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To Defer or Differ

Experimental Evidence on the Role of Cash Transfers on Nigerian Couples' Decision-Making

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Abstract

We conduct an original lab-in-the-field experiment on the decision–making process of married couples over the allocation of rival and non-rival household goods. The experiment measures individual preferences over allocations and traces the process of deferral, consultation, communication and accommodation by which couples implement these preferences. We find few differences in individual preferences over allocations of goods. However, wives and husbands have strong preferences over process: women prefer to defer decisions to their husbands even when deferral is costly and is not observed by the husband; men rarely defer under any condition. Our study follows a randomized controlled trial that ended a year earlier and gave large cash transfers over eighteen months to half of the women in the study. We estimate the effect of treatment on the demand for agency among women and find that the receipt of cash transfers does not change women's bargaining process except in a secret condition when the decision to defer is shrouded from her husband. This suggests that the cash transfer to women increases their demand for agency but does not change the intra-household balance of power enough to allow them to express it publicly.

Keywords: intra-household decision-making, bargaining, cash transfers

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1 Introduction

Policymakers focus on progress in women's empowerment and equality because women continue to experience unequal outcomes, even within households (see Duflo, 2012, for a review). Intrahousehold inequality in consumption and health outcomes has been documented worldwide (e.g., Altonji and Blank, 1999; Azmat et al., 2006; Beaman et al., 2017; Bertrand and Hallock, 2001). In addition, large gains in measurable outcomes have been documented for women, children, and even the whole household when women in poor households are provided additional resources such as cash transfers (e.g., Bandiera et al., 2017; Carneiro et al., 2021). Money given to women is more likely to be used for investments in education, children's nutrition, and housing than money in the hands of their husbands (e.g., Adato et al., 2000; Duflo, 2003; Fiszbein et al., 2009; Hoddinott and Haddad, 1995; Thomas, 1994) and increasing women's say in family finances raises savings and investment (Armendáriz and Morduch, 2010; Ashraf, 2009; Duflo, 2012).

Much of the literature assumes that the pattern of unequal consumption is a result of lower empowerment, in line with the dominant economic model of intrahousehold bargaining power in which the utility function of individual members is solely defined over material outcomes (e.g., Browning and Chiappori, 1998; Chiappori, 1988, 1992, 1997; Chiappori et al., 2002; McElroy, 1990; McElroy and Horney, 1981). Indeed, when this assumption is combined with a symmetry assumption about the other-regarding preferences of the spouses,[1] equality in bargaining power implies equality in outcomes. In this model, the welfare weights or bargaining power of spouses is subsumed in a sharing rule which can be inferred from the intrahousehold division of rival consumption (Brown et al., 2021; Cherchye et al., 2017; Dunbar et al., 2013). Implicit in this modeling framework is the assumption that individuals do not care about the way these outcomes are achieved. Perhaps as a result, economists have paid less attention to the *process* of decision–making within the household.

Even when more attention is paid to process, such as whether women have executive agency and whether external interventions can improve female agency within the household (e.g., Dhar et al., 2022; Karimli et al., 2021; Pitt et al., 2006; Riley, 2022), the emphasis remains on the instrumental value of agency, that is, on its capacity to affect material outcomes, rather than on agency's intrinsic value. With a few exceptions (e.g., Afzal et al., 2022; Fernandez et al., 2015),[2] the simple question of whether empowerment per se is valued by women (similar to the 'capabilities' view of Nussbaum, 2001; Sen, 1999) has been mostly

[1] E.g, spouses only derive utility from their own (rival) consumption, or have symmetrical altruistic preferences with identical welfare weights.

[2] Fernandez et al. (2015) examine the correlation between subjective well-being and the right to make particular decisions. Although provocative, the results are not identified.

ignored in the literature on intrahousehold resource allocation.

To examine the link between consumption and empowerment, we present results from an original lab-in-the-field experiment conducted with married couples in Northern Nigeria, a setting within a lower middle-income country where women's agency and rights are severely constrained. We combine traditional elements of economic laboratory design (experimentally assigned controls and separation of individuals) with field elements (a random sample of married women received significant unconditional cash transfers over eighteen months before the study took place) and unique lab–in–the–field elements designed by the team (three laboratory shopping stalls with separate categories of female, male and household items). Finally, the experiment includes a randomly assigned secret treatment in which most decisions are shrouded so neither spouse can tell what their spouse chose or what processes they followed to reach that decision.

We find that the preferences of both male and female participants are egalitarian on average. Despite what seems to be a lack of overt disagreement over budget allocations (as in Almås et al., 2020), spouses have strong preferences over the *way* decisions are made. Women are far more likely than men to consult their spouse, defer to them, and accommodate their wishes. In contrast, male participants tend to make a decision on their own without consulting or accommodating their wife's wishes. Furthermore, we find that women over-defer and men under-defer compared to optimal decisions. The experimental design allows us to conclude that spouses' preferences over the way decisions are made are consequential: they impose an allocative efficiency cost on already very poor households.

The experiment also enables us to estimate the effect of an unconditional cash transfer (UCT) program on both material outcomes and the process by which these outcomes are reached. We can compare the joint decision–making processes of control and treated households, including consultation, communication (honest or not), deferral, revision and accommodation of spouse's preferences and a measure of the willingness to pay for agency over own consumption. From these measures, we can examine several important features of the decision–making process. First, we test, in a controlled environment, whether the randomized cash transfer treatment increases the desire for private consumption and leads to higher material welfare. Second, we test whether treatment has an impact on the willingness to exert agency or to relinquish control to a spouse, either secretly or openly. We do so in a way that enables us to test whether subjects' willingness to pay for agency is driven primarily by instrumental value, or whether subjects deviate from taking the action that would maximize their own material utility. Third, we test whether the treatment increased or decreased efficiency in decision–making.

The UCT intervention had a small effect on the social preferences of men and women;

women allocate more goods or money to themselves if they received the UCT. Treated women are less likely to defer their choice to their husbands, but only when their deferral decision is shrouded and therefore kept secret from their husband. UCT treated women are also slightly less willing to consult. Taken together, these suggest a slight improvement in procedural empowerment but only when decisions are shrouded.

Lab-in-the-field experiments have been used to measure demand and willingness to pay for agency within a household (e.g., Abbink et al., 2020; Afzal et al., 2022; Almås et al., 2018; Iversen et al., 2011; Jakiela and Ozier, 2016; Mani, 2020; Schaner, 2016), but there are only a few studies that look into the effect of a cash transfer on experimental measures of female empowerment. Almås et al. (2018), report results from a lab-in-the-field experiment in North Macedonia where a CCT (for children staying in school) was randomly allocated to either the head of household (usually a man) or a woman. They find that, compared to wives of male recipients, female recipients of this long-term CCT exhibit a lower willingness to pay (WTP) to appropriate an additional windfall for themselves instead of their spouses. This, they argue, shows an improved bargaining power of the CCT-receiving women: they are willing to pay less than others because they have more say over the allocation of the windfall even if it is received by their husband. However, other channels could explain this finding[3] and our study, by including a secret condition treatment, helps unwrap some of the issues raised in that paper.

In the following section, we develop a conceptual framework for analyzing the behavior of our participants. Section 3 explores the setting and details of our lab experiment and explain how we use it for examining the behavior of households. Our empirical work is divided into two sections. First, in Section 4 we examine the behavior of the households in the control group, a baseline of behavior. Second, in Section 5 we examine how this behavior was changed by the UCT experiment. Finally, in Section 6, we conclude.

2 Conceptual framework

In the canonical model of intrahousehold consumption allocation (e.g., Becker, 1964, 1981; Chiappori, 1988; McElroy and Horney, 1981), the decision that a couple makes is represented

[3]For example, fairness norms could explain why women who were beneficiaries of a CCT program are less likely to object to a new transfer to be given to their spouse instead of receiving it themselves again. Moreover, former recipients of a CCT might want to avoid 'taxation' from family and relatives (see Jakiela and Ozier, 2016) after experiencing it first-hand and may rather have their husbands deal with such attempts. This issue is salient in Almås et al. (2018) because the information on being a recipient of the CCT program was common knowledge.

as the solution to:

$$\text{Max}_x \ \omega u_h(c_h) + (1-\omega)u_w(c_w) \qquad \text{subject to } c_h + c_w = y \tag{1}$$

where w and h represent the wife and husband, respectively, y is the combined income of the couple and c_h and c_w are the consumption expenditures of the husband and wife, respectively. The relative welfare weights of the husband and wife, ω and $1-\omega$, represent bargaining power over consumption: the larger ω is, the larger c_h is relative to c_w. It follows that the relative bargaining power of the two spouses can be inferred from their consumption: an empowered wife consumes more (Cherchye et al., 2017).[4]

A simple theory of intrahousehold agency Empowerment, however, is also about having a say in decisions that affect you. The call for female empowerment is partly because of its anticipated material benefits, as it allows women to better defend and promote their interests. But it is also about the process by which decisions are made: just as a country is not considered democratic simply because it fulfills the material needs of its population, the empowerment of women cannot be solely judged by their material welfare. Which spouse believes they have the right to decide how to allocate the household's consumption budget? Who consults and who is consulted on that decision? Does the consulted spouse distort his or her reported preferences? Are reported preferences taken into account by the other spouse? Our experiment is designed to capture each of these important dimensions of the decision–making process within the couple while controlling for the consumption preferences of each spouse.

Afzal et al. (2022) offer a straightforward formalization of preferences over process (see also Doepke and Tertilt, 2019). Let there be two spouses h and w and let c_h and c_w be their consumption bundles. According to their definition, spouse w has a preference for executive agency on her consumption if:

$$u_w(c_w, D_w^h) < u_w(c_w, D_w^w) \tag{2}$$

where consumption c_w is kept constant, D_w^h means that spouse h decides the consumption bundle c_w for w, and D_w^w means w decides for herself. The above inequality implies that when w (or h) prefers to decide, she is willing to accept a lower level of material welfare in exchange for having executive agency on her consumption.

[4]This logic is behind a series of recent papers on Engel curves within households (e.g., Bargain and Donni, 2012; Bargain et al., 2014; Brown et al., 2021; Calvi, 2020; Dunbar et al., 2013; Lechene et al., 2022; Sokullu and Valente, 2022; Tommasi, 2019).

In this paper we do two things: 1) we experimentally assess the *decision process* by which couples allocate consumption between themselves and estimate spouses' demand for control and agency within that process; and 2) we estimate the causal effect that a full-scale external intervention — an unconditional cash transfer (UCT) — has on the decision process and on the demand for agency of each spouse. We know, from an evaluation of the UCT, that this UCT increased women's self-employment and income and that it raised traditional indicators of female empowerment focusing on material welfare and on decision–making in farm production (Papineni et al., 2024). We want to know whether it also affected agency and, if yes, along which dimensions.

Our experiment starts by eliciting true allocative preferences in consumption, which we identify by letting each spouse independently decide how to allocate various consumption budgets y between c_w and c_h, as well as between individual and joint consumption. This is achieved by setting up stalls that carry gender-specific goods. One advantage of this approach is that it does not assume that each spouse is solely motivated by self-interest: it allows subjects to manifest (possibly different) altruistic preferences in household consumption.[5] This differs significantly from the canonical model of intrahousehold allocation in which differences in material allocation between spouses are seen as a manifestation of different bargaining weights. When spouses are differentially altruistic towards each other, the canonical model cannot identify how power is distributed within the household. Furthermore, with altruistic preferences, it is possible for both spouses to divide a budget y in the *same* manner $c_w + c_h = y$ while at the same time both wanting to make that decision themselves:

$$u_w(c_w, c_h, D_w^h) < u_w(c_w, c_h, D_w^w) \text{ and } u_h(c_w, c_h, D_h^w) < u_h(c_w, c_h, D_h^h) \tag{3}$$

We experimentally measure this demand for executive agency by allowing subjects to *defer* to their spouse the division of a budget y between consumption bundles c_w and c_h. Deferral refers to a subject's willingness to delegate consumption decisions. It indicates a reluctance to hold sole *executive agency* over household consumption decisions. In our model, this preference can be represented by reversing the sign of equation (2):

$$u_w(c_w, c_h, D_w^h) > u_w(c_w, c_h, D_w^w) \tag{4}$$

Demand for executive agency can be measured experimentally: we let subjects independently and secretly decide how to divide a budget y into c_w and c_h on their own and then we ask

[5]Altruistic behavior can arise from a variety of sources, such as social norms, moral and philosophical principles, affection, or reaction to emotional stimulus. Our experiment is not designed to disentangle them.

them whether they would prefer to delegate that division to their spouse. We can also look at whether *both* husband and wife delegate the decision to their spouse, suggesting a joint preference towards a negotiated outcome.

Delegating the final decision to someone else does not, however, imply an absence of demand for agency: the person may still wish to *influence* that decision, e.g., because of asymmetric information about preferences between spouse (e.g., Tagat et al., 2023) or because agency is valuable in its own right (e.g., Afzal et al., 2022).

Measuring demand for consultative agency is more complex because consultation involves at minimum three distinct steps: truthful communication of a preferred split $(c_w, c_h)^w$ by w to h; consultation by h of this communication made by w; and accommodation of that communication by h who revises his original division budget allocation $(c_w, c_h)^h$ at least partially in the direction of the split communicated by w.

To capture these ideas, we invite subjects to communicate a preferred allocation to their spouse. Ideally, this allocation should correspond to their true preferred allocation, in case the spouse decides to implement it. It also may involve some *strategic misrepresentation* whereby the subject distorts their true preferences when communicating with their spouse, e.g., to avoid disapproval or retaliation. Misrepresentation may also indicate an unwillingness to reveal one's true preferences due to self-image considerations (e.g., not wanting to appear too selfish). The absence of misrepresentation therefore signals a relatively serene approach to joint decision–making among spouses and is a pre-condition for consultative agency to achieve allocative efficiency in consumption.

Communicating one's preferences to a spouse may fall on a deaf ear, though: the spouse may refuse to hear them. Willingness to listen to someone else's preferences is what we call consultation. Two-way communication between the spouses is thus a necessary condition for a subject to influence their spouse's decision. But it is not sufficient: the communicated preferences must also be taken into account by the deciding spouse, i.e., they must be accommodated. Taken together, truthful communication, consultation, and accommodation therefore create the conditions for a negotiated allocation of the household consumption budget. Even in the presence of deferral, the combination of these three processes confers to the deferring spouse the right to be heard and influence decisions — a process we call *consultative agency*. It is measured as the combined effect of communication (including misrepresentation) by the subject and of their spouse's willingness to consult and accommodate.

Formally, let c_w^w be the consumption for self, chosen by subject w in isolation; let c_w^h be the consumption for w chosen by subject h in isolation; let $k_h = 1$ be h's decision to consult w's communicated preferences and 0 otherwise; and let $c_w^{h\_accom}$ be the consumption for w chosen by h *after* being told w's communicated preference. Consultative agency is then

defined as the extent to which c_w^h moves towards c_w^w as a result of the consultation process. It is given by the following formula:

$$C_w^h = 1 - \frac{c_w^w - (k_h c_w^{h\_accom} + (1 - k_h)c_w^h)}{c_w^w - c_w^h} \tag{5}$$

where we have normalized by $c_w^w - c_w^h$, the difference between the true preferences of w and h. Note, first, that C_w^h is undefined if $c_w^w = c_w^h$; if the husband and wife both prefer the same amount to for the wife, we can't observe accommodation. Whenever the initial preferences are different, however, $C_w^h = 1$ means that w receives her true preference while 0 means that she receives her husband's preference. Any value between 0 and 1 indicates a compromise between the spouses. It is also possible for $C_w^h < 0$, in case h revises his initial choice c_w^h *away* from c_w^w, for instance, to manifest disapproval, or for $C_w^h > 1$ in case h overcompensates by moving beyond what w asked for. To facilitate the analysis, we constrain C_w^h to only take values between 0 and 1.

This expression can be decomposed into those parts which are due to misrepresentation, willingness to consult, and extent of accommodation:

$$C_w^h = 1 - \Big(\frac{c_w^w - c_w^{w\_comm}}{c_w^w - c_w^h} + \frac{(1 - k_h)(c_w^{w\_comm} - c_w^h)}{c_w^w - c_w^h} + \frac{k_h(c_w^{w\_comm} - c_w^{h\_accom})}{c_w^w - c_w^h} \Big) \tag{6}$$

where $c_w^{w\_comm}$ is the choice communicated by w to her husband. The first fractional term is the loss of agency due to misrepresentation by w, the second fractional term is the loss of agency due to lack of consultation by h, and the last fractional term is the loss of agency due to the lack of accommodation. An equivalent formula can be derived for the consultative agency of the husband – should the wife be granted sole executive agency.

We also borrow aspects of the design developed by Afzal et al. (2022) to study the decision to defer when it has no instrumental value. This allows us to parse out the role played by instrumental motives from preferences over process — a distinction that mirrors that between consequentialist/utilitarian and deontological ethics (e.g., Benabou et al., 2024). In this part of the experiment, w chooses one of four physical consumption bundles for herself to consume on the spot. She is then invited to pick a bundle for h without knowing which bundle h prefers and is finally asked whether she wants to defer the choice to h. Mirror decisions are independently made by h. Here, *not* deferring the choice to the spouse has no instrumental value — w cannot appropriate any of h's bundle and vice versa. It is therefore always inefficient since choosing for the spouse has a strong chance of deviating from his or her preferred bundle. Hence choosing *not* to defer is a measure of demand for pure control

(e.g. Afzal et al., 2022; Ashraf, 2009; Jakiela and Ozier, 2016)[6].

Finally, we examine how spouses handle the trade-off between efficiency and self-interest in household production decisions, using a simplified version of a game developed by Fafchamps and Kebede (2022). The literature has shown that assigning (legal or customary) control over financial or productive assets within the couple can affect the allocation of consumption expenditures between spouses (e.g., Browning et al., 1994; Lundberg et al., 1997). In some cases, this can even lead to inefficient choices (e.g., Lundberg and Pollak, 1993; Udry, 1996). The purpose of this part of the experimental is to test whether subjects are capable of taking efficient production decisions even if it means reallocating productive endowments to their spouse. Deviation from the efficient choice again captures demand for pure control, in this case over the production process.

A simple theory of emancipation Our experiment, by combining these different elements, produces evidence on how executive agency is allocated between spouses and the extent to which spouses are granted consultative agency in the absence of external intervention. We then use the experiment to test how this equilibrium is affected by two separate interventions: secrecy in executive agency, which is granted to some subjects in the experiment; and a large UCT intervention targeted to the wife. The objective of these interventions is to disentangle three broad mechanisms of subjugation which we refer to as oppression, indoctrination, and alienation.

