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Abstract

This paper provides the first direct measure of intra-couple bargaining power, based on an experiment with 95 established couples in Germany. In the first step, the partners made consumption choices independently of each other, thereby revealing their individual preferences. In the second step, couples made decisions jointly over five rounds with varying resource allocations between the partners, while the total couple allocation remained constant. From the individual and joint consumption patterns, we define an empirical bargaining power index without structural restrictions, which reflects the in-couple sharing rule. Our main result is that, within the couple, a partner's bargaining power increases significantly with his or her money allocation. We further control for socio-economic, divisional, behavioral, and distributional characteristics of the couples, including information that is rarely available in economic data sets. Among these, female attractiveness and selfishness have a positive impact, while traditional values have a negative impact on female bargaining power. If we impose the theoretical structures of the most common household models on our experimental data (from unitary to non-cooperative), we find that the semi-cooperative and collective frameworks match the participating spouses' choices best. Nonetheless, postulating any of these models as the underlying decision structure for the whole sample would conceal the heterogeneous behavior among the couples we observe.

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Keywords

Intra-household allocation, Consumption choices, Couple experiment

JEL Codes

C71, C91, C92, D13

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1. Introduction

While a vast body of research on economic decision-making within couples exists in the literature, the question of how exactly two partners share and use resources remains a very dark box. According to bargaining models of the household, in-couple resource allocation is driven by the partners' individual bargaining power, represented by the intra-household sharing rule equation (see for example Manser & Brown, 1980; McElroy & Horney, 1981 for Nash bargaining models; Apps & Rees, 1988; Chiappori, 1988, 1992 for the collective approach with respect to labor supply; Browning & Chiappori, 1998 for the collective approach with respect to consumption). This rule is typically defined as a function of individual incomes, socio-economic characteristics, and distribution factors, determined e.g. by marriage market institutions such as sex ratios or legislation influencing the division of marital goods upon divorce (Browning et al., 2006; Bobonis, 2009). However, the sharing of power within a couple is difficult to investigate empirically using available survey data. These usually lack simultaneous information on the preferences of each spouse, the couple's mutual decisions, and how these decisions depend on the spouses' relative resources.

To overcome these limitations, first-generation proponents of the collective approach apply structural econometric models that impose constraints on the couples' behavior: e.g. egoism and Pareto-efficient decision-making, and on the samples investigated: e.g. childless dual-earner couples (Browning et al., 1994; Browning & Chiappori, 1998; Chiappori et al., 2002). Major drawbacks of these approaches are that the sharing rule can only be identified up to an additive constant, and that the coefficients are calculated indirectly in a two-step procedure from the estimates of the labor supply equations. Second-generation studies show a prediction gain from exploiting additional information on individual expenditures of selected goods provided by recent data surveys in Denmark (DES) and the Netherlands (LISS), for instance (Chiappori & Ekeland, 2009; Bourguignon et al., 2009; Bonke & Browning, 2010; Cherchye et al., 2012).

However, in these data sets, neither the individual preferences and the negotiation process, nor the impact of a change in the intra-household income structure on the spouses' decisions are observed as such. Instead, the sharing between spouses is identified through individual expenditures of a limited set of private goods and the income variation among households (see Chiappori & Ekeland, 2009 for the model specifications in the collective framework). Partner-specific income effects are thus still difficult to determine precisely.

The only way to guarantee the necessary ceteris paribus environment is through an experimental approach with random assignment of non-labor income to different decision-makers in the household and a comparison of the household's resulting consumption choices (Lundberg & Pollak, 2008; Bobonis, 2009). Our paper does exactly this, and compares spouses' revealed individual preferences with the outcomes of their negotiations. The originality of our experimental study is threefold. First, the participants make their decisions in a controlled environment. Hence, we observe the complete individual and joint consumption patterns. So we record the choice of each spouse separately, as well as the joint decision of the couple. Secondly, we observe the potential changes in couples' decisions when the resource allocation between spouses varies, while total household allocation remains the same. Thus, we can directly derive an index for the relative bargaining power within the household (i.e. the sharing rule in the collective setting) depending on relative resource allocation, without imposing behavioral restrictions such as caring preferences or egoism. Third, we can identify the determinants of the bargaining power index by use of socio-economic, division, and behavioral characteristics of the couples collected in a separate questionnaire after the experiment. To our knowledge, only one field experiment to date has examined

partner-specific transfers while holding prices and participants' characteristics constant (Robinson, 2012), and few others studied the couples' resulting saving decisions (Ashraf, 2009; Schaner, 2015). All papers found a strong correlation between allocated or earned individual resources and their re-allocation between the partners. However, none has aimed to specify a sharing rule between partners and none have provided: (i) the complete household consumption pattern; (ii) both individual and couple preferences; and (iii) decisions of the couple by variation of relative incomes.

In addition to the experimental innovation, we try to close the gap between the experimental and structural approaches by predicting the intra-couple bargaining power within the corset of various household models, and comparing it to the results of the couples' negotiation process we observed. In this way, we offer a validation strategy for the model-based identification of the bargaining power.

In the next section, we briefly describe our experiment. Section 3 gives the statistical evidence for the partners' individual and couples' joint decisions. In Section 4, we present our index of female bargaining power, and discuss explanatory factors based on a panel regression analysis of the participants' actual choices. We extend the explanatory model with behavioral information in Section 5, using variables that are rarely available in commonly used economic data. We then interpret our data and results in light of a number of commonly used household models in Section 6: We first classify the couples' decisions according to the assumptions made in commonly known frameworks; i.e. we check whether the model restrictions are acceptable regarding the couple's decision pattern. Models considered are the unitary, dictatorial, bargaining (collective or Nash bargaining), and non-cooperative settings. We further check the general consistency of each model with our experimental data by predicting the couples' consumption decisions and bargaining power separately in each framework, and comparing them to the actual values. Section 7 concludes our paper.

2. Our experiment

For our experiment, we recruited 95 established mixed-sex couples who had been living together for a minimum of one year, regardless of marital status. According to Harrison & List (2004), we classify our experiment as an artefactual field experiment since it is conducted with non-standard subjects; i.e. the pool of participants does not only include students, but people with substantial heterogeneity on a broad set of characteristics. In this way, it combines the controlled environment of a standard laboratory experiment with the realism of a subject pool from the market of interest (in this case, couples). The pool of participants matches the Mannheim population with respect to age, income level, and employment status. University or college graduates are over-represented in our sample, however.[1] At the end of the experiment, the participants were asked to fill out a questionnaire on socio-economic characteristics, their family values, attitudes and self-assessments of personal traits related to the experiment (for example, selfishness and attractiveness). In this survey, participants report disproportionally high satisfaction levels with their relationship: 90% choose a value of at least 8 on an 11-point scale of 0 to 10, while the mean satisfaction rating is just slightly above 8 in other German data sets such as the Socio-Economic Panel (SOEP) or the Panel Analysis of Intimate Relationships and Family Dynamics (PAIRFAM) (Hardie et al., 2014). This bias is likely to reduce the variation among

[1] The experiment was conducted in Mannheim, a city in South-West Germany with about 300,000 inhabitants. See Beblo & Beninger (2015) for a more detailed description of the experiment and the participants.

our couples' decisions during the experiment. Consequently, our results may be treated as a lower bound to couple heterogeneity in bargaining power.

