time employment, can have indirect gender effects on relative entitlements.

However we could also argue that it is not only the factors themselves that policy should address, but also the general social and cultural environment which makes those factors affect relative entitlements. 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 reduce entitlements and make people less satisfied. Understanding what determines the distribution of entitlements within households may in this way be important for a number of policy areas.

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Table 1. Interpretation of gendered and symmetric effects on household and relative entitlements

	Effect on household entitlements, $E_s$	Effect on relative entitlements, $E_d$
<b>For household and extra-household variables, <math>H^j</math></b>		
	$\beta_s^j \neq 0$	$\beta_d^j \neq 0$
<b>For individual variables, <math>C_m^j</math> and <math>C_f^j</math></b>		
Symmetric	$\lambda_{ss}^j = \lambda_{sm}^j + \lambda_{sf}^j \neq 0$ ; so that $C_s^j = C_m^j + C_f^j$ has an effect	$\lambda_{dd}^j = \lambda_{dm}^j - \lambda_{df}^j \neq 0$ ; so that $C_d^j = C_m^j - C_f^j$ has an effect
Asymmetric/ Gendered	$\lambda_{sd}^j = \lambda_{sm}^j - \lambda_{sf}^j \neq 0$ ; so that $C_d^j = C_m^j - C_f^j$ has an effect	$\lambda_{ds}^j = \lambda_{dm}^j + \lambda_{df}^j \neq 0$ ; so that $C_s^j = C_m^j + C_f^j$ has an effect

Table 2. Change in male and female satisfaction with household income due to consecutive change in employment status and presence of young children

	No. of households	Change in male satis.	Change in female satis.
<b>Male</b>			
remains in non full-time/non work	568	-0.07	0.00
non full-time to full-time job	293	0.62	0.47
remains in full-time job	7194	0.00	0.00
full-time job to non full-time	245	-0.60	-0.52
<b>Female</b>			
remains in non full-time/non work	3928	0.00	0.04
non full-time to full-time job	419	0.27	0.34
remains in full-time job	3410	-0.02	-0.04
full-time job to non full-time	543	-0.10	-0.25
<b>no child &lt;0-4y</b>			
from no child to child <0-4	362	-0.18	-0.32
keep child <0-4	1962	0.01	0.03
from child <0-4 to older child	379	-0.07	0.06

Source: own calculations using British Household Panel Survey (years 1996 to 2005).

Note: transitions are computed from one year to another. "Non full-time" stands for any other employment status than full-time (i.e. part-time job, inactivity, unemployment, long term disability)

Table 3. Estimation results for the sum and difference of satisfaction with household income (indicating household and relative entitlements respectively)

	Average satisfaction			Difference in satisfaction		
	fct of hh entitlements (Eq. 7)			fct of rel. entitlements (Eq. 7)		
	Coeff	Std err		Coeff	Std err	
<b>Household variables</b>						
Log of household income	0.273	0.028	***	0.003	0.022	
Prop. benefits >0% of hh income	-0.103	0.035	***	0.045	0.028	
Prop. benefits >50% of hh income	-0.077	0.071		0.080	0.056	
Prop. benefits >95% of hh income	0.145	0.091		-0.038	0.071	
HH receives investment income	0.088	0.023	***	-0.013	0.018	
HH receives transfer income	-0.073	0.042	*	-0.074	0.033	**
Home owned on mortgage	0.111	0.044	**	-0.020	0.035	
Home owned outright	0.239	0.066	***	-0.001	0.052	
No of children aged 0-4	-0.076	0.023	***	0.038	0.018	**
No of children aged 5-11	-0.016	0.021		-0.012	0.016	
No of children aged 12+	-0.032	0.024		-0.012	0.019	
Constant	1.100	0.139	***	-0.195	0.109	*
<b>Individual variables</b>						
Symmetric effect						
Share of earnings 75-100%	0.192	0.061	***	0.068	0.044	
Share of non lab. inc. 75-100%	-0.063	0.040		0.024	0.024	
Essex score	0.044	0.009	***	0.015	0.008	*
Working part-time	-0.345	0.061	***	-0.113	0.049	**
Inactive (care or other)	-0.431	0.079	***	-0.143	0.064	**
Unemployed	-1.461	0.089	***	-0.246	0.074	***
Long term disabled	-0.616	0.146	***	-0.457	0.119	***
Reporting poor health	-0.239	0.059	***	-0.109	0.047	**
Providing care for others within hh	-0.015	0.096		0.052	0.101	
Providing care for others outside hh	-0.033	0.046		-0.022	0.046	
Weekly hours of housework	-0.016	0.004	***	-0.008	0.003	**
Weekly hours of housework squared	0.000	0.000	***	0.000	0.000	**
Overall satisfaction	0.431	0.013	***	0.240	0.012	***
Gendered effect						
Share of earnings 75-100%	-0.148	0.057	***	-0.087	0.048	*
Share of non lab. inc. 75-100%	-0.061	0.031	**	0.005	0.032	
Essex score	0.015	0.010		0.008	0.007	
Working part-time	-0.099	0.062		-0.052	0.048	
Inactive (care or other)	-0.164	0.081	**	0.027	0.062	
Unemployed	-0.624	0.094	***	-0.110	0.070	
Long term disabled	-0.399	0.151	***	-0.103	0.115	
Reporting poor health	-0.065	0.060		0.005	0.047	
Providing care for others within hh	-0.133	0.129		0.059	0.076	
Providing care for others outside hh	0.069	0.058		0.021	0.036	
Weekly hours of housework	-0.006	0.004		-0.002	0.003	
Weekly hours of housework squared	0.000	0.000		0.000	0.000	
Overall satisfaction	0.052	0.015	***	0.015	0.010	
*** p<0.01; ** p<0.05; * p<0.1						
R-sq (within / between)	0.201	0.427		0.058	0.197	
No of (obs. / groups)	11818	2314		11818	2314	
Prob>F	0.000			0.000		
Joint stat. sig. fixed-effects (p-value)	0.000			0.000		

Source: own calculations using British Household Panel Survey (years 1996 to 2005).