Oppression refers to the fear of retaliation: a spouse may wish to exert control over the allocation of household consumption, but fears disapproval or reprisal if this action is observable by the spouse (e.g., Buchmann, 2022). Secrecy may also enable individuals to insulate their income from social pressures from the spouse (e.g., Zhang, 2023a,b) or from outside the household (e.g., Boltz et al., 2019). By providing the opportunity for a subject to exert executive agency in secret (e.g., Ashraf, 2009), we elicit what we call 'pent-up demand' for agency, that is, demand for executive agency that is repressed by the spouse and can only be expressed in secret (e.g., Ashraf et al., 2014). Reprisal may also take a financial form, e.g., by diverting household resources away from the offending spouse. In this case, providing more financial autonomy to an oppressed spouse should offer protection against such reprisal. Hence an intervention that helps that spouse gain financial independence — such as the UCT (see Papineni et al., 2024) — should reduce the fear of reprisal, thereby allowing the spouse to openly exert more agency, either executive or consultative, without the need for secrecy.

[6]For a deeper understanding of the difference between instrumental and intrinsic control, see the following papers on intimate partner violence (IPV) (e.g., Angelucci, 2008; Bobonis et al., 2013; Haushofer and Shapiro, 2016; Hidrobo et al., 2016; Perova and Vakis, 2013; Roy et al., 2018).

Indoctrination refers to the internalization of gender norms. Other researchers have sought to document the effect of a change in such norms — or in the perception of such norms — on behavior and agency (Bursztyn et al., 2020). In this paper, we do not attempt to change norms or perceptions directly. Nonetheless we are hopeful that gender norms may improve in the aftermath of a sustained intervention that, by providing regular monetary transfers to married women, helped them start a business and gain financial autonomy (Papineni et al., 2024). If this is the case, we expect the UCT intervention to modify the household budget allocation in favor of women, to induce husbands to grant more consultative agency to their wife — i.e., by consulting them and accommodating their stated preferences — and to induce wives to be less willing to defer consumption decisions to their husband and more willing to truthfully disclose their true preferences to their husband.

The third main channel for subjugation is alienation, which often manifests itself through a lack of aspiration for agency: women do not imagine that they could make decisions on their own (e.g., Bernard et al., 2023; Orkin et al., 2023). In individualistic societies, executive agency over own consumption is taken for granted. But in collectively-minded societies (e.g., Enke, 2019; Roland, 2020), making important decisions without consulting with the group is often regarded as unwise or illegitimate. Consulting others and deferring to those in charge of the group is regarded as beneficial to the group and its members — and in patriarchal societies the application of this principle to women and other dependents means that they do not imagine being capable of making correct decisions by themselves. This makes it all the more important to capture consultative agency in contexts, such as our study, where collective decision–making is generally seen as the norm (Thomas et al., 2023).

If women refrain from expressing a demand for agency because of collective thinking, the decisions they take should be the same whether they are taken in secret or not: there should be no pent-up demand for agency that is expressed in secret. An external intervention that specifically targets funds to one member of the household does, however, create a new reality in which the individual agency of married women is recognized by an external actor. This in turn may favor a rise in individualism that would express itself in more selfish consumption choices and a demand for executive agency. If such demand may trigger reprisal from the spouse or the social group, it may only be expressed in secret.

3 Experimental Design and Background

We conducted a lab-in-the-field experiment in 38 sessions with married couples in 27 villages from two rural regions in Kebbi State, in northwest Nigeria. The experiment was embedded in a larger randomized controlled trial of an unconditional cash transfer (UCT) program

targeted at ultra-poor women in this region. The majority of households in this region live in extreme poverty. These households are predominantly of Hausa ethnicity and Islamic faith, known for their patriarchal social structures and women face restrictive social norms, low levels of education, and low labor force participation, resulting in limited agency (Braimah, 2014; Ogu et al., 2016).

The UCT baseline survey confirms women's limited agency, especially regarding labor outside the home which is decided on by husbands, and it documents the existence of social norms restricting women's work and mobility, with 40% of men considering it inappropriate for women to accept paid jobs outside the home. Female labor force participation was low before the intervention, with most women engaged in household work or childcare. Only 36% of women reported any income-generating activities in the twelve months prior the baseline survey, mostly on household-operated farms (Papineni et al., 2024).

The UCT, randomized at the household level within study villages, provided a total of 75,000 Nigerian Naira (roughly USD 693 PPP for 2015) over fifteen months to the primary female decision-maker of the household. This is a considerable amount of money for the participating households, amounting to approximately half of their annual consumption. Indeed 92% of sample households lived on less than USD 1.90 a day according to the baseline survey.

The cash transfers did not come with any explicit conditions of how the money should be spent or shared. However, during a sensitization campaign, households were told by traditional community leaders that the money was for the female recipient. As noted by Papineni et al. (2024), this light intervention could have influenced the female recipient's ability to keep more of the cash transfer (e.g., Benhassine et al., 2015). Bastian et al. (2017) report that 54% of the cash transfer (in the same program) was kept by female recipient and 26% was passed on to her husband; per capita consumption increased by 25%; and the value of household assets (mainly small animals) increased by 30%. Papineni et al. (2024), similarly, show an increase in a women's empowerment index as measured by a modified versions of the Women's Empowerment in Agriculture Index (WEAI).

The experimental protocol is detailed in the rest of this section. Further details are available in Sections C of the Online Appendix.

3.1 Budget allocation decisions

At the heart of our design is a set of budget allocation decisions that subjects are asked to make under several treatment conditions. In the first part of the experiment, each spouse independently and secretly chooses how to split a budget of 2500 Naira (around 20 USD)

between two categories of goods.[7] This choice is never revealed to their spouse but it has a positive probability of being implemented, making revealed preferences incentive compatible. These choices can be seen as defining the social utility of each spouse if he/she were given full control over household consumption — i.e., they measure $W_i(x)$ for a particular x vector and fixed budget. $y = 2500$.

For three of the four domains (A, B and C) subjects are given a budget and asked how they wish to allocate it to pre-stipulated categories of goods they can only purchase from us at the end of the experiment, thereby reducing the chance of ex post transfers outside the experiment. Once that budget has been assigned to a particular category, it cannot be converted into cash or spent in another category. To facilitate comparison with other experiments in which spouses are given cash, we also include a separate allocation decision (Domain D) in which subjects divide a cash amount between themselves and their spouse.

To implement this design, three market stalls are constructed in the lab, each of which contains only one category of items. These items were pre-tested to be recognizable and desirable, and they include some goods that are easy to buy locally and some goods that only available in town. All participants are shown pictures of the items available in each stall. One stall includes goods intended to appeal to women: jewelry, colorful fabric, and dresses. The second stall includes male-oriented goods such as hats, caps, belts, shoes, and fabric. The third stall offers common household items such as cleaning supplies, mats, cups, plates, and mosquito coils.[8] The choice of these items was carefully designed such that male goods would not appeal to women and vice versa. Given how strongly gendered the local context is, this was not particularly difficult to do.

At the end of the experiment, husband and wife are reunited and, if that decision was randomly selected for implementation, couples are given vouchers redeemable in specific stalls. Thus, when a subject allocates funds to a stall expected to appeal to their spouse, the subject may intend to purchase something for their spouse or to let their spouse choose – in the context of this experiment, both choices are observationally equivalent. We did not record the items that subjects purchased or who made the choice.

By making two of the stalls gender-specific, the design limits the scope for ex post reallocation of the objects between spouses. There still remains the possibility that subjects sell or give the objects to others after the experiment. To avoid this, we include a fifth domain in which subjects separately consume a food and drink of their choice directly in the lab, as in Afzal et al. (2022). In that case, reallocation across spouses is impossible.

[7]This amount is roughly equivalent to six days of household consumption or around two weeks of the UCT payments. It was chosen to be sufficiently large to incentivize participants to take the experimental tasks seriously.

[8]See Online Appendix photographs C3, C4, and C5, respectively.

Throughout the experiment, each spouse answers various allocation decisions regarding their preferred budgetary allocations over four possible choice pairs:

A female vs male items purchased in the lab stalls

B household items vs male items purchased in the lab stalls

C household items vs female items purchased in the lab stalls

D cash for wife vs cash for husband[9]

J two kinds of cookies and two flavors of juice for both self and spouse.

Choice A measures the social utility $W_i(x_w, x_h)$ of consumption bundles x_w and x_h for individuals $i = \{w, h\}$, conditional on the choice of goods available in our stalls.

Choice D is over money and can thus potentially be undone outside the lab, but it offers the advantage that consumption is not restricted to the goods on sale in the lab. It measures the utility $W_i(x_w, x_h)$ of consumption budgets x_w and x_h for individuals $i = \{w, h\}$ that can be achieved from the choice of goods available outside the lab.

Choices B and C are between private goods and household goods, thereby revealing how husbands and wives differ in the extent to which they care for household public goods, including child consumption (x_c). They measure $W_i(x_w, x_c)$ and $W_i(x_h, x_c)$, respectively.

In each case A-D, the subject is given a budget to divide — in multiples of 100 Naira — between each of the two options listed above. In the rest of the paper, we refer to each of these choice sets using the letters A to D above. The food-and-drink game is only played once with real stakes — i.e., actual food and drinks given to the subject at the end of the experiment. At the end of the experiment, subjects are also asked to choose between two input allocations that determine individual incomes — see below.

3.2 Decision blocks

The experiment is divided into a series of decisions grouped into blocks that each subject makes silently and in isolation from their spouse — who is in another room. In terms of sequencing, Block 1 always comes first while Blocks 4, 5 and 6 always come last, in that order. The order of Blocks 2 and 3 is permuted at random across sessions.

At the end of the experiment, one decision from one of Block 1 through 4 and 6 is selected at random for each couple to determine the cash and vouchers received by the couple. This

[9]The decision was presented as money for self or money for spouse but we flip the husbands decisions and always present it as money for wife versus money for husband.

means that each decision a subject makes is fully incentivized. 1 provides examples of the flow of decisions across blocks 1 to 4 and how final payoffs are determined. We delineate which choices were secret for everyone and which ones were secret only in the secret treatment, and, in the next sub-section, explain how choices were hidden.

Block 1 *Allocating a budget across different types of items or payments* [**split** and **resplit**]: Each participant is sequentially asked to split a budget of 2500 Naira (about $23) in 100 Naira increments. This is done in each of the four domains: **split**A-D. Each subject is then asked to split a budget of 2100 Naira[10] in domains A and D: **resplit**A and **resplit**D. The order of both sets of choices is the same for all subjects in a session and randomized across sessions. These choices are never revealed to the spouse. The purpose of this block is to elicit each subject's true preferences over all possible choice pairs.

Block 2 *Choosing whether to allow one's spouse to make the decision instead of making one's own* [**defer**]: Subjects are reminded of their initial allocation across **split**A-D and can choose to retain this allocation or to replace it with their spouse's allocation, which they have not seen (**defer**A-D). The object is to elicit subjects' willingness to defer budget allocation to their spouse. This decision is not revealed to the spouse in the secret treatment.

Block 3 *Choosing whether to allow one's spouse to make the decision instead of making one's own with additional costs* [**defercost**, **deferbenefit**]: Having already made decisions in Block 1, subjects are first reminded of their initial allocation across **split**A and **split**D and then given a choice between their decision over a budget of 2500 or their spouse's decision over a budget of 2100 (**defercostA** and **defercostD**). In addition, subjects are given a choice between their decision over a budget of 2100 Naira (**resplit**D) or their spouse's decision over 2500 Naira. This decision applies only to domain D, splitting money between husband and wife (**deferbenefitD**). For **defercost** it is costly to defer the decision and for **deferbenefit** it is costly to retain the decision. The purpose of this block is the elicit subjects' willingness to pay to defer — or not defer — budget allocation to their spouse. These choices are not shown to the spouse in the secret treatment.

Block 4 *Communicating preferences, consulting over preferences and revising decisions* [**communicate**B-D, **consult**B-D, **revise**B-D] Subjects are then asked to pick an allocation across domains B, C and D that will be communicated to their spouse **communicate**B-D). The purpose of this part of the experiment is to determine whether subjects choose to misrepresent their true choices from their spouse. These are the only decisions in the secret treatment that are always visible to the spouse without shrouding.

[10]The difference of 400 Naira was chosen so as to be just large enough to identify variation in deferral rates among women. In the last two sessions (10% of subjects), we increased the difference by reducing the amount to 1800 Naira to see whether we could induce deferral among men.

After having done this, subjects are asked, if they would like to see the communication of their spouse (**consult**B-D). The purpose of this question is to ascertain whether subjects are interested in learning about their spouse's preferences — something they would want to do in case they are willing to accommodate these preferences, in part or in full.

Finally, whether or not the subject chose to see their spouse's communication, the subject is shown the communication[11] of their spouse and asked if they would like to revise their split decisions made in Block 1. It is indeed possible that a subject does not wish to be informed of his or her spouse's preference but, once informed, cannot resist the mental pressure of accommodating their wishes. This phenomenon, if observed, would be reminiscent of the findings of DellaVigna et al. (2012) whose subjects avoid being asked for something they have difficulty refusing when asked. Variable **revise**B-D records the revised decision after receiving communication: if a subject did not want to change their split, **revise** is the same as the original **split**. The purpose of this part of the experiment is to determine the extent to which each subject accommodates the revealed preferences of their spouse.

Block 5 *Food and drink choices* [**defer**F] In this block, each subject is asked to select one of two different cookies (Food) and one of two different drinks (Juice) for themselves and for their spouse. Having chosen for themselves and their spouse each is given the option to defer their decision over both food and juice to their spouse (**defer**F) without knowing what their spouse chose for them. The purpose of this question is to elicit the subject's willingness to defer their private consumption of food and drink to their spouse even when that own consumption has no effect on the spouse's own consumption and their consumption is not observed by the spouse, as in Afzal et al. (2022). Subjects who do not defer receive the food and drink of their choice; those who defer receive the food and drink chosen for them by their spouse. The food and drink are consumed privately by each subject in their gender-specific room so the spouse cannot determine what the subject selected for themselves and the consumption of the spouse does not affect own consumption.

In about a third of the sessions (13 sessions with 166 subjects), there is a penalty for retaining the decision: the subject receives one cookie and a half glass of juice of their own selection if they do not defer; but they receive two of cookies and a full glass of the options that their spouse chose for them if they do defer. The purpose of this design is to elicit a bound on subjects' willingness to pay to defer their own consumption choice to their spouse.

Table 1 shows two examples of how decisions are made and paid out in Blocks 1 through 5 for domain B (male vs. household goods). Note that the first woman chooses to spend 1400 on male goods, communicates to her spouse that she wants to spend 1200, asks to see her spouse's preferences, and then moves towards his communication. The second woman

[11] All subjects retained the right not to look at the information they were given.

chooses to spend 1300 on male goods, communicates her true preferences, does not want to see her husband's preferences and, when shown them anyway, does not alter her decision. Note that, in both examples, by chance, the husband's decision is implemented, but the first couple had the woman's choice to defer selected, and the second couple had the man's original decision selected. In Block 5, the first woman wanted round cookies and coke, guessed what her husband wanted and then chose to consume what he wanted for her (not shown). In the second example, she chose to consume what he chose for her.

Block 6 *Allocating inputs across two production functions* [efficiency] In this final block, the focus of the choice is not consumption but production. Each subject is asked to pick one of four possible input allocations between themselves and their spouse. Each input allocation maps into a cash income for themselves and a cash income for the spouse.[12] Subjects answer two versions of the game.[13] Each game has an efficient choice that maximizes the total income of the household. In Game 1, the efficient choice implies less output is assigned to self and in Game 2, the efficient outcome assigns less to the spouse.

3.3 The secret treatment

We randomized the sessions equally into a secret treatment in which most decisions are shrouded and a no-secret treatment in which most decisions are not shrouded. Other than Block 5 (cookie and juice), which is always implemented during the lab experiment, all other choices are only implemented if selected at the end. Some decisions are always shrouded from spouses, irrespective of the secret condition. In particular, all Block 1 decisions (initial allocations) are always hidden from the spouse. In contrast, the communication sent to the spouse in Block 4 and 5 is never hidden. All the other decisions, if selected at the end of the experiment, are either potentially revealed or shrouded depending on the secret condition.

Shrouding of these decisions is achieved as follows. At the end of the experiment, when a decision is selected for implementation, if the decision is to be shrouded, the actual decision is first mixed with a random decision, one of the two is drawn at random and then implemented. This ensures credible deniability in the secret condition: the spouse never knows whether the implemented allocation was randomly selected or selected by the subject. The precise process is described in further detail in Section C.4 of the Online Appendix.

Once this process is over, for domains A, B and C, the selected individual receives tokens to be spent in the stalls, and the couple is brought together to the lab stalls associated with that decision. For domain D and Block 6 (the production game), the money is split between

[12]The games mimic Udry (1996) in which men and women farm separate plots and fertilizer should be allocated across the plots to achieve the maximum level of output.

[13]For a small number of sessions, only one version was presented to subjects.

the husband and wife according to the choices (or shrouded choices) of the individual whose decision was selected to be implemented. Block 5 is always selected and is implemented (either the choice or the decision to defer) privately in the gender-separated room during the experiment.

3.4 Implementation

The UCT randomized controlled trial (RCT) was designed by the Africa Gender Innovation Lab of the World Bank. The UCT intervention, supported by USAID and implemented by the Catholic Relief Services, took place between September 2015 and March 2017. The baseline survey for the RCT took place between April and June 2015. A midline survey was conducted approximately one month after the last UCT monthly payment, i.e., between April and June 2017. The endline survey was conducted one year after the end of treatment, in May to July 2018.

The lab-in-the-field experimental sessions took place in 27 villages from the UCT impact evaluation sample in 38 distinct lab sessions between March and May 2018, one year after the UCT intervention ended and just before the endline survey began.[14] The one-year gap between the RCT and our experiment is intended to diminish the pure income effects of cash receipts to identify longer-term effects on decision–making within the household. To ensure that participants could easily walk to a location that allowed sufficient privacy, we selected villages from the evaluation sample with a nearby school. This means that our sample is not necessarily representative of the full UCT study sample. Lab sessions were conducted either on off days or after regular school hours.

Participants for the lab sessions were recruited among married women included in the UCT experiment either as control or as treated. Female participants were invited to participate to the lab experiment with their husband. Upon arrival, participants were told that they would receive a compensation of 500 Naira (around $5) as show-up fee. Additionally, they were informed that they could earn significantly more, either in cash or in-kind, based on their decisions in the experimental games, in the sense that one of all the decisions made by both husband and wife that day would be selected for implementation and additional pay-out. Husbands and wives were then sent to two separate gender-specific rooms where the bulk of the experiment took place. The female room only included female enumerators; the male room only had male enumerators. As is common in settings where illiteracy is widespread, all instructions were read to subjects by a room supervisor or an enumerator

[14]Nine of them took place in villages that received an intervention from the Feed the Future Nigeria Livelihoods Project (FNLP). This intervention is modeled on an ultra-poor graduation program focusing on focuses on education, coaching and savings groups – but without monetary transfers.

who sat with each subject and asked them to make decisions by pointing to pictures using experimental prompts. This setup allowed us to reach a wide range of subjects and avoided participants revealing their choices to others verbally. When allocating money to different decisions or budgets, participants used laminated photocopies of Nigerian Naira denominations with which they were familiar. Participants spent approximately 2.5 to 3 hours in the lab session and earned up to an equivalent of 3000 Naira (around 25 USD) – 500 as show-up fee and up to 2500 in cash or in kind, depending on the random draw.