Our experiment comprised seven tasks, two of which were devoted to individual and couples' consumption decisions. In the first consumption task, we asked the participants to choose between consumption good bundles individually. That is, each spouse made decisions separately according to his or her own preferences. The partners were each allocated four banknotes of an experimental currency[2] with which they could purchase up to four vouchers for three different nearby department stores that offered distinct portfolios of either fashion/sports (*FS*), cosmetics (*CS*), or entertainment electronics products (*EE*).[3] Note that our selection of department stores had not been guided by a strategy to match gender-stereotypical consumption preferences but to offer the participants a maximum variety of choices in order to contrast couple decisions with individually revealed preferences. Each participant was asked to distribute the four banknotes between three envelopes stamped with the respective shop logo according to their individual consumption choice.

In the second consumption task, the couples made joint decisions in a five-round procedure. Both partners were seated together and were allowed to communicate about their joint decisions. In each round, each couple received the same total amount of money, i.e. four banknotes, as in the individual task.[4] However, the allocation between the spouses varied across rounds, with both spouses being allocated two banknotes in the first round but having different asymmetric allocations in the following rounds (see Table 1).[5]

3. Individual and couple decisions

As documented in Table 2, the average choices of female and male participants do not differ much, although there are notable differences in individual choices between partners. This is an indication that the set of shops offered is indeed gender-neutral, and sufficient to reveal diverging preferences within couples. Overall, the participants preferred fashion and sports products, with 1.8 banknotes spent on average by women and 1.9 by men. Cosmetics were the least popular with both sexes; over half of the participants were unwilling to spend any banknote on this product store. The aim of this first consumption task was to reveal the participants' individual preferences, without interference from the partner. Within couples, preferences between partners showed an average of about one banknote deviation with respect to the electronics and fashion-sports stores and a little bit less for cosmetics.[6]

In the second step, the couples had to agree on joint consumption decisions. Table 2 displays how couples chose between department stores by different resource allocations. It shows that, in the case of higher female allocation, fashion and sports products were slightly more often chosen by the couple than electronic

[2] For the consumption choice tasks, we created and printed out 50-Taler banknotes. The exchange rate was 10 Talers = 1 Euro.
[3] This way, we avoided the problem of redistribution between spouses after the experiment.
[4] In our experiment, the couple decisions are Pareto-efficient by definition. This assumption is supported by the "repeated game" argument by Browning and Chiappori (1998), as well as by experimental evidence for a positive correlation between cooperation and information about participants (Martin et al., 2013).
[5] Prior to each individual or joint decision, participants were reminded that only one of the decisions (out of 35 in the whole experiment) would be selected to determine their compensation at the end of the experiment.
[6] Please recall that the deviations correspond to about 5 euros per product category. Although these do not seem to be large amounts, the differences are far from negligible for the kind of everyday consumption decisions that we study.

supplies. When both spouses received the same amount, or when male relative resources increased, most banknotes were devoted to the electronics store.

We are mostly interested in the deviations of the couples' decisions from the respective individual choices across rounds. Figure 1 depicts the couples' mean distance $d^{i,i=f,m}_{k=1,..5}$ between the individual consumption choice of the female or male spouse ($c^{ni}_{X(X=FS,CS,EE)}$) and the couple's joint decision in round *k* (c^{nc}_{kX}):

$$d^i_k = \frac{1}{2N}\sum_{n=1}^{N=95}\left(\left|c^{ni}_{FS} - c^{nc}_{k,FS}\right| + \left|c^{ni}_{CS} - c^{nc}_{k,CS}\right| + \left|c^{ni}_{EE} - c^{nc}_{k,EE}\right|\right) \quad (1)$$

The variables d^f and d^m are easy to interpret, and are integers between 0 and 4. For example, d^f is 0 if the couples' joint and individual female decisions are the same for all couples, while d^m equals 4 if the voucher choices made with the four banknotes differ between the joint and individual male decisions for all couples: If he prefers fashion and sports products only (i.e. four banknotes here), but ends up with a joint couple decision for electronics only (i.e. four banknotes there), $d^m = \frac{1}{2}(|4-0|+|0-0|+|4-0|) = 4$.

We observe that the female line (in black) remains below the male line (in grey), regardless of the allocation of money between the spouses. The couple's decision is thus, on average, always closer to the female's preferences than to the male's. In our experiment, women seem to have a higher bargaining power regarding expenditures for private good bundles, although the female and male distances do not remain significantly different (at the 10% level) when men receive more resources than women.

However, the most remarkable observation in Figure 1 is that the distance d^i diminishes for both spouses when their own share of the household income increases, indicating a positive association between relative income and decision power within the couple. The male line is indeed decreasing monotonically, except at the right end, where the man exhibits altruistic behavior when he receives all the resources. The female line does not have a steadily increasing pattern as the couples' decisions at the symmetric allocation (2 : 2) deviates more from the women's mean choice compared to the unequal allocation (3 : 1). However, neither distance proves statistically different, and the right end is statistically higher than the left end. Nonetheless, the general pattern of the lines in Figure 1 indicates increasing individual bargaining power with increasing relative allocation.

4. Standard determinants of the bargaining power

Is this relationship significant, i.e. robust to a regression analysis of the bargaining power on relative resources? To investigate this question, we define the female relative bargaining power rp^f as the ratio between the male and the sum of female and male deviations from the couple's decision in each round *k*:

$$rp^f_k = d^m_k / \left(d^f_k + d^m_k\right) = 1 - d^f_k / \left(d^f_k + d^m_k\right). \quad (2)$$

The index is a discrete variable with values between 0 and 1.[7] The sample mean over all rounds is .567, indicating that women have on average significantly higher bargaining power (*p*-value of "female bargaining power < .5" = .0008). Figure 2 illustrates the variation of rp^f across rounds. As already suggested by the lines in Figure 1, women have more bargaining power in all rounds, on average. The index rp^f increases from .523, if women do not receive any banknote, to .632 when they are allocated all the money, and remains significantly higher than .5 (at the 10% level – *p*-values < .077 for rounds 1, 2, and 3) if they receive at least as many banknotes as their male partners.

The variation of the female relative bargaining power with the female relative resource allocation is further investigated conditional on various background characteristics of the couple. The main variable of interest is the relative allocation, measured as ra^f = (# banknotes the wife receives)/4. Hence, ra^f varies from 1 (she receives all 4 banknotes, her partner none) to 0 (she receives none, her partner all).

The basic estimation equation for our panel of couple decisions reads:

$$rp^f_{nk} = \beta_0 + \beta_1 ra^f_{nk} + \beta_2 SEF_n + \beta_3 DF_n + \varepsilon_{nk} \quad (3)$$

SEF is a vector of socio-economic factors, *DF* represents intra-couple division factors, and ε_{nk} is an idiosyncratic error term.[8]

This estimation procedure corresponds technically to the estimation of the sharing rule equation in the collective model. However, as outlined above, the direct observation of couples' decisions offers many advantages and allows us to estimate Equation (3) in a more flexible way than existing studies are able to: First, econometric studies with traditional survey data usually estimate the collective sharing rule in a two-step procedure, with coefficients calculated from the estimates of labor supply equations. By the design of our experiment, we are able to estimate the bargaining power directly. Secondly, we can identify the complete sharing rule, not only up to an additive constant, which is the limitation of most structural econometric model approaches. Finally, we do not have to impose restrictions on the couples' behavior such as caring preferences, or even egoism, as is typically done.

