

# Experimental measures of intra-household resource control\*

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*Abstract.* We study experimental measures of preferences for intra-household resource control among spouses in Ghana and Uganda. We implement two incentivized tasks: (1) a game that measures willingness to pay for resource control in the household, and (2) private and joint dictator games that measure preferences for resource allocation and the extent to which those preferences are reflected in joint decisions. Behavior in the two tasks is correlated, suggesting that they describe similar underlying latent variables. In Uganda the experimental measures are robustly correlated with a range of household survey measures of resource control and women's empowerment and suggest that simple private dictator games may be as informative as more sophisticated tasks and survey modules. In Ghana, the experimental measures are not predictive of survey indicators, suggesting that context may be an important element of whether experimental measures are informative.

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## 1.Introduction

Measuring individual decision power within households is difficult but important from a theoretical perspective and as an element of women's empowerment. Economists typically use one of two approaches to study and empirically identify how much say someone has in the household. One approach consists of using rich consumption data sets, which also often contain information on labor supply, leisure, prices, and home production, to estimate household models of behavior (Chiappori and Mazzocco 2017). These models can identify the pareto weights associated with individual preferences in intra-household bargaining models, which have a natural interpretation as the relative say or decision power each person has in the household. Another empirical approach uses rich household survey data with modules designed to measure specific aspects of intra-household behavior such as individual agency, access to resources, decision-making power over expenditure categories, marital quality, and intimate partner violence to try to capture both decision power directly and broader measures of empowerment. In this paper, we investigate a third approach, studying whether two simple, incentivized measures of preferences for resource control elicited from spouses in a lab-in-the-field experiment provide an alternative way to measure individual decision-making power, access to resources, and more broadly, women's level of empowerment within households.

Our lab-in-the-field experiment consists of two incentivized tasks. Task 1 measures willingness to pay for resource control in the household by having participants make two binary decisions. During the first decision participants choose which spouse should receive a sum of money. During the second decision, a tension between household income maximization and preferences for resource control is introduced: we ask participants whether paying 50 percent more money to the household, conditional on all resources being paid to the spouse not chosen in the first decision, would change their decision. This simple two-step decision provides a coarse measure of willingness to pay for intra-household resource control. The second task asks participants to make two dictator game decisions in which they divide a sum of money between the couple. One decision is made in private and one jointly by spouses. Private dictator game decisions allow us to measure individual preferences for resource control and the degree of preference alignment between spouses. The private and joint decisions allow us to study how much influence each spouse has over the joint resource allocation decision made by the spouses. One of the decisions made by spouses in the experiment was randomly selected to be paid.

Dictator games provide an appealing way to elicit incentivized measures of resource control in the household due to their simplicity. However, because there is no tension between household income maximization and resource control decisions, dictator game choices can be undone at home at no monetary cost to the household. To address this issue and make it incentive compatible for participants who desire

more resource control to reveal their true preferences in the experiment, a lottery was conducted which could determine earnings for the couple. This lottery allowed participants to control the privacy of their decisions and hide income from each other outside of our study.

The experiment was conducted in two study sites located in Ghana and Uganda, with a total of 3,387 couples. Both study samples were chosen because they include participants from a population where there are important gender asymmetries within households. Additionally, understanding intra-household resource allocations is particularly important in the developing world, where household dynamics interact with social programs aimed at poverty alleviation and economic development. The experiments were conducted in the context of a baseline survey for a large research project at both study sites. These surveys included extensive data on intra-household decision making and women's role in the household, which we use to study how our incentivized measures of preferences for resource control align with traditional survey measures of empowerment.

Results reveal robust gender differences in preferences for resource control within households. Across study sites, we find that women pay a higher price for resource control than men, and that they have lower influence over joint decisions in the dictator game. These results indicate that women have lower resource control in the household and have less influence over joint decisions in the experiment.

Since dictator game choices can be undone at home at no cost to the household, and participants who do not hide income need not reveal their true preferences in the experiment, we study the correlation between dictator game choices and our experimental measure of willingness to pay for resource control. This allows us to assess the validity of dictator game choices as measures of resource control in the household. Results reveal a strong correlation between how much women choose to keep for themselves in the dictator game and the price paid for resource control in both study sites. There is also a positive correlation between the price women pay for resource control and lower influence over joint dictator game decisions in both countries. This exercise validates dictator game decisions as a measure of preferences for resource control in the household and tells us that both variables are picking up similar underlying latent variables.

Intra-household resource control is an important element of empowerment within a household. We therefore also study the correlation of our experimental measures with a range of survey indicators of women's empowerment. Using household survey data, we construct indices of a broad range of variables representing different domains of women's empowerment, including access to resources, decision-making

power, preference alignment, marital quality, and intimate partner violence. We then study how predictive our experimental measures are of these survey measures of empowerment.

Results reveal no systematic correlation between our experimental measures of resource control and the survey empowerment indices in Ghana. However, we find strong and systematic correlations in Uganda. The price a woman pays for resource control is negatively associated with empowerment based on the survey measures. The strongest and most robust correlations show that women who keep more for themselves in the private dictator game are less empowered, suggesting that they intend to take advantage of the opportunity to hide income. Similar correlations are documented when considering the distance between private and joint dictator game decisions and the alignment of husband and wife preferences. When we examine the correlation of these survey measures with household types defined by both husband and wife choices, we find that, irrespective of husbands' choices, it is consistently true that wives' choices to keep money for themselves or pay to control resources are associated with lower empowerment, indicating that it is primarily the wives' choices that predict empowerment.

Our paper contributes to the literature along several dimensions. First, while previous studies have used lab-in-the-field experiments to elicit incentivized measures of preferences for intra-household resource control and bargaining power (e.g. Schaner 2017, Almas et al 2018; see section 2), most studies elicit only one measure, typically after an intervention has occurred, and sometimes from one spouse only. We collect two incentivized measures of preferences for resource control from both spouses before any intervention has occurred and conduct a systematic investigation of how the measures correlate with each other and with a set of rich household survey variables. Several papers have conducted similar exercises to study how experimental and survey measures compare at the individual level (e.g. Dohmen et al 2011, Vieider et al 2015, and Falk et al 2016, Buser et al 2020). We bring this approach to the growing literature that makes use of intra-household experiments.<sup>1</sup>

Second, we conduct our experiment in two study sites, using a large sample of households located in two different countries, which provides some information about the generalizability of our findings. For example, the robust correlation between the price paid for resource control and dictator game decisions that we find in both countries gives credence to our validation of dictator games as a measure of resource control in the household. While previous work has used dictator games to study intra-household decision-making

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<sup>1</sup> Papers using a specific incentivized task to study aspects of intra-household behavior and resource control have reported correlations between the survey measures and the experimental measures they collect. However, there is typically not a systematic reporting of correlations between variables. In section 2 we provide a review of the literature that also describes the correlations documented by past studies.

and to proxy intra-household bargaining power (e.g. Schaner 2017), they have not directly investigated what dictator games measure when played by spouses. The differences between the correlation of survey and experimental variables across study samples is also informative for researchers seeking to understand when incentivized measures of preferences for resource control may be able to capture behavior of interest outside of the experiment. The Ugandan sample, in which we document strong correlations between the experimental measures and survey indicators, is one where households are involved in commercial farming and accustomed to monetary transactions. Conversely, the Ghanaian sample is heavily reliant on subsistence farming and has a relatively non-monetized economy, suggesting that such experimental measures may be less useful in situations where financial literacy is low. We find suggestive evidence for this explanation by documenting that the results in Ghana are more similar to those in Uganda among subsets of the Ghanaian population that are more educated and have some savings.

The paper proceeds as follows. Section 2 reviews the literature using lab-in-the-field experiments to measure aspects of resource control in the household. Section 3 describes the experiment. Section 4 describes the experimental data. Section 5 analyzes the correlation of the experimental measures with survey measures and section 6 concludes.

## 2. Background on experimental measures of intra-household resource control

The use of lab experiments to study various aspects of intra-household decision making is a growing area of research.<sup>2</sup> In this section we discuss the development of experimental tasks that directly or indirectly measure preferences for resource control in the household, specifically among married couples.<sup>3</sup>

A primary class of tasks used by researchers to directly measure preferences for resource allocation in the household are dictator games. In a standard dictator game, the decisionmaker divides an endowment between themselves and another person. When the game is played with strangers, it measures altruism. However, when played among spouses the game speaks to the dictator's willingness to share resources with their spouse and thus his or her preference for resource control in the household. A joint decision on

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<sup>2</sup> Some examples include studies that test properties of household models (Peters et al. 2004, Bateman and Munro 2005, Iversen et al. 2011), study the role of informational asymmetries within households (e.g., Ashraf 2009, Castilla and Walker 2013, Ambler 2015, Hoel 2015, and Castilla 2019), or examine preference heterogeneity and joint decisions in the domains of risk and time (e.g., Carlsson et al 2012, 2013). More recent work has also studied social learning in the household (Conlon et al 2021).

<sup>3</sup> This review is not exhaustive. We restrict attention to experiments conducted with couples, that elicit decisions over money rather than real effort or consumption, and that study resource control separately from risk or time preferences. For a more comprehensive review of the literature using intra-household experiments see Munro (2018).

allocation of the endowment following private decisions made by each spouse can also be used to measure resource control by quantifying how close the joint allocations are to the private preferences of each spouse.

It is true that in a household where either the preferences of spouses are perfectly aligned, spouses pool income, or spouses perfectly communicate with each other, it does not matter who controls income. In such cases, the standard dictator game need not measure preferences for resource control. However, in a household where there is not perfect preference alignment and at least one spouse hides income, dictator game choices can reveal information about intra-household dynamics. In one example in a study in rural Kenya, Schaner (2017) uses the standard dictator game to elicit private and joint decisions from spouses and construct an experimental estimate of the bargaining power of each spouse. She finds that this measure is positively correlated with a demographic proxy of bargaining power (constructed from within-couple differences in age, education, literacy, and income), but uncorrelated or negatively correlated with survey measures related to decision-making power in spending and saving decisions.<sup>4</sup>

The dictator game is useful in its simplicity but suffers from the drawback that, in some households, decisions can be reversed outside of the game at no cost. As such, it may not be incentive compatible for spouses in these households to reveal their true preferences in the experiment. Another stream of experimental measures introduces a trade-off between maximizing household resources and controlling income to overcome this problem. One such game is the modified dictator game, in which the amount transferred by the decisionmaker is multiplied by an amount greater than one, such that total household resources are maximized when the decisionmaker transfers income to their partner. The game thus measures willingness to sacrifice household resources to control income. The main drawback of this approach is that it cannot distinguish whether higher transfers result from a lower desire for resource control, other-regarding preferences, or efficiency concerns.

Modified dictator games have been used to study whether households maximize joint income in various countries and study samples such as Uganda (Iversen et al 2011), Ethiopia (Kebede et al 2014), France (Cochard et al 2016), and India (Mani 2020). They have also been used to study the resource allocation decisions made by spouses. In rural Kenya, for example, Hoel (2015) elicits choices in modified dictator games under public and private information conditions and shows that more knowledge about resources at home is associated with higher levels of opportunism in the lab in this subset of households. On the other

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<sup>4</sup> Another study that uses the standard dictator game to study intra-household decision-making but only elicits private decisions from spouses is Holden and Bezu (2013), who document a positive relationship between the amount spouses allocate to the wife in the dictator game and attitudes about women's land rights in Ethiopia.

hand, in urban Zambia, Jack et al. (2018) find that households that make higher transfers and thus behave more efficiently in a private modified dictator game are more sensitive to water prices in a field experiment that provides financial incentives for households to consume less water. Additionally, the intra-household efficiency measure is positively correlated with survey measures of joint decision making.

A related task, which is perhaps the most commonly used in the literature to indirectly measure resource control in the household, is the linear public goods game. In this game, each partner receives an endowment and must decide how to allocate it between a private and a joint account. All contributions made to the joint account are multiplied (for example by 1.5) and are split equally between partners, while money placed in the private account is kept by the decision maker, introducing a tension between household income maximization and retaining control over resources. A spouse who wishes to maximize household resources should contribute everything to the joint account, while a spouse who wishes to retain control over resources may instead choose to sacrifice some household income by keeping part or all of the endowment.<sup>5</sup>

Analysis of correlations between behavior in public goods games and field behavior has shown mixed findings. For example, Castilla (2019) conducts an experiment in India that combines a linear public good game with an ultimatum game and documents some positive correlations between women's cooperation in the lab and survey measures of decision-making power at home. However, Lowes (2018) finds the opposite result in an urban sample located around the matrilineal belt in the Democratic Republic of Congo. In matrilineal households, where women have higher outside options and thus higher bargaining power relative to patrilineal households, the cooperation rates of husbands and wives are lower, yet the well-being of matrilineal women is higher. Hoel et al. (2021) investigate semi-nomadic pastoralist households in Senegal and find that households that are more cooperative in public goods games display a lower degree of inefficiency in household milk production but report less collaborative decision making at home.