Recruitment was stratified to ensure that half of the lab participants had received the UCT and the other half had not. Appendix Table A1 shows that the lab sample is balanced on observables across UCT treated and controls.[15] It also indicates that, on average, women in the lab sample are about ten years younger than their husbands and are unlikely to be considered adequately empowered at baseline, according to various empowerment indicators, including the A-WEAI.

In terms of power, we have 506 participants in 38 lab sessions and four equally-sized treatment cells resulting from the crossing of the UCT and the secret condition. Given that we cluster all standard errors at the level of the lab sessions, we are powered enough to identify large effects of combinations of the UCT intervention and the secret condition: the minimum effect size to reject the null with 80% probability is 14 percentage points in all the dichotomous choices – such as the decision to defer or consult. Given that the UCT was found to have effects exceeding 25 pp on many outcomes, including empowerment (Papineni et al., 2024), we can reasonably expect causal effects of a similar magnitude in our experiment. For continuous variables such as split choices, these decisions are typically unaffected by the secret condition. For these, the minimum effect size that we can reject with large probability is 85 Nairas – which is small (3.4%) relative to the choice budget of 2500 Nairas.

4 Preferences over outcomes and process in the UCT control group

To properly appreciate the impact of the UCT intervention, we examine, first, the behavioral patterns of experimental participants in the control group, that is, those who did not receive the UCT treatment.

[15]The test of balance between secret and no secret treatments also shows no significant differences. A test across all four treatment cells (not reported) shows that men and women in the UCT+secret treatment cell are 4 and 2 years older than average, respectively. All other variables are balanced.

4.1 Budget allocation decisions

We present, in Table 3, summary statistics of all the key behavioral variables, broken down by gender. A t-statistic for the test that the means (pairwise within couples) are equal is also provided, together with the associated p-value.

The first panel of Table 3 shows the four main split decisions with the full budget of 2500 Naira. Most split decisions are significantly different by gender, but the average differences between husbands and wives are not large in magnitude. Both spouses tend to divide budgets more or less equally on average, and this is true for all four splitting decisions (1250 would be an equal split) — a finding reminiscent of equal sharing in dictator games. However, these averages hide a lot of variation across the sample with significant proportions of both men and women allocating much less or much more to themselves.[16] Note that men tend to allocate a larger budget share to female goods sold in the lab (1298>1250), but less to money for their wives (1062<1250); money that could spent outside the lab. Note that if we convert the amount a man gives to his wife in goods or money into the amount he keeps for himself, women are more selfish in goods than men are ($1410 > 1202$, p-value<0.00) and women are less selfish in money than men are ($1265 < 1438$, p-value<0.00). This may reflect the fact that the items sold in the lab shop appeal more to women than men or that men had planned to buy female goods on their wife's behalf both in and outside of the lab.[17]

Given that these splitting decisions were always shrouded, the findings violate the idea that, given the opportunity, spouses would like to appropriate a large share of the offered budget to themselves. This is true of women but also of men who, as we shall see shortly, wield most of the power in our sample population. From this evidence we conclude that spouses have social preferences, meaning that they incorporate the expenditures of each other in their own utility function. We also note that women do not, contrary to common perception, wish to spend much more than men on household goods.

While it is true that husbands and wives have relatively similar divisions of expenditures *on average*, the same does not hold *within* individual households. In nearly 50% of the couples, the difference between the allocation chosen by the wife and that chosen by her husband is more than 400 Naira. Few couples (around 10%) have an identical allocation. This implies that, while spouses have social preferences, they need not agree on how to divide a budget between specific expenditure categories. Hence, they may wish to influence

[16]Thirteen and 20 percent of women allocate less than 1000 to themselves in goods and money respectively and 30 and 22 percent of women allocate less than 1000 to their husband in goods and money respectively. For men, 22 percent and 11 percent allocate less than 1000 to themselves in goods and money and 20 and 36 percent allocate less than 1000 to their wife in good and money respectively.

[17]Recall that, although a couple must spend tokens in the stall for which they are designated, we have no way of forcing couples to buy things chosen by either the husband or wife.

household expenditure decisions in the direction of their own social preferences.

4.2 Decision Process

Four variables are used to characterize the decision process of the couple. Two of these (defer and consult) are measured directly; the other two (misrepresent and accommodate) are constructed from the sequence of decisions described above.

The first of these is *deferral* (**defer**): whether they wish to use final allocation preferred by their spouse. Our findings, summarized in Panel II of Table 3, offer arguably the most striking contrast between spouses in our study: for all split choices, wives are much more likely to defer (67-68%) than husbands (20-26%). The difference is highly significant and there is no noticeable difference in women's proclivity to defer depending on the type of choice. This is consistent with the existence of strong social norms that men's control of household finances is expected to be acknowledged by their wife. Furthermore, women are not less likely to defer even when expenditures are fully rival — i.e., choices A and D — then when they are not – i.e., choices B and C. This suggests that deferral decisions by women are not affected by instrumental considerations, a point we revisit below.

The second measure in our experimental decision tree is the decision to *misrepresent* one's true preferences from the spouse. This is measured as the difference between the communicated split (**communicateB-D**) and the original split (**splitA-D**). Panel III of Table 3 presents the average splits that subjects choose to communicate to their spouse. Comparing the allocations reported to their husbands to those they chose when decisions were shrouded, wives allocate slightly more to their husbands in choices B and D and slightly less to themselves in choice C. The magnitude, however, of these changes is small, suggesting minimal misrepresentation. This being said, we also find that, in all three cases, choices communicated by wives shrink allocations towards the middle. A similar, but much more muted, process is observed among husbands.

The third measure is the decision to *consult* (**consult**B-D): subjects are asked whether they wish to be told what allocation their spouse chose. The decision to consult is always secret, but individuals may be planning to accommodate and therefore believe consulting is necessary. Panel IV of Table 3 shows the subjects' willingness to consult their spouse's choice. We see that wives are much more likely to consult than husbands, with few differences across goods. The only surprise is that wives' propensity to consult is less than their propensity to defer — perhaps because consultation is not required when the choice is deferred anyway.

The fourth decision is whether to *accommodate* or dismiss the preferred split communicated by the spouse. Subjects may 'stick to their guns' and keep their original split choice

even if it diverges from their spouse's; or they may opt to partially or fully accommodate their spouse's wishes. We regard this measure as the closest to the concept of 'procedural empowerment', meaning that a subject feels entitled to impose his or her consumption allocation preferences on their spouse. To capture this idea, we construct a categorical variable that compares the revised split (**revisedB-D**) to the original split (**splitA-D**). If the subjects 'sticks to their guns', then their revised split is the same as their original split; if they fully accommodate their spouse's choice, their revised split is equal to the communicated split of their spouse. Partial accommodation is when the revised decision goes in the direction of the spouse's choice, but not completely. Over-accommodation is when the subject's revised allocation overshoots their spouse's. It is also conceivable that subjects are contrarian in the sense that they revise their allocation away from their spouse's preferred choice.

Panel V of Table 3 shows the revised splitting decisions of husbands and wives after having been shown their spouse's communication. We see husbands allocating significantly less than wives to female goods in choice C while in choice D wives allocate more money to themselves than their husbands do. For both women and men, however, these differences were already present in their original splitting decisions.

In Panel VI of Table 3 we examine in more detail the extent to which husbands and wives accommodate the communicated split of their spouse when revising their original choice. Here, accommodation is measured compared to the communication received from the spouse: do subjects move toward their spouse's preferences? We see that mean accommodation by wives is much higher than that of husbands, and the difference is highly significant. This is presented in more detail in Table A2. We see that full accommodation is the modal behavior for women: in 57, 60 and 38 percent of choices. In contrast, zero accommodation despite discordant choices is the overwhelming response of husbands (84, 84 and 91 percent of choices).

What these results indicate is a strong procedural inequality between husbands and wives in the study area — but much less inequality in the allocation of consumption expenditures. This suggests that intrahousehold allocative fairness is achieved through social preferences—which are largely (albeit not fully) shared between husbands and wives— not through procedural equality.

4.3 The demand for agency

The discussion so far has focused on decisions where the interests of the two spouses are potentially divergent. In this context, agency has instrumental value because it allows each spouse to allocate the household's consumption budget in a way more in line with their pref-

erences. To investigate the possibility of non-instrumental demand for agency, we examine the choices of food and drink that they make in Block 5. The stated preferences indicate which of the four private consumption bundles c_i, has the highest private utility $U_i(c_i)$ for individual i. Since consumption is non-rival — what the husband consumes does not affect the wife's choice set, and vice versa — interfering with the consumption decision of a spouse has no instrumental value. Hence if i defers his/her consumption decision to spouse j, it can only satisfy j's desire for control. This gives us a clean measure of deferral (**defer**F) for non-instrumental reasons, i.e., as a way for i to increase j's non-material utility from the decision process itself.

In the last line of Panel II of Table 3 we see that 68% of wives and 19% of husbands delegate the selection of their food and drink to their spouse. Do they believe their spouse knows what they want? Since there are only two options, congruent choices should occur with a 50% probability if couples do not know each other's preferences. This is indeed what we find: the proportion of congruent choices is 54, 54, 52 and 49% for husbands and wives for cookies and husbands and wives for drink, respectively.[18] Partners do a bad job of picking for their spouse. This suggests that, on average, deferral has a material utility cost for subjects: they are less likely to consume the items they prefer.

In Table 4, we examine the rate at which subjects defer when they are faced with varying costs of deferral. Since the change in the size of the budget represents a cost of deferral, observed choices map out the demand for agency as a function of the cost.

In domain A (women's versus men's goods) subjects made three sets of deferral choices: 1) when deferral used the spouse's decision over 2500 compared to retention using their own decision over 2100; 2) when the budgets were both 2500 and 3) when deferral used the spouse's decision over 2100 compared to retention using their own decision over 2100. In domain D (money for the woman versus money for the man) subjects made two sets of deferral choices: 1) when deferral used the spouse's decision over 2500 compared to the retention using their own decision over 2100; and 2) when the budgets were both 2500.

In domain J (non-rival choices over food and drink) subjects made one choice but with two randomly allocated deferral budgets: 1) deferral was for two cookies and a full glass of juice while retention was for one cookie and half a glass and 2) deferral and retention had the same budget. Note that, in domain J, no subject faced both choices: the differences are across, not within subjects.

Table 4 shows a downward sloping demand for the choice to defer for women: the higher the price of deferring (smaller budgets for deferring), the less likely women are to defer their

[18] In a similar experiment, Afzal et al. (2022) show that subjects are no better informed about the preferences of their spouse than a stranger.

choice. In contrast, there is no change for men and most men chose to retain their choices, even when there is a cost for doing so — a low and price-inelastic demand for deferral.

It is possible that women (and men) defer because they believe their spouse will chose for them something that is more advantageous than what they would have chosen for themselves. We investigate this possibility here. We observe both what someone chooses for themselves and what their spouse chooses over the same choice set and we can compare the individual payoffs for both choices to see if deferring is, indeed, sometimes optimal. Since subjects were not asked what they expect their spouse to do in case of deferral, we do not know what each of them expects to gain or lose from deferral but if subjects form rational expectations on splits, on average their guesses should be correct. With these assumptions, we can compare subjects' private material payoff without deferral to the private material payoff they would receive if they deferred. For Table 5 we calculate the proportion of cases in which it would be optimal for subject to defer. We see that, on average, women over-defer relative to what would be optimal, a difference that is always significant. In contrast, husbands massively under-defer: 20-21% when it would be optimal to defer in 60-64% of optimal cases, a difference that is always significant.

Taken together, these results indicate that deferral is driven primarily by non-instrumental considerations. This is particularly clear for men, who seldom defer and, when they do, show no responsiveness to instrumental concerns. Women, in contrast, tend to over–defer. There is no evidence that deferral is a method for improving material outcomes, but, like a normal good, demand for deferral does respond to costs. This serves as further confirmation that the deferral decision is mostly driven by intrinsic motives, such as respect for the husband's authority or adherence to an internalized social norm.[19]

4.4 Aggregating agency at the level of couples

So far we have examined individual decisions related to agency. We now turn to the impact on the collective behavior of spouses that is implied by our experimental results.

Executive agency We start by examining the combined deferral behavior of spouses across five experimental decisions: A, B, C, D, and J (see Panel II in Table 3). Note that although the proportion of female and male deferrals are quite similar across A, B, C, D, and J (see Panel II in Table 3), they are not perfectly correlated within subject; for A to D,

[19]We cannot entirely rule out the possibility that women's adherence to local social norms is reinforced by a kind of Hawthorne effect: being observed encourages participants to be on their best behavior. We can, however, rule out experimenter effects: neither female nor male participants show any inclination to follow Western gender norms.

correlations coefficients vary between 0.51 and 0.60 for women and between 0.36 and 0.58 for men. Correlation coefficients between deferral in domains A through D and deferral in the food-and-juice experiment are even lower: between 0.22 and 0.31. In addition, deferral decisions are not synchronized across spouses: in only about half of the couples do we observe the wife deferring to her husband and the husband not deferring to his wife, and this is true for all five experimental decisions. In 26-28% of couples, neither the wife nor the husband defer; in 12-14% of them, both husband and wife defer; and in 8-11% of them, the husband defers and the wife does not. Thus, there is significant variation in deferral within individuals and little evidence of coordination in deferral behavior across spouses.

Consultative agency Next we turn to our measure of consultative agency, C_w^h, which measures how much of the gap $(c_w^w - c_w^h)$ between the preferred allocations of the wife and her husband is bridged by the husband through the process of misrepresentation, consulting, and accommodation. To recall, $C_w^h = 1$ means that the allocation implemented through consultation is that preferred by the wife, and $C_w^h = 0$ means it is that of the husband. A number between 0 and 1 implies a compromise between the two. The husband's consultative agency C_h^w is computed in a similar manner. By construction, C_w^h and C_h^w cannot be computed if $c_w^w = c_w^h$. This happens in around 10% of the cases – see column 1 of Table 6.

In column 2 of Table 6, we report the average values of C_w^h and C_h^w for choices B, C, and D. We see that C_w^h is very low – between 2.6% and 5.2%, indicating that the consultation process reproduced in the lab moves the allocation chosen by the husband only 2.6 to 5.2% in the direction of the wife's preferred choice. In contrast, C_h^w takes values between 31.7% and 40.2%, indicating that wives grant a lot more consultative agency to their husband when given executive agency by the experimenter.

Next we decompose C_w^h and C_h^w in three separate components (see equation 6 which we reproduce below for convenience): misrepresentation (i.e., self-censoring); willingness to consult the spouse; and accommodation when consulting.

$$C_w^h = 1 - \Big(\frac{c_w^w - c_w^{w\_comm}}{c_w^w - c_w^h} + \frac{(1-k_h)(c_w^{w\_comm} - c_w^h)}{c_w^w - c_w^h} + \frac{k_h(c_w^{w\_comm} - c_w^{h\_accom})}{c_w^w - c_w^h} \Big)$$

The results are shown columns 3, 4 and 5 of Table 6. Column 3 reports first term $\frac{c_w^w - c_w^{w\_comm}}{c_w^w - c_w^h}$. This term can lie outside the c_w^w to c_w^h range. We see that, for choices B and C – which involve allocating a budget between a private good or a household good – there is little misrepresentation/self-censoring: values are close to 0. Things are different for choice D – which divides a monetary budget between the spouse: here wives reduce what they report

to their husband by 18.9% of the difference between their private preferred allocation c_w^w and that of their husband. In contrast, all values are uniformly small for husbands, indicating no self-censoring on their part.

The second term $\frac{(1-k_h)(c_w^{w\text{-}comm}-c_w^h)}{c_w^w-c_w^h}$ captures the loss of consultative agency because the spouse refuses to be informed of the participant's chosen allocation.[20] It is shown in column 4. We see that this is where most of the loss of consultative agency occurs: for wives, this term accounts for between 67.6 and 83.8% of the difference between $c_w^w - c_w^h$; for husbands it is smaller but still represents between 45.6 and 46.9%.

The third term $\frac{k_h(c_w^{w\text{-}comm}-c_w^{h\text{-}accom})}{c_w^w-c_w^h}$ is shown in the fifth column and represents the loss of consultative agency due to lack of accommodation by a consulting spouse. This term is not negligible, accounting for between 10.9 and 18.2% of the gap for wives and between 6.2 and 28.4% for husbands. But it is smaller in magnitude than the second term largely because spouses seldom consult: 15 to 20% of husbands and 52 to 56% of wives consult, depending on the allocation decision.

The experiment allows us to compare C_w^h and C_h^w to the counterfactual allocation $\hat{C}_w^h = 1-\frac{c_w^w-c_w^{h\text{-}accom}}{c_w^w-c_w^h}$ that would result if spouses were forced to hear the allocation that their spouse communicated to them. The results of this calculation are presented in column 6 of the Table. It shows a slight increase in the consultative agency of women, rising by a factor of 2.4 to 3.8 times relative to the values reported in column 2. The modesty of this improvement reflects the fact, already documented earlier in the paper, that husbands do not accommodate the communicated allocation of their wife. In contrast, forcing consultation would improve the consultative agency of husbands by 45 to 68% – assuming counterfactually that they would delegate executive agency to their wife.

Table A3 in the online appendix examines whether material allocations of consumption budgets lean more towards women's preferences when they have executive vs consultative agency – i.e., we compare c_w^w to $k_h c_w^{h\text{-}accom} + (1-k_h)c_w^h$. We find that the material agency of women is slightly but significantly better when they have executive agency, but the differences are quite small on average. Additional analysis, not presented here, nonetheless shows that these small differences in the *average* allocation hide large within-couple differences: how husbands allocate the consumption budget is rarely what wives would have chosen. This means that, for women in our sample, lack of executive agency is consequential: consumption is not allocated the way they want.

[20]Note that, because we always show participants the communication of their spouse, this is not observed in the experiment, but can be inferred.

4.5 Allocative efficiency in production

We now turn to Block 6, which allows allocative inefficiency in production, either due to a desire to increase one's individual income, or driven by fairness considerations in input allocation. Most of the theoretical literature on intrahousehold allocation implicitly or explicitly assumes efficiency in production decisions. Yet some evidence suggests that input endowment effects can impede production efficiency of households in Africa (see Udry, 1996).