The estimation results in Table 3 confirm that the female bargaining power increases significantly with the woman's relative resource allocation. An estimated coefficient of .114 indicates that an increase of the woman's income share ra^f from 0 to 1 leads to a rise of .114 points in bargaining power rp^f. The parsimonious Model 1 is extended by controlling for socio-demographic characteristics in Model 2, the inclusion of distributional covariates in Model 3, and a test-design variable in Model 4.

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[7] rp^f can take 13 values: 0, 1/5, 1/4, 1/3, 2/5, 3/7, 1/2, 4/7, 3/5, 2/3, 3/4, 4/5, or 1.

[8] ra^f can be interpreted as the "time" or round fixed effect. ra^f does not vary across couples, and the individual characteristics do not vary across rounds.
We do not introduce interactions of any kind, as the number of explanatory variables is limited by the small sample size.

The regression analysis of Model 2 reveals that the power index is positively related to the number of children in the household and being a high-income household. The woman's age and the man's education level both have a negative impact.[9] When further investigating the determinants of bargaining power by introducing division facts (Model 3), we learn that unequal sharing of the partners' time devoted to paid and unpaid work proves to be a valid statistical predictor beyond the absolute level of income. As expected, a lower female power index is observed in more traditional households, i.e. when the man is the main earner, has more working hours, and/or the woman does most of the housework. Each of these three factors is statistically significant. On the contrary, the duration of the relationship does not seem to determine the female's relative bargaining power.

To ensure that our results are not driven by the experimental design, we check the impact of the round order in the voucher task (see Model 4 in the last column). In 4 of 7 experimental sessions, the female partner was allocated the lot of banknotes first (after starting with a round of symmetric allocation: Round order 1 in Table 1). In the remaining sessions, we inverted the round order so that the men received all the banknotes first (Round order 2 in Table 1). We do not observe a systematically different female power index between the two sets of sessions. Hence, rank order or anchoring effects seem of minor importance and do not alter the main result of resource allocation determining power.

Note that our regression analysis ignores all couples where the female and male partners reveal the same individual preferences because we are not able to draw conclusions regarding the sharing of these couples. This is why the number of couples is reduced to 79. As a robustness check, we performed estimations considering all couples by setting rp^f to 0.5 for those in which the female and male revealed the same preferences. Estimation results barely change.

5. Behavioral determinants of bargaining power

To examine further factors determining the female power index, we exploit rarely available information on intra-couple behavior and attitudes collected in the post-experimental questionnaire. Our extended estimation equation reads:

$$(4) \qquad rp_{nk}^{f} = \beta_0 + \beta_1 ra_{nk}^{f} + \beta_2 SEF_n + \beta_3 DF_n + \beta_4 BDF_n + \varepsilon_{nk},$$

now including also a vector of behavioral and distributional factors *BDF*.

In addition to the flexibility feature of Equation (4) discussed in the former section, our analysis is preferable to a common structural estimation of the income sharing rule equation in collective-model settings, as we have richer information compared to the available data sets. We include the participants' responses to questions on self-assessed selfishness, traditional values, and attractiveness (for summary statistics, see Table 4).

Our aim here is to investigate specific gender effects related to these characteristics, usually unobserved, and thereby increase the explanatory power of the couples' decision model. We introduce the female and male values separately, plus the female/male partners' interaction for each of the three variables to control

[9] Male and female education is highly correlated, while the interaction of "male and female have high education" does not prove statistically significant. We use male education due to its higher standard deviation.

for the within-couple correlation: We estimate six additional equations in total (Models 5 to 7 in Table 5).[10]

We observe that women who report selfish behavior, i.e. they answer willing to spend more money on themselves if their individual wage increases while total household income remains constant, are more likely to end up with higher bargaining power according to the point estimate, though not statistically significant at conventional levels. In contrast, male selfishness has negative impact. When both partners report selfish behavior, female bargaining power increases significantly. In the questionnaire, we also posed the symmetric question, i.e. whether the participants would spend less money on themselves if their personal wage income decreased while total household income remained constant (selflessness). Although economic models would predict symmetric effects for positive and negative income shocks, the Pearson correlation coefficient of the participants' answers to both questions is below .5. If we introduce the selflessness instead of the selfishness variable in the estimation equations (Models 5a and 5b in Table 5), we observe some differences between the estimates; e.g. selfless women have significantly more bargaining power. However, the general picture of selfishness and selflessness in relation to bargaining power is similar.[11] Traditional values are strongly related to female bargaining power too. Women who favor a traditional role model tend not to enforce their own preferences, and hence diminish their say in joint consumption decisions, while the reverse is true for men. This finding is perfectly consistent with the behavior of de facto traditional couples, as indicated by the distribution factors "work division" in section 4.

The inclusion of behavioral factors leads to a sharp increase in the explanatory power of the model, from .080 up to .109. $\chi^2(2)$-values for *F*-tests (individual and cross characteristics are simultaneously equal to zero) are at least 13.31. This is in contrast to experimental studies on interactive decisions when participants are matched randomly (Cooper et al. 2014). Our result is particularly true when accounting for the impact of attractiveness. Each participant was asked to assess his or her attractiveness to other potential partners. This variable is a typical example of an "extra-household-environmental parameter" that determines the partners' outside options to the present relationship, without having any impact on preferences (see for example McElroy, 1990). The female self-rated attractiveness significantly increases her bargaining power, independently from the attractiveness of her partner. On the contrary, sole male attractiveness does not seem to have any significant impact on the intra-household bargaining (Models 7a and b in Table 5). This result is consistent with theoretical and empirical findings (see for example Chiappori et al., 2012 for the effect of body mass index – BMI – on matching on the marriage market). However, we would like to highlight that we use a rarely available variable of subjective and general attractiveness (in analogy to an item in the German panel on families, PAIRFAM) instead of an anthropometric measure such as the BMI.

6. Interpretation in terms of household models

Beyond the raw results on consumption decisions and bargaining power in our data, in this section we will interpret our data in light of the theoretical household frameworks applied in the literature. The advantages of using structural models when investigating household behavior should not be neglected. They offer the

[10] The female and male values of the three variables are highly correlated. Proceeding in this way, we are able to disentangle the specific gender effects separately.

[11] We will not comment further on the asymmetric results of the two measures, as this is beyond the goal of our study.

possibility of performing estimations, making predictions, and, most importantly, testing for restrictions (e.g. Slutsky symmetry in the unitary model). This way, the model can eventually be rejected empirically. However, structural models subject all participants in the sample to the same corset. Even if the model's testable restrictions are empirically acceptable, and part of the heterogeneity among subjects is captured by shift operators (through socio-demographic characteristics, distribution factors, etc.), a significant proportion of the sample may be better represented by an alternative model. The usual data structure takes the whole sample to discriminate between models, and thereby does not allow distinguishing between sub-samples to determine which model would fit best.

In contrast to usual data, we observe the individual preferences of each spouse directly as well as the couples' joint decisions for different income distributions between the spouses. Hence, we are able to diagnose which model best describes each couple's behavior. Nonetheless, we are interested in the model that best captures the sample's heterogeneity, and best matches with the observations of the whole sample.

Thus, we propose a dual exercise. We first classify the couples' observed decisions according to the general assumptions of the usual household models. That is, we sort the couples depending on whether their decision scheme is "unitary," "dictatorial," "non-cooperative," or "bargaining" (this includes "collective" and "Nash bargaining"). Then, we predict the decisions and bargaining power for the whole sample with each model separately (plus the semi-cooperative model by d'Aspremont & Dos Santos Ferreira, 2014), and check whether the different models are able to depict the real (experimental) data and produce an acceptable representation of our sample.