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<sup>5</sup> The linear public goods game has been used by researchers to study whether spouses maximize joint income (Iversen et al 2011, Kebede et al 2014, Munro et al 2014, Lopez et al 2015), income concealing in the household (Castilla 2019), and the role of social norms and spite in intra-household resource control decisions (Mani 2020). It has also been used to compare spousal cooperation rates across different types of households (e.g. Barr et al 2019, Munro et al 2019, Lowes 2018, Hoel et al 2021, and Lecoutere and Jassogne 2019). Barr et al (2019) and Munro et al (2019) compare monogamous and polygamous households, Lowes (2018) compares households with different kinship systems, while Hoel et al (2021) and Lecoutere and Jassogne (2019) classify households into types based on their lab behavior and study the correlation between these types and smallholder agricultural practices in the field. Another study that examines the correlation between lab measures of intra-household resource control and agricultural practices is Lenjiso et al (2016), but they use a coordination game instead of a public goods game.

Recent studies have employed a new approach comprised of binary decisions to directly measure willingness to sacrifice household resources to control income.<sup>6</sup> For example, Fiala and He (2017) and Fiala (2018) ask participants to choose between  $X$  paid to them or  $MX$  paid to their spouse. As in linear public good games and modified dictator games, parameter  $M = 1.5$  introduces a tension between resource control and household income maximization. Almas et al (2018) instead have participants make similar decisions but in a series of binary choices designed to more precisely elicit willingness to sacrifice household resources to control income. The first decision asks participants to choose between  $(1/M_1)X$  paid to them or  $X$  paid to their spouse. As in other studies,  $M_1 > 1$  to ensure that there is a trade-off between retaining resource control and maximizing household resources. Depending on the choice made by the decision maker, the next choice changes  $M_{k+1}$  up or down. The experiment ends when the participant starts to switch between choices, and thus signals that they have reached a range of indifference between options.

While Fiala and He (2017) use their lab experiment to test the unitary model of the household, Fiala (2018) uses it to identify income hiding in the household and examine heterogeneous treatment effects of an RCT conducted with microenterprise owners in Uganda.<sup>7</sup> Almas et al (2018) instead use their lab experiment to measure the impact of a cash transfer program in Macedonia. Results show that wives who received the cash transfer were willing to forego less to control income than women who did not receive the transfer. However, this measure is not robustly correlated with survey measures of resource control.

Almas et al (2018) make an important methodological contribution, but similar to other tasks, the method is not capable of perfectly measuring intra-household resource control. This is because a zero willingness to sacrifice household resources to control income may mean several things. It may be an indicator of preference alignment in the household, of full resource control by wives, or of wives having such low bargaining power that they are not willing to forego household resources control income. Furthermore, the measure by design does not truncate willingness to pay for resource control at zero. There is a large fraction of households (approximately 35%) where wives have a negative willingness to pay for resource control (they pay to have their spouse control resources). The Almas et al (2018) design is also not easy to implement in samples where literacy levels are low.

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<sup>6</sup> Binary decisions have also been used to study the trade-off between equality and efficiency in intra-household resource allocation. See, for example, Beblo et al (2015) and Cochard et al (2016).

<sup>7</sup> This RCT provided loans, grants, and training to participants and showed no impact of any capital treatment on the average enterprise owner. Analysis of heterogeneous treatment effects, however, revealed positive impacts for men who are not willing to sacrifice household resources to control income, and negative impacts for men who do. The opposite is true for women; those who maximize household resources in the lab experiment show negative impacts of the capital treatments, while those who do not show positive impacts.

More recent papers in the literature have used variations of the Almas et al. (2018) measure to elicit willingness to pay for intra-household resource control in other study samples and using slightly different procedures. For example, Jayachandran et al. (2021) conduct a study in rural northern India with a sample of married women where they document negative willingness to pay in approximately 60% of the sample. Qualitative work suggested that the negative willingness to pay was associated with strong household norms regarding husbands making household finance decisions, or wives fearing that their husbands would find out that they received the money. In analysis designed to develop a short survey module to measure agency, the authors find that the lab measures perform poorly, but qualitative interviews perform much better.

Other work conducted by Barr et al. (2020) reveals similar findings. In a study that investigates income hiding among spouses in Zambia, Barr et al. (2020) have either the husband or the wife in a household make a series of binary decisions which vary the tradeoff between resource control and household income maximization. Unlike Almas et al. (2008) or Jayachandran et al. (2021), however, there is no stopping rule in the experiment; all participants make all binary decisions. Results reveal that 30% of participants have negative willingness to pay for resource control in the one decision where choosing to control resources is the efficient choice in the experiment. Results also reveal that wives are more likely to demand resource control than husbands across all decisions. In the subsample of choices where there is tension between household income maximization and resource control, on average participants are willing to sacrifice 17.6% of household resources in order to control income.<sup>8</sup>

The existing literature has described useful experimental measures of intra-household resource control and provided some mixed evidence on their correlation with survey-based measures. The experiment we conduct builds upon these studies by conducting a within-subject experiment that elicits multiple measures of preferences for resource control from the same couples, allowing us to investigate how the different experimental measures correlate with each other and with household behavior outside of the experiment. The first task incorporates a tradeoff between household income and resource control and is similar to Almas et al (2018). However, we make some modifications to simplify the task and adapt it to a population with lower literacy levels. These modifications were necessary with our study samples and make the

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<sup>8</sup> In an additional example, Riley (2020) uses an incentivized measure of resource control based on Almas et al (2018) to identify income hiding in the household in a sample of female microfinance borrowers in Uganda. She then uses this binary income hiding variable together with some survey measures to construct an index that measures the degree of pressure women experience to share money with others at baseline. The study shows positive impacts of a program that offers direct loan deposits into the mobile money accounts on business capital and profits. Treatment effects are stronger among women who experience above median pressure to share income with others. The share of women that display a negative willingness to pay for resource control is not reported in the paper.

experimental measure easier to elicit in developing country settings, but do make our measure a much coarser proxy of willingness to pay for intra-household resource control. While these measures are growing in use, the documented negative willingness to pay for resource control has raised questions about their interpretation. Importantly, we do not recode negative willingness to pay decisions and instead ask what negative willingness to pay for resource control captures. The second task measures preferences for resource control using the standard dictator game, incorporating private decisions followed by a joint decision.<sup>9</sup> The next section describes our experimental design in detail.

### 3. The experiment

#### 3.1 Experimental design

We designed a lab-in-the-field experiment to elicit two incentivized measures of preferences for intra-household resource control from spouses. Each measure was collected using a separate experimental task, which consists of one or more decisions that could determine earnings for both spouses. Participants knew at the beginning of the experiment that they would be making several decisions and that only one decision made by the couple would be randomly selected to be paid. They were also informed that a separate lottery could determine the earnings of both spouses, and that neither they nor their spouse would find out whether a lottery or a decision determined earnings and whose decision was chosen to be paid. Below we describe the tasks and what they are designed to measure. The goal of the paper will be to investigate how these measures correlate with each other and how they map onto household behavior outside of the experiment.

##### 3.1.1 Task 1: Willingness to pay to control resources

Task 1 measures individual willingness to sacrifice household resources to control income using a two-step procedure. The first decision asks individuals to choose who in the household should receive a sum  $X$  of money, themselves or their spouse. The second decision asks participants if  $1.5X$  paid to the spouse not chosen in stage 1 would change their decision. Specifically, if the decision maker chooses to be the recipient in stage 1, we ask the decision maker in stage 2 to choose between  $X$  paid to them or  $1.5X$  paid to their spouse. If instead the decision maker chooses not to be the recipient in stage 1, then we ask the decision maker in stage 2 to choose between  $1.5X$  paid to them versus  $X$  paid to their spouse. Participants knew at the beginning of the task that they would be making two decisions but not what each decision entailed.

Payoffs in the experiment were chosen in such a way that the average amount of resources earned by the household was roughly equivalent to twice the daily wage that participants could have earned in the study

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<sup>9</sup> Like Schaner (2017), we elicit private and joint decisions from spouses. However, our choice set is different because we prevent the equal split from being a choice option.

area. This made the decision meaningful and ensured that the two decisions elicited from spouses introduced an important tradeoff between household income maximization and the preference over who in the household should control income. If the decision-maker chooses to give up  $0.5X$  to receive income, then the participant is willing to sacrifice at least 50% of the endowment to control income. If the decision maker chooses to give up  $0.5X$  to let their spouse receive the income, then the participant is willing to pay  $-0.5X$  to control resources (or to give up at least 50% of the endowment not to control income). In Appendix A, we present a theoretical appendix that distinguishes between the price paid to control resources and the underlying willingness to pay variable that the price paid captures. There are four possible decision scenarios in this task, each associated with a possible range of values for the underlying willingness to pay variable.

This task was designed to identify willingness to pay for resource control in the household. Either spouse is likely to give up resources to maintain control if they do not believe that the money will be spent in accordance with their preferences if given to their spouse. Cases where the respondent does not choose to give up income are indicative of a household where the benefit of maintaining control is not greater than the resources that would be lost, and suggestive of a more cooperative relationship. Finally, the choice to give up income in order for the respondent's spouse to maintain control could be suggestive of self-control problems on the part of the decisionmaker or strong preferences coupled with no undoing of choices outside of the experiment. By strong preferences we mean altruistic preferences strong enough to lead spouses to sacrifice household income to have their preferences enacted or strong household norms regarding who should receive the money. In Appendix A we present a theoretical examination of the decision environment where we go over each possible decision scenario and argue that no undoing of choices outside of the experiment can be rationalized both by income hiding as well as by strong household norms regarding how income is used and controlled once it is earned and split between spouses.<sup>10</sup>

### 3.1.2 Task 2: Dictator game

Task 2 asks participants to make two decisions. In each decision participants must divide a sum  $Y$  of money between themselves and their spouse. The choice set available to participants does not change across the decisions; it is discrete, contains 8 choices, and by design excludes an even split between spouses as a choice option. This design choice forces participants to choose an unequal resource division and was done

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<sup>10</sup> Error could, of course, also explain why some participants are willing to pay for their spouse to control resources (pay a negative price for resource control). However, error is not one-sided and should also manifest itself as a positive price paid for resource control.

to reduce any experimenter demand effect that may arise from participants' potential perception that an equal split of resources is preferred by the experimenter.

Choices were first made individually by each spouse in private, and then jointly by spouses after they were given the opportunity to deliberate face to face away from others. Participants did not know when making their private decision that they would be repeating the same decision together with their spouse. Stakes were similar to Task 1. However, the stakes in Task 1 and Task 2 were not identical, in order to frame decisions in the two tasks differently and to accommodate the desired design features.

Private dictator game decisions reveal individual preferences for resource allocation between spouses in the game. The difference between private and joint decisions allows us to study how private and joint decisions differ and thus how much influence each spouse has over joint dictator game decisions in the experiment. As highlighted in the previous section, one drawback to this task is that, because there is no tension between household income maximization and resource control in the dictator game, choices can be undone outside of the experiment by spouses at no monetary cost to the household.<sup>11</sup> However, in households where there is competition over resource control and at least one spouse hides income, it is incentive compatible for participants to reveal their true preferences in the private dictator game.

### 3.1.3 Lottery

Before spouses made the incentivized choices in each of the tasks discussed above, we conducted a lottery that pays  $(z_A, z_B)$  to spouses. Variable  $z_i$  is independently and uniformly distributed over  $[0, \bar{Z}]$  where  $i = A, B$  denotes the two spouses and  $\bar{Z}$  represents the maximum earnings that can result from a decision made by a spouse in the experiment. This lottery was implemented by having each spouse draw a lettered card from a deck, where each letter had a unique value associated with it. Participants did not learn the outcome of the lottery, only that all possible payment outcomes in the experiment could result either from decisions made by either spouse or from random chance. This lottery is a crucial design feature because it allows participants to control the privacy and confidentiality of their decisions outside of the experiment.<sup>12</sup>

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<sup>11</sup> This is problematic for joint decisions in all types of households, and for private decisions in households where spouses pool income, have perfectly aligned preferences, or communicate perfectly with each other, because all choices in the game are theoretically equivalent in these scenarios. See Appendix A for a theoretical discussion of this issue.

<sup>12</sup> We chose to implement the lottery using a deck of cards to make it salient to participants that a lottery was conducted and that they could hide income from their spouses outside of the experiment if they wished to do so. Each card in the lottery had a code associated with it. This code was entered by enumerators in the tablet used to record decisions. Neither the participant nor the enumerator knew what value was associated with each card and code during the study.

### 3.1.4 Other experimental design features

The lottery was implemented first, to explain to participants in subsequent tasks that their private decisions could not be revealed directly or indirectly to their spouse during or after the experiment. After the lottery was conducted, Tasks 1 and 2 were conducted in fixed order. At the end of the experiment, either the lottery or one of the decisions made by spouse A or B in Task 1 or 2 was randomly selected to be paid.<sup>13</sup>

No feedback about earnings or the decisions was provided to participants throughout the experiment. Payment was done in private at the end of the study, using procedures that guaranteed the privacy and confidentiality of decisions. For example, spouses never learned which task or decision was randomly selected to count for payment, or what private decisions their spouse made in the study. They were also not provided copies of receipts to avoid any risk with others seeing their earnings.