The two production games played in Block 6 examine whether subjects make decisions that are efficient for the couple. Recall that, in one game, maximizing household production requires giving more input to the spouse and in the other, maximizing household production requires giving more input to oneself. We see from Panel VII of Table 3 that, in three of the four cases, about half of the subjects choose the efficient outcome that maximizes their joint income. The one exception is that, unlike female subjects, male subjects are less likely to choose the efficient allocation when it yields less for themselves — a statistically significant gender difference. This is a priori surprising: since the subjects are paid in cash in front of each other for this block, they could easily compensate each other for making efficient choices after the experiment. The fact that most men do not opt for the efficient outcome when it benefits their wife suggests that they do not, in fact, expect to be able to costlessly appropriate the surplus ex post.[21]

Combined with our earlier results showing that subjects often defer to their spouse even when doing so reduces the household surplus, these findings indicate the existence of preferences over the process by which a particular allocation is obtained: it is preferable to choose the "right" allocation rather than the "best" outcome and, ex post, reallocate. With this understanding in mind, we now examine whether offering an unconditional cash transfer to women modifies these preferences.

5 Effect of the UCT on intrahousehold agency

Equipped with a better understanding of the decisions made in the lab by couples who did not receive the unconditional cash transfer (UCT) intervention, we now examine the effect of the UCT intervention on female empowerment using the full sample of treated and control participants.

The impact evaluation study by Papineni et al. (2024) examines the effects of cash transfers on various economic and social outcomes, with a particular focus on women's empowerment. The findings reveal that, one year after the program ended, beneficiary women

[21] In Online Appendix B we examine the full set of choices and show that the best model of decision–making is a blend of preferences over both input and output allocations.

experienced a 20 percentage point increase in enterprise ownership, while non-beneficiary women saw a 13 percentage point increase. This surge in female-led entrepreneurship significantly enhanced household consumption and reduced food insecurity. However, while the cash transfers effectively mobilized previously underutilized female labor, they did not significantly alter societal attitudes toward women working outside the home.

As part of the impact evaluation of the UCT intervention, RCT participants were asked a series of questions about decision–making in their households before and after receiving the program. These questions were used to create indices of empowerment based on the Women's Empowerment in Agriculture Index (WEAI).[22] The impact evaluation study by Papineni et al. (2024) reports significant positive impacts on this index for the full RCT sample. Specifically, the cash transfer treatment led to a 0.69 standard deviation increase in the pro-WEAI index for beneficiary households compared to the control group.

In Table 7 we reproduce these findings for our much smaller sample of lab participants: while the A-WEAI index constructed from answers to the baseline survey is balanced across UCT treatment and control, we observe a significant effect on pro-WEAI, the index collected at endline – implying an improvement in female empowerment in our sample as well.

Significant improvements are also reported by Papineni et al. (2024) for specific components of the pro-WEAI index, such as group membership, inputs into productive decisions, and ownership of assets and plots. Additionally, there was a 0.28 standard deviation increase in the decision–making index, which captures control over enterprise activities and income use. Overall, this shows that the cash transfer program significantly enhanced women's economic empowerment by increasing their participation in decision–making and control over resources.

In spite of these effects, the program did not significantly impact psychosocial components of the index, like self-efficacy and attitudes toward gender-based violence. In this section, we complement these findings by testing whether the UCT intervention affected the gender distribution of executive and consultative agency within couples, separately under the no-secret and secret conditions.

5.1 Testing strategy

To investigate the effect of the UCT treatment and the secret condition in the lab, we estimate a model, in equation 7, that examines the interaction of the secret condition (S) and the UCT treatment (T) as four independent categories (with $T_i = 0$ and $S_i = 0$ as the

[22]One, referred to as A-WEAI by Malapit et al. (2019), is based on 6 questions collected at baseline, and another, referred to as pro-WEAI, is based on 12 different questions asked at endline.

omitted category) and also, in equation 8, as the interaction of two treatments.

$$x_i = \beta_0 + \beta_1[T_i^1 S_i^0] + \beta_2[T_i^0 S_1^1] + \beta_3[T_i^1 S_i^1] + \epsilon_i \quad (7)$$

$$x_i = \beta_0' + \beta_1' T_i + \beta_2' S_i + \beta_3' T_i S_i + \epsilon_i' \quad (8)$$

x_i is any of the budget allocations or other decisions made by the subject, variables T_i and S_i indicate the UCT treatment and secret condition and ϵ_i is an error term which we cluster at the level of the session to control for unobserved session effects that would lead to correlated effects. Note that $\beta_1 = \beta_1'$, $\beta_2 = \beta_2'$, $\epsilon_i = \epsilon_i'$ and $\beta_3 = \beta_1' + \beta_2' + \beta_3'$. Since the two regressions are almost exactly the same, we only report the coefficients for equation 7 and the p-value of the coefficient β_3'.

Similar regressions are estimated for the two subsequent allocation decisions subjects are asked to make. The three dichotomous measures of procedural empowerment — defer, consult, and accommodate — are regressed on treatment. If the UCT treatment empowers women in a procedural sense and makes them more openly assertive, we should observe that their decisions to defer, consult, and accommodate all fall with treatment. The need to misrepresent would also fall. Furthermore, if the treatment also reduces the power of husbands, or makes them take their wife's wishes into consideration, we should observe increases in the rate in which men defer, consult, and accommodate.

5.2 Budget allocation decisions

We begin with the initial split decisions of husbands and wives. As explained in Section 3, initial split decisions (Block 1) are always kept secret in the experiment. Thus, choices made by subjects can be interpreted as representing their true preferences and any treatment effect we find can be seen as a shift in preferences induced by the UCT.[23]

To investigate this, we show in Table 8 the estimates obtained by regressing split decisions on a UCT treatment dummy. Since choices are shrouded, we expect no effect of the no-secret treatment.[24] We see that women who experienced the UCT increased the allocation to themselves in goods and money by 67 Naira in domains A and D, for a total change of 134 Naira. Only the total allocation is significantly different between those who received the UCT and those who did not (the p-values for domain A and D are 0.103 and 0.107 respectively). The total change in A and D for men, by comparison is 12 Naira, an amount

[23] A shift in preferences may arise because the utility function of the subject has changed or because of an income effect induced by the UCT.

[24] We confirm in Online Appendix Table A4 that the secret/no-secret treatment has no separate significant effect on split decisions.

both statistically and economically non-significant. There is also suggestive evidence that women allocated more to the household versus their husband (domain B). The increase in household allocation is 51 Naira (p-value = 0.116)

The UCT treatment changed the amounts women are willing to allocate to themselves (and their household compared to their husband). The changes are marginally significant, but economically small. The total change in the amount women allocate to themselves after a eighteen-month cash transfer program is 134 Naira, 5% of the average allocation across domains A and D. Since men do not change their allocation, the treatment can be seen as widening (slightly) the divide between women's and men's preferred consumption bundles. This finding is consistent with a slight rise of individualism among women who received the UCT.

5.3 Decision Process

In Table 9 we estimate regression model (7) for deferral decisions. Unlike the split decision, defer decisions are only shrouded in the secret condition, something participants were informed of before making a decision. Consequently, we include both a UCT and a secret effect. We find that, in all four rival domains, wives defer much less often when they receive the UCT treatment under the secret condition. The difference is large in magnitude – between 12 and 17 percentage points — and it is significant in all cases and in the aggregate (column A-D). No such changes are observed for husbands who, as we noted earlier, are much less likely to defer on average. We see the results of the same magnitude for the non-rival food and juice (J) but the coefficients are not significant. Combined with the findings from Table 8, these results suggest that the UCT treatment has made women want more consumption *and* agency. But it has not made them more vocal or openly assertive: they continue to defer to their husband if this decision is observed. This is consistent with deferral being a social norm internalized by participating women, since it is also present in the Secret treatment. The fact that this behavior changes with the UCT indicates that the treatment changed this internalized norm for some female recipients, but did not change the fear of possible retribution for breaking it. This is quite a remarkable outcome, and not one that would be observable outside this experiment.

Table 10 presents a similar analysis for the decisions to misrepresent, consult, and accommodate. Note that the initial allocation is always secret, the communicated allocation is never secret and the decision to consult is always secret. The decision to accommodation could be revealed in the no-secret condition, since the spouse knows both their communication and the final allocation. Despite the fact that the secret condition only directly affects

the accommodation decision, it might indirectly affect misrepresentation and consult, and therefore we examine all four treatment conditions.

In the decision to misrepresent, presented in Panel A, the dependent variable is the difference between the communicated split and the initial (secret) split: a negative coefficient implies that the communicated split is smaller than the secret split. We find that women who received the UCT tend to misrepresent more in the secret condition but the effect is only significant at the 10% level in one of the three regressions. For husbands we observe more misrepresentation as a result of treatment, but only in choice D. The lack of systematic pattern across choices makes us suspect the result is not robust. There is no evidence for an effect of the UCT treatment alone.

In the second panel of Table 10 the dependent variable equals 1 if the subject manifested a desire to see their spouse's communicated split. In five of the six regressions, we observe a large fall in the likelihood of consultation as a result of treatment, with all but one significant effect being concentrated in the secret condition. The magnitude of these effects is large, especially in the secret condition: wives reduce the likelihood of consulting by a combined 13 to 27 percentage points, while husbands reduce it by 16 to 23 percentage points (starting from a much lower base.) The fact that these changes are significant primarily in the secret condition suggests the presence of hidden tension between treated spouses, tensions that they are trying not to learn about.

The third panel of Table 10 focuses on accommodation. Here we find little evidence of treatment effects: except for one significant coefficient at the 10% level, there is no dominant pattern across choices. Even in secret, treated women are not less willing to accommodate their husbands' communicated allocation; the pressure is too direct.

These findings contribute to a coherent picture of the effect of treatment on procedural fairness in couples: treated women become secretly more demanding and less willing to defer and consult, as long as these decisions can be hidden; treated husbands also tend to shift their budget allocation towards a more selfish posture, although the effect is not statistically significant; and they consult less often, especially if this decision is less observable.

5.4 The Demand for Agency

In the control group, we saw that there is a demand for agency: the willingness to defer is sensitive to the cost of deferral. In a parallel analysis, we show that the secret treatment shifts the demand curve, increasing the demand for agency at every price. While changes in consumption bundles or increased demand for agency could reflect an income effect of the UCT treatment on household assets and female labor force participation, the impact of the

secret treatment cannot be an income effect as the secret treatment was randomized across individual on the day of the experiment.

We examine the effect of the UCT and no-secret treatments in Table 11 where we combined all the deferral decisions subjects make in domains A (female v. male goods) and D (cash for the wife v. the husband) and in the food and drink domain J. By combining decisions made in Blocks 2 and 3, we can estimate the response of the demand for agency (i.e., non-deferral) to its cost.[25] The results confirm what we found earlier: that increasing the cost of agency reduces women's willingness to exert agency. For men, the cost of agency has no significant effect on deferral, except for domain D (cash to the wife) where increasing the cost to deferral actually *increases* the propensity to defer.[26]

In the secret condition the deferral decision cannot be discovered by the spouse; otherwise, it can. We expect the secret condition to potentially have an effect on deferral: if a wife is enticed to demand more agency as a result of the UCT treatment but is afraid of retribution if it is revealed that she did not defer to her husband, she may refrain from deferring only in the secret condition. The impacts of the treatment match those shown above: women (but not men) increase their demand for agency if they received the UCT treatment and are in the secret condition. This result is significant both in total — i.e., UCT recipients in the secret condition are different from non-recipients in the no-secret condition — as well as on the margin — i.e., the combined impact of the UCT and secret treatments is different from the sum of the UCT treatment and secret condition.

5.5 The distribution of agency within the couple

So far we have examined the impact of the UCT and secret treatments on individual behavior. We now turn to its impact on the collective agency of spouses. We start by creating four variables that average the proportion of paired spousal decisions across experimental choices A to J. The first variable represents the proportion of paired decisions in which the wife defers and the husband does not, and so on. Equal agency is achieved when both defer – and it can be seen as a premise for a negotiated outcome. In contrast, disharmony in the couple can be expected when neither defer. We already know that, on average, the combination of UCT and secrecy induces less deferral by wives without changing husbands' behavior. But these averages could mask shifts in opposite directions across couples: if men who deferred to a non-deferring wife no longer do as a result of treatment (i.e., they oppose the treatment),

[25] Coefficient estimates for the cost variable in the J domain are across-subject comparisons since no subject made a decision over deferring a cookie and drink at two different costs.

[26] This can be read as a reaction to experimental demands for deferral, but should not be interpreted as a reaction to female agency; men are pushing back on the experimenter, not necessarily their wives.

we could observe both an increase in the proportion of equal agency couples (both defer) *as well as* in the proportion of disharmonious couples (neither defer).

To investigate this issue, we regress each of these four proportions on the UCT and secret treatments .[27] Results, shown in Table 12, show that the combination of the UCT and the secret treatment causes a transfer of around 8-9% of couples from the "Wife defers, husband does not" to "No one defers" – and another 4-5% transfer from "Both defer" to "Husband defers, wife does not" (significant only for the former). These findings indicate no correlation between deferral among husbands and the change in deferral by their wife – i.e., it is not the case that husbands react negatively to a reduction in deferral by their spouse. We nonetheless note a reduction in the proportion of couples who both defer from around 16% to 11% and an increase in the proportion of no-deferral couples from approximately 23% to 32%. In other words, in our sample, equal agency has gone down and the risk of conflict has increased – a finding that is largely due to the fact that husbands do not accommodate the increased demand (or rising aspirations) for women's agency that the UCT induced. Given this lack of accommodation, it is no surprise that pent-up demand for executive agency remains hidden: it is only expressed in secret.

May husband nonetheless have accommodated their wives' increased demand for agency by consulting them more? To investigate this possibility, we regress C_w^h and C_h^w on the UCT and secret treatments, as done in Table 12 for deferral. We find no evidence on an effect of treatment on the consultative agency of either husbands or wives.[28] The same holds for the aggregate consultative index when the spouse is forced to consult. We also find no evidence of any effect of the UCT or secret treatments on material allocations resulting from consultation among spouses.[29] This indicates that the UCT intervention has had no effect on husbands' willingness to consult their wife over the allocation of consumption in the household, suggesting that the intervention has not changed gender norms in favor of women. This evidence also contradicts the collective thinking hypothesis: if collective thinking was the reason for women not to want to exert executive agency over consumption, then we should observe husbands consulting them – which we do not.

5.6 Aggregate Welfare and Secrecy

Here, we examine the effect of treatment on the expected payoff of experimental subjects. As explained in Section 2, one of a long list of possible choices made by subjects is drawn at

[27] Similar but slightly more significant results obtain using a fractional logit model.

[28] Of the 18 estimated coefficients (3 regressors x 3 decisions x 2 spouses), only one is significant at the 10% level – see Appendix Table A5.

[29] See Appendix Table A6.

random to determine final payoffs. We focus on the most important choices made by both spouses, namely **split**A-D and **defer**A-D. Using simple rules described in the note to Table 13, we construct a variable that measures the payoffs π_f and π_m that a male and female subject can expect to receive based on their own decisions. These expected payoffs are what subjects can expect to receive purely for themselves at the end of the experiment based on their own split and defer decisions and the decisions of their spouse.

Coefficient estimates are presented in Table 13. Although the point estimate for the UCT is positive, it is not significant. The material payoff of women only increased in the UCT/secret treatment. The increase in this category is about 5 percent of the total possible payouts. To the extent that the rule for selecting payoffs in the experiment mimics what happens at home, this suggests that the UCT treatment is most likely to raise the material welfare of women if it is accompanied by some form of secrecy. Without secrecy, women overwhelmingly delegate consumption decisions to their husband, whose social preferences are largely unaffected by treatment.

5.7 Allocative Efficiency in Production

Finally, we examine the impact of the UCT treatment and other experimental conditions on the efficiency of couple's production decisions. Based on the existing literature, we have no reason to believe that the UCT treatment should increase or decrease efficiency, since theory suggests efficiency is a dominant strategy in all households, irrespective of the decision–making process. Moreover, the game does not allow deferring production decisions to one's spouse, so there is no way to express or avoid agency — and thus no possible effect of the UCT through demand for agency.

Table 14 summarizes the impact of the UCT treatment and secret conditions on decision–making in the production games. We examine two measures of efficiency: subjects who played both versions of the game are strongly efficient if they chose the efficient outcome in both games; subjects who played only one version are weakly efficient if they chose the efficient outcome in that game.

In the top Panel of Table 14, we see that, among control participants (no-UCT) in the secret condition, women chose the efficient option less frequently. This is true for both sets of subjects, i.e., those who played both versions of the game and those who only played one version. Based on model predictions, this finding indicates lower social preferences for women in the condition that mimics a non-cooperative state. There is no similar effect of the secret condition on men (see Panel II) but, on average, they choose the efficient option less frequently — suggesting that, unlike women, men act equally selfishly in both the secret

and no-secret conditions.

Turning to the UCT, we see that it induces a large drop in the frequency of efficient choices by women in the no-secret condition. Since this loss in efficiency is potentially visible to the husband, it suggests that, on average, treated women take a more confrontational stance in the production game. The effect of the UCT is also negative in the secret condition, but much less so than among controls, and it is no longer significant. This, in contrast, seems to suggest that women who received the UCT become more altruistic in secret. We similarly find that husbands of UCT recipients choose the efficient option more often in the secret condition (although not significantly so) but we do not see this in the no-secret treatment. This implies that, like women, men in UCT households behave more altruistically in the secret than in the no-secret condition. When combined with the previous result that consulation fell in the UCT, these results suggest that the UCT treatment induced a fall in cooperative outlook — but an increase in altruism — among both spouses.

6 Conclusion

The use of an experimental laboratory setting allowed us to examine changes in decision–making processes after a year-and-half-long unconditional cash transfer, to break decisions into constituent parts and to test how decisions would be made both in a secret and no secret condition. Although we acknowledge the possible limitations of laboratory evidence in terms of external validity, the approach allows us to distinguish between key components of the intrahousehold decision process, namely, the social preferences of the spouses and the distribution of executive and consultative agency between them.

By examining the behavior of participants in the control group we show that both men and women have social preferences over each others' consumption, even with fully rival goods, and we do not see the gender imbalance in outcomes that we had expected in this setting. This stands in contrast with much of the literature on female empowerment which has bypassed the issue entirely by focusing instead on the private material welfare of the spouses. Our findings demonstrate that ignoring the possibility that spouses have social preferences and may behave altruistically towards each other is likely to lead to an incorrect assessment of female empowerment (see also Almås et al., 2020). Indeed, we also find that the *way* allocations are chosen is highly biased. Women are more likely than men to consult their spouse when offered the option, to misrepresent the choices they communicate to their spouse (stating they want less than they originally chose), and to accommodate their spouse's choices after being informed of them. In addition to observing the negotiation process over outcomes, we allowed both men and women to skip this process by deferring their decision

to their spouse. We find a marked contrast between men and women. Women defer 67% of their decisions to their spouse while men only defer between 20 and 25% of their decisions. Furthermore, men refuse to defer even when the allocation is a choice between household items and female items, a choice over which they likely have little at stake in the context of our experiment.

Our experiment demonstrates that intrahousehold equity in consumption is achieved through social preferences, not through participation in household decisions. The process by which decisions are made leads to final allocations that are not, on average, different from the initial choices of either spouses. In fact, any examination of the initial and final choices of the couples would give the impression of significant female bargaining power. By varying the costs of decisions and examining their efficiency, both at the individual level and household level, we see strong willingness to incur costs to follow the process outlined above: women over- and men under-defer relative to optimal. This strongly suggests an intrinsic value to the process: in the local context of our experiment, men 'need' to be decision makers and women 'need' to let their husband decide. Men in particular, show no sensitivity to the costs or benefits of deferral.