6.1 Model typology of the couples

To classify the couples according to the household model that best represents their decision pattern, we first make a distinction between income-pooling and non-pooling couples. Income-pooling couples are those who decide to spend the same number of banknotes on each shop across all five rounds (see Beblo & Beninger, 2015 for details). In other words, the female bargaining power index rp^f remains constant across rounds (see Table 6). Within this sub-category, we distinguish between dictatorial and unitary-like behavior. In the dictatorial case, the couple decisions match exactly with the individual female or male preferences. We define unitary-like behavior as non-changing couple decisions over the rounds, but with differences in the female and male preferences.[12]

If the consumption decisions differ across rounds, i.e., the couple is not pooling the spouses' resources, we further distinguish between non-cooperative and bargaining-like behavior. In the non-cooperative setting, each spouse decides on her consumption expenditures solely according to her own preferences, subject to the budget she is allocated. This means that if the female receives all the banknotes (Round 1), the couple's decisions correspond to the female preferences.[13] The couple has a bargaining-like behavior if the female bargaining

[12] Note that we consider the unitary model in a strict way: (i) The dictatorial model is a special case of the unitary model, and (ii) We suppose that the preferences in the unitary setting do not depend on income-related variables. We do not consider "distribution factor dependent unitary models" (in Browning et al., 2006's household models taxonomy).

[13] r_1^f, r_2^f, r_3^f, r_4^f and r_5^f should theoretically take the values 1, .75, .5, .25, and 0. However, this may not be the case empirically, because of the limited set of possible decisions in our experiment.

power decreases from Round 1 to Round 5, and the couple decisions are different from individual choices, except in Round 1 – when they match the female's – *or* in Round 5 – the male's.

Using the classification system and characteristics described above, we see from Table 7 that the bargaining couples form the largest group (39 out of 79). The female bargaining power decreases on average, though not monotonically, from the round she receives all the banknotes to the round she does not receive any. Surprisingly, a total of 27 couples show dictatorial behavior, with more women than men (17 vs. 10) among this group.

Overall, the sample is characterized by very heterogeneous behaviors. In particular, it is quite balanced between non-poolers and income-pooling couples, which makes it difficult to choose a specific household model to represent the whole sample.

6.2 Predictions of female bargaining power within household models

Our experimental data offer the opportunity to validate or reject the most commonly used household models. For this purpose, we take our data as the "real world" and corset it into the structures of the models. Based on estimates of the individual and couple preferences, we predict the consumption decisions and female bargaining power for each model. We then test the quality of the predictions.

For this exercise, we consider the following household frameworks:

- Dictator setting: Spouse *i* decides on the couple's consumption bundle:

(5) $\max U^c = \max U^i = \max U^i\left(c^{nc};d\right)$ s.t. $c^{nc}=4$ if *i* is the dictator

where U^c and U^i are the couple and individual utility functions, respectively, and *d* is a vector of socio-demographic variables.

- Unitary setting: The couple decides on its preferred consumption bundle as a single unit:

(6) $\max U^c = \max U^c\left(c^{nc};d\right)$ s.t. $c^{nc}=4$

- Collective setting: The couple maximizes the weighted individual utility, where the Pareto-weights represent the sharing rule:

(7) $\max U^c = \max\left\{rp^f U^f\left(c^{nc};d\right)+\left(1-rp^f\right)U^m\left(c^{nc};d\right)\right\}$ s.t. $c^{nc}=4$,

where rp^f is the female bargaining power, which depends on socio-demographics and the female relative allocation: $rp^f = rp^f\left(d;ra^f\right)$.

- Nash bargaining setting: The couple minimizes the joint loss of common decisions regarding the dictatorial choices. Thus, the sharing rule is defined by the joint loss function:

(8) $\max U^c = \min\left\{\left(U^f\left(c^{nf};d\right)-U^f\left(c^{nc};d\right)\right)\cdot\left(U^m\left(c^{nm};d\right)-U^m\left(c^{nc};d\right)\right)\right\}$ s.t. $c^{nc}=4$

- Non-cooperative setting: Each spouse decides independently to spend the banknotes she is allocated according to her preferences:

(9)
$\left\{\max U^f = \max U^f\left(c^{nf};d\right)\right.$ s.t. $c^{nf}=k$; $\left.\max U^m = \max U^m\left(c^{nm};d\right)\right.$ s.t. $\left.c^{nm}=4-k\right\}$

Therefore, the female bargaining power may not be strictly steadily decreasing from Round 1 to Round 5 for some couples, taking for example values (1, 1, .5, 0 and 0).

We perform estimations for three utility functions: the unitary equation (6), and both individual utility equations $U^{i=f,m}$. For their parametric specification, we use an LES-function with fixed demand elasticity: $U^{i=c,f,m} = \sum_{X=FS,CS,EE} \alpha_X^i \ln\left(c_X^{ni}+1\right)$. Estimation results are displayed in Table 8.

We use the estimates of the utility functions and model characterizations from Equations (5) - (9) to predict the female bargaining power separately for each model. For the dictatorial models, the power is set to 1 or 0, depending on whether the female or male is the dictator: $\overline{rp}^f_{dcf} = 1$, $\overline{rp}^f_{dcm} = 0$. For the unitary model, defining a bargaining power does not make sense a priori. However, we use the predictions regarding both individual and couple decisions to observe whether the joint choices are closer to the female or male preferences of the man or the woman. We can thus use an identical distance measure as in Equation (1) to define a unitary female bargaining power index as in Equation (2), $\overline{rp}^f_{uni}$. The female bargaining power in the non-cooperative setting, $\overline{rp}^f_{nco}$, is defined in a similar way:

$$\overline{rp}^f_{M=uni,nco} = \bar{d}^f_M \Big/ \left(\bar{d}^f_M + \bar{d}^m_M\right) \tag{10}$$

As already set forth in the setting descriptions, the definition of the female bargaining power is set by the loss function in the Nash bargaining case:

$$\overline{rp}^f_{nas} = \frac{\ln\left(\overline{U}^f\left(c^{nf}\right) - \overline{U}^f\left(c^{nc}\right)\right)}{\ln\left(\overline{U}^f\left(c^{nf}\right) - \overline{U}^f\left(c^{nc}\right)\right) + \ln\left(\overline{U}^m\left(c^{nm}\right) - \overline{U}^m\left(c^{nc}\right)\right)} \tag{11}$$

where $\overline{U}(c)$ is the predicted level of utility reached for consumption bundle *c*. By contrast, the collective female bargaining power $\overline{rp}^f_{col}$ cannot be calculated directly from the model settings, as the couples' sharing rule is unknown. In empirical papers, it is typically derived from the model estimates in a two-step procedure. In our case, we can directly compute it since we observe both individual spouses' and couples' decisions in solving equations (12):

$$\begin{cases} \overline{rp}^f_{col} = \left(\rho^f\right)^\beta \\ \left(\rho^f\right)^\beta + \left(\rho^m\right)^\beta = 1 \\ \rho^i = \dfrac{\overline{U}^i\left(c^{ni}\right) - \overline{U}^i\left(c^{nc}\right)}{\overline{U}^i\left(c^{ni}\right) - \min U^i\left(c^{ni}\right)} \end{cases} \tag{12}$$

where ρ and β are the relative utility, and the convexity factor of the couple's Pareto-frontier at the couple's choice. $\min U(c)$ is the minimum utility by any consumption bundle (see Figure 3 for an illustration).