## 3.2 Study samples

We conducted the lab-in-the-field experiment described above using two study samples. One sample includes 1,024 couples who had expressed interest in participating in a randomized controlled trial conducted by an agribusiness in the Upper East Region of Ghana. When households expressed interest in participating in the RCT, they were asked to sign up as a couple. Interest in the trial was based on the couple's desire to rent irrigated land and their willingness to have a potential rental contract randomly assigned to either the husband or wife. In polygamous households, the household could choose which wife would be enrolled. Household surveys regarding decision-making and preference alignment were conducted during in-home visits between March and September 2016. Once households in a village had been interviewed, the lab-in-the-field experiment invited couples to a "meeting." This meeting took place in a central location in the village and simultaneously elicited incentivized decisions from spouses. Private interviews were conducted first, by two enumerators who privately interviewed each spouse in a separate interview booth. Joint decisions were elicited afterwards, by one enumerator after spouses were brought together. Thereafter, participants were paid. An interview with each couple took approximately 30 minutes to complete in Ghana. A detailed description of the experimental procedures used in this study site is provided in Appendix B.

Our second study sample includes 2,363 couples who were part of randomized controlled trial conducted near Jinja, Uganda (Ambler, Jones, and O'Sullivan 2021).<sup>14</sup> The trial sample included small-scale sugarcane

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<sup>13</sup> In one of our study sites, Ghana, Task 2 also elicited investment decisions from spouses. These decisions measure risk preferences and are described in detail in Appendix B.

<sup>14</sup> The trial examines the impact of a pair of interventions designed to increase women's empowerment.

contract farmers who held contracts with a specific, large sugarcane buyer. If located, each contract farmer registered with this buyer was enrolled in the study, conditional on being married. One husband and one wife were enrolled per study household. In polygamous households, the wife most involved in sugar production participated. The lab-in-the-field experiment was implemented together with the baseline survey of the RCT, between July and September 2016. Households were interviewed at their homes, by one enumerator. Incentivized decisions were elicited first, followed by the household survey. The spouse readily available, who the couple agreed should be interviewed first, made private decisions first. Afterwards, the second spouse was interviewed privately. After both spouses made their private decisions, the couple was brought together to make the joint decision. Afterwards, the enumerator proceeded with the household survey. It took approximately 30 minutes for the enumerator to elicit incentivized decisions from both spouses, and approximately 2.5 hours for the household survey to be administered. Participants were paid at the end of the household survey; however, payment was not contingent upon participation in the household survey. A detailed description of the experimental procedures used in Uganda is provided in Appendix C.

Table 1 summarizes some basic characteristics of the participating households. The characteristics show some similarities between the households in the two countries. Households are only slightly larger in Ghana (9.13 members compared to 8.7 members), and approximately one third of households are polygamous in both samples. Couples have been married approximately two years longer in Ghana. Despite these similarities, education levels are very different. In Ghana, education is extremely low; 58% of husbands have no formal education. In Uganda, that is true of only 6% of men in the sample. This is indicative of a major difference between the two samples. The Ghanaian sample is composed primarily of households engaged in subsistence agriculture who reside in a remote area, while the Ugandan sample is defined by its engagement in commercial agriculture.<sup>15</sup>

Within sample, there are gender differences in individual characteristics in both countries. Women are younger and have lower education than men; they also have lower personal savings in both countries. Women are also far less likely to report having individual income than men in Uganda. However, in Ghana most men and women report having individual income. This reflects the norms surrounding agricultural cultivation and land use in Ghana where husbands and wives cultivate different plots of land and control the agricultural income generated by their plot (see e.g. Udry 1996). However, only 15% of women in Ghana report earning as much or more than their husbands (Appendix Table 1). Additionally, in both

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<sup>15</sup> All households in the Uganda sample have a relationship with a large sugar company that is based outside Jinja, a small to medium sized city with an active economy.

countries women's personal expenditures are less than their husbands' (Appendix Tables 1 and 2). In general, these measures show that in both countries women have less initial control of income and access to resources than their husbands. There is variation within the samples regarding women's agency, as measured by whether women have equal or more say than their husbands in a range of decisions, but in both countries the pattern is that 60 to 80% of women have at least equal say for most types of decisions. In Uganda, this falls to 50% or less for decision making regarding household purchases and for use of own or husband's earnings. The combination of differences in age, education, savings, and these other income and access to resources measures indicate that women are, in general, less empowered than men in both study samples, but do have some role in decision making.

There are several important experimental design differences between study sites. First, the Ghana experiment was designed and piloted first and in addition to collecting incentivized measures of resource control, it also elicited two private and one joint investment decisions from spouses. These investment decisions measure risk preferences and were conducted in conjunction with the dictator game decisions. Participants made their private dictator game decision first, followed by two private investment decisions. Thereafter participants were brought together to make the joint dictator game decision and a joint investment decision sequentially.<sup>16</sup> Participants learned at the beginning of the task how many decisions they would make but not what each decision entailed. Decisions were described in detail only when participants were presented with a decision.

Second, implementation procedures were different in our Ghana and Uganda study sites. In Ghana the baseline survey was conducted in two parts, the first was conducted approximately one to three months prior to the collection of the experimental measures and the second was conducted two to three months after. We use survey data from the first visit to construct the survey measures of empowerment.<sup>17</sup> The Ghana experiment was conducted in central locations with several couples participating at the same time. Multiple enumerators were at each session and thus spouses were interviewed simultaneously. This setup provided a high degree of control over experimental procedures and allowed us to collect data from all households residing in the same geographical area in a short time. The Uganda experiment was conducted by one enumerator per couple at each couple's home during the same visit as the baseline survey. As such

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<sup>16</sup> Investment decisions were elicited using similar procedures to Ambler, Godlonton, Recalde (2021). Participants chose how much of an endowment  $W$  to invest in an account that pays three times the amount invested with 50% probability and 0 otherwise.  $W$  represents approximately the daily wage in the study area. Only the order of private investment decisions was randomized across couples; the order of all other decisions and tasks was fixed. See Appendix B for a script and experimental procedures used to elicit all decisions in Ghana.

<sup>17</sup> In the event that a registered household had not received the first survey visit prior to the lab-in-the-field experiment, we conducted the corresponding household survey immediately after the couple participated in the experiment.

the investment decisions were not included to reduce the time spent, and implementation procedures were modified as needed. However, the way in which incentivized decisions were elicited was not changed across study sites.

A third difference between study sites are the payoffs used to elicit decisions. In Ghana, the stakes at play in Tasks 1 and 2 were  $X = 10 \text{ GHC}$  and  $Y = 14 \text{ GHC}$  respectively. These values do not change across households in Ghana, but they do in Uganda where  $X = 10,000 \text{ UGX}$  in all households, while  $Y$  could be either  $14,000 \text{ UGX}$  or  $28,000 \text{ UGX}$ . One fourth of the sample in Uganda was randomized into the high stakes environment.<sup>18</sup> The stakes were designed to be roughly comparable across sites with  $Y$  in Ghana equal to approximately  $\$3.66\text{USD}$  and the low-stakes  $Y$  in Uganda equal to approximately  $\$4.14\text{USD}$ . This translates to similar expected earnings across all households at each study site, which is approximately twice the daily wage a participant could have earned in the study area.

### 3.3 Ethics

The experimental measures of intra-household resource control and survey measures of empowerment we construct using household survey data involve primary data collection that is sensitive in nature because it can create conflict in the household or exacerbate it. We took several steps to minimize this risk and safeguard the safety of participants. As described in section 1 and subsection 3.2, the experimental and survey data we use was collected in two randomized controlled trials (RCTs) conducted in Ghana and Uganda. Ethical approval of the research was obtained under the umbrella of the larger RCTs conducted at each study site. We had ethical clearance to conduct our research from the International Food Policy Research Institute's Institutional Review Board and from local ethical review boards in Ghana and Uganda.<sup>19</sup>

The design and implementation of the lab-in-the-field experiments was done in such a way that any disputes, conflict, or potential risk to participants that could arise as a result of the lab-in-the-field experiment was minimized. For example, we used a lottery at the beginning of the experiment and scripts to elicit decisions that explained to participants how the privacy and confidentiality of their individual decisions was guaranteed. We also paid participants in private and did not provide receipts to participants

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<sup>18</sup> Though definitive conclusions are somewhat limited by power, in general we do not document consistent differences across low and high stakes in Uganda for any of our analyses.

<sup>19</sup> All authors were employed at the International Food Policy Research institute at the time of data collection. In Ghana approval to conduct the research was obtained from the University of Ghana Ethics Committee for the Humanities (ECH). In Uganda approval was obtained from the IRB at the International Health Sciences University (now Clarke International University) and research approval was also obtained from the Uganda National Council for Science and Technology.

to minimize the risk that their earnings were inadvertently revealed to others after the experiment. Show-up fees (minimum earnings) were also paid separately from decision earnings to make it easier for participants to hide income if they wished to do so outside of the experiment.

When collecting household survey data, we followed best practices for the responsible conduct of research on intimate partner violence, in line with guidance provided by the Demographic and Health Surveys (DHS) Program. For example, in Ghana we asked intimate partner violence questions using the DHS Program survey module on domestic violence. In Uganda, we included a much shorter intimate partner violence module but also generally followed DHS recommendations.<sup>20</sup>

Finally, we gave additional specialized training to enumerators in both countries to conduct the household survey and elicit intimate partner violence incidence questions as well as to conduct the lab-in-the-field experiment. Principal investigators of the RCTs were directly involved in this specialized training in both study sites. In Appendix D we provide more information about the steps taken to ensure the responsible conduct of research at each study site and minor deviations from best practices that occurred due to feasibility, sample characteristics, and staffing constraints.

## 4. Results: Examining the experimental data

In this section we describe the experimental data in both countries to characterize behavior in the experiment and understand differences by gender. We then conduct an analysis to assess how well the experimental measures perform relative to each other.

### 4.1 Describing the data

Figure 1 shows the distribution of the price paid to control resources (Task 1) for Ghana in Panel A and Uganda in Panel B.<sup>21</sup> The variable can acquire three values: 0.5 indicates that the participant sacrificed 50% of the endowment to control resources, 0 indicates that the participant did not give up resources to assign control to either themselves or their spouse, and -0.5 indicates that the participant gave up resource control to their spouse (paid not to control resources). Panel A reveals that in Ghana, the majority of both husbands and wives do not sacrifice resources to determine who in the household should control income. Around 30% of husbands pay a negative price for resource control, i.e. they pay for their wife to control resources,

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<sup>20</sup> The one exception was that the survey in Uganda included one question for men regarding IPV. More details are available in Appendix D.

<sup>21</sup> For a full histogram of choices, which distinguishes between the four possible decision scenarios see Appendix Figure 1.

while 15% pay to maintain resource control themselves. The wives' responses show that 20% pay for their husband to control resources while 20% pay to maintain control themselves. Thus, the overall distribution of choices shows that women pay a higher price for resource control than men.

In Uganda, the distributions of responses look different, but tell a similar story: women pay a higher price for resource control than men. Panel B shows that about 40% of both husbands and wives do not pay to shift control of resources. 40% of husbands and approximately 35% of wives pay to have their spouse control resources, and around 20% of husbands and 24% of wives pay to maintain resource control.

The distribution of choices by gender tells us that women are generally more willing to pay for resource control than men in our data. The data also allows us to compare the choices made within households. For example, those that behave efficiently and maximize household income in the experiment represent 35% of households in Ghana and 22% of households in Uganda. Households where women pay a higher price for resource control than their husbands represent 35% of households in Ghana and 29% of households in Uganda, while households where men pay a higher price for resource control than wives represent 21% and 24% of households in the Ghana and Uganda samples, respectively. These patterns that include both positive and negative willingness to pay for resource control are consistent with other studies. Barr et al. (2020), for example, also document this pattern in both men and women in Zambia.

Next, we examine choices in the dictator game. We use the share of the endowment assigned to the wife as our main variable to make the analysis comparable across countries and to normalize the difference in stakes in the Uganda sample. Figure 2 shows histograms of the amounts assigned to the wife by the wife, by the husband, and in the joint decision separately. In Ghana, the three distributions are fairly similar, but suggest that joint decisions assign more to the wife than individual decisions. In Uganda, the differences between men's and women's allocation are larger and show that women assign themselves more money than men assign them. Joint decisions in Uganda are more common towards the middle of the choice set.