This leads to inefficiency. Although husbands on average make choices that are similar to the choices of their wives, women defer to them even when doing so reduces their joint surplus. Husbands are making similarly expensive decisions by failing to defer even when doing so reduces the couple's joint surplus and their wives would have made the same decisions that they made. The inefficiency is apparent in these costly decisions as well as in the two production games. Women are trying to balance inputs and outputs across the couple instead of just picking the clearly largest pie and then reallocating after the fact. Men are also making inefficient decisions and their poor choices are quite visible in the production game where efficiency requires them to let their wives earn more than they do. These men should be able to capture the gain in income but they are unwilling to allow this to happen — a result that is reminiscent of the findings of Bertrand et al. (2015) in a developed country context.

We do see some changes in these patterns in households that received the UCT. There are small changes in the initial choices of allocations for both men and women, suggesting some impact on the weights each member places on their own consumption as a result of wives receiving the UCT: in the lab, women tend to allocate a slightly larger share of the consumption budget to themselves, suggesting a change in social preferences (or an income effect). The changes in processes are muted: UCT recipients are less likely to defer their budget allocation decisions to their husband, but only when doing so is not observable. This is compatible with a pent-up demand for agency that would be repressed if expressed openly.

We find no effect of the UCT intervention on husbands' propensity to consult their wife or accommodate their preferences, indicating no effect of the UCT on gender norms of power in the household. Taken together, these results suggest that the effect of the UCT on the intrahousehold distribution of agency is limited to a rise in aspiration for agency that is not met by changes in gender norms or fear of reprisal, and therefore can only be expressed in secret – a finding reminiscent of Ashraf et al. (2014).

Our results call into question the ability to infer bargaining power by focusing on outcomes: in settings with strong social preferences, outcomes may bear little resemblance to the distribution of power within the household. The UCT has been shown to increase the material welfare of women, children, and the household. But it only had a small impact on the way decisions are made in the household, i.e., that women demand more agency only when they can do so in secret. While not unimportant (many households decisions are shrouded and therefore, effectively secret), this small change does not support the hypothesis that a cash transfer significantly improve agency in the household.

The objective of this paper was to investigate whether participants to our study have a demand for agency, not *why* they do not demand agency. There are many reasons other than social norms why individuals may prefer to delegate decisions to others: because they do not care enough to waste time or cognitive load on making a decision (e.g., Dhar, 1997; Shafir et al., 1993); because others are better informed and thus better able to make a good decision (e.g., Costa-Gomes et al., 2022; Tagat et al., 2023); because they lack self-confidence or have a failure of aspirations; or because they altruistically opt to let others decide who value making decisions. More research is needed to disentangle how these various factors influence decision–making within households.

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Table 1: Experimental flow for one block (B) with two female examples

Decision	Description	Ex 1	Ex 2
	Block 1		
splitB	Divide 2500 Naira between male items and household items	1400/1100	1300/1200
resplitB	Divide 2100 Naira between male items and household items	1100/1000	900/1200
	Block 2‡		
deferB	Keep original split or change to spouse's	defer	not defer
	Block 3‡		
defercostB	Keep original split or change to spouse's (lower total) resplit	defer	not defer
deferbenefitB †	Keep original (lower total) resplit or change to spouse's split	defer	defer
	Block 4		
communicateB	choose allocation to show to spouse	1200/1300	1300/1200
consultB	Ask to see the decision of spouse	yes	no
shown	All participants shown communication of their spouse, whether consult or not	*(1800/700)*	*1200/1300)*
reviseB	Revise split after being shown decision of spouse (even if did not consult)	1500/1000	1300/1200
	Block 5 (Always implemented immediately)		
splitF,J	Choose round or square cookies and coke or fanta for self	round:coke	round:fanta
spousesplitF,J	Choose round or square cookies and coke or fanta for spouse	round:coke	square:coke
deferF	Defer both cookies and drink to spouse's choice or keep original choice	defer	not defer
Randomized Payout	One spouse is randomly selected	wife	husband
	One decision (**split, resplit, defer, defercost, deferbenefit**) from all four domains is randomly selected and implemented for that spouse	wife's **defer**B ↓ husband's **split**B	husband's **split**B
Shopping	Couples receive experimental money to shop, specific to each store	1800/700§	1200/1300§

Notes: Only domain B (male items vs. household items) is shown here. Other domains follow the same protocol. †Defer with benefit was not implemented for domain B, shown here for completeness. ‡The order of Block 2 and Block 3 is randomly assigned within session. §Spouse choices are shrouded as follows. First, husbands and wives were placed in separate rooms. Second, to guarantee plausible deniability, a random pay-off could be chosen for any decision made in Block 1 and for all deferral and consulting decisions included in the secret treatment.

Table 2: The Production Games

Choice	Own Input	Spouse input	Own Income	Spouse Income	Total Income
Game 1: efficient means less for self than spouse					
a	10	0	1500	600	2100
b (dominated)	7	3	1200	800	2000
c (efficient)	3	7	1000	1500	2500
d	0	10	400	1900	2300
Game 2: efficient mean more for self than spouse					
a	10	0	1900	400	2300
b (efficient)	7	3	1500	1000	2500
c (dominated)	3	7	800	1200	2000
d	0	10	600	1500	2100

Table 3: T-tests of the difference between wife and husband means in the control sample

	Sample mean				
	Wife	Husband	t-stat	p-value	N
Panel I: Split the budget secretly - spending on 1st good					
splitA– female vs male goods	1410	1298	3.22	0.001	251
splitB– household vs male goods	1396	1316	2.36	0.019	251
splitC– household vs female goods	1168	1214	-1.37	0.171	250
splitD– money for wife vs husband	1265	1062	5.67	0.000	251
Panel II: Decision to delegate splitting decision to spouse:					
deferA– female vs male goods	67%	25%	10.19	0.000	223
deferB– household vs male goods	68%	22%	11.22	0.000	251
deferC– household vs female goods	67%	20%	12.38	0.000	251
deferD– money for wife vs husband	67%	26%	9.77	0.000	251
deferF–choice of cookie and juice	68%	19%	10.32	0.000	165
Panel III: Split shown to spouse - spending on 1st good					
communicateB – household vs male goods	1316	1328	-0.30	0.761	198
communicateC – household vs female goods	1178	1240	-1.75	0.082	223
communicateD – money for wife vs husband	1226	1076	2.90	0.004	123
Panel IV: Whether decides to see the split shown by spouse					
consultB – household vs male goods	55%	23%	6.83	0.000	198
consultC – household vs female goods	57%	20%	8.63	0.000	223
consultD – money for wife vs husband	59%	20%	7.24	0.000	123
Panel V: Revised split after seeing spouse's split - spending on 1st good					
reviseB – household vs male goods	1329	1323	0.20	0.840	198
reviseC – household vs female goods	1161	1230	-2.70	0.007	223
reviseD – money for wife vs husband	1172	1089	1.72	0.088	123
Panel VI: Extent of accommodation of spouse's communicated split*					
accommodateB – household vs male goods	1.94	0.47	11.70	0.000	197
accommodateC – household vs female goods	1.91	0.41	12.69	0.000	223
accommodateD – money for wife vs husband	1.27	0.22	6.00	0.000	121
Panel VII: Whether chooses efficient allocation in production					
efficientG1 – efficient is less for self	56%	38%	3.74	0.000	227
efficientG2 – efficient is more for self	51%	53%	-0.48	0.633	215

Notes: Each row reports the results for a t-test between sample means, only using observations on control households. The number of observations varies because some decisions were only introduced in later experimental sessions. Split choices A to D = split 2500 between two goods. The order is the same for both spouses. A = between female and male goods; B = between household and male goods; C = between household and female goods; D = money for wife or husband. All goods are purchased in a shop set up in the lab. Resplit decisions are made on a smaller amount (either 2100 or 1800). The choices for the communicate (Panel III) and revise decisions (Panel V) are made over the same allocations as those in Panel A. In Panels I, III, and V, the averages shown in columns Wife and Husband are, in both cases, the budget amount allocated to the *first* option – e.g., female goods for splitA.

(*) Variable defined as: -1 (move away from spouse's choice); 0 (keep same choice, different from spouse's choice); 1 (keep same choice=communicated choice of spouse); 2 (partially accommodate the spouse's choice); 3 (fully accommodate spouse's choice); 4 (over-accommodate spouse'schoice).

Table 4: The demand for agency (choosing not to defer)

		Rate of deferral			
		The budget when deferring is			
	Choice:	larger	the same	smaller	N
Wife	A	74.1%	68.3%	53.2%	139
	D	73.2%	71.1%		97
	J	93.0%			86
	J		68.5%		165
Husband	A	20.1%	26.6%	22.3%	139
	D	19.6%	24.7%		97
	J	25.6%			86
	J		19.4%		165

Note: The dependent variable is the choice to defer the allocation to the spouse. The number of observations differs because some treatments only appear in certain sessions. Drink and Juice choices were only posed once for each participant.

Table 5: Examining deferral efficiency

Comparing deferral propensity to optimal own deferral							
Domain: retain v. defer		decider	**Actual**	**Optimal**	t-stat	p-value	N
A	2500: 2500	Wife	67%	46%	4.85	0.000	223
		Husband	25%	46%	-5.08	0.000	223
D		Wife	67%	44%	5.46	0.000	251
		Husband	26%	44%	-4.65	0.000	251
A	2100: 2500	Wife	74%	61%	2.54	0.012	153
		Husband	21%	64%	-8.69	0.000	154
D		Wife	73%	49%	3.47	0.001	97
		Husband	20%	60%	-6.35	0.000	97
A	2500: 2100	Wife	53%	34%	3.27	0.001	154
		Husband	21%	36%	-2.97	0.003	154

Notes: Deferral choices refer to situation in which the subject must choose between their own split or the split choice made by their spouse. Data uses only observations on control households. Deferral is defined to be optimal if the subject would receive more (or the same) for self by deferring to spouse.

Table 6: Consultative agency

	% of cases when spouses' chosen alloc.	Consultative agency index if spouse free to consult or not		Loss of consultative agency due to: Self-censored comm. to spouse		No consultation by spouse		Limited accomm. by spouse		Consultative agency index if spouse forced to consult	
	(1)	(2)		(3)		(4)		(5)		(6)	
Decision:	are identical	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband
Household vs male items	9.9%	5.2%	40.2%	5.5%	3.0%	75.6%	46.9%	12.1%	6.2%	12.5%	63.8%
Household vs female items	7.8%	3.1%	40.2%	-4.2%	3.7%	83.8%	45.6%	18.2%	13.7%	11.8%	65.1%
Cash for wife vs for husband	10.6%	2.6%	31.7%	18.9%	-1.0%	67.6%	46.9%	10.9%	28.4%	6.3%	53.5%

Note: The aggregate index is winsorized to remain between 0 and 1. This explains why the sum of the three components differs somewhat from the aggregate index value.

Table 7: Female empowerment index in the lab sample

	UCT Treatment				
	Control	UCT	t-stat	p-value	N
A-WEAI index (6 questions at baseline)	1.94	2.09	-1.42	0.155	503
pro-WEAI index (12 questions at endline)	4.42	5.02	-3.96	0.000	446

Notes: The A-WEIA index stands for Adapted Woman's Empowerment in Agriculture Index. It is based on 6 questions asked to female participants at baseline. The pro-WEAI index stands for Project Woman's Empowerment in Agriculture Index and is based on 12 different questions asked to participants at endline as described in Malapit et al. (2019). Both indices capture empowerment but the component indicators in the baseline and endline index are slightly different. The Table only uses respondents to the baseline and endline surveys that also participated to the lab experiment. The A-WEAI index should be balanced across treated and control, while the pro-WEAI index may be affected by the UCT treatment.

Table 8: Effect of UCT on split decisions

Dependent Variable is Split Decision by the Wife					
for choice:	A	B	C	D	A + D
UCT	66.83	51.40	-16.81	66.81	133.6**
	(1.674)	(1.610)	(-0.535)	(1.650)	(2.164)
Constant	1,410***	1,396***	1,168***	1,265***	2,674***
	(61.07)	(49.22)	(40.89)	(41.66)	(74.57)
Observations	503	503	502	503	503
R-squared	0.008	0.004	0.000	0.007	0.014
Dependent Variable is Split Decision by the Husband					
for choice:	A	B	C	D	A + D
UCT	-8.921	5.295	-11.96	-3.422	-12.34
	(-0.287)	(0.131)	(-0.327)	(-0.104)	(-0.248)
Constant	1,298***	1,316***	1,214***	1,062***	2,360***
	(50.96)	(46.06)	(37.08)	(40.28)	(64.73)
Observations	503	503	502	503	503
R-squared	0.000	0.000	0.000	0.000	0.000

Notes: The dependent variable is the initial split decision (between 0 and 2500) made by each subject in each of the four domains: A: female v. male goods; B: household v. female goods; C: household v. male goods; D: female v. male money. UCT refers to the subjects who received the UCT treatment.
Robust t-statistics in parentheses, clustered by session. *** p<0.01, ** p<0.05, * p<0.1

Table 9: Treatment effects on deferral decisions

Dependent Variable is Deferral Decision by the Wife for choice:	A	B	C	D	J	A-D
UCT/no-Secret	-0.050	0.011	-0.064	-0.013	-0.089	-0.141
	(-0.871)	(0.149)	(-1.112)	(-0.182)	(-1.167)	(-0.619)
no UCT/Secret	0.000	0.036	-0.029	-0.013	-0.051	0.013
	(0.006)	(0.486)	(-0.361)	(-0.190)	(-0.578)	(0.046)
UCT/Secret	-0.143**	-0.123*	-0.124*	-0.168**	-0.133	-0.591**
	(-2.148)	(-1.861)	(-1.784)	(-2.509)	(-1.416)	(-2.395)
Constant	0.672***	0.664***	0.679***	0.679***	0.709***	2.707***
	(14.561)	(13.710)	(13.096)	(14.424)	(10.563)	(14.571)
Observations	450	503	503	503	337	450
R-squared	0.015	0.017	0.010	0.022	0.011	0.026
p-value of marginal effect‡	[0.280]	[0.075]	[0.729]	[0.098]	[0.952]	[0.126]
Dependent Variable is Deferral Decision by the Husband for choice:	A	B	C	D	J	A-D
UCT/no-Secret	-0.052	-0.030	0.008	-0.092	-0.049	-0.196
	(-1.229)	(-0.656)	(0.173)	(-1.578)	(-0.851)	(-1.450)
no UCT/Secret	-0.007	-0.037	-0.023	-0.097*	-0.129	-0.203
	(-0.104)	(-0.873)	(-0.412)	(-1.858)	(-1.703)	(-1.073)
UCT/Secret	-0.002	-0.022	0.061	-0.068	-0.009	-0.043
	(-0.036)	(-0.484)	(1.040)	(-1.331)	(-0.124)	(-0.235)
Constant	0.250***	0.237***	0.206***	0.305***	0.256***	1.034***
	(6.783)	(7.842)	(5.181)	(8.142)	(4.426)	(8.495)
Observations	450	502	503	503	337	449
R-squared	0.002	0.001	0.006	0.008	0.015	0.004
p-value of marginal effect‡	[0.434]	[0.468]	[0.287]	[0.106]	[0.026]	[0.119]

Notes: The dependent variable is the deferral decision made by each subject in each of the four deferA-D decisions and in the deferJ decision from Block 5. A: female v. male goods; B: household v. female goods; C: household v. male goods; D: female v. male money, J: food and drink. The dependent variable is a dummy equal to 1 if the subject chooses to defer, 0 otherwise. The dependent variable in the last column is the sum of the dependent variables in columns A to D; it takes values from 0 to 4.: Each regressor corresponds to a different treatment category with the intercept corresponding to the no-UCT/no-secret category.
‡ is the p-value of the F-test that UCT / Secret = UCT + Secret and tests the marginal contribution of the combined treatments compared to the sum of the contributions.
Robust t-statistics in parentheses, clustered by session. *** p<0.01, ** p<0.05, * p<0.1

Table 10: Treatment effects on decisions to misrepresent, consult, and accommodate

decision by spouse:	Wife			Husband		
for choice:	B	C	D	B	C	D
Panel A: Dependent variable is Misrepresent: communicate minus splitB-D						
UCT/no-Secret	-24.44	-8.692	7.750	8.095	2.647	-23.25*
	(-0.712)	(-0.339)	(0.163)	(0.666)	(0.170)	(-1.814)
no UCT/Secret	-42.58	-7.740	17.06	40.68	-33.54	-9.524
	(-1.309)	(-0.247)	(0.293)	(1.692)	(-1.460)	(-0.561)
UCT/Secret	-20.63	-50.47*	-43.62	2.058	0.0556	-26.43**
	(-0.444)	(-1.826)	(-1.078)	(0.118)	(0.004)	(-2.192)
Constant	-13.33	14.41	-25.40	-18.10	-1.695	9.524
	(-0.738)	(0.697)	(-0.748)	(-1.624)	(-0.113)	(1.261)
Observations	394	450	245	394	450	245
p-value of marg. effect‡	[0.473]	[0.418]	[0.389]	[0.097]	[0.217]	[0.800]
Panel B: Dependent variable is Consult						
UCT/no-Secret	-0.0365	-0.0514	-0.0626	-0.0556	-0.0468	-0.163**
	(-0.472)	(-0.663)	(-0.729)	(-1.483)	(-1.035)	(-2.272)
no UCT/Secret	-0.0648	-0.0419	-0.117*	-0.0839	-0.0849	-0.0556
	(-0.848)	(-0.575)	(-1.776)	(-1.267)	(-1.265)	(-0.688)
UCT/Secret	-0.0904	-0.150**	-0.172***	-0.125**	-0.114**	-0.0673
	(-1.412)	(-2.150)	(-3.204)	(-2.132)	(-2.461)	(-0.838)
Intercept	0.581***	0.585***	0.651***	0.267***	0.237***	0.222***
	(12.10)	(11.87)	(27.14)	(6.924)	(5.597)	(3.619)
Observations	394	450	245	394	450	245
p-value of marg. effect‡	[0.915]	[0.573]	[0.944]	[0.838]	[0.794]	[0.105]
Panel C: Dependent variable is Accommodate see Table 3						
UCT/no-Secret	0.0315	0.0162	-0.0252	-0.00794	-0.0616	0.0177
	(0.482)	(0.355)	(-0.271)	(-0.123)	(-1.059)	(0.285)
no UCT/Secret	-0.0409	0.00670	-0.0452	-0.0363	-0.00444	-0.0421
	(-0.587)	(0.092)	(-0.631)	(-0.615)	(-0.0749)	(-0.823)
UCT/Secret	-0.0406	-0.0662	-0.0114	-0.0209	-0.0474	-0.0883*
	(-0.551)	(-1.171)	(-0.139)	(-0.341)	(-0.784)	(-1.781)
Intercept	1.942***	1.873***	1.333***	0.505***	0.424***	0.270***
	(15.47)	(14.09)	(8.236)	(3.277)	(4.160)	(3.702)
Observations	392	449	243	394	450	245
p-value of marg. effect‡	[0.708]	[0.280]	[0.605]	[0.776]	[0.813]	[0.356]