The summary statistics on actual and predicted female bargaining power are given in Table 9. We may not be surprised that the dictator models predict worse, even in Rounds 1 and 5, when the wife or the husband receives all the banknotes. Hence, the dictator models are clearly rejected to represent the whole sample ($\chi^2(6) = 10.42$ – *Chi-square*-test on: "actual and model-predicted bargaining power means across rounds are the same"),[14] although one spouse is observed to behave as a dictator in more than a quarter of the couples. The non-cooperative setting is equally weak in predicting the couples' decisions in our experiment ($\chi^2(6) = 6.22$). The other models do quite well in predicting the bargaining power at the mean. However, by definition, the unitary model does not capture the variations across rounds. Even though it cannot be fully rejected (at the 10%-level, $\chi^2(6) = 3.12$), the unitary model does not seem to be the best candidate in representing couple behavior in general. Neither is the Nash bargaining model, as it systematically over-estimates the female bargaining power ($\chi^2(6) = 3.00$). The best setting among those proposed is the collective model, although it fails to convincingly predict the female bargaining power when the banknotes are equally allocated between the spouses, or when the man receives all the banknotes (Rounds 3 and 5). However, the collective model cannot be rejected by any test, based on the distributions of the actual and predicted female bargaining power, or on the estimates of the female bargaining equation ($\chi^2(6) = 2.43$).[15] Finally, we introduce the semi-cooperative model proposed by d'Aspremont & Dos Santos Ferreira (2014). We calibrate the in-couple degree of co-operation θ from the distributions of the actual, predicted non-cooperative and collective female bargaining powers. The calibration procedure offers the best fit for the female bargaining power among all models investigated. We must note that the degree of cooperation within couples is high: $\theta = .911$ within the interval between 0 and 1. This means that the couples behave almost "collectively" on average, although some show non-cooperative behavior.

7. Conclusions

In this paper, we provided insights into the mechanisms of intra-couple decision-making beyond the existing literature. Where structural econometric models of the household rely on observed spouses' incomes and labor supplies or consumption at the household level, our experiment enables us to manipulate the bargaining situation between partners with full information on individual incomes and spending. Our experimental design allows us to derive an empirical index of female bargaining power directly from the participants' behavior by comparing individual preferences of each spouse for a set of private goods with the mutual decisions of both partners when the resource allocation between them varies. We observe this index to increase significantly with the female partner's money allocation. We identify the woman's age, the man's education, having children, the work division of the couple (both as a role model and in practice), cooperation and selfishness measures, as well as the partners' attractiveness as an extra-household environmental parameter, hence as additional important determinants for female bargaining power. When matching our experimental data with a number of commonly used structural model settings, a semi-cooperative approach provides the best predictions for female bargaining power. As the degree of in-couple

[14] The presented test results are based on the suitability of fit of the female bargaining power. Tests on the suitability of fit of the consumption decisions yield very similar results.
[15] We performed an estimation of the predicted female bargaining power indices, similar to Equations (3) and (4).

cooperation is high, the semi-cooperative model is close to a collective one, which cannot be rejected either. Although even the unitary setting cannot be fully rejected with our data, the bargaining weight predictions and subsequent tests confirm the role of allocative empowerment. Overall, the couples in our experiment are very heterogeneous in the way they make joint decisions, as every household model is able to match with the behaviors of at least a few couples. Even the dictatorial settings, although clearly rejected by the empirical test, match more than a quarter of the couples.

It goes without saying that our approach shares many of the caveats that usually apply to laboratory experiments: synthetic environment, small stakes, and small number of participants. However, due to the artefactual field nature of our experiment and the heterogeneity of our sample, we argue that there is no reason to dispute the external validity of our results. The decisions to be made in the experiment were very close to situations in the participants' real lives. We investigated consumption choices made for additional unearned income and may well have captured the true behavior of the participating couples regarding their spending habits with this type of income. We can state that if non-standard subjects—namely, established couples of all ages and socio-economic backgrounds who are positively selected in terms of satisfaction with their relationship—exhibit unambiguous economic bargaining behavior when interacting in a familiar environment as a couple, we may well expect to observe this behavior within the average population.

References

Apps, P. F. & Rees, R. (1988). Taxation and the household. *Journal of Public Economics* 35, 355-369.

Ashraf, N. (2009). Spousal control and intra-household decision making: An experimental study in the Philippines. *American Economic Review* 99, 1245-1277.

Beblo, M. & Beninger, D. (2015). Do husbands and wives pool their incomes? A couple experiment. *Discussion Paper* 28, Harriet Taylor Mill Institut, Berlin. *Review of Economics of the Household*. Advance online publication. doi:10.1007/s11150-016-9342-0.

Bobonis, G. J. (2009). Is the allocation of resources within the household efficient? New evidence from a randomized experiment. *Journal of Political Economy*, 117(3).

Bonke, J. & Browning, M. (2010) Allocation of expenditures within the household: A new Danish survey. *Fiscal Studies* 30, 461-481.

Bourguignon, F., Browning, M. & Chiappori, P.-A. (2009). Efficient intra-household allocations and distribution factors: Implications and identification. *Review of Economic Studies* 76, 503-528.

Browning, M., Bourguignon, F., Chiappori, P.-A. & Lechene, V. (1994). Incomes and outcomes: a structural model of intra household allocations. *Journal of Political Economy* 102, 1067-1096.

Browning, M. & Chiappori, P.-A. (1998). Efficient intra household allocations: A general characterization and empirical tests. *Econometrica* 66, 1241-1278.

Browning, M., Chiappori, P.-A. & Lechene, V. (2006). Collective and unitary models: A clarification. *Review of Economics of the Household* 4(1), 5-14.

Cherchye, L., De Rock, B. & Vermeulen, F. (2012). Married with children: A collective labor supply model with detailed time use and intrahousehold expenditure information. *American Economic Review* 102(7), 3377-3405.

Chiappori, P.-A. (1988). Rational household labor supply. *Econometrica* 56, 63-89.

Chiappori, P.-A. (1992). Collective labor supply and welfare. *Journal of Political Economy* 100, 437-467.

Chiappori, P.-A. & Ekeland, I. (2009). The micro economics of efficient group behavior: Identification. *Econometrica* 77, 763-799.

Chiappori, P.-A, Fortin, B. & Lacroix, G. (2002). Household labor supply, sharing rule and the marriage market, *Journal of Political Economy*, 110(1), 37-72.

Chiappori, P-A., Oreffice, S. & Quintana-Domeque, C. (2012) Fatter attraction: anthropometric and socioeconomic matching on the marriage market. *Journal of Political Economy* 120(4), 659-695.

Cooper, D. A., Connolly, T. & Kugler, T. (2015). Lay personality theories in interactive decisions: Strongly held, weakly supported. *Journal of Behavioral Decision Making* 28, 201–213.

d'Aspremont, C. & Dos Santos Ferreira, R. (2014). Household behavior and individual autonomy: an extended Lindahl mechanism. *Economic Theory* 55(3), 643-664.

Harrison, G. & List, J. (2004). Field experiments. *Journal of Economic Literature* 152, 1009-1055.

Hardie, J. H., Geist, C. & Lucas, A. (2014). His and hers: Economic factors and relationship quality in Germany. *Journal of Marriage and Family* 76, 728-743.