The within-household differences in allocation decisions are examined in Figure 3. The Joint-minus-Husband difference (J-H) shows the largest mass at zero in both samples; for 60% of men in Ghana and almost 50% of men in Uganda, private and joint decisions coincide. The Joint-minus-Wife difference (J-W) also shows a mass at zero that is modal, but smaller for women than men. Approximately 30% of wives make the same choice individually as they do jointly with their spouse. Since joint decisions should coincide with individual decisions in households where individual preferences are perfectly aligned, we also plot the difference between Husband-minus-Wife (H-W) decisions. This variable shows that spouses in

approximately 20% of households have perfectly aligned preferences in both study sites. These figures reveal that more men than women have full say over joint decisions (their private and joint decisions coincide), but that even when we exclude households with aligned preferences (husband and wife decisions are equal), there are both men and women with full say over the joint decision.<sup>22</sup>

To better understand the difference between wife and husband responses within households we conduct a series of regressions to estimate the average gender difference in responses using household fixed effects. We examine two indicators from each task: a binary variable taking the value of one if the respondent paid a positive price to control resources (Price paid = 0.5 in Figure 1), a binary variable equal to one if the respondent paid not to control resources (Price paid = -0.5 in Figure 1), the percent of the endowment allocated to the wife in the private dictator game decision, and the absolute value of the distance between the private allocation to the wife and the joint allocation to the wife. We estimate the following equation:

$$y_{ih} = \beta wife_{ih} + \gamma_{ih} + \delta_h + \varepsilon_h$$

Where  $y_{ih}$  is one of the described outcome variables for individual  $i$  in household  $h$ .  $wife_{ih}$  is an indicator that the respondent is the wife,  $\gamma_{ih}$  is a vector of individual-level control variables that includes age group, years of schooling, whether the individual reports any personal income, and savings, and  $\delta_h$  is the household fixed effect.  $\beta$  is an estimate of the within-household difference between wife and husband responses. Standard errors are clustered at the household level. The results are reported in Table 2 with Ghana in Panel A and Uganda in Panel B. To account for the number of analyses and hypotheses tested we additionally present p-values adjusted for the family wise error rate (FWER) using the method described in List et al. (2019) and Barsbai et al. (2020). We apply this correction over all hypothesis tests presented in each regression panel of our main tables.<sup>23</sup> These p-values are presented in tables in Appendix E.

The results related to the willingness to pay task are reported in columns 1 through 4. Columns 1 and 2 show regressions estimating the probability that wives and husbands pay to control resources, without and with control variables, respectively. Columns 3 and 4 show the same for the probability of paying for the spouse to control resources. Focusing on the results with control variables, the estimates show that in Ghana a woman is five percentage points more likely to pay for resource control than her husband, and approximately nine percentage points less likely than he is to pay for her spouse to control resources. We

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<sup>22</sup> The private decisions made by both spouses coincide with the joint decision made by the couple in 18% of the households in Ghana and 14% of the households in Uganda.

<sup>23</sup> In Table 2, we apply the FWER correction only for regressions with control variables.

document the same pattern in Uganda, though the magnitudes of the coefficients are sometimes smaller. In Appendix Table 3 we present estimates of an ordered logit model where the dependent variable can acquire 4 values, corresponding to the 4 choices participants can make in the experiment. Results are similar.

In columns 5 through 8 of Table 2, we examine the responses in the dictator game, reporting the percentage assigned to the wife in columns 5 and 6, and the absolute distance between the private allocation to wife and the joint allocation to wife in columns 7 and 8. In Ghana, a woman assigns slightly *less* to herself than her husband assigns to her, on the order of two percentage points. However, the distance from the wife allocation to the joint allocation is also larger for a woman, by around 8 percentage points. This is a substantial difference, particularly when compared to the average among husbands of 9 percentage points. In Uganda, a woman does allocate more to herself than her husband assigns to her (by five percentage points) and experiences a larger gap between private and joint allocation of seven percentage points, roughly 50 percent of husbands' average. All but one coefficient (on absolute distance in Uganda) remain statistically significant with FWER p-values (Appendix Table E.1).

The results presented here show that women are more likely to pay for resource control than their husbands which indicates that they have lower control over household income outside of the experiment. They are also less likely to pay for their spouse to control resources. At the same time, women experience larger differences between their private allocation and the joint allocation in the dictator game, which is indicative of lower influence over decisions regarding household resources.

## 4.2 Correlation between experimental measures

By design, Task 1 measures willingness to pay for resource control in the household. However, as indicated in Section 3.1.2, dictator game choices need not identify preferences for resource control in households where spouses do not hide income because choices can be undone at home by participants at no cost to the household. In this section, we study the extent to which behavior in the willingness to pay task is correlated with behavior in the dictator game. Studying this correlation allows us to assess the extent to which dictator game choices reflect preferences for resource control in the household, and to study the extent to which these measures are picking up similar or different aspects of household behavior.

To investigate the correlation between measures, we estimate an OLS regression model with two indicators from the willingness to pay task as the dependent variables of interest and an indicator from the dictator game as an independent variable. We also include individual and household level control variables. The individual controls (as in the previous regressions) include age group, years of schooling, whether the

individual reports any personal income, and personal savings. The household controls are measures of food security, household income, and household savings.<sup>24</sup> The models are run separately for wives' responses and husbands' responses. The results for wives are shown in Table 3, with Ghana in Panel A and Uganda in Panel B. The corresponding models using husband responses are in Appendix Table 4.<sup>25</sup>

Columns 1 through 4 of Table 3 show correlations with the indicator for paying to control resources and columns 5 through 8 with the indicator for paying for the spouse to control resources. The first two columns of each set examine the correlation with the percentage assigned to the wife by the wife in the private dictator game decision, both without and with controls for the percentage assigned to the wife by the husband and the percentage assigned to the wife in the joint decision. The next two columns examine the absolute distance between the wife's allocation to herself and the joint allocation to the wife and the absolute distance between the wife's and husband's private allocations to the wife. In both cases, we include an indicator to control for the sign of the difference (not shown), though excluding it does not substantially change the results.

In Ghana we document strong correlations between the experimental measures. The percent of the endowment assigned by wives to themselves is strongly positively correlated with them paying to control resources. Interestingly, additionally controlling for the husband's allocation to the wife and the joint allocation to the wife does not change this relationship. We also document a positive correlation of paying to control resources with the absolute distance between the wife's private allocation and the joint allocation, as well as with the absolute distance between the wife's allocation and the husband's allocation. In Uganda a similar pattern is documented between wives paying to control resources and their allocation to themselves as well as with the distance measures, though the magnitudes of the coefficients are smaller. The results in columns 5-8 regarding paying for spousal control of resources show generally opposite patterns, as expected, though the results are somewhat less robust. These consistent correlations suggest that paying for the spouse to control resources is a meaningful behavior, and not simply noise or measurement error. All FWER-adjusted p-values remain significant, except those in columns 3, 4, and 7 (Appendix Table E.2). In Appendix Table 5 we present ordered logit models that combine the analysis of both dependent variables into a single model and shows similar results. Overall, the analysis presented in

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<sup>24</sup> Summary statistics for control variables are shown in Table 1. In the analysis we use the first four components from a principal components analysis for food insecurity as controls (see Appendix F for details). As these are not descriptive, Table 1 presents a simple indicator for experiencing any food insecurity. In Ghana, household income is a self-reported estimate. In Uganda we construct household income by summing wage income, household enterprise income, sugarcane revenue, and revenue from production of other crops.

<sup>25</sup> We present the results for wives as our leading models because some of the survey measures used in section 5 are elicited from wives only. It is also not uncommon in the literature to elicit measures from wives only.

this section indicates that dictator game choices and the willingness to pay task are capturing some of the same underlying latent variation.

The corresponding analysis of husbands' responses is presented in Appendix Tables 4 and 6. Appendix Table 4 shows that men whose wives allocate more of the endowment to themselves are less likely to pay to maintain control over resources in both countries. The joint allocation to the wife is also negatively correlated with the husband paying to control resources, as is the husband's allocation to the wife in Uganda only. We also document that larger differences between the joint allocation to the wife or the wife's allocation to the wife and the husband's allocation to the wife are negatively correlated with paying for resource control in Uganda. In Ghana these coefficients are positive, but statistically significant only for the latter. We also note correlations in the opposite direction for paying for the wife to control resources. In general, the male responses indicate that resources are allocated to women in households where men have less interest in controlling resources.

## 5. Results: Experimental choices and survey measures

The study of women's role in the household and their empowerment has driven the development of survey-based methods to measure various components of these concepts. In this piece of our analysis, we study the correlation of our experimental measures with a range of survey indicators of women's empowerment in the household. To do this, we take advantage of the rich baseline data collected in both countries and create standardized indices to represent the three key domains of empowerment as described by Kabeer (1999). These are: *access to resources*, which is our first index of interest, *agency*, represented by an index for decision-making power, and *achievements*, represented by indices for marital quality and (absence of) intimate partner violence. We also include an index for intra-household preference alignment. While this does not directly measure empowerment, more closely matched preferences may be a sign of a more cooperative household. Further, this measure also provides a comparison for preference alignment as measured by the dictator game.

Each index is composed of several indicators, which are combined following the method described in Kling, Liebman, and Katz (2007). For variables with categorical outcomes, we first create a question-level outcome index that preserves the full variation in each variable, without treating them as continuous, following a method developed in Heath, Hidrobo, and Roy (2020) and Roy et al. (2019). Because the surveys were not the same in each country, the variables that comprise each index vary somewhat. A full

list of the variables in each index and their means are reported in Appendix Tables 1 and 2. A detailed description of variable selection, index construction, and questions used are provided in Appendix F.

### 5.1 Correlation of experimental choices and survey responses

The empirical strategy is the same as in the previous section, but the outcome variables are the survey measure indices, and the independent variables of interest are each of the experimental variables in turn. As before, we focus on wife's responses. The results for Ghana are in Table 4 and for Uganda in Table 5. The corresponding results for husband's responses are in Appendix Tables 7 and 8.<sup>26, 27</sup> Model 1 examines the relationship between the willingness to pay variables and the survey outcomes. The indicators for both a positive and negative price paid for resource control are included, with zero price paid for resource control as the omitted category. Model 2 examines the percent allocated to the wife in the dictator game by the wife, husband, and in the joint decision. Models 3 and 4 examine the absolute difference between the wife's allocation to herself and the joint allocation or the husband's allocation respectively. Models 3 and 4 also include a control for the direction of that distance (not reported).

In Ghana we find very little evidence of any robust correlation between the experimental measures and the survey measures (Table 4). The same is also generally true of the husband's responses (Appendix Table 7). However, in Uganda (Table 5) there are strong patterns of correlation. Wives paying to control resources is negatively correlated with their access to resources and marital quality and is positively correlated with women's decision-making power. Conversely, wives paying for spousal control of resources is positively correlated with access to resources, decision making, and preference agreement, while negatively correlated with intimate partner violence incidence. These results suggest that paying for resource control is an indication of lower female empowerment, though the correlation with decision making is not consistent.<sup>28</sup> The correlations with paying for spouse to control resources also reveal that it is not disempowered women who pay for their spouse to receive the money, but rather more empowered women who have less interest in controlling resources. These correlations (in combination with the correlation with dictator game preferences in Table 3) suggest that paying for spouse to control resources is meaningful behavior. As

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<sup>26</sup> Some of the outcomes are collected for both husbands and wives, in which case we use the husband response in the husband regression and the wife response in the wife regression. In Ghana these variables are preference alignment and decision making. In Uganda they are marital quality and decision making.

<sup>27</sup> In models B and D, the independent and dependent variables are the same in the husband and wife models, except for the cases noted where we use husband's reports for the outcome variable. The estimates differ slightly from the wife regressions because the individual-level controls are different. However, the results are essentially the same and included in the husband response tables only for completeness.

<sup>28</sup> This inconsistent result disappears when an ordered logit model that exploits the full variation of choices is used to examine the correlation between willingness to pay for resource control and the decision-making power index. See Appendix Table 11.

described in Section 3.1.1, these choices could be driven by strong individual preferences regarding who should control resources, coupled with strong household norms regarding allocation rules not being undone once made. These individual preferences could reflect altruism or norms regarding who should receive the money in the household. Paying not to control resources could also reflect self-control issues on the part of the respondent. See Appendix A.

Examining the indicators from the dictator game (Model 2), we find that the percentage assigned to the wife by the wife is negatively correlated with her access to resources, decision making power, and marital quality. It is also positively related to intimate partner violence incidence. This indicates that women with low levels of empowerment assign higher amounts to themselves in the private dictator game. There is no strong pattern for the husband or joint allocations, suggesting that the women's allocation to herself alone is a more reliable indicator of low empowerment. This may be because joint decisions can be easily undone outside of the experiment and do not allow for income hiding. The fact that women who allocate larger amounts to themselves privately pay a higher price for resource control and appear to be less empowered using household survey variables suggests that income hiding may be a key feature of their private dictator game decision.

We note these same significant correlations for distance from joint decision in Model 3 (access to resources, decision making power, marital quality, intimate partner violence) and distance from husband's decision in Model 4 (access to resources, decision making power, and intimate partner violence).<sup>29</sup> All correlations in Table 5 remain significant when FWER adjustments are applied, with the exception of the association of wife's allocation to herself with intimate partner violence in Model 2 and the joint minus wife allocation with the marital quality index in Model 3 (Appendix Table E.4). The husband responses (Appendix Table 8) tell a less robust story. Altogether, these results suggest that in Uganda, the experimental measures are good proxies of a broad range of women's empowerment indicators, but do not necessarily pick up specific elements of household behavior. Women's responses are more predictive than men's, and in fact, if a study were conducted where men were not available for interview, women's allocations to themselves could be used independently, as they perform similarly to the measures that include husbands' allocations.