Notes: Each regressor corresponds to a different treatment category with the intercept corresponding to the no-UCT/no-secret category. As explained in Section 3, subjects are first asked whether they want to consult their spouse allocation and this decision is recorded. Later they are told what their spouse chose and are offered an opportunity to revise their chosen allocation. This design allows us to observe accommodation for all subjects. ‡ is the p-value of the F-test that UCT/Secret = UCT + Secret and tests the marginal contribution of the combined treatments compared to the sum of the contributions. Robust t-statistics in parentheses, clustered by session. *** p<0.01, ** p<0.05, * p<0.1

Table 11: Treatment effects on demand for agency

Dependent variable is deferral by	wife	husband
A (female v. male goods)	omitted	
D (cash for wife v. husband)	0.0161	0.0172
	(0.776)	(0.874)
J (drink and cookie)	0.0273	-0.0140
	(0.951)	(-0.553)
A X cost	-0.0220***	-0.00160
	(-6.009)	(-0.491)
D X cost	-0.0150*	0.0129*
	(-1.773)	(1.813)
J X cost	-0.0623***	-0.00106
	(-6.989)	(-0.109)
UCT/no-Secret	-0.0182	-0.0417
	(-0.426)	(-1.079)
no UCT/Secret	0.0106	-0.0385
	(0.266)	(-1.003)
UCT/Secret	-0.128***	-0.0168
	(-3.047)	(-0.438)
Constant	0.648***	0.249***
	(21.54)	(8.211)
Observations	2,284	2,284
R-squared	0.045	0.003
p-value of marginal effect‡	[0.046]	[0.230]

Notes: This Table combines observations on all the deferral decisions taken by the wife (column 1) and the husband (column 2) in decision domains A, D, and J. The dependent variable equal 1 if the subject defers, and 0 otherwise. As in Tables 5 to 9, regressors UCT treatment, Secret condition, and UCT x Secret, each corresponds to a different treatment cell. The other regressors are added on top of that. Deferral choices made in domain A are the omitted category. Dummies for domains D and J (Block5) are included. We also include dummies for deferral decisions made for domains A and D in Block2, when deferral either decreases or increases the allocatable budget; the dummy is 1 if deferral is costly and -1 if non-deferral is costly. We also include a dummy equal to -1 if non-deferral is costly in the food and drink game (Block5). The intercept gives the value of the dependent variable in the no-UCT/no-secret treatment cell, domain A, and no cost condition. Each regressor corresponds to a different treatment category with the intercept corresponding to the no-UCT/no-secret category.
‡ is the p-value of the F-test that UCT / Secret = UCT + Secret and tests the marginal contribution of the combined treatments compared to the sum of the contributions.
Robust t-statistics in parentheses, clustered by household. *** p<0.01, ** p<0.05, * p<0.1

Table 12: Treatment effect on paired deferral rates

Dependent variable is the proportion of choice pairs in each category				
Deferral?	W yes, H no	W no, H no	W yes, H yes	W no, H yes
UCT/no-secret	0.005	0.035	-0.035	-0.006
	(0.141)	(1.142)	(-1.333)	(-0.276)
no-UCT/Secret	0.008	0.040	-0.018	-0.030
	(0.174)	(0.847)	(-0.533)	(-1.062)
UCT/Secret	-0.088*	0.094**	-0.050**	0.044
	(-1.754)	(2.372)	(-2.061)	(1.278)
Constant	0.525***	0.228***	0.156***	0.092***
	(15.300)	(9.639)	(8.672)	(3.517)
Observations	503	503	503	503
R-squared	0.012	0.011	0.006	0.017
p-value of marg. effect‡	[0.061]	[0.720]	[0.937]	[0.021]

Notes: Each column is the proportion of couples in the described category. ‡ is the p-value of the F-test that UCT or Secret = UCT + Secret and tests the marginal contribution of the combined treatments compared to the sum of the contributions. Robust t-statistics in parentheses, clustered by session. *** p<0.01, ** p<0.05, * p<0.1

Table 13: Treatment effects on expected material payoff for self

Regressors:	Wife	Husband
UCT/no-Secret	49.70	11.30
	(1.639)	(0.382)
no UCT/Secret	4.964	23.36
	(0.169)	(0.618)
UCT/Secret	59.84*	0.907
	(2.004)	(0.025)
Intercept	1,295***	1,256***
	(79.89)	(54.13)
Observations	449	449
R-squared	0.015	0.001
p-value of marginal effect‡	0.906	0.410

Notes: The dependent variable is a constructed variable combining the 8 most common payoff vectors at the end of the experiment, namely, **split**A-D and deferA-D. Each of these is randomly drawn with equal probability at the end of the experiment. If **split**A or **split**D is drawn, the material payoffs of the wife and husband are **split** and 2500-**split**, respectively. If **split**B is drawn, the material payoff of the husband is 2500-split; the material payoff of the wife is 0. If **split**C is drawn, the material payoff of the wife is 2500-**split**, and the material payoff of the husband is 0. When one of the DeferA-D decisions is drawn, the outcome vector is **split**A-D if the subject does not defer and **split**A-D of the spouse if the subject defers. The dependent variable is the sum of these 8 equal probability outcomes, divided by 6. Each regressor corresponds to a different treatment cell. The intercept gives the value of the dependent variable in the no-UCT/no-secret treatment cell. Each regressor corresponds to a different treatment category with the intercept corresponding to the no-UCT/no-secret category.
The exact formulas used are:

$$\pi_w = \frac{1}{8}(\mathbf{split}A_w(2-\mathbf{defer}A_w) + (2500-\mathbf{split}C_w)(2-\mathbf{defer}C_w) + \mathbf{split}D_w(2-\mathbf{defer}D_w)$$
$$+\mathbf{split}A_h\mathbf{defer}A_w + (2500-\mathbf{split}C_h)\mathbf{defer}C_w + \mathbf{split}D_h\mathbf{defer}D_w)$$

$$\pi_h = \frac{1}{8}((2500-\mathbf{split}A_h)(2-\mathbf{defer}A_h) + (2500-\mathbf{split}B_h)(2-\mathbf{defer}B_h) + (2500-\mathbf{split}D_h)(2-\mathbf{defer}D_h)$$
$$+(2500-\mathbf{split}A_w)\mathbf{defer}A_h + (2500-\mathbf{split}B_w)\mathbf{defer}B_h + (2500-\mathbf{split}D_w)\mathbf{defer}D_h)$$

‡ is the p-value of the F-test that UCT / Secret = UCT + Secret and tests the marginal contribution of the combined treatments compared to the sum of the contributions.
Robust t-statistics in parentheses, clustered by session. *** p<0.01, ** p<0.05, * p<0.1

Table 14: Treatment effects on efficiency in the production game

efficiency type	strong	weak
Panel I: Dependent variable is the decision by the wife		
UCT/no-Secret	-0.194***	-0.173***
	(-2.858)	(-2.883)
no UCT/Secret	-0.140*	-0.121*
	(-1.779)	(-1.787)
UCT/Secret	-0.063	-0.034
	(-0.849)	(-0.516)
Constant	0.396***	0.412***
	(7.127)	(8.439)
Observations	392	503
p-value of marginal effect‡	[0.011]	[0.004]
Panel II: Dependent variable is the decision by the husband		
UCT/no-Secret	-0.036	-0.019
	(-0.545)	(-0.327)
no UCT/Secret	0.085	0.074
	(1.560)	(1.265)
UCT/Secret	0.086	0.088
	(1.513)	(1.512)
Constant	0.238***	0.267***
	(5.251)	(5.605)
Observations	392	503
p-value of marginal effect‡	[0.648]	[0.650]

Notes: Dependent variable is 1 if the subject chooses the efficient outcome in both games (strong) or the one game presented (weak). Each regressor corresponds to a different treatment cell. The intercept is the value of the dependent variable in the no-UCT/no-secret treatment cell. ‡ is the p-value of the F-test that UCT / Secret = UCT + Secret and tests the marginal contribution of the combined treatments compared to the sum of the contributions. Robust t-statistics in parentheses, clustered by session. *** p<0.01, ** p<0.05, * p<0.1

ONLINE APPENDIX

A Additional Tables and Figures

Table A1: Lab sample: Balance on baseline observables between UCT treated and control

	No UCT		UCT		
Variable	Mean	SE	Mean	SE	p-value
Age of household head	40.984	(1.039)	42.817	(1.075)	0.174
Age of wife	30.063	(0.912)	30.952	(0.858)	0.382
HH Head can read and write	0.390	(0.051)	0.401	(0.047)	0.814
Polygamous marriage	0.207	(0.030)	0.218	(0.032)	0.642
Any HH member involved in farming	0.546	(0.040)	0.563	(0.042)	0.665
Number of HH Plots	0.693	(0.063)	0.655	(0.057)	0.529
Wife is involved in farming	0.316	(0.045)	0.308	(0.040)	0.821
Wife owns HH or farm assets	0.592	(0.048)	0.658	(0.037)	0.144
Wife is empowered (based on A-WEAI)	0.090	(0.021)	0.128	(0.032)	0.183
Decision-making index of wife (0-7)	1.809	(0.170)	1.980	(0.131)	0.286
Number of Observations	251		252		

Notes. 'Wife is empowered' takes the value of 1 if adequacy is achieved in 2 or more A-WEAI domains, otherwise 0. See Malapit et al. (2019) for details on A-WEAI. The decision-making index is obtained by summing answers to 7 decision-making questions. Higher values of the A-WEAI index and weighted score, the empowerment indicator, and the decision-making index indicate higher levels of empowerment in household decision-making for the wife. P-value shown is for the test that the difference between the two averages is significantly different from zero. Robust standard errors in parentheses, clustered by session. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A2: Accommodating spouse's choices when revising after being informed of their choice

Wife's behavior: / **Panel I: Choice B**	Contrarian	No revision diff. choice	No revision same choice	partial accomm.	Full accomm.	Over-accomm.	Total
	Husband's behavior:						
Contrarian	0	11	1	0	0	0	12
No revision, different choice	1	37	0	0	5	0	43
No revision, same choice	1	1	9	0	1	0	12
Partial accomm.	0	9	0	0	3	0	12
Full accomm.	2	89	5	0	15	2	113
Over-accomm.	1	3	0	0	1	0	5
Total	5	150	15	0	25	2	197
Panel II: Choice C							
Contrarian	1	13	0	0	1	0	15
No revision, different choice	4	35	1	2	6	0	48
No revision, same choice	0	2	14	0	0	0	16
Partial accomm.	1	8	0	0	0	0	9
Full accomm.	2	109	5	1	16	1	134
Over-accomm.	0	1	0	0	0	0	1
Total	8	168	20	3	23	1	223
Panel III: Choice D							
Contrarian	0	19	3	1	2	0	25
No revision, different choice	1	25	0	0	1	0	27
No revision, same choice	0	0	8	0	1	0	9
Partial accomm.	2	9	0	1	0	0	12
Full accomm.	1	44	0	0	1	0	46
Over-accomm.	0	1	1	0	0	0	2
Total	4	98	12	2	5	0	121

Notes: The table shows the number couples in different cells based on their behavior. Only observations from control subjects are used to construct this Table. The number of observations varies because some decisions were only introduced in later experimental sessions. Behavior is defined as follows. Each subject first makes a split choice on B, C, and D, is told the communication of their spouse, and allowed to revise their split. Full accommodation means replacing one's original split by the split communicated by their spouse. Partial accommodation means revising one's original split in the direction of the spouse's choice, but only partly. Over-accommodation means revising one's original split by overshooting the spouse's choice. No revision, different choice means that the subject does not revise their original split even though they have been informed their spouse chose a different split. No revision, same choice means the subject does not revise their original split knowing that it is identical to the split communicated by their spouse. Contrarian means that the subjects revises their original split to be further away from the spouse's communicated split than it was originally.

Table A3: Material allocations with executive or consultative agency

Chosen allocation (in Naira)		Within subject:			
Spouse is:		Agency of spouse is:		t-test	Correlation
Wife:	N. obs.	Executive	Consultative	p-value	coefficient
Household vs male items	394	1388	1326	0.027	0.107
Household vs female items	450	1169	1217	0.073	0.098
Cash for wife vs for husband	245	1264	1060	0.000	-0.077
Husband:					
Household vs male items	394	1316	1341	0.278	0.421
Household vs female items	450	1214	1155	0.006	0.419
Cash for wife vs for husband	245	1063	1233	0.000	0.132

Notes: The budget is 2500 Naira and the reported amounts are the amount spent on the first of the two listed alternatives. Executive agency is measured by c_w^w and consultative agency is measured by $k_h c_w^{h\_accom} + (1 - k_h)c_w^h$. The t-test of the difference (and associate p-value) compares the sample average outcomes and the correlation coefficient compares the two values for each pair. Although the difference is small on average, this hides large differences as shown by the fact that executive and consultative agency are not highly correlated, particularly for women.

Table A4: Treatment effects on split decisions

Dependent Variable is Split Decision by the Wife for choice:	A	B	C	D
UCT/no-Secret	116.4**	69.27	-11.80	87.31*
	(2.067)	(1.386)	(-0.228)	(1.710)
no-UCT/Secret	47.56	51.16	4.099	-16.69
	(1.039)	(0.907)	(0.070)	(-0.275)
UCT/Secret	66.31	81.58	-17.50	34.15
	(1.221)	(1.562)	(-0.382)	(0.606)
Constant	1,387***	1,372***	1,166***	1,273***
	(45.08)	(34.72)	(36.15)	(30.00)
Observations	503	503	502	503
R-squared	0.012	0.006	0.000	0.010
p-value of marginal effect‡	[0.222]	[0.550]	[0.882]	[0.653]
Dependent Variable is Split Decision by the Husband				
for choice:	A	B	C	D
UCT/no-Secret	-40.84	41.84	-29.66	-53.45
	(-0.914)	(0.848)	(-0.564)	(-1.288)
no-UCT/Secret	-67.24	55.65	-87.81	-70.77
	(-1.376)	(0.970)	(-1.388)	(-1.349)
UCT/Secret	-41.26	23.29	-74.98	-23.22
	(-0.763)	(0.370)	(-1.340)	(-0.430)
Constant	1,330***	1,289***	1,256***	1,096***
	(33.07)	(39.47)	(28.17)	(42.14)
Observations	503	503	503	503
R-squared	0.004	0.002	0.007	0.005
p-value of marginal effect‡	[0.273]	[0.361]	[0.557]	[0.117]

Notes: The dependent variable is the initial split decision (between 0 and 2500) made by each subject in each of the four domains: A: female v. male goods; B: household v. female goods; C: household v. male goods; D: female v. male money. Each regressor corresponds to a different treatment category with the intercept corresponding to the no-UCT/no-secret category.
‡ is the p-value of the F-test that UCT / Secret = UCT + Secret and tests the marginal contribution of the combined treatments compared to the sum of the contributions.
Robust t-statistics in parentheses, clustered by session. *** p<0.01, ** p<0.05, * p<0.1

Table A5: Treatment effects on consultative agency

Dependent variable is consultative agency index						
	Wife			Husband		
	B	C	D	B	C	D
UCT/no-Secret	0.004	0.014	-0.006	0.021	0.012	-0.041
	(0.122)	(0.190)	(-0.351)	(0.271)	(0.699)	(-0.695)
no-UCT/Secret	-0.018	-0.078	-0.001	0.030	0.017	-0.105
	(-0.553)	(-0.994)	(-0.062)	(0.364)	(0.550)	(-1.573)
UCT/Secret	-0.060**	-0.104	-0.016	-0.079	-0.006	-0.097
	(-2.679)	(-1.429)	(-0.828)	(-1.137)	(-0.271)	(-1.194)
marginal effect (p-value)‡	[0.244]	[0.703]	[0.748]	[0.232]	[0.193]	[0.648]
Constant	0.071***	0.445***	0.038**	0.412***	0.021	0.381***
	(3.591)	(7.768)	(2.364)	(7.820)	(1.186)	(8.713)
Observations	355	355	415	415	219	219
R-squared	0.013	0.011	0.002	0.008	0.004	0.009

Notes: ‡ is the p-value of the F-test that UCT or Secret = UCT + Secret and tests the marginal contribution of the combined treatments compared to the sum of the contributions. Robust t-statistics in parentheses, clustered by session. *** p<0.01, ** p<0.05, * p<0.1

Table A6: Treatment effects on material allocations

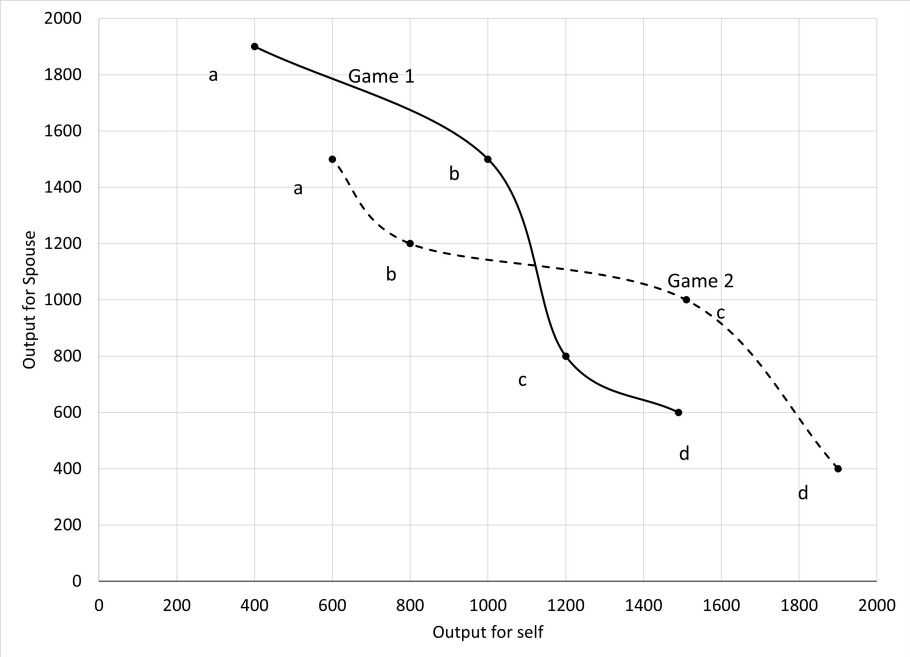
Material allocations	Wife			Husband		
	B	C	D	B	C	D
UCT/no-Secret	51.7	-13.2	-52.5	-23.6	-73.2	115.1
	(0.874)	(-0.258)	(-0.871)	(-0.415)	(-1.307)	(1.461)
no-UCT/Secret	67.4	14.3	-99.1	-46.4	-77.2	-22.6
	(1.108)	(0.242)	(-1.395)	(-0.735)	(-0.824)	(-0.306)
UCT/Secret	3.8	48.8	-88.6	-56.1	-96.9	116.2
	(0.060)	(0.859)	(-1.501)	(-1.061)	(-1.303)	(1.638)
marginal effect (p-value)‡	[0.190]	[0.508]	[0.462]	[0.859]	[0.556]	[0.818]
Constant	1,297***	1,327***	1,276***	1,186***	1,122***	1,180***
	(43.330)	(34.141)	(26.850)	(31.733)	(37.297)	(21.649)
Observations	394	394	450	450	245	245
R-squared	0.005	0.003	0.008	0.003	0.008	0.024

Notes: ‡ is the p-value of the F-test that UCT or Secret = UCT + Secret and tests the marginal contribution of the combined treatments compared to the sum of the contributions. Robust t-statistics in parentheses, clustered by session. *** p<0.01, ** p<0.05, * p<0.1

B A model of decision-making in the production game

There are four ways to make choices in the production game, graphed in Figure B1. This

Figure B1: The production games in output space



game design serves four objectives: First, it shows whether subjects choose an efficient allocation, and whether they do so even when it is against their individual interest. Second, the fact that Game 1 is a mirror image of Game 2 allows us to test whether both spouses choose the same joint allocation. For instance, choosing a in Game 1 for self is equivalent to the spouse choosing d in Game 2. This tells us whether spouses share a focal division of inputs or income within their household. Third, Games 1 and 2 are identical in the input domain. Hence if subjects base their selection purely on the input domain, they should pick the same option in both games. This tells us whether spouses put input fairness considerations above considerations of efficiency or intrahousehold distribution of income. Fourth, each game has a choice that is dominated in the output domain, that is, a choice that violates any reasonable (altruistic or selfish) utility function over *income*. This choice, however, is not dominated if subjects evaluate choices exclusively in the input domain. This tells us whether subjects make production decisions based purely on input fairness considerations, irrespective of their income consequences.