Lundberg, S. & Pollak, R. A. (2008). Family decision making. In S.N Durlauf & L.E. Blume (Eds.), *The New Palgrave Dictionary of Economics Online*.

Manser, M. & Brown, M. (1980). Marriage and household decision making. *International Economic Review* 21, 31-44.

Martin, J. M., Gonzalez, C., Juvina, I & Lebiere, C. (2014). A description–experience gap in social interactions: Information about interdependence and its effects on cooperation. *Journal of Behavioral Decision Making* 27, 349–362.

McElroy, M. B. (1990). The Empirical Content of Nash-Bargained Household Behavior *The Journal of Human Resources* 25(4), 559-583.

McElroy, M. B. & Horney, M. J. (1981). Nash bargained household decisions. *International Economic Review* 22, 333-349.

Robinson, J. (2012). Limited insurance within the household: Evidence from a field experiment in Kenya. *American Economic Journal: Applied Economics 4*, 140-164.

Schaner, S. (2015). Do opposites detract? Intrahousehold preference heterogeneity and inefficient strategic savings. *American Economic Journal: Applied Economics* 7(2), 135-74.

Tables

Table 1: Resource allocation within the couple

Order 1 (Sessions 1-4)			Order 2 (Sessions 5-7)		
Round	Fem. allocation (# banknotes)	Male allocation (# banknotes)	Round	Fem. allocation (# banknotes)	Male allocation (# banknotes)
1	2	2	1	2	2
2	4	0	2	0	4
3	3	1	3	1	3
4	1	3	4	3	1
5	0	4	5	4	0

Note: The table shows the allocation of the four banknotes between spouses across rounds.
For practical reasons, we organized seven sessions in total, with 15 participating couples each. The sessions were all identical with the exception of the order of the resource allocation across rounds. To control for a potential impact of the order, we allocated the partners in sessions 1 to 4 as indicated on the left-hand side of the table. The right-hand side shows the order for sessions 5 to 7.

Table 2: Comparison of separate individual decisions and joint couple decisions

Average number of banknotes dedicated to…		Fashion/Sports	Cosmetics	Electronics
Individual female partner's decisions		1.8	0.6	1.6
Individual male partner's decisions		1.9	0.4	1.7
Within-couple difference		1.0***	0.6***	1.1***
Joint couple decisions				
# banknotes *f*	# banknotes *m*			
4	0	1.8	0.4	1.7
3	1	1.9	0.4	1.7
2	2	1.7	0.5	1.8
1	3	1.6	0.5	1.9
0	4	1.6	0.5	1.9
Number of couples…				
… spending all banknotes on this store at maximum female allocation		18	2	18
… spending all banknotes on this store at maximum male allocation		13	4	22
… with same choices for both partners		16		

Notes: The table shows the individual consumption choices of the partners as well as the couple decisions across rounds. N=95.
*** indicates a statistically significant difference at the 5 percent level for the within-couple decisions. *p*-values from *t*-tests for "partners make same choices" are all three infinitesimal.

Table 3: Linear regression of the female power index (with adjusted robust standard errors for correlated panels)

	Model 1		Model 2		Model 3		Model 4	
	Coef.	Std.err.	Coef.	Std.err.	Coef.	Std.err.	Coef.	Std.err.
Female relative allocation	**.114**	**.023**	**.114**	**.023**	**.114**	**.023**	**.114**	**.023**
Socio-economic factors, SF								
Female age / 100			**-.362**	**.190**	**-.413**	**.182**	**-.416**	**.179**
Number of children			**.087**	**.009**	**.052**	**.014**	**.052**	**.015**
Duration of relationship / 100			-.178	.217	.060	.227	-.066	.221
College/university degree, male (0/1)			**-.104**	**.007**	**-.108**	**.008**	**-.109**	**.008**
High-income household (0/1)			**.083**	**.035**	.058	.36	.058	.035
Division factors, DF								
Male has higher earned income (0/1)					-.013	.019	-.011	.020
Difference in working hours / 100, m - f					**.231**	**.056**	**.226**	**.065**
Female does more housework (0/1)					**-.046**	**.021**	**-.047**	**.021**
Round order 1 – see Table 1 (0/1)							.014	.025
Constant	**.510**	**.014**	**.663**	**.052**	**.690**	**.055**	**.682**	**.063**
No. of observations	395		395		395		395	
No. of couples	79		79		79		79	
R-squared	.010		.061		.080		.080	

Note: The number of couples with distinct individual preferences is 79, each of which was observed five times (in each round). Bold coefficients indicate a significance level of at least 5%.

Table 4: Characteristics of the experimental sample

	Mean	Std. dev.	Min	Max
Female relative allocation	.500	.354	0	1
Female age	40.2	15.9	18	77
Number of children living in household	.42	.787	0	3
Duration of relationship (years)	12.5	13.7	1	47
College/university degree, female (0/1)				
College/university degree, male (0/1)	.463			
High-income household (0/1)	.337			
Male has higher earned income (0/1)	.484			
Difference in working hours, m - f	6.02	25.3	-55	68
Female does more housework (0/1)	.442			
Female satisfaction with relationship				
Male satisfaction with relationship				
Female reports selfish behavior (0/1)	.484			
Male reports selfish behavior (0/1)	.463			
Both report selfish behavior (0/1)	.305			
Female reports traditional values (0/1)	.200			
Male reports traditional values (0/1)	.221			
Both report traditional values (0/1)	.105			
Female self-assesses attractiveness (0/1)	.432			
Male self-assesses attractiveness (0/1)	.442			
Both self-assess attractiveness (0/1)	.242			
Female receives all banknotes in Round 2 (4 sessions from 7), (0/1)	.568			
N	95			

Note: The indicator variables "Male has higher earned income" and "Female does more housework" have a "roughly equal" option included in the zero value.

Table 5: Linear regression of the female power index (with adjusted robust standard errors for correlated panels)

	Model 5a		Model 5b		Model 6a		Model 6b		Model 7a		Model 7b	
	Coef.	Std.err.	Coef.	Std.err.	Coef.	Std.err.	Coef.	Std.err.	Coef.	Std.err.	Coef.	Std.err.
Female relative allocation	**.114**	**.023**	**.114**	**.023**	**.114**	**.023**	**.114**	**.023**	**.114**	**.023**	**.114**	**.023**
Socio-economic factors, SEF	YES		YES		YES		YES		YES		YES	
Division factors, DF	YES		YES		YES		YES		YES		YES	
Behavioral/distribution factors, BDF												
Female reports selfish behavior (0/1)	.63	.040										
Male reports selfish behavior (0/1)			-.029	.034								
Both report selfish behavior (0/1)	.45	.074	**.109**	**.034**								
Female reports traditional values (0/1)					**-.094**	**.030**						
Male reports traditional values (0/1)							**.202**	**.018**				
Both report traditional values (0/1)					-.038	.044	**-.296**	**.036**				
Female self-assesses attractiveness (0/1)									**.132**	**.015**		
Male self-assesses attractiveness (0/1)											-.021	.057
Both self-assess attractiveness (0/1)									.023	.023	**.130**	**.065**
Constant	**.658**	**.051**	**.696**	**.077**	**.726**	**.058**	**.696**	**.054**	**.656**	**.051**	**.673**	**.066**
No. of observations	395		395		395		395		395		395	
No. of couples	79		79		79		79		79		79	
R-squared	.090		.086		.092		.109		.106		.093	

Note: 79 couples have distinct individual preferences and each of them is observed five times (in each round). Bold coefficients indicate a significance level of at least 5%.