Note: both equations include year dummies as controls (not shown).



## APPENDIX TABLES

*Table A.1. Mean and Standard deviation of the explanatory variables used in the regressions*

		Mean	Std Dev.
Score of satisfaction with hh income	man	4.57	1.43
	woman	4.64	1.45
Real annual household income (GBP)		35,584	20,130
Prop. benefits >0% of hh income		66%	
Prop. benefits >50% of hh income		6%	
Prop. benefits >95% of hh income		3%	
HH receives investment income		61%	
HH receives transfer income		6%	
Home owned on mortgage		73%	
Home owned outright		8%	
No child in hh		39%	
Youngest child aged 0-4		26%	
Youngest child aged 5-11		25%	
Youngest child aged 12+		10%	
No. of children in hh		1.11	1.10
More than 75% of total earnings	man	41%	
	woman	5%	
More than 75% of non labour income	man	15%	
	woman	53%	
Essex score	man	8.84	3.63
	woman	6.85	3.11
Working full-time	man	89%	
Working part-time	man	3%	
Inactive	man	2%	
Unemployed	man	3%	
Disabled	man	3%	
Working full-time	woman	47%	
Working part-time	woman	30%	
Inactive	woman	19%	
Unemployed	woman	2%	
Disabled	woman	2%	
Reporting poor health	man	5%	
	woman	7%	
Providing care to others within hh	man	3%	
	woman	3%	
Providing care to others outside hh	man	7%	
	woman	11%	
Weekly hours of housework	man	5.22	5.18
	woman	16.35	11.00
Score of satisfaction with life	man	5.24	1.09
	woman	5.29	1.14

Source: own calculations using British Household Panel Survey (years 1996 to 2005).

Table A.2. Estimated effects on household and relative entitlements using couple-specific satisfaction scores (pooled ordered logit with 'Mundlak' correction)

	Average satisfaction			Difference in satisfaction		
	fct of hh entitlements (Eq. 7)			fct of rel. entitlements (Eq. 7)		
	Coeff.	Std err.		Coeff.	Std err.	
<b>Household variables</b>						
Log of household income	0.531	0.078	***	0.007	0.065	
Prop. benefits >0% of hh income	-0.164	0.076	**	0.068	0.076	
Prop. benefits >50% of hh income	-0.135	0.155		0.309	0.163	*
Prop. benefits >95% of hh income	0.454	0.208	**	-0.012	0.241	
HH receives investment income	0.140	0.046	***	-0.024	0.048	
HH receives transfer income	-0.140	0.083	*	-0.181	0.095	*
Home owned on mortgage	0.178	0.103	*	0.000	0.100	
Home owned outright	0.463	0.151	***	0.034	0.151	
No of children aged 0-4	-0.157	0.049	***	0.101	0.051	**
No of children aged 5-11	0.005	0.047		-0.035	0.046	
No of children aged 12+	0.006	0.056		-0.045	0.055	
<b>Individual variables</b>						
Symmetric effect						
Share of earnings 75-100%	0.374	0.154	**	0.266	0.131	**
Share of non lab. inc. 75-100%	-0.118	0.077		0.046	0.063	
Essex score	0.093	0.019	***	0.038	0.019	**
Working part-time	-0.657	0.129	***	-0.316	0.133	**
Inactive (care or other)	-0.721	0.178	***	-0.215	0.174	
Unemployed	-2.676	0.226	***	-0.647	0.266	**
Long term disabled	-1.437	0.356	***	-0.997	0.454	**
Reporting poor health	-0.401	0.120	***	-0.080	0.142	
Providing care for others within hh	0.025	0.237		0.011	0.332	
Providing care for others outside hh	-0.028	0.085		-0.084	0.128	
Weekly hours of housework	-0.026	0.008	***	-0.023	0.009	**
Weekly hours of housework squared	0.000	0.000	***	0.000	0.000	**
Overall satisfaction	0.823	0.033	***	1.118	0.038	***
Gendered effect						
Share of earnings 75-100%	-0.281	0.143	**	-0.183	0.138	
Share of non lab. inc. 75-100%	-0.071	0.061		0.048	0.085	
Essex score	0.038	0.021	*	0.028	0.019	
Working part-time	-0.234	0.134	*	-0.189	0.133	
Inactive (care or other)	-0.305	0.182	*	-0.045	0.172	
Unemployed	-1.018	0.231	***	-0.313	0.234	
Long term disabled	-0.984	0.385	**	-0.239	0.422	
Reporting poor health	-0.161	0.127		0.089	0.137	
Providing care for others within hh	-0.341	0.289		0.213	0.257	
Providing care for others outside hh	0.145	0.111		0.060	0.098	
Weekly hours of housework	-0.010	0.008		-0.010	0.009	
Weekly hours of housework squared	0.000	0.000		0.000	0.000	
Overall satisfaction	0.111	0.035	***	0.063	0.033	*
*** p<0.01; ** p<0.05; * p<0.1						
Pseudo R-sq	0.115			0.048		
No of obs.	11818			11818		
Prob>Chi2	0.000			0.000		
Joint stat. sig. Mundlak terms (p-value)	0.000			0.166		

Source: own calculations using British Household Panel Survey (years 1996 to 2005).

Note: both equations include year dummies as controls (not shown). Mundlak terms are time-averages of time-varying variables used in the regressions, tested for jointly equal to zero (test rejected in both equations).