Households may choose the most efficient allocation in each game. Efficiency makes the most sense in households no matter what sharing rule is used. Even if unearned income is allocated more to the person who receives it (the philosophy of the cash transfer program), the individual should choose the efficient payoff and then insist on allocation after the fact.

Alternatively, households might choose the allocation that best matches their preferences, ignoring efficiency. This suggests that redistribution after the fact is difficult, so it is better to pick a distribution that most neatly matches the desired final allocation. This might coincide with the efficient allocation, but not necessarily. This should be similar to the allocation of

cash observed earlier. Even though the game is different, the solution will follow the same principle.

Since payoffs are determined solely by outputs, subjects who are consequentialists should ignore input values. It is nonetheless conceivable that subjects made choices partially or wholly based on the input domain. Since the framing of the experiment encourages subjects to think of inputs as being shared and outputs being produced by inputs, subjects who follow an 'equality of opportunity' reasoning may allocate inputs according to a particular welfare function, and consider the fact that inputs produced different outputs as irrelevant for making a choice. This is equivalent to viewing the mapping between inputs and outputs (i.e., the 'production function') as an entitlement that the subject is justified to benefit from since 'it is not their choice' Fafchamps and Kebede (e.g., 2022).

Fourth, a household might blend the output and input model. Note that this fourth type is not efficient, but could end up choosing an allocation which is efficient.

There is a straightforward test for each of the three models: An efficient household should be efficient in both versions of the game. An output based decision maker will never choose the 'interior' allocation. An input based household will make the same decision in both games. Our tests show that, the average husband or wife (in either treatment or control or in secret or observable decisions making domains) does not adhere to any of these three models alone, suggesting a model in which people balance both inputs and outputs.

We now examine the behavioral predictions made by either of these choice domains, before aggregating them into a unified model.

Efficiency There is only one choice in each game associated with efficient outcomes at the household level. Thus, any efficient individual should choose these options in both games and any efficient household should have both partners choosing these outcomes in both games.

The data show that for households in the control treatment 30% of men and 35% of women always make the efficient choice, which is higher than random, but not by much. Only 10% of husband/wife pairs both make the efficient choice, a similarly low number.

Output Domain Figure 2 shows the games in output space, assuming that utility functions have some weight on the output of both the husband and the wife.

Assume that each subject has other-regarding preference of the standard altruistic type:

$$W_{im} = \omega_{im} U_i(x_i) + (1 - \omega_{im}) U_j(x_j)$$

where $i \in \{\text{husband, wife}\}$, m denotes a treatment or treatment combination, ω_i is a welfare weight specific to i, and $j \neq i$.[30] We further assume that $U_i(x) = U_j(x)$ for all x – which is equivalent to saying that subjects believe their spouse to enjoy the financial payoff as much as they do –[31] and we allow function $U(.)$ to be concave to capture satiation/risk aversion, e.g., $U(x) = x^\beta$. As we will show below, the value of β does not, in fact, matter for our main test of interest.

[30] There is no point assuming a more complex other-regarding welfare function since we cannot identify it from our experimental data.

[31] Again, this is a simplification but we cannot falsify this assumption with our data.

When choosing between different $\{x_i, x_j\}$ pairs, each subject picks the one that gives the highest welfare value:

$$argmax_{\{x_i,x_j\}} \left(\omega_{im} x_i^{\beta} + (1-\omega_{im}) x_j^{\beta}\right)$$

For each value of β, the above function defines intervals of values of ω_{im} for which each of the four possible choices available in the two games would be optimal. For instance, for $\beta = 1$ (utility linear in payoffs), the intervals are as shown below:

Table B7: Altruism bounds in the output domain

$\beta = 1$	Game 1		Game 1	
Choice	lower bound	upper bound	lower bound	upper bound
A	0.6	1.0	0.643	1
B	0.357	0.6	n.a.	n.a.
C	n.a.	n.a.	0.4	0.643
D	0	0.357	0	0.4

Similar tables can be produced for other values of β. They produce different interval bounds, but choice C is never optimal in Game 1 and choice B never optimal in Game 2. This is illustrated on Figure B1 where we plot the payoff for self on the x axis and the payoff for the spouse on the y axis. Indifference curves for linear or concave preferences would themselves be linear or concave. Since choice 3 in Game 1 is below the line joining the payoffs from choices 2 and 4, it can only be optimal for a limited set of unlikely indifference curves which can be ruled out by checking choices in the other game.[32]

Eighteen percent of women and 16 percent of men in the control treatment chose one of the dominated points in these games, which suggests a statistically significant number of people are not playing only in the output domain.

Input domain We now write a similar welfare function for the different input choices, assuming that subjects judge the equity of their choice by only considering the input domain. We have:

$$argmax_{\{z_i,z_j\}} \left(\theta_{im} z_i^{\alpha} + (1-\theta_{im}) z_j^{\alpha}\right)$$

where z_i is the input share allocated to self, z_j is the input share allocated to the spouse, θ_{im} is the welfare weight parameter for individual type i in treatment m, and α is a curvature parameter.

As earlier, we can identify the interval of θ_{im} values for which each of the four possible choices is optimal. We start by noting that these intervals are identical for Games 1 and 2 since the input value pairs to choose from are the same. Next, we observe that for linear utility ($\alpha = 1$), choices 2 and 3 are not optimal – except in the knife-edge case where $\theta_{im} = 0.5$, in which case all four choices are equivalent).

Things are different when utility is concave: in this case, there exist values of θ_{im} at which choices 2 and 3 are optimal. One such case is illustrated in the table below, which

[32]For example, a Leontief utility function could lead the subject to choose B in Game 1, but then they would always choose B in Game 2, which we can easily reject.

shows that, in the input domain, choice 3 in Game 1 and choice 2 in Game 2 are not always dominated: they can be optimal.

Table B8: Altruism bounds in the Input game

$\beta = 0.9$	Both games	
Choice:	lower bound	upper bound
A	0.551	1
B	0.5	0.551
C	0.449	0.5
D	0	0.449

This implies that subjects who pick choice 3 in Game 1 or choice 2 in Game 2 *must* be playing (at least partly) in the input domain. We also note that if subjects make a choice purely based on the input domain, these choices should be identical for Games 1 and 2 – something we can test: if subjects pick different choices in Games 1 and 2, they *must* be playing (at least partly) in the output domain. The data clearly reject the hypothesis that subjects make the same input choices in each game because over 50% of women chose the efficient outcome in each game even though it requires different input choices.

Under the maintained assumption that subjects play in the input domain, we can use the above approach to test whether the altruism of husbands and wives varies by treatment and treatment combination. This is done by estimating, for different values of α, an interval regression in which the bounds of the intervals are those given in a Table like Table 2 and the regressors are treatment dummies. Observations from the two games are pooled and the model is estimated separately for husbands and wives.

Recall that, the input game is the same in both versions, so if someone was playing only in that domain they would make the same choice in both versions. Twenty-seven percent of women and 25% of men in the control treatment make the same input choice in both versions, suggesting that most people are not playing solely in the input domain.

Combining both domains We now consider the situation in which we can reject that subjects play exclusively in the output domain, and also reject that they play exclusively in the input domain. Our approach is to start from the output domain, since it determines payoffs directly, but adjust it for the distance from equal sharing of inputs. The reasoning is that subjects may wish to deviate from a selfish division of payoffs if it results in a very unequal division of inputs. In that case, they may be willing to sacrifice some of their own payoff to achieve a more equitable division of inputs.

We first examine whether it is possible to obtain all four choices if we set $\omega_i = \theta_i$ and $\alpha_i = \beta_i$, i.e., utility functions in the two domains are identical. The issue then is whether there is a blending parameter value that can account for all choices. The objective function now is:

$$W_{im} = b\left(\omega_{im}x_i^{\beta} + (1-\omega_{im})x_j^{\beta}\right) + (1-b)\left(\omega_{im}z_i^{\beta} + (1-\omega_{im})z_j^{\beta}\right)$$

where b is a blend parameter capturing the weight subjects put on the two objective function, and where the input variables z_i and z_j have been multiplied by the mean of x_i over both

games. The purpose of this transformation is to make the two utility functions have the same approximate weight in forming welfare function W_{im}.

By choosing values for β and b and then testing whether the model can explain the behavior of individuals in the control group, we find (through grid search) optimal values of approximately 0.63 and 0.3 respectively. This suggests that the average person is indeed blending an output and input model with a heavier weight on the output domain, but a significant though smaller weight on the input domain.

C Experimental Instructions and Materials

Note that the full script – which is repetitive and long – is available in this online appendix. Here we outline the experiment and provide the representative scripts.

C.1 Introduction

Upon arrival, subject pairs (i.e., married couples) were assigned to their respective gender-specific room. This means that all the husbands were put in one room, while all the wives were put be in a separate room. Thus, husbands and wives could not directly interact with each other during the sessions.

The plan was to conduct two experimental sessions for each experimental site on the same day. However, this depended on the size of the impact evaluation sample in the nearby villages. If there were enough participants to have two sessions, we conducted both sessions consecutively, allowing no possibility for interaction between experimental subjects in the different sessions. We ensured this by having the subjects from the first round leave the premises of the experiment immediately after their session ended, without providing any opportunity to interact with subjects from the following round, who would wait in a separate room. Research Assistants at the site implemented this "no interaction" protocol between subjects in consecutive sessions.

Experimental subjects were seated in compartments separated by curtains made of opaque clothing material. Thus, subjects were not able to see each other or observe each others' experimental decisions. This ensured the privacy of decisions during the experiment. Any contact between subjects during the session was strongly discouraged. Moreover, subjects were not allowed to verbally communicate any of the experimental decisions to their assigned enumerators. Rather, they communicated all their decisions using experimental prompts, e.g, envelopes and pictures that denoted binary choices and (laminated) cash prompts to allocate between binary choices. This further protected privacy and subdued any mimicking effort.

Subjects were thanked for coming to the session and were handed the participation fee: "Thanks for coming today. Before we start, we would like to give you 250 NGN as a compensation for your time. This amount is not part of today's activities and is yours to keep. You and your spouse, who is in a different room now, will make a number of decisions today, through which your household can earn additional money. At the end of this session, only one of the decisions that you and your spouse make will be chosen via a lottery, which is likely to be implemented as final pay-off for your household. Since any of your decisions can be chosen, you should take each of your decisions seriously and carefully. In addition to the participation fee, the pay-off for your household can be between 2,100 NGN and 2,500 NGN, in cash or in kind, depending on which round is chosen from the lottery for pay-off. Again, only one decision of all the decisions that both you and your spouse make today will be chosen through a lottery as final pay-off for your household."

A visual demonstration was then shown which demonstrated how one decision - from all the decisions made by the husband and the wife in the experimental session - was going to be chosen by a lottery as final pay-off for the household. The decision rounds for female experimental subjects were represented with white numbered balls while the decision rounds

for male subjects were represented by orange numbered balls. The numbers on the balls denoted different rounds. In the demonstration, subjects were told that at the end of all the decisions by the husband and the wife, all the white and orange numbered balls would be put in a basket. One ball would be taken out and the corresponding decision was likely to be implemented as the final pay-off for the household. The following script was used:

"I will now give examples of the type of decisions that you and your spouse will make today. This will also clarify how your household will likely get paid for one of your or your spouse's decisions. Let me give some examples. [Enumerator: Please show cash prompts]. Consider a decision in which you will choose how to divide 2,500 NGN between rice and millet [Enumerator: Please show pictures of rice and millet. Also, please show rice and millet packets/pouches in the room]. We will represent your, i.e., female [male] participants' decisions with this white [red] ball with "1" written on it. Once you make the decision, I will put this ball in this bag. Similarly, the decision by your spouse, who is in the other room, is represented by this red [white] ball with "1" written on it - my colleague in the other room will put it in another bag. Every time you make a decision today, I will put in a white [red] numbered ball representing that decision. Similarly, every time your spouse makes a decision today, my colleague in the other room will put in a red [white] numbered ball representing that decision. At the end of all the decisions, all the white [red] balls representing your own decisions and all the red [white] balls representing your spouse's decisions will be put in the same box. And they will be thoroughly mixed. If then a white [red] ball with "1" written on it is taken out of the box, your household is likely to get rice and millet amounts, based on the money you, i.e., female [male] participant decided to allocate for each item. If I take out the red [white] ball with "1" written on it, your household is likely to get rice and millet amounts, consistent with the money/Naira your husband [wife] decided for each item."

Participants had the opportunity to engage in several practice rounds where they distributed 2,500 Naira across binary choices. One practice round involved deciding between maize and guinea corn, two agricultural products that are commonly found in this region.

C.2 Plausible deniability ("secret-keeping"):

The pay-off process was designed to ensure that the individual, private choices made during the experiment were not revealed to the subject's spouse (or anyone else), unless warranted by the experimental treatment (i.e., in 'no-secret' sessions). Recall that at the end of a session, based on which numbered ball was randomly drawn out of the basket, a particular decision round would be chosen as pay-off for each household. This decision round could be either the husband's or the wife's. The session supervisor would then find out the recorded decisions and write the response on a piece of paper and insert it in an envelope. The envelope would then be put in a tin box.

One envelope (called the 'secret-keeping' envelope) randomly chosen from a bag that contained all the possible allocations written inside different envelopes, would also be put in the tin box. The tin box would then be shaken several times and one of the envelopes would be taken out, based on which the household would receive a pay-off. Script is as follows:

"Until told otherwise, the decisions that you will make today are completely secret. Even if one of your own decisions is chosen at the end, your spouse or anyone else will not know

exactly what your choice was. Let me explain how we will ensure this.

Say, the white [red] Ball 1 is chosen from the bag, which means how much of rice and millet you decided to buy is selected for final pay-off for your household. This bag is full of envelopes [please show bags], with all combinations of decisions written on it, for both the options, i.e., rice and millet. For example, there is an envelope with 0 NGN for rice and 2,500 NGN for millet. Similarly, there is an envelope with 1,300 Naira for rice and 1,200 Naira for millet. There is also an envelope with 2,000 NGN for rice and 500 for millet and another with 2,000 NGN for millet and 500 for rice, written inside it. There is also an envelope with 0 for millet and 2,500 Naira for rice, and so on. So, basically, all combinations, with increments/reductions of 100 NGN.

Since, White Ball 1 is chosen. I will write down your decision for rice and millet in this paper and put it in this envelope. The envelope will be put in this box. Now, we will take an envelope from the bag full of envelopes (with all combinations of decisions). We will call this the "Secret-Keeping" choice. We will now put the envelope from the "Secret-Keeping" choice in the same box. Notice that the box has two envelopes: one with your choice written on it and another with any random allocation written in it. Any of these two will now be chosen for your household. Why the "Secret-Keeping" choice? We are adding this to ensure that your choice remains secret, from your spouse or anyone else. We do this so that you can be assured that your choices are known only to you and no one else. The same applies for your spouse; there is no way for you to know his/her choices - unless we let you know otherwise beforehand. We will not share any information about what you choose in private with your spouse - unless we tell you beforehand. I will now take one of the envelopes from the box.

We will let you know beforehand if any decision round will NOT remain private or secret. Until we tell you so, assume that your decisions are private and secret.

At the end of the session, if a money round is chosen for pay-off, you and your spouse will get separate envelopes. If a round involving in-kind/items round is chosen both you and your spouse will be brought together and you will get tokens which you can use to get the items."

C.3 Description of the Different Experimental Blocks

C.3.1 Block 1 - Allocating a budget across different types of items or payments (split and resplit)

Individual preference elicitation is carried out on experimental subjects in different decision domains in the very beginning, i.e., in Block 1. The decisions in this block involve dividing an endowment (either 2,500 Naira or 2,100 Naira) between two options. For the 2,500 Naira endowment, experimental subjects use plastic laminated and colored photocopies of four 500 NGN bills, four 100 NGN bills and two 50 NGN bills (adding up to 2,500 NGN) as cash prompts. The preference elicitation decisions using 2,500 Naira endowment are made across four domains:

- **split**A: female vs male items

- **split**B: household items vs male items
- **split**C: household items vs female items
- **split**D: cash allocation - husband vs. wife

Subjects also split 2,100 Naira in domains A and D:

- **resplit**A: female vs male items
- **resplit**D: cash allocation - husband vs. wife

In preparatory fieldwork before carrying out the experiments, we carried out market and consumer surveys to make sure that the male and female items used in the experiment are indeed identified as distinctly male and female items respectively in the study area. Similarly, "household items" consist of materials that are not typically assigned to any gender and are usually used by everyone in a household.