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<sup>29</sup> The positive correlation between heterogeneity in preferences for resource control and intimate partner violence incidence, is consistent with results from other papers in the literature which find that intra-household preference heterogeneity is associated with worse household outcomes. For example, Serra-Garcia (2020) finds a positive correlation between heterogeneity in risk preferences and marital instability in a representative sample of the German population, while Schaner (2015) finds that heterogeneity in time preferences is associated with inefficient household savings decisions in Kenya.

In Appendix Tables 9-12 we present models that examine the correlation between the survey measures of empowerment and the categorical willingness to pay variable using ordered logit models. In these models, the dependent variable is the category of willingness to pay for resource control and the independent variable is each survey measure. Appendix Tables 9 and 10 show results for wives and husbands in Ghana, while Appendix Tables 11 and 12 show results for wives and husbands in Uganda. Appendix Table 11 shows that by exploiting the full variation of choices of the willingness to pay measure, there is no longer an anomalous correlation between wives' willingness to pay for resource control and their decision-making power; the ordered logit models show robust correlations in the hypothesized direction between willingness to pay for resource control and all survey measures of empowerment in Uganda.

## 5.2 Concordance between experimental measures within households

In the results presented so far, we have limited our analyses to the experimental choices of one spouse at a time, focusing on the choices made by the wife, with the husband's choices analyzed in appendix tables. In this section we investigate the correlations of the survey measures with household "types" as defined by different combinations of husband and wife decisions in the experimental tasks, and consider whether this analysis provides further insight into the results. The categories defined from the experimental measures are different, but otherwise the specification is the same as in Tables 4 and 5. We focus on Uganda because we did not document significant correlations in the Ghana sample, and we present the results in Table 6. The Ghana results are presented in Appendix Table 13 for reference. However, it should be noted that due to the large number of categories and corresponding hypothesis tests, many of these correlations do not survive FWER corrections (see Appendix Table E.5). As such the patterns should be considered suggestive.

We first use the price paid to control resources by husbands and wives to classify households into nine types. These categories and their distribution in the Uganda sample are displayed in the first two columns of Panel A of Table 6. Decisions where a spouse pays a price of zero for resource control are classified as "efficient" and cases where both spouses behave "efficiently" and agree to maximize household resources constitute our benchmark category (21.8% of households) in the regression. This is comparable to the benchmark category in Tables 4 and 5 of the individual maximizing household resources. Results, presented in Panel A of Table 6 for Uganda, show a number of patterns. First, the types that include a wife paying for herself to control resources (line 3, 7.4% of the sample; line 4, 10.2%; and line 8, 6.1%)<sup>30</sup> display the same associations as the "wife pays to control resources" variable from Table 5, namely lower access to resources and marital quality, and the anomalous positive association with decision making in lines 3 and 4. This is

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<sup>30</sup> Line 3 is "both pay for resource control"; line 4 is "both pay for wife to control resources"; line 8 is "wife pays for wife to control resources, husband is efficient."

true regardless of whether her husband competes with her for control, supports her control, or acts efficiently. This supports the interpretation that women's desire to hide income is associated with lower levels of empowerment, and that the husband's preferences are less informative about her empowerment.

This analysis also allows for a more in-depth investigation of cases where one or both spouses pay for the other spouse to control resources. In particular it allows us to speak to the possibility that such choices are motivated by strong preferences driven by altruism or household norms regarding who should receive the money.<sup>31</sup> The case where both spouses pay for their spouse to control resources (line 2, 17.4% of the sample) can be considered an indication of altruistic types who are not competing for resource control and display higher levels of empowerment across all measures. Cases that may be indicative of a norm of husband control of resources (line 5, 6.7% of the sample; line 9, 10.8%)<sup>32</sup> or a norm of wife control of resources (line 6, 13% of the sample)<sup>33</sup> are all associated to some extent with higher levels of empowerment relative to the benchmark category of both spouses paying a price of zero for resource control, but the pattern is not as robust as the case where both spouses pay for the other to control resources. This provides some suggestive evidence that altruistic households and household norms regarding who controls resources are associated with households where women are more empowered, relative to cases where women hide income, and even relative to households that maximize household resources in the experiment.

This pattern also speaks to the question of whether respondents' motives for controlling income in the experiment is driven by a desire to see their preferences enacted in the household or a desire for decision-making power itself, suggesting that for many of our respondents, a desire to see their preferences enacted plays an important role. For example, altruistic spouses derive utility from giving money to their spouses, to the extent that they are willing to sacrifice resources to do so. However, for those who keep money for themselves, our results cannot disentangle the two explanations.

In Panel B of Table 6 we use the dictator game decisions to classify households into types based on agreement between choices. The omitted category is households that disagree on who should receive the money and where both spouses want to keep more than 50% of the endowment themselves (33.7% of cases). The other three categories are: spouses disagreeing and wanting their spouse to receive more money

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<sup>31</sup> Note that altruism or household norms regarding who should receive the money could only be driving this behavior under the assumption that experimental choices are not "undone" outside of the experiment. Self-control issues and error are other explanations not addressed here.

<sup>32</sup> Line 5 is "both pay for husband to control resources"; line 9 is "wife pays for husband to control resources, husband is efficient."

<sup>33</sup> Line 6 is "husband pays for wife to control resources, wife is efficient."

(16.9% of cases), spouses agreeing that the wife should receive more money than the husband (14.8% of cases), and spouses agreeing that the husband should receive more money than the wife (34.6% of cases). Results are overall similar to Panel A. Households where spouses disagree and say their spouse should receive more money (line 2, altruistic types), and households where both say husbands should receive more (line 3, possibly indicative of norm of husband control) are associated with higher levels of women's empowerment relative to the omitted category. However, when both spouses agree the wife should receive more money, we see an increase in decision making power relative to the omitted category, but no differences for the other outcomes. This is consistent with the results in Panel A where any case where the wife is keeping money for herself is associated with lower empowerment regardless of her husband's choice, but the decision-making result suggests that wives are somewhat better off in cases where husbands also assign them income.

### 5.3 Discussion

These results suggest that experimental measures are sometimes useful as simple proxies of women's resource control in the household. They show promise in Uganda, where the experimental measures are highly correlated with survey measures of empowerment. In both countries, the consistency across measures suggests that they are measuring similar or correlated phenomenon and not necessarily different aspects of intra-household dynamics. One contribution of this study is to show that both positive and negative willingness to pay to control resources are informative of household behavior. While our analysis provides some guidance for what types of households might display negative willingness to pay, understanding this behavior is an important area for future research. However, our results also show that the measure may not ultimately be more informative than a simple dictator game. Dictator games in which women make allocations to themselves privately appear to be good proxies for resource control as they are correlated with other experimental measures and a range of survey measures. This occurs even though, theoretically, dictator game choices may not be the best measures of intra-household resource control as choices can be undone at home at no monetary cost to the household.

One of the interesting components of these results is the difference that we observe between countries. Though correlations between the experimental measures are documented in both countries, they are larger in magnitude in Ghana. In Uganda we observe much stronger correlation between survey measures and experimental measures, suggesting that the experimental measures in Uganda do a better job at mirroring household behavior outside of the experiment. Possible reasons for this difference include implementation differences between the two experiments; in Ghana the experiment was part of a separate lab-based session with multiple enumerators and survey data was collected separately, at a different point in time than the

experimental data, while in Uganda the experiment was part of the survey with one enumerator. The sample size was also different, affecting statistical power. In general, the implementation in Uganda is a more realistic setup for projects with limited resources that wish to incorporate experimental measures into survey work. As such, the results indicating that games conducted in this way can produce useful data are encouraging for researchers.

Contextual differences between the two samples may also play an important role in the usefulness of the experimental measures. The sample in Ghana is more rural and remote, and characterized by a reliance on subsistence farming. There are also large differences in education, with the majority of the Ghana sample reporting that they have no formal schooling. In Uganda the households are all involved in some level of commercial farming and most have attended school. This difference means not only that the Ugandan households are somewhat more empowered overall, but they are also more familiar with money as a component of their day-to-day lives. Because these games focused on money, and the women in the Ghana sample may have been less accustomed to such choices, the games may have not performed as well in picking up meaningful aspects of their relationships.

To examine this explanation, we conduct heterogeneity analysis to study whether the patterns in Ghana might be more similar to those in Uganda among households that “look” more like the Uganda households, specifically considering financial literacy or familiarity with money. We are able to employ two measures: whether or not the wife has any education and whether or not she reports any savings. We then analyze how the correlations with survey measures vary with these variables. In Table 7 we present the results for Model 2 (dictator games) in Ghana, as those were the most robust correlations in the full Uganda sample. We also report the results for Model 1 (willingness to pay task) in Appendix Table 14. For completeness, we also include the corresponding tables for Uganda in Appendix Tables 15 and 16.

All tables are constructed in a similar manner. Results using the schooling interaction term are in columns 1 through 5, and results using the savings interaction terms are in columns 6 through 10. We show a fully saturated regression model where the schooling or savings variable is interacted with each independent variable such that the coefficients express the correlation for each group. For both schooling and savings, the “any” group (any schooling or any savings) are the group of interest as they are more like the Uganda sample. Though the patterns are not as robust as in Uganda, there is some evidence that experimental measures are performing better among those in these “any” groups. Women who assign more to themselves have lower levels of agreement with their husbands and experience higher levels of psychological violence. Though other correlations aren’t statistically significant, they follow the same pattern as in Uganda with

the exception of women's access to resources. We view these results as exploratory and do not perform FWER corrections, and as such they should not be over-interpreted. However, in general, this analysis provides some evidence that household characteristics may drive some of the differences between countries. Less clear patterns are evident in the willingness to pay measure presented in Appendix Table 14.<sup>34</sup>

## 6. Conclusion

In this paper we examine two types of experimental measures of intra-household resource control: dictator game choices and a task that measures willingness to pay for resource control. We elicit both measures from the same participants in two research settings in Ghana and Uganda. We find that the two measures correlate with each other, suggesting that they describe similar underlying latent variables. We also show that both tasks are correlated with survey measures of women's empowerment in the Uganda sample. Our work supports the use of the dictator game choices, including a simple private decision made by the wife only, as proxies for intra-household resource control, suggesting that more complex measures may not add much additional information. The consistent patterns in our data also indicate that the finding of negative willingness to pay for resource control is meaningful, reveals that households do not undo choices outside of the experiment, and can be consistent with household models. See Appendix A.

The results also highlight the need for further research to better understand when incentivized measures are most appropriate relative to other methods of measuring women's empowerment. In general, our study shows that simple incentivized measures can be effective proxies for women's empowerment. Though it costs money to incentivize these measures, lengthy survey modules highlighting different domains of empowerment and resource control are also expensive. As such, the "best" measure may depend on the goals of the researcher. At the same time, the differences we note across contexts also indicate that researchers should carefully consider the setting when designing incentivized measures as part of a research program. Lab-in-the-field measures where participants earn money may not capture meaningful household behavior outside of the experiment in settings where everyday transactions are largely not monetized, or where literacy and education levels are low. Future studies should investigate the role of context in the usefulness of incentivized measures such as the ones studied in this paper.

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<sup>34</sup> In the Uganda sample (Appendix Tables 15 and 16) we document similar patterns in both groups, with no consistent evidence of varying effects.