Table 6: Model-typology of the couples

Model	Condition on consumption choices	Condition on fem. bargaining power
Pooling	$c^{nc}_{1X(X=FS,CS,EE)} = c^{nc}_{2X} = ...c^{nc}_{5X}$	$rp^f_1 = rp^f_2 = ...rp^f_5$
Dictator, female	$c^{nc} = c^{nf}$	$rp^f = 1$
Dictator, male	$c^{nc} = c^{nm}$	$rp^f = 0$
Unitary		$0 < rp^f < 1$
Non-pooling		$1 \geq r^f_1 \geq r^f_2 \geq ...r^f_5 \geq 0$
Non-cooperative	$c^{nc}_1 = c^{nf}; c^{nc}_5 = c^{nm}$	$r^f_1 = 1; r^f_5 = 0$
Bargaining		$1 > r^f_1 \geq r^f_2 \geq ...r^f_5 > 0$ (possibly: $r^f_1 = 1 \, or \, r^f_5 = 0$)

Note: We do not distinguish further within the bargaining models family due to data limitations. However, we introduce different bargaining models in Section 6.2.

Table 7: Actual average female bargaining power index (rp^f) by rounds and household type

	# obs	# banknotes (female : male)					mean
		(4 : 0)	(3 : 1)	(2 : 2)	(1 : 3)	(0 : 4)	
All	79	.632	.578	.588	.513	.523	.567
Pooling	36						.602
Dictator, female	17						1
Dictator, male	10						0
Unitary	9						.519
Non-pooling	43	.657	.559	.576	.438	.456	.537
Non-cooperative	4	1	.667	.75	.25	0	.533
Bargaining	39	.622	.547	.558	.457	.503	.538

Note: We do not consider the 16 couples with the same individual preferences, as it is impossible to classify them.

Table 8: Estimates of the utility equations

	Men		Women		Couples	
	Coeff.	Std. err.	Coeff.	Std. err.	Coeff.	Std. err.
# banknotes for fashion/sports, interaction with…						
Constant	1.720	3.30	.126	3.06	-1.91	1.30
Female relative allocation	-	-	-	-	.182	.571
Male age	.0812	.0715	-	-	-	-
Female age	-	-	.113	.076	.200	.033
Number of children in household	-.0045	1.03	-1.09	.877	-1.12	.395
Duration of relationship (years)	.0199	.096	-.035	.092	-.091	.041
University degree, male (0/1)	.554	1.25	-	-	-2.17	.477
University degree, female (0/1)	-	-	.340	1.19	-	-
Male higher earned income (0/1)	.012	1.17	1.26	1.08	-.290	.461
High-income household (0/1)	-4.35	1.30	-2.13	1.16	-2.62	.530
Difference in empl. hours, m - f	.038	.024	-.017	.023	.0156	.010
Female more housework (0/1)	-.410	1.18	.560	1.06	-.131	.466
Male cooperates (0/1)	-2.13	1.19	-	-	-	-
Female cooperates (0/1)	-	-	-4.95	1.05	-3.13	.431
Male reports selfish beh. (0/1)	.690	1.147	-	-	-.340	.454
Female reports selfish beh. (0/1)	-	-	.003	1.03	-	-
Male reports trad. values (0/1)	-.319	.661	-	-	-.270	.261
Female reports trad. values (0/1)	-	-	-.149	.633	-	-

(Continued on next page)

Table 8: Estimates of the utility equations (continued)

	Men		Women		Couples	
	Coeff.	Std. err.	Coeff.	Std. err.	Coeff.	Std. err.
# banknotes for electronics, interaction with…						
Constant	3.55	3.15	2.07	2.82	1.27	1.27
Female relative allocation	-	-	-	-	-.194	.567
Male age	.039	.061	-	-	-	-
Female age	-	-	.002	.058	.116	.028
Number of children in household	.242	.946	-.848	.864	-.865	.386
Duration of relationship (years)	.00005	.082	.034	.075	-.048	.036
University degree, male (0/1)	-1.12	1.20	-	-	-2.67	.469
University degree, female (0/1)	-	-	.321	1.13	-	-
Male higher earned income (0/1)	-.108	1.14	1.21	1.03	-.203	.455
High-income household (0/1)	-3.48	1.21	-1.57	1.11	-2.39	.507
Difference in empl. hours, m - f	.052	.024	-.015	.022	.021	.009
Female more housework (0/1)	-1.37	1.12	.879	1.02	-.348	.459
Male cooperates (0/1)	-1.95	1.18	-	-	-	-
Female cooperates (0/1)	-	-	-4.80	1.02	-2.68	.431
Male reports selfish beh. (0/1)	1.10	1.13	-	-	-.169	.455
Female reports selfish beh. (0/1)	-	-	.137	1.01	-	-
Male reports trad. values (0/1)	-.196	.634	-	-	-.419	.262
Female reports trad. values (0/1)	-	-	.0706	.592	-	-

(Continued on next page)

Table 8: Estimates of the utility equations (continued)

	Men		Women		Couples	
	Coeff.	Std. err.	Coeff.	Std. err.	Coeff.	Std. err.
# banknotes for cosmetics, interaction with…						
Constant	1.92	2.65	.418	2.52	-1.32	1.14
Female relative allocation	-	-	-	-	-.150	.518
Male age	.022	.052	-	-	-	-
Female age	-	-	.030	.053	.115	.024
Number of children in household	.166	.833	-.860	.789	-.423	.361
Duration of relationship (years)	.064	.072	.029	.070	-.044	.032
University degree, male (0/1)	.015	1.01	-	-	-2.98	.439
University degree, female (0/1)	-	-	-.282	1.01	-	-
Male higher earned income (0/1)	-.523	.960	.205	.934	-.906	.418
High-income household (0/1)	-2.57	1.04	1.43	1.01	-1.56	.475
Difference in empl. hours, m - f	.033	.020	-.003	.020	.018	.009
Female more housework (0/1)	-.458	.948	.419	.906	.243	.416
Male cooperates (0/1)	-1.97	.994	-	-	-	-
Female cooperates (0/1)	-	-	-4.61	.912	-2.96	.403
Male reports selfish beh. (0/1)	1.21	.964	-	-	1.178	.426
Female reports selfish beh. (0/1)	-	-	.715	.893	-	-
Male reports trad. values (0/1)	-.665	.546	-	-	-.410	.240
Female reports trad. values (0/1)	-	-	-.022	.526	-	-
N	1410		1410		7110	
Pseudo R-squared	0.2257		0.1875		0.2388	

Notes: One couple was dropped in the estimation procedure.
There are 15 alternatives to spend 4 banknotes in three shops.
A total of 94 (fe)male participants and a choice set with 15 possible alternatives results in 1,410 observations of individual men and women. A total of 94 couples, 15 possible alternatives, and 5 decision rounds results in 7,110 observations of couples. The dependent variable is the dichotomous variable of choice made: it takes a value of 1 if the choice corresponds to the alternative in the choice set, and takes a value of 0 for all other 14 alternatives. Explanatory variables are the three-dimensional vectors that give, for each alternative, the number of banknotes spent on electronics, fashion and sports, or cosmetics plus their interactions with all controls used in models 5 to 7 in Table 5.