In the first three decisions above, subjects are asked to divide an experimental endowment between binary choices of commonly used household items (e.g., between men's items vs. women's items). A 'lab shop' is set up for the experiment and if any of the decisions in A, B or C is chosen through the end-of-the-session lottery as the final pay-off for the household, participants can choose items from the 'lab shop' according to either their endowment choices they made earlier or a randomly chosen allocation from all possible allocations (which gives participants plausible deniability). Either way, depending on the round chosen (or a random alloation) for pay-off, participants are given tokens with a type of good (e.g., female items) and a Nigerian Naira amount written on it which they can show at the lab shop. Suppose, a female participant chooses to allocate 2,100 NGN for women's items and 400 NGN for men's items using a 2,500 NGN endowment (in **split**A) and this decision is chosen for final pay-off through the lottery at the end of the session (i.e., a white ball numbered '1' is randomly drawn in the lottery). Assume, further, that her own decision is chosen instead of a random allocation (i.e., 'secret-keeping' option is not selected in the lottery). Then, the female participant gets a token for "Men's items" with 400 NGN written on it and another token for "Women's items" with 2,100 NGN written on it. Since, the female round is chosen, the wife is given the tokens. The subject can herself visit the 'lab shop' with the tokens, she can go together with her husband. An example script for this round (**split**A) is: "For this decision round, you are given 2,500 NGN [Enumerator: Please, give participant the cash prompts]. You will need to decide how much you want to spend for items in Picture A vs. items in Picture B. The items in Picture A and Picture B are ... [Enumerator: Please, describe the items]. As you can see, these items are also displayed in the middle of the room. These are just sample items. Varieties/options in fashion and color are available in the shop we have set up outside. You will need to make a decision NOW on how much to spend. You can decide LATER which items you want to pick. [Enumerators: Please use two envelopes: one envelope for "Items in A" which you put near picture A and the other envelope for "Items in B" which you put near picture B] Remember that this decision is private. No one else, including your spouse, will know what your exact decision is. This is because of the "secret-keeping" choice explained earlier. How much of this 2,500 NGN will you spend for items in A vs. items in B?"

The scripts for **split**B, **split**C and **resplit**A are similar to above. For **split**D, participants allocate 2,500 Naira between themselves and their spouses. While for **resplit**D, participants split 2,100 Naira between themselves and their spouse. The script for **split**D is provided below: "For this decision round, you are given 2,500 NGN. [Enumerator: Please, give participant the cash prompts]. You will need to decide how much you want to keep for yourself and how much you would like to give to your spouse? [Enumerators: Please put two envelopes in front of the participant] Please use these two envelopes. One envelope, the one near you, is for "Yourself" while the other envelope is for "Your Spouse". Remember that this decision is private. No one else, including your spouse, will know what your exact decision is. This is because of the "secret-keeping" choice explained earlier." The script for **resplit**D is similar to above (the only difference being a 2,100 Naira endowment). As indicated in the script, irrespective of the secret/no-secret treatment status of an experimental session, all decisions in this round remain shrouded.

C.3.2 Block 2 - *Choosing whether to allow one's spouse to make the decision instead of making one's own [defer]*

For each of the different decision domains from Block 1, participants are reminded of their previous allocation choice (**split** and **resplit**) and that their spouse made a similar decision in another room. Participants are then told that - for this new decision - they can now choose whether they would like to use their previous choice, or change their choice to their spouse's choice (i.e., whether they would like to defer to their spouse's choice or not). In Block 2, the deferral decision for the different domains will be elicited in the same order as the original preference decisions. The script for the "Secret" Treatment is:

"Recall the decision that you made earlier on _____. Your spouse has also been asked to make the same decision in the other room. You can choose to either: (a) use the choice you made earlier or (b) change your choice to your spouse's choice Put the matchbox on the envelop near you to suggest that you will use the choice you made earlier. Put the matchbox on the envelop away from you to suggest that you will change your decision to your spouse's choice. [Enumerator, please show the experimental subject the two envelopes representing each of the two choices. Placing the matchbox on one of the envelopes, represents making a particular choice. At no point should the subject relay his/her response verbally] This round is represented by this white ball with a number [Enumerator, please mention number] on it that I am putting in this basket. At the end of the session today, if this ball is picked from the bag, then your decision now may determine the final pay-off. For example, if you decide to use your spouse's choice then your spouse's choice will be chosen as your household's final pay-off. Otherwise, your previous choice will be chosen as your household's final pay-off.

However, you can also get the "Secret-keeping" choice. Thus, from this decision, your spouse will not know whether you used your own choice or his choice."

The script for the "No-Secret" Treatment will have the following line, instead of the last line in the "Secret" Treatment script:

"If this round is selected, your spouse will be told whether you decided to use your earlier choice or your spouse's choice. However, your earlier allocation choice on how to divide the money will still remain private/secret, due to "secret-keeping" option."

C.3.3 Block 4 *Communicating preferences, consulting over preferences and revising decisions [communicate, consult, revise]*

Communicate For each of the decision domains B-D, participants are asked to communicate their preferences to their spouse for the different allocation decisions he or she would be making again. The script for this round will be:

"Remember the previous decision in which you were given 2,500 Naira to divide between _____. [Show the pictures and describe some of the items to remind her].

Your spouse is going to make a similar decision again, in the other room. We are going to pass on information about what you choose now to your spouse BEFORE he/she makes the decision.

Since this decision that your spouse will make, can be chosen at the end for your household, you should think about what choice you would like your spouse to see, BEFORE he/she makes the decision.

For the purposes of showing to your spouse, how much of this 2,500 NGN will you put for Items in Picture B (women's items) vs. Items in Picture C (everyone's items) ?

You made the following allocation earlier, which you can pass on to your spouse: _____. Or, you can decide to send him/her a different choice. _____" [Enumerator, please use cash prompts and envelopes to collect information on their communication for their spouse. No verbal communication, please.]

While the above is a script for **communicateC** (i.e., for decision domain C), it is similar for the other domains. Irrespective of the secret/no-secret treatment status of an experimental session, none of decisions in this **communicate**B-D is shrouded.

Consult For each decision domain B through D, participants are asked whether they would like to use their previous decision (in **split**A-D) as the final decision in this new round, or whether they would like to see their spouse's communication before making the decision. The script for this round is:

"Recall the decision that you made earlier on _____. You made the following allocation: _____. Your spouse has also been asked to make the same decision in the other room. You can choose to either: (a) still use the choice you made earlier or (b) see your spouse's choice before making the choice again."

For "Secret" Treatment, the following line is added: "No one will know exactly what your decision is going to be. This means that your spouse will not know if you decide to see your spouse's choice before making the choice again." The "No-Secret" Treatment will have the following line added: "If this round is selected, your spouse will be told whether you decided to see her choice or not before making the final decision. However, your earlier allocation choice still remains private and secret. "

Revise: For each of the decision domains B-D, participants are informed of their spouse's communication and were given the option to redo each of the decisions or keep their original decision. Participants are reminded what their original decision was as well as the communication choice from spouse. The script for this round is:

" Remember the previous decision in which you were given 2,500 Naira. You decided how much you want to spend on items in Picture B (Women's items) vs. items in Picture C (everyone's items).

Earlier you chose: [see automatic prompt on SurveyCTO] for women's items ____ and ____

for everyone's items. [Enumerator: Please show the pictures and rearrange the cash prompts to remind own decision].

Your spouse in the other room has also made a choice he/she shared with you which is ____. [use cash prompt]

How much of this 2,500 Naira will you put for Items in B (women's items) vs. Items in C (everyone's items)?"

For "Secret" Treatment, the following line is added: "This round is represented by this white ball with a number [Enumerator, please mention number] on it that I am putting in this basket. At the end of the session today, if this ball is picked from the bag, then your decision now may determine the final pay-off. For example, if you decide to use your spouse's choice then your spouse's choice will be chosen as your household's final pay-off. Otherwise, your previous or a new choice will be chosen as your household's final pay-off. However, you can also get the "Secret-keeping" choice. Thus, from this decision, your spouse will not know whether you used your own choice or his choice."

The "No-Secret" Treatment will have the following line added: "If this round is selected, your spouse will be told what your choice was. However, your earlier allocation choice still remains private and secret. "

While the above is a script for **reviseC** (i.e., for decision domain C), it is similar for the other domains. Also, note that **communicate-consult-revise** is jointly implemented if chosen in the final lottery.

C.3.4 Block 5 - *Food and drink choices* [deferF]

We identified popular food and drink items in the study area which have similar market prices. For drinks, subjects has a choice between a plastic cup of Coke or Fanta, valued locally at around 150 NGN. For food, two different types of cookies are be offered, again of similar market prices. Subjects are asked to choose which food and drink pair he/she wants to consume in the experimental session. It is explained that he/she can only have it before the session ends and is not be allowed to take the food and drink outside. The script is as follows:

"You will now be offered to taste and then consume within the session, a food and a drink item from several options. At any point of this round, you can refuse to taste or consume the items you are being offered.

We have two types of drinks available for you, i.e., Coke and Fanta, with the same market price. We also have two types of cookies available for you, all valued locally at the same price.

You must drink and eat these items here. You cannot take them outside.

- Which drink do you want to consume?
- Which food do you want to consume?
- Which drink do you want your spouse to consume?
- Which food do you want your spouse to consume?

You made a decision on the food and drink you want to consume. We have also asked your spouse to select a food and drink for you to consume. You can choose to either: (a) use the choice you made earlier or (b) change your choice to your spouse's choice.

Put the matchbox on the envelop near you to suggest that you will use the choice you made earlier. Put the matchbox on the envelop away from you to suggest that you will change your decision to your spouse's choice. [Enumerator, please show the experimental subject the two envelopes representing each of the two choices. Placing the matchbox on one of the envelopes, represents making a particular choice. At no point should the subject relay his/her response verbally]"

For "Secret" Treatment, the following line is added: "Your spouse will not know whether you used your own choice or decided to consume what your husband chose for you. " The "No-Secret" Treatment will have the following line added: "Your spouse will be told at the end of today' session whether you used your own choice or decided to consume what your husband chose for you. "

Note that for some sessions, the cost of deferring this decision-making to spouse was lowered by offering half the amount for choice (a). In other words, subject's choice was between "(a) use the choice you made earlier but you have only half a glass of drink and one cookie you choose or (b) change your choice to your spouse's choice - you get to consume full glass of juice and two cookies."

C.3.5 Block 6 - *Allocating inputs across two production functions* [efficiency]

The focus of this block is not consumption but production. Subjects are asked to pick one of four possible input allocations between themselves and their spouse, where each input allocation maps into a cash income for themselves and a cash income for the spouse. The script is below:

[Supervisor: please explain this round after enumerators place the four pictures related to this round before subjects, along with cash prompts in front of each picture]

"In this scenario, you have an income generating activity and your spouse also has an income generating activity, both of which involve production using an input. The income generating activity can be production of a crop, for example. Examples of input can be manure or fertilizer needed for the income-generating production activity.

You are now given 10 units of input (shown as green balls in the pictures in front of you) that you can divide between your own income-generating production activity and your spouse's income-generating production activity.

The four pictures in front of you are four possible ways to divide the 10 units of input between yourself and your spouse. The different ways of dividing the input can produce different income amounts for yourself and your spouse, as well as the total household income, as can be seen through the cash prompts under each picture.

You must choose one picture. If this round is chosen for pay-off, you and your spouse will likely receive income in the way it is explained in the pictures and the cash-prompts under each picture.

[In "SECRET" room, please mention: "Because of "secret-keeping" option, no one will know what decision you will make now. So, your decision will remain completely private from anyone else, including your spouse.]

[In "NO SECRET" room, please mention: "If this round is selected as final pay-off, your spouse will be told the decision that you will make."]"

Note that subjects answer two versions of the game. Each game has an efficient choice that maximizes the total income of the household. In Game 1, the efficient choice implies less output is assigned to self and in Game 2, the efficient outcome assigns less to the spouse. For each version of the game, subjects are shown pictures for the different input/output scenarios as shown in the table in Section 2.3. Given that there are four potential scenarios, participants are presented with a set of four illustrative images from which they are expected to select one. One of the four images is shown in Figure C2. Cash prompts are put on top of each image so that subjects understand the potential pay-off/output in each scenario.

Figure C2: Production game prompt

Figure C3: Women's Items Prompt: typical women's items

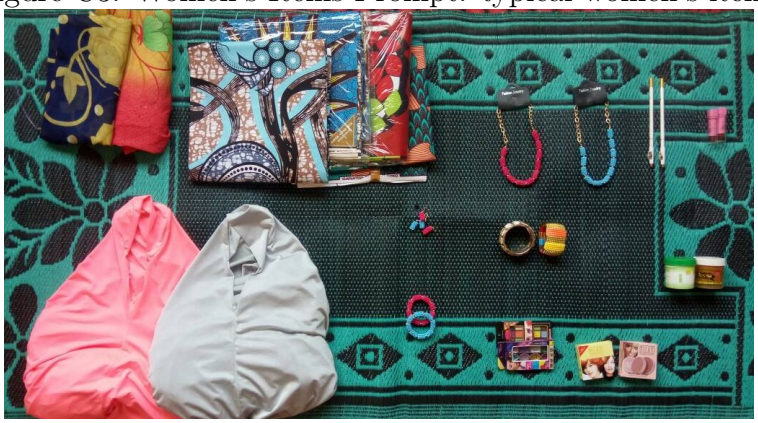
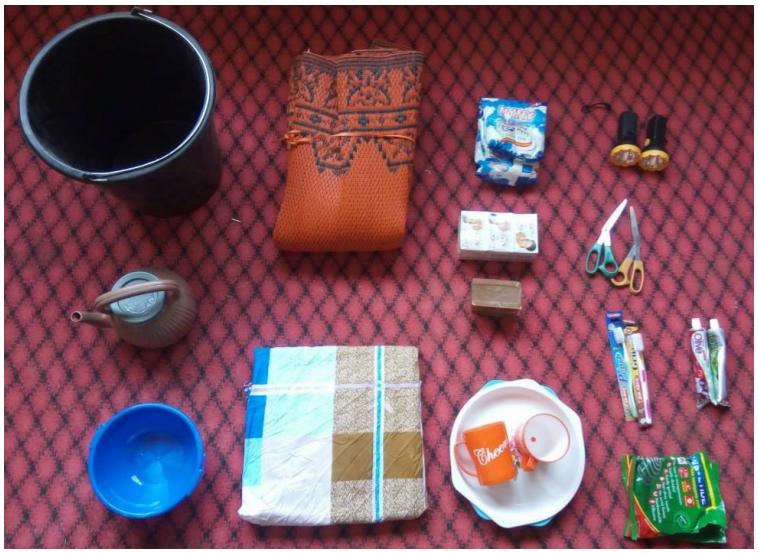


Figure C4: Men's Items Prompt: typical men's items

Figure C5: Household Items Prompt: example of typical household items available in the shop



C.4 Allocation selection and shrouding

At the end of the experiment, the enumerator determines the cash or voucher allocation that is given to each couple, partly determined by the choices made by both spouses in Blocks 1 to 4 and Block 6, but also shrouded for secrecy. In order that subjects understand how their decisions are implemented (and therefore their incentives) the following process was demonstrated to all subjects before any decisions were made.

The enumerator starts by drawing a ball indicating whether it is the choices of the wife or husband that will be implemented. The enumerator then draws a ball from a bag that contains one ball for each of the relevant decisions made by subjects, namely: four **split** balls and two **resplit** balls from Block 1; four **defer** balls from Block 2; two balls for **defercost** and one for **deferbenefit** from Block 3; three **revise**B-D balls from Block 4; and two efficiency balls from Block 6 (one for each game) — in total, 18 balls. If a ball is drawn from Block 1 or Block 4, the allocation made by the subject is selected for implementation. When the subject chooses to defer in Block 2 or Block 3, the selected allocation is the corresponding choice made by the spouse in Block1.[33]

After an allocation has been selected for a couple, it is *shrouded* as follows. If the selected decision is **split**, the experimenter randomly draws a number x between 0 and 2500 in 100 Naira increments. This number determines the allocation going to the first option in **split** and 2500-x is allocated to the second option. If the decision is **resplit**, the process is the same but the randomly drawn number x ranges from 0 to 2100. The experimenter then puts two envelopes in a box and randomly draws one of them. One envelope contains the subject's choice selected as indicated in the previous paragraph; the second envelope contains the random allocation implied by the randomly drawn number x. This implies that the spouse whose choices are not selected cannot infer with certainty the choice made by his or her

[33]For instance, if the subject does not defer in Block 2, the selected allocation is their own **split** choice from Block 1; if the subject defers, the selected allocation is the **split** choice of their spouse from Block 1.

spouse, ensuring credible deniability.

If the selected allocation is in the cash domain D or Block 6, each spouse is given their assigned monetary amount separately, *but not privately*. This is explained to all subjects at the beginning of the experiment. For selected allocations in domains A, B, and C, couples are brought together and are given the corresponding stall-specific tokens for items they can purchase from the lab. We make no attempt to influence couple's choices of items within each stall — i.e., a husband can impose his selection of female goods or let his wife choose.

For Block 5, subjects who do not defer, receive the food and drink of their choice and those who defer, receive the food and drink chosen for them by their spouse. If a subject chooses to not defer and there is a cost for retaining own choice, they only receive one cookie and half a glass of the selection they made earlier for themselves.

We divided the sessions equally (by random selection) into a secret treatment and a no-secret treatment. Block 1 is identical in both treatments, in that we continue to shroud the **split** and **resplit** decisions made in Block 1 to ensure credible deniability.

In Blocks 2 and 3, in the no-secret condition, subjects are told that their *deferral* decisions will be revealed to their spouse. If at the end of the experiment the experimenter draws a ball for Block 2 or 3 for subject i, the spouse of subject i is told *whether* i deferred the decision to the spouse in that game. The chosen allocation, however, remains shrouded as before, i.e., by using two envelopes as explained in the previous sub-section. The only revealed deferral decision is that for the chosen subject in the chosen domain and Block. This means that each deferral decision is fully incentivized in the sense that, in the no-secret treatment, it is disclosed to the spouse with strictly positive probability.

Block 4 is where the difference between the secret and no-secret treatments is the largest. In the no-secret treatment, there is no random selection of two envelopes. If Block 4 is selected for subject i at the end of the session, i's spouse is first told whether i chose to consult the spouse's communicated choice (**communicate**B-D) and is then told i's revised allocation **revise**. Given that the spouse knows his or her own communicated allocation (**communicate**B-D), this enables the spouse to observe how closely subject i accommodates these communicated preferences. The spouse, however, is *not* told whether subject i modified his or her allocation after seeing the spouse's communicated preferred allocation (**communicate**B-D). Consequently, the spouse cannot determine whether i's **revise** choice is identical to — or different from — i's secret preferences **split** revealed in Block1. Hence the secrecy of i's **split** allocation to the spouse is maintained. All this is made clear to subjects, i.e., in the no-secret treatment each subject is told that the decisions **consult**B-D and **revise**B-D that they make for domain j in Block 4 will be revealed to their spouse if the selected ball corresponds to domain j in Block 4.

In Block 5, with food and drink, the decision to defer is revealed to the spouse in the no-secret treatment, and never revealed in the secret treatment. In both treatments, subjects only learn what their spouse chose for them if they defer, but the selected food and drink are still consumed in private.

In Block 6, the input allocation is revealed in the no-secret treatment but not in the secret treatment.

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