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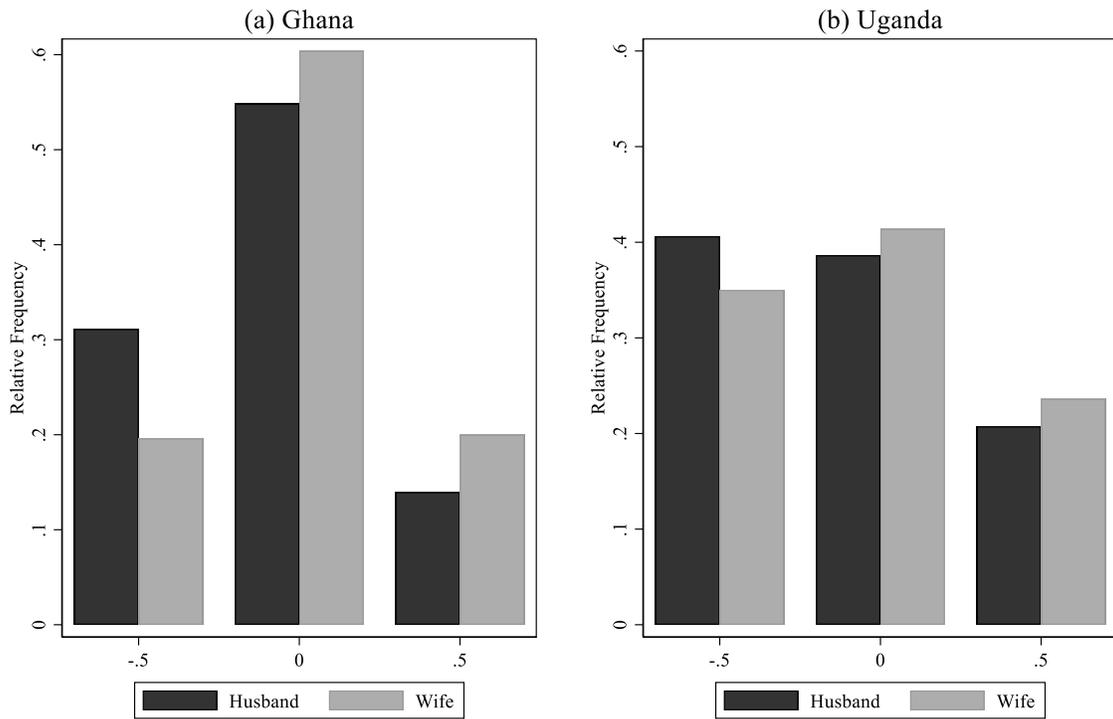
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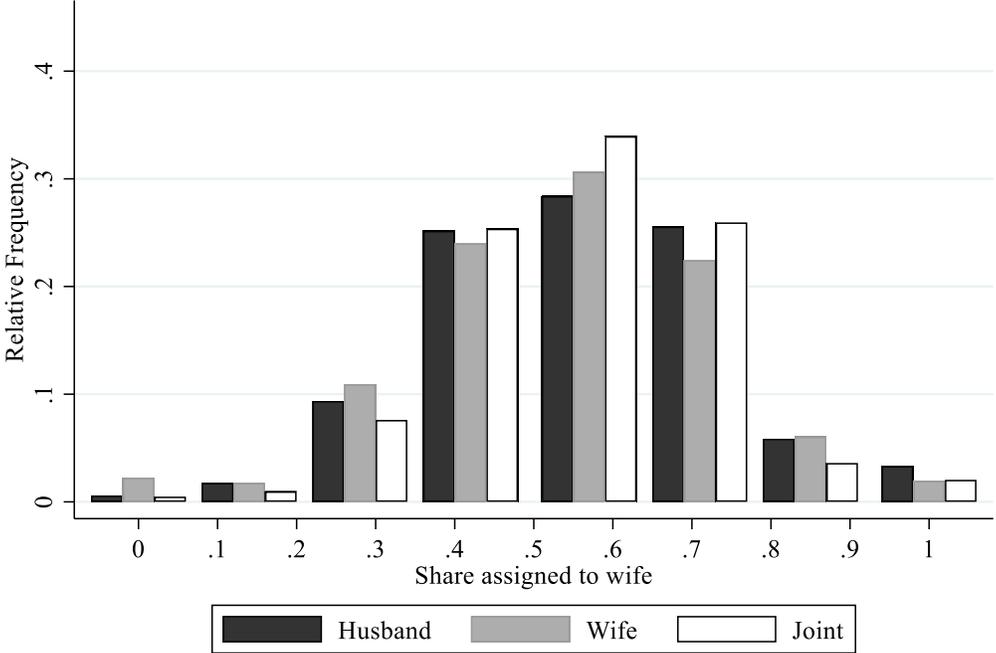
Figure 1. Price paid for resource control, Task 1



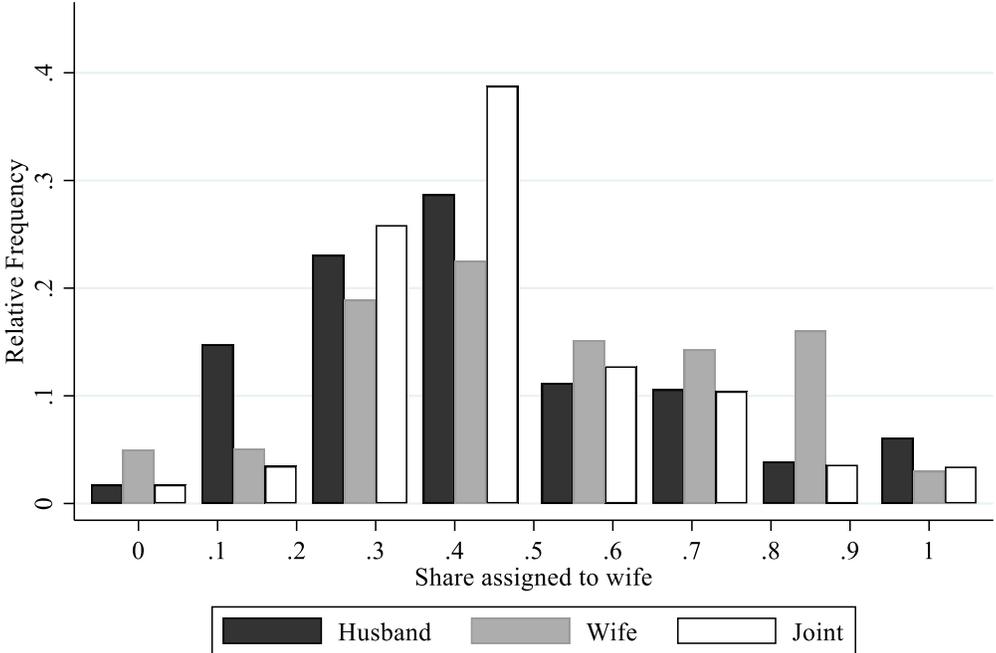
Notes: The price paid for resource control can acquire value  $P \in \{-0.5, 0, 0.5\}$  when the spouse is willing to sacrifice  $P$  (as a share of the endowment) to receive the money. A positive (negative) value indicates paying to receive (not receive) the money. The distributions are significantly different between husbands and wives in both panels (Chi-squared  $p < 0.001$ ).

Figure 2. Dictator game decisions, Task 2

(a) Ghana

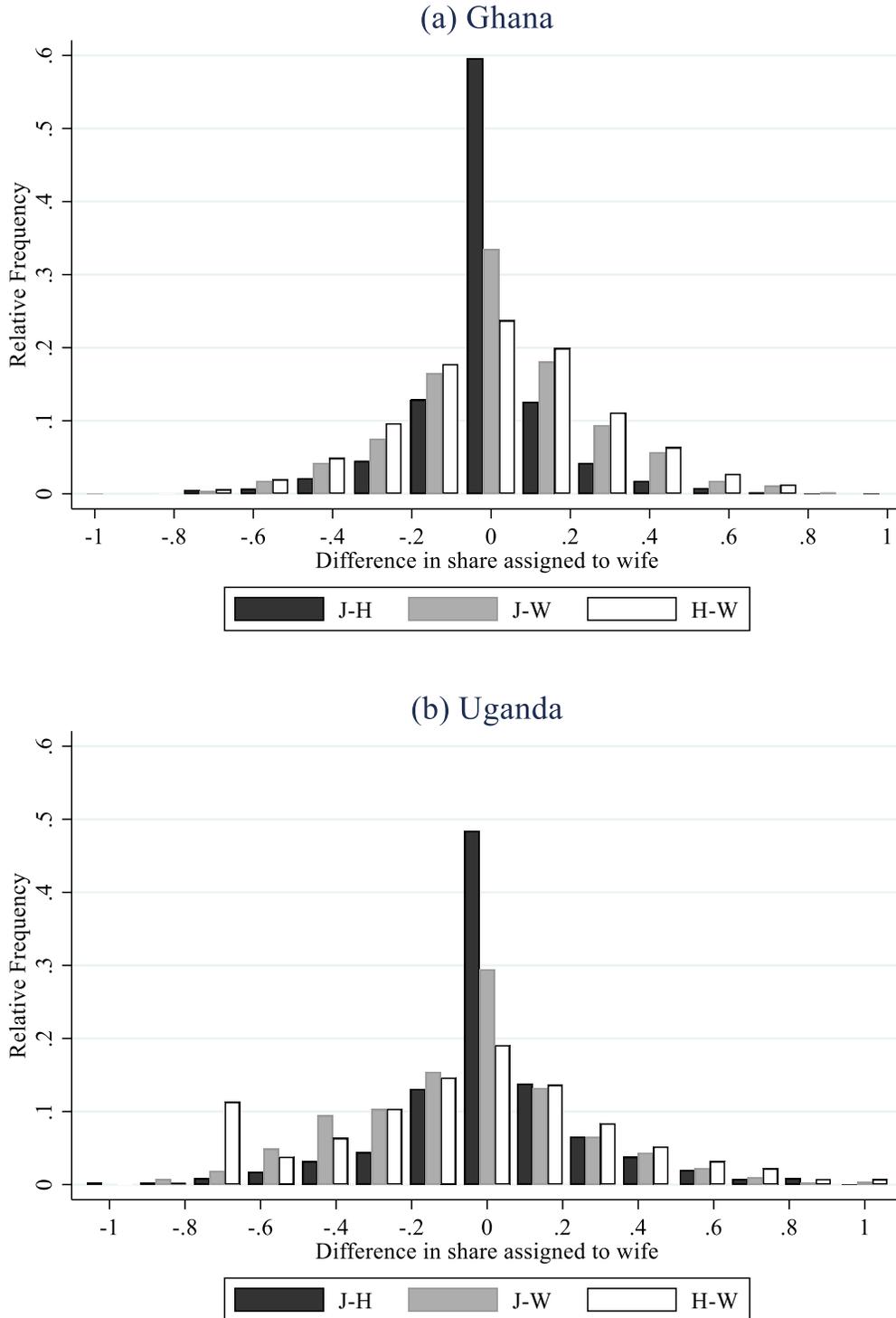


(b) Uganda



Note: Husband and Wife indicate the private decisions made by spouses. Joint indicates the decision made jointly by the couple, after they make private decisions.

Figure 3. Intra-household differences in dictator game decisions, Task 2



Note: J, H, and W denote the joint, husband, and wife decisions respectively (shown in Figure 2). J-H and J-W denote the difference between the joint decision made by the couple and the private decision made by the husband and by the wife respectively. H-W is the difference between the private decisions made by spouses.

**Table 1: Summary Statistics**

	<i>Ghana</i>		<i>Uganda</i>	
<i>Household characteristics</i>				
Household size	9.13		8.70	
Polygamous household	0.33		0.34	
Years of marriage	21.7		19.5	
Any food insecurity	0.57		0.66	
<i>Individual characteristics</i>				
	<i>Women</i>	<i>Men</i>	<i>Women</i>	<i>Men</i>
<i>Age group</i>				
Under 25	0.07	0.01	0.10	0.01
25 to 39	0.49	0.34	0.46	0.30
40 to 64	0.40	0.45	0.42	0.60
65 or older	0.04	0.19	0.02	0.09
<i>Years of schooling</i>				
Has no schooling	0.76	0.58	0.18	0.06
Did not complete primary school	0.92	0.81	0.56	0.40
Reports individual income	0.71	0.70	0.25	0.94
Personal savings (USD)	34	118	50	216

Note: Savings are reported in USD. Any food insecurity indicates reporting any of the issues listed in Appendix F Section 4. There are 1,024 households in the Ghana sample and 2,363 households in the Uganda sample.

**Table 2: Fixed Effects Regressions to Estimate Difference between Husband and Wife**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>Willingness to pay task</i>				<i>Dictator game</i>			
	Pays to control resources		Pays to have spouse control resources		Percentage assigned to wife		Absolute distance to joint  J-I	
<b><i>Panel A: Ghana</i></b>								
Coefficient on "Wife"	0.0605***	0.0492**	-0.115***	-0.0946***	-0.0216***	-0.0218**	0.0799***	0.0799***
Standard error	(0.0164)	(0.0217)	(0.0187)	(0.0253)	(0.00828)	(0.0109)	(0.00684)	(0.00902)
R-squared	0.515	0.518	0.530	0.537	0.505	0.506	0.560	0.565
Number of observations	2,048	2,048	2,048	2,048	2,048	2,048	2,048	2,048
Mean outcome: husbands	0.14		0.312		0.565		0.0929	
<b><i>Panel B: Uganda</i></b>								
Coefficient on "Wife"	0.0288**	0.0461**	-0.0563***	-0.0936***	0.0704***	0.0512***	0.0759***	0.0719***
Standard error	(0.0112)	(0.0215)	(0.0131)	(0.0264)	(0.00783)	(0.0162)	(0.00598)	(0.0122)
R-squared	0.573	0.576	0.570	0.572	0.416	0.420	0.509	0.512
Number of observations	4,726	4,726	4,726	4,726	4,726	4,726	4,726	4,726
Mean outcome: husbands	0.207		0.406		0.444		0.145	
Control variables	No	Yes	No	Yes	No	Yes	No	Yes

Note: J indicates joint allocation to wife, I indicates individual allocation to wife. Responses are at the individual level and include a fixed effect for household, as well as controls for age group, years of schooling, whether the individual reports any personal income, and personal savings. Robust standard errors are clustered at the household level. \*\*\* Significant at the 1% level, \*\* 5% level, \* 10% level.