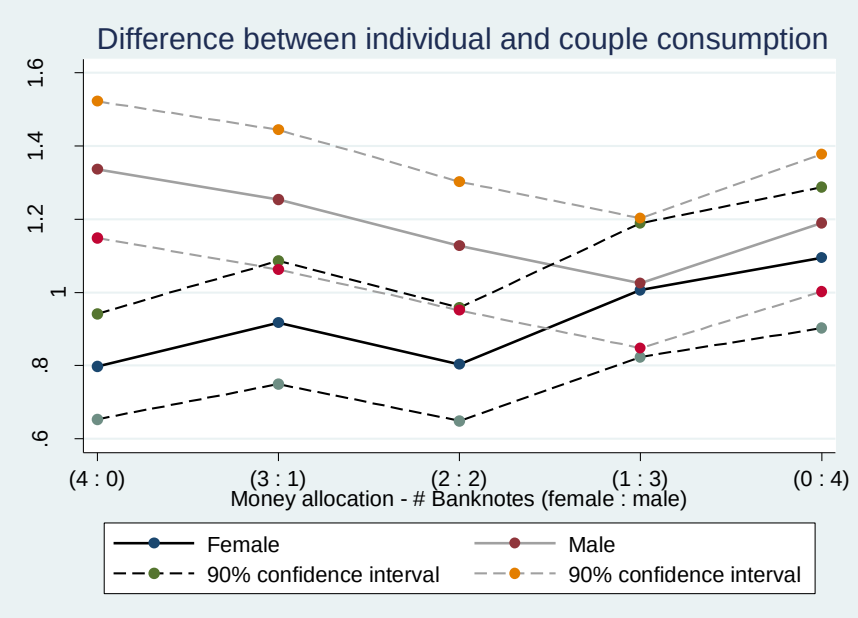
Table 9: Predicted average female bargaining power indices ($\overline{rp}^{f}$) over rounds for different household models

	# obs	# banknotes (female : male)					mean
		(4 : 0)	(3 : 1)	(2 : 2)	(1 : 3)	(0 : 4)	
Actual rp^{f}	79	.632	.578	.588	.513	.523	.567
Dictator, female	74						1
Dictator, male	74						0
Unitary	74						.589
Collective	74	.639	.594	.629	.534	.570	.593
Nash-bargaining	74	.633	.625	.647	.555	.571	.589
Non-cooperative	74	1	.713	.453	.265	0	.486
Semi-cooperative	74	.677	.611	.607	.509	.513	.583

Note: The number of observations is 74, as 21 couples are predicted to make the same individual choices when predicting individual consumption decisions.

Figures

Figure 1: Mean absolute difference between individual and couple choices across rounds



Reading example: Absolute difference = 1 means that 3 voucher choices overlap (i.e., have been chosen for the same stores) by the couple and the individual spouse.

Figure 2: Female relative bargaining power

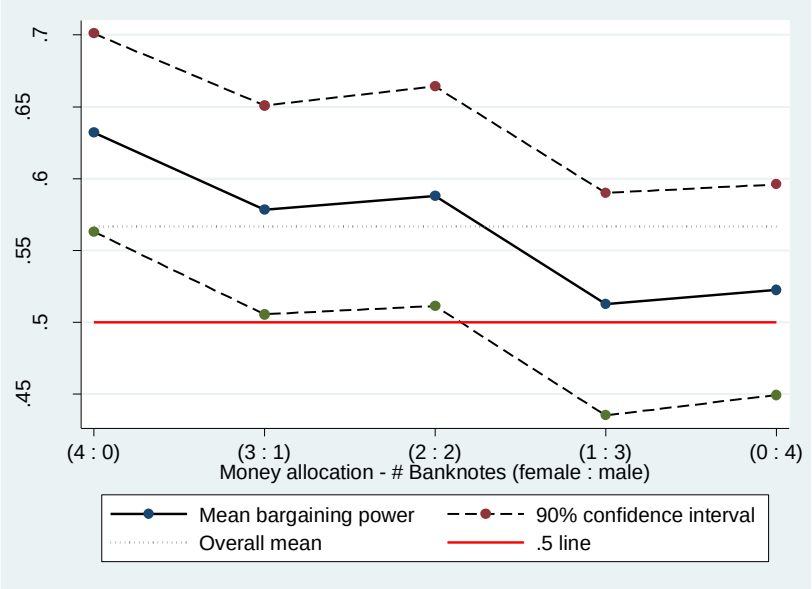
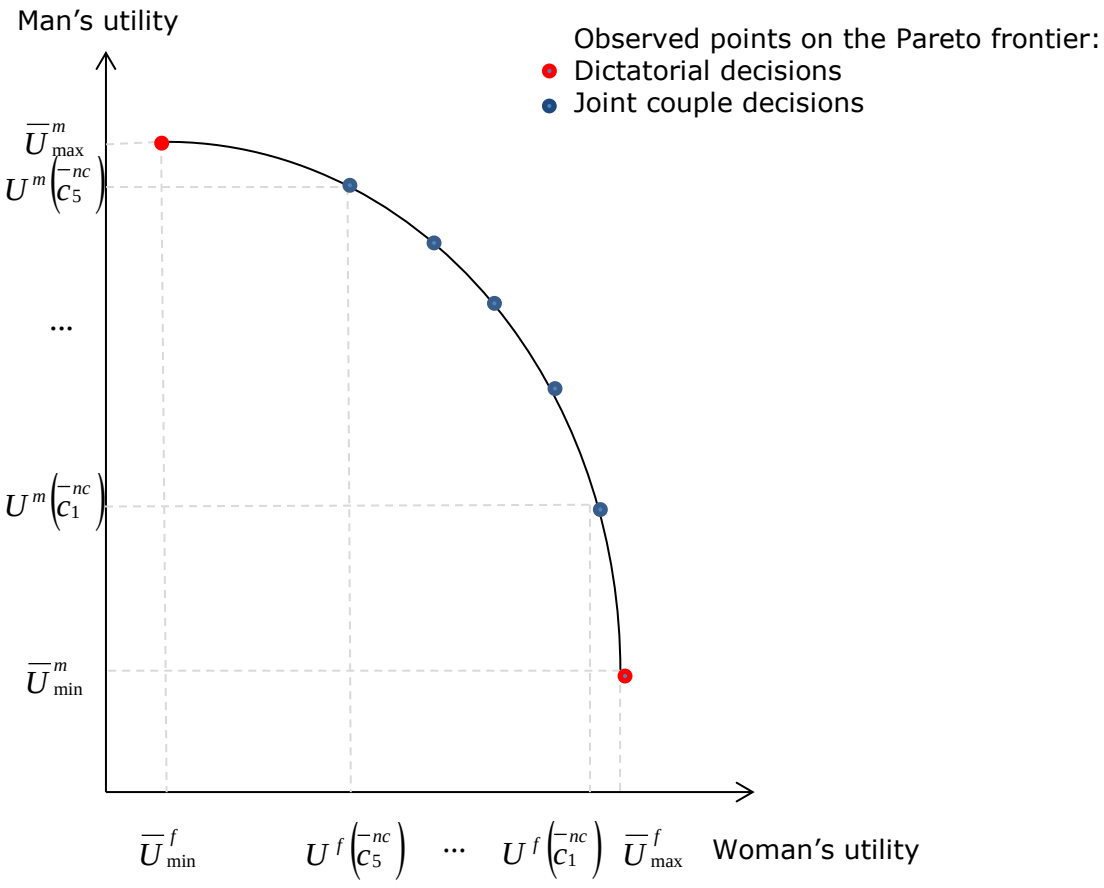


Figure 3: The Pareto frontier



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