**Table 3: Relationship between Experimental Measures**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>Dependent variable is</i>							
	Wife pays to control resources				Wife pays to have husband control resources			
<b><i>Panel A: Ghana</i></b>								
Percent of endowment assigned to wife: wife	0.443*** (0.063)	0.445*** (0.064)			-0.418*** (0.066)	-0.424*** (0.065)		
Percent of endowment assigned to wife: husband		0.063 (0.079)				-0.112 (0.081)		
Percent of endowment assigned to wife: joint		-0.041 (0.089)				0.131 (0.095)		
Absolute difference: Joint allocation to wife - wife allocation to wife			0.192** (0.085)				-0.019 (0.076)	
Absolute difference: Husband allocation to wife - wife allocation to wife				0.176** (0.081)				-0.030 (0.074)
R-squared	0.073	0.073	0.048	0.045	0.058	0.060	0.029	0.027
Number of observations	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024
<b><i>Panel B: Uganda</i></b>								
Percent of endowment assigned to wife: wife	0.242*** (0.033)	0.231*** (0.035)			-0.405*** (0.038)	-0.400*** (0.040)		
Percent of endowment assigned to wife: husband		-0.002 (0.041)				-0.010 (0.045)		
Percent of endowment assigned to wife: joint		0.100** (0.047)				-0.072 (0.054)		
Absolute difference: Joint allocation to wife - wife allocation to wife			0.054 (0.042)				-0.107** (0.048)	
Absolute difference: Husband allocation to wife - wife allocation to wife				0.055 (0.035)				-0.023 (0.040)
R-squared	0.044	0.046	0.026	0.030	0.064	0.065	0.034	0.039
Number of observations	2,363	2,363	2,363	2,363	2,363	2,363	2,363	2,363

Note: Unless otherwise indicated, responses are from the wife. Dependent variables are from the willingness to pay to control resources task. Independent variables are from the dictator game task. All regressions include the following household level control variables: food security measure, household income, and household savings. They also include the following individual level control variables: age group, years of schooling, whether the individual reports any personal income, and individual savings. Robust standard errors are in parentheses. \*\*\* Significant at the 1% level, \*\* 5% level, \* 10% level.

**Table 4: Correlation of Wife Experimental Measures with Survey Measures: Ghana**

	Wife's access to resources index	Decision making index	Agreement index	Psychological violence incidence index	Physical violence incidence index
<b><i>Panel A: Model 1</i></b>					
Pays to control resources	0.086 (0.080)	0.120 (0.083)	-0.046 (0.075)	-0.019 (0.081)	-0.024 (0.094)
Pays to have spouse control resources	0.062 (0.079)	0.102 (0.084)	0.072 (0.072)	-0.131* (0.078)	0.080 (0.106)
R-squared	0.036	0.015	0.016	0.031	0.022
<b><i>Panel B: Model 2</i></b>					
Percent of endowment assigned to wife: wife	0.155 (0.160)	-0.176 (0.178)	-0.032 (0.188)	0.554*** (0.178)	0.007 (0.121)
Percent of endowment assigned to wife: husband	0.089 (0.193)	0.215 (0.199)	0.296 (0.269)	0.035 (0.199)	-0.137 (0.142)
Percent of endowment assigned to wife: joint	0.084 (0.220)	0.061 (0.218)	-0.200 (0.333)	-0.481* (0.254)	0.126 (0.266)
R-squared	0.036	0.015	0.017	0.044	0.021
<b><i>Panel C: Model 3</i></b>					
Absolute difference: Joint allocation to wife - wife allocation to wife	-0.013 (0.188)	0.008 (0.191)	-0.135 (0.232)	0.359 (0.225)	-0.022 (0.122)
R-squared	0.035	0.015	0.015	0.037	0.020
<b><i>Panel D: Model 4</i></b>					
Absolute difference: Husband allocation to wife - wife allocation to wife	0.036 (0.191)	-0.019 (0.192)	0.153 (0.160)	0.038 (0.186)	-0.191 (0.163)
R-squared	0.035	0.012	0.015	0.030	0.021
Number of observations	1,024	1,024	1,024	1,024	1,024

Note: Unless otherwise indicated, responses are from the wife. Model 1 includes responses from the willingness to pay to control resources task. Models 2-4 include responses from the dictator game task. Dependent variables are standardized indices of variables in each category as described in Appendix F. All regressions include the following household level control variables: food security measure, household income, and household savings. They also include the following individual level control variables: age group, years of schooling, whether the individual reports any personal income, and individual savings. Robust standard errors are in parentheses. \*\*\* Significant at the 1% level, \*\* 5% level, \* 10% level.

**Table 5: Correlation of Wife Experimental Measures with Survey Measures: Uganda**

	Wife's access to resources index	Decision making index	Agreement index	Marital quality index	Intimate partner violence incidence index
<b><i>Panel A: Model 1</i></b>					
Pays to control resources	-0.064*** (0.015)	0.137*** (0.053)	0.021 (0.054)	-0.314*** (0.055)	0.018 (0.039)
Pays to have spouse control resources	0.051*** (0.012)	0.247*** (0.048)	0.121** (0.048)	0.046 (0.045)	-0.083*** (0.031)
R-squared	0.056	0.031	0.016	0.080	0.026
<b><i>Panel B: Model 2</i></b>					
Percent of endowment assigned to wife: wife	-0.086*** (0.023)	-0.330*** (0.087)	-0.140 (0.086)	-0.320*** (0.084)	0.144** (0.058)
Percent of endowment assigned to wife: husband	0.023 (0.025)	0.209** (0.095)	0.041 (0.094)	0.055 (0.091)	-0.040 (0.066)
Percent of endowment assigned to wife: joint	-0.009 (0.031)	0.046 (0.109)	0.071 (0.117)	0.038 (0.114)	0.007 (0.080)
R-squared	0.039	0.031	0.015	0.067	0.025
<b><i>Panel C: Model 3</i></b>					
Absolute difference: Joint allocation to wife - wife allocation to wife	-0.069** (0.027)	-0.370*** (0.103)	-0.108 (0.102)	-0.180* (0.099)	0.189*** (0.069)
R-squared	0.036	0.027	0.014	0.064	0.025
<b><i>Panel D: Model 4</i></b>					
Absolute difference: Husband allocation to wife - wife allocation to wife	-0.052** (0.022)	-0.222*** (0.083)	-0.064 (0.083)	0.008 (0.080)	0.143** (0.057)
R-squared	0.037	0.024	0.014	0.066	0.026
Number of observations	2,363	2,363	2,363	2,363	2,363

Note: Unless otherwise indicated, responses are from the wife. Model 1 includes responses from the willingness to pay to control resources task. Models 2-4 include responses from the dictator game task. Dependent variables are standardized indices of variables in each category as described in Appendix F. All regressions include the following household level control variables: food security measure, household income, and household savings. They also include the following individual level control variables: age group, years of schooling, whether the individual reports any personal income, and individual savings. Robust standard errors are in parentheses. \*\*\* Significant at the 1% level, \*\* 5% level, \* 10% level.

**Table 6: Correlation of Husband and Wife Experimental Measures with Survey Measures: Uganda**

	<i>Category mean</i>	Wife's access to resources index	Decision making index	Agreement index	Marital quality index	Intimate partner violence index
<b><i>Panel A: Willingness to pay</i></b>						
1 <i>Omitted category: Agree to maximize resources</i>	0.218					
2 Both pay for spouse to control resources	0.174	0.077*** (0.018)	0.415*** (0.067)	0.113* (0.067)	0.125* (0.064)	-0.132*** (0.040)
3 Both pay for resource control	0.074	-0.047* (0.026)	0.198** (0.093)	0.046 (0.085)	-0.171* (0.089)	0.041 (0.075)
4 Both pay for wife to control resources	0.102	-0.037* (0.022)	0.281*** (0.077)	-0.036 (0.081)	-0.322*** (0.086)	-0.020 (0.054)
5 Both pay for husband to control resources	0.067	0.074*** (0.024)	0.369*** (0.109)	0.159* (0.086)	-0.104 (0.103)	-0.060 (0.061)
6 Husband pays for wife to control resources, wife efficient	0.130	0.035* (0.019)	0.096 (0.064)	-0.077 (0.071)	0.169*** (0.061)	0.004 (0.049)
7 Husband pays for husband to control resources, wife efficient	0.066	0.031 (0.025)	-0.036 (0.086)	-0.143 (0.096)	0.025 (0.084)	0.046 (0.065)
8 Wife pays for wife to control resources, husband efficient	0.061	-0.073** (0.030)	-0.053 (0.089)	-0.109 (0.095)	-0.304*** (0.096)	0.091 (0.070)
9 Wife pays for husband to control resources, husband efficient	0.108	0.046** (0.021)	0.010 (0.069)	-0.040 (0.078)	0.185*** (0.064)	0.017 (0.053)
R-squared		0.064	0.053	0.024	0.094	0.036
<b><i>Panel B: Dictator games</i></b>						
1 <i>Omitted category: Both say self should receive more</i>	0.337					
2 Both say their spouse should receive more	0.169	0.046*** (0.017)	0.277*** (0.062)	0.107* (0.064)	0.268*** (0.054)	-0.080** (0.040)
3 Both say wife should receive more	0.148	0.007 (0.018)	0.151** (0.059)	0.035 (0.063)	0.047 (0.066)	-0.014 (0.047)
4 Both say husband should receive more	0.346	0.052*** (0.014)	0.236*** (0.051)	0.109** (0.051)	0.177*** (0.051)	-0.105*** (0.034)
R-squared		0.044	0.037	0.020	0.076	0.033
Number of observations		2,363	2,363	2,363	2,363	2,363

Note: Dependent variables are standardized indices of variables in each category as described in Appendix F. All regressions include the following household level control variables: food security measure, household income, and household savings. They also include the following individual level control variables for the wife: age group, years of schooling, whether the individual reports any personal income, and individual savings. Robust standard errors are in parentheses.

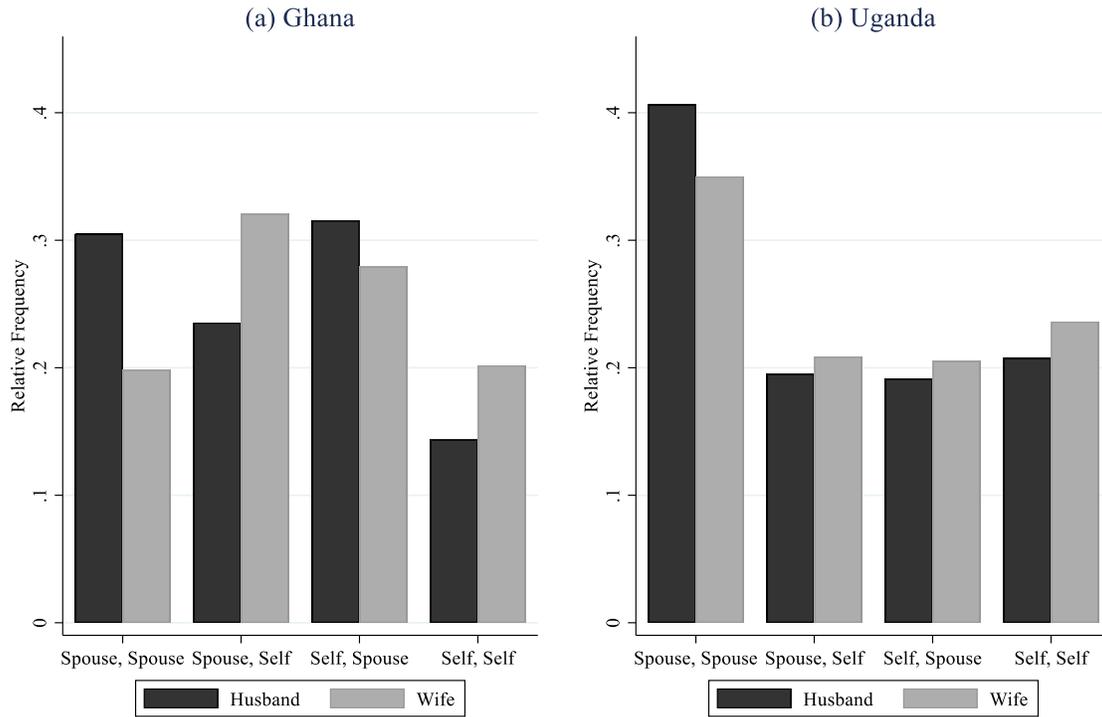
\*\*\* Significant at the 1% level, \*\* 5% level, \* 10% level.

**Table 7: Heterogeneity of Correlation of Dictator Game Measures with Survey Measures: Ghana**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Interaction term: Schooling					Interaction term: Savings				
	<i>Dependent variable is</i>									
	Wife's access to resources index	Decision making index	Agreement index	Psychologic al violence incidence index	Physical violence incidence index	Wife's access to resources index	Decision making index	Agreement index	Psychologic al violence incidence index	Physical violence incidence index
<b><i>Interaction term: None X ...</i></b>										
Percent of endowment assigned to wife: wife	0.135 (0.75)	-0.184 (-0.92)	0.142 (0.62)	0.438* (2.23)	-0.0262 (-0.22)	0.151 (0.61)	0.00230 (0.01)	-0.0860 (-0.26)	0.386 (1.57)	-0.0853 (-0.50)
Percent of endowment assigned to wife: husband	0.275 (1.27)	0.276 (1.18)	0.393 (1.25)	0.0746 (0.36)	-0.255 (-1.87)	-0.164 (-0.53)	0.119 (0.41)	-0.0560 (-0.18)	-0.286 (-1.25)	-0.253 (-1.12)
Percent of endowment assigned to wife: joint	0.0108 (0.04)	0.239 (0.94)	-0.338 (-0.85)	-0.281 (-1.13)	0.221 (0.74)	0.244 (0.65)	0.491 (1.39)	0.129 (0.25)	-0.0912 (-0.32)	0.421 (0.78)
<b><i>Interaction term: Any X ...</i></b>										
Percent of endowment assigned to wife: wife	0.232 (0.68)	-0.145 (-0.38)	-0.642* (-2.41)	0.960* (2.36)	0.121 (0.38)	0.146 (0.70)	-0.343 (-1.47)	-0.0123 (-0.06)	0.648** (2.66)	0.0600 (0.35)
Percent of endowment assigned to wife: husband	-0.612 (-1.54)	0.0652 (0.20)	-0.127 (-0.38)	-0.0176 (-0.03)	0.310 (0.77)	0.304 (1.20)	0.242 (0.89)	0.582 (1.40)	0.247 (0.79)	-0.0692 (-0.35)
Percent of endowment assigned to wife: joint	0.452 (0.99)	-0.525 (-1.22)	0.391 (1.30)	-1.184 (-1.65)	-0.266 (-0.47)	-0.0166 (-0.06)	-0.245 (-0.90)	-0.412 (-1.00)	-0.702 (-1.92)	-0.0690 (-0.30)
P-value Wife: None = Any	0.801	0.928	0.0246	0.249	0.654	0.989	0.340	0.850	0.446	0.545
P-value Husband: None = Any	0.0512	0.597	0.240	0.878	0.190	0.242	0.756	0.207	0.174	0.551
P-value Joint: None = Any	0.401	0.132	0.126	0.229	0.449	0.571	0.0996	0.408	0.183	0.390
R-squared	0.0395	0.0194	0.0233	0.0498	0.0231	0.0375	0.0198	0.0196	0.0490	0.0221
Number of Observations	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024

Note: The model includes responses from the dictator game task. Dependent variables are standardized indices of variables in each category. All regressions include the following household level control variables: food security measure, household income, and household savings. They also include the following individual level control variables: age group, years of schooling, whether the individual reports any personal income, and individual savings. Robust standard errors are in parentheses. \*\*\* Significant at the 1% level, \*\* 5% level, \* 10% level.

Appendix Figure 1. Category of willingness to pay for resource control, Task 1



Note: The x axis shows the four possible decision scenarios, ordered by the underlying willingness to pay variable they capture (see Appendix A Table A1). Participants who choose “Spouse, Spouse” in decision 1 and 2 of Task 1 have a strong willingness to pay for their spouse to control resources. Participants who choose “Spouse, Self” have a weak willingness to pay for their spouse to control resources. Participants who choose “Self, Spouse” have a weak willingness to pay for resource control, and participants who choose “Self, Self” have a strong willingness to pay for resource control. These 4 possible decision scenarios translate into a price paid for resource control (as a share of the endowment) of -0.5, 0, 0, and 0.5 respectively (see Figure 1).

**Appendix Table 1: Survey Measures Index Components: Ghana**

	Mean	SD	Min	Max
<b>Agreement: Wife reports couple agrees on (1 -5 scale, 5 is agree)</b>				
Spending	1.462	0.746	1	5
Saving/Investing	1.412	0.696	1	5
Crop choice	1.443	0.675	1	5
Land use	1.385	0.672	1	5
<b>Intimate partner violence: Psychological (behavior ever occurred?)</b>				
<u>Controlling behaviors</u>				
Jealous of talking to other men	0.235	0.424	0	1
Frequently accuses infidelity	0.076	0.266	0	1
Does not allow meeting female friends	0.162	0.369	0	1
Limits her contact with her family	0.069	0.254	0	1
Insists on always knowing whereabouts	0.445	0.497	0	1
Does not trust her with money	0.111	0.315	0	1
Refuses sex	0.085	0.280	0	1
<u>Emotional abuse</u>				
Humilates her in front of others	0.141	0.349	0	1
Threatens her	0.064	0.246	0	1
Insults her	0.335	0.472	0	1
Reports any psychological violence	0.710	0.454	0	1
<b>Intimate partner violence: Physical (behavior ever occurred?)</b>				
Pushing/shaking/throwing things	0.037	0.189	0	1
Slapping	0.011	0.106	0	1
Twisting arm / pulling hair	0.024	0.152	0	1
Punching	0.061	0.239	0	1
Kicking/dragging/beating	0.180	0.385	0	1
Choking/burning	0.041	0.198	0	1
Threatening with weapon	0.084	0.277	0	1
Reports any physical violence	0.209	0.407	0	1
<b>Wife's access to resources</b>				
Wife owns house	0.309	0.462	0	1
Wife owns land	0.312	0.464	0	1
Wife earns as much or more than husband	0.149	0.356	0	1
Personal expenditure ratio (Wife/Husband)	0.440	0.280	0	1
<b>Decision making: Wife has equal or more say on...</b>				
Use of own earnings	0.802	0.398	0	1
Use of husband earnings	0.589	0.492	0	1
Own healthcare	0.646	0.479	0	1
Major purchases	0.604	0.489	0	1
Visits to own family	0.700	0.459	0	1
Investment in business vs family	0.794	0.405	0	1

Note: The table shows representative summary statistics for these variables. The statistics are shown for descriptive purposes and some do not enter the index in the form shown. For index construction, categorical variables are first converted to question-level indices that take advantage of the full variation in responses, with a category index then calculated across questions. For clarity here, one mean is shown to best summarize the data in a succinct manner. This applies to agreement, psychological intimate partner violence, physical intimate partner violence, and decision making. Full details on index creation, including question texts for component variables, are provided in Appendix F.

**Appendix Table 2: Survey Measures Index Components: Uganda**

	Mean	SD	Min	Max
<b>Agreement: Husband and Wife agree on</b>				
Whether to spend on clothes or entertainment	0.693	0.461	0	1
Whether to spending on education or health	0.767	0.423	0	1
Whether to spend on business/farm or house quality	0.616	0.486	0	1
How to use land	0.450	0.498	0	1
<b>Marital quality: Wife's report (1 - 10 scale, 10 is agree)</b>				
We discuss household decisions/issues together	7.986	2.467	1	10
Husband contributes a lot to household wellbeing	8.202	2.374	1	10
We have talked about how to improve family situation	8.084	2.412	1	10
I like to discuss personal concerns with Husband	7.259	2.787	1	10
I have confidence in the stability of our relationship	7.959	2.628	1	10
I strongly desire to promote the wellbeing of Husband	8.703	2.106	1	10
<b>Intimate partner violence: Hit/pushed/slapped/thrown things?</b>				
Wife report: Ever	0.182	0.386	0	1
Wife report: In past year	0.092	0.289	0	1
Husband report: In past year	0.073	0.260	0	1
<b>Wife's access to resources</b>				
Personal expenditures ratio (Wife/Husband)	0.426	0.334	0	1
Wife reports having any say in use of cane income	0.776	0.417	0	1
<b>Decision making: Wife has equal or more say on...</b>				
Use of own earnings	0.460	0.499	0	1
Use of husband earnings	0.432	0.495	0	1
Own healthcare	0.761	0.426	0	1
Children's healthcare	0.746	0.436	0	1
Major purchases	0.508	0.500	0	1
Minor purchases	0.658	0.474	0	1
Visits to own family	0.666	0.472	0	1

Note: The table shows representative summary statistics for these variables. The statistics are shown for descriptive purposes and some do not enter the index in the form shown. For index construction, categorical variables are first converted to question-level indices that take advantage of the full variation in responses, with a category index then calculated across questions. For clarity here, one mean is shown to best summarize the data in a succinct manner. This applies to marital quality and decision making. Full details on index creation, including question texts for component variables, are provided in Appendix F.

**Appendix Table 3: Fixed Effects Ordered Logit Model: Difference in Willingness to Pay for Resource Control between Husband and Wife**

	(1)	(2)
	<i>Dependent variable is</i>	
	Category of willingness to pay for resource control	
<b><i>Panel A: Ghana</i></b>		
Coefficient on "Wife"	0.343***	0.240**
Standard error	(0.0807)	[0.113]
Number of observations	1,510	1,510
<i>Marginal effects</i>		
(1) Strong WTP for spouse to control resources	-0.0645*** (0.0151)	-0.0450** (0.0212)
(2) Weak WTP for spouse to control resources	-0.0211*** (0.00495)	-0.0147** (0.00694)
(3) Weak WTP for resource control	0.0331*** (0.00777)	0.0231** (0.0109)
(4) Strong WTP for resource control	0.05245*** (0.0123)	0.0366** (0.0173)
<b><i>Panel B: Uganda</i></b>		
Coefficient on "Wife"	0.220***	0.332***
Standard error	(0.0567)	[0.111]
Number of observations	3,012	3,012
<i>Marginal effects</i>		
(1) Strong WTP for spouse to control resources	-0.0479*** (0.0123)	-0.0721*** (0.0242)
(2) Weak WTP for spouse to control resources	-0.00682*** (0.00176)	-0.0103*** (0.0034)
(3) Weak WTP for resource control	0.0155*** (0.00399)	0.0234*** (0.0078)
(4) Strong WTP for resource control	0.0392*** (0.0101)	0.0591*** (0.0198)
Control variables	No	Yes

Note: WTP stands for willingness to pay. The dependent variable can acquire four ordered values which map onto the following willingness to pay task decisions: (1) Spouse, Spouse; (2) Spouse, Self; (3) Self, Spouse; and (4) Self, Self. These categories translate into a price paid for resource control (as a share of the endowment) of -0.5, 0, 0, and 0.5 respectively. See Appendix Figure 1 and Table A1 in Appendix A for more information about the ordered variable. The number of observations differs from those presented in Table 2 because the feologit command in stata (Baetschmann et al. 2020) drops households where there is no variation in choices from the estimation sample. Control variables are as in Table 2. Standard errors are clustered at the household level. \*\*\* Significant at the 1% level, \*\* 5% level, \* 10% level.

**Appendix Table 4: Relationship between Experimental Measures: Husband Responses**

	<i>Dependent variable is</i>							
	Pays to control resources				Pays to have spouse control resources			
<b><i>Panel A: Ghana</i></b>								
Percent of endowment assigned to wife: wife	-0.328***	-0.172**			0.458***	0.365***		
	(0.061)	(0.073)			(0.076)	(0.090)		
Percent of endowment assigned to wife: husband		0.050				0.072		
		(0.063)				(0.070)		
Percent of endowment assigned to wife: joint		-0.347***				0.206**		
		(0.077)				(0.104)		
Absolute difference: Joint allocation to wife - husband allocation to wife			0.053				0.093	
			(0.094)				(0.115)	
Absolute difference: Husband allocation to wife - wife allocation to wife				0.151**				-0.164**
				(0.074)				(0.081)
R-squared	0.060	0.079	0.031	0.046	0.072	0.077	0.045	0.050
Number of observations	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024
<b><i>Panel B: Uganda</i></b>								
Percent of endowment assigned to wife: wife	-0.289***	-0.250***			0.523***	0.387***		
	(0.030)	(0.035)			(0.041)	(0.047)		
Percent of endowment assigned to wife: husband		-0.114***				-0.035		
		(0.034)				(0.041)		
Percent of endowment assigned to wife: joint		-0.189***				0.397***		
		(0.040)				(0.057)		
Absolute difference: Joint allocation to wife - husband allocation to wife			-0.184***				0.331***	
			(0.043)				(0.059)	
Absolute difference: Husband allocation to wife - wife allocation to wife				-0.104***				0.109***
				(0.033)				(0.040)
R-squared	0.046	0.060	0.026	0.031	0.082	0.103	0.038	0.060
Number of observations	2,363	2,363	2,363	2,363	2,363	2,363	2,363	2,363

Notes: The dependent variables are from the willingness to pay for resource control task. Independent variables are from the dictator game task. All regressions include the following household level control variables: food security measure, household income, and household savings. They also include the following individual level control variables: age group, years of schooling, whether individual reports any individual income, and individual savings. Robust standard errors are in parentheses. \*\*\* Significant at the 1% level, \*\* 5% level, \* 10% level.

**Appendix Table 5: Relationship between Experimental Measures: Ordered logit model, Wife Responses**

	(1)	(2)	(3)	(4)
	<i>Dependent variable is</i>			
	Category of willingness to pay for resource control			
<b><i>Panel A: Ghana</i></b>				
Percent of endowment assigned to wife: wife	2.412*** (0.311)	2.435*** (0.314)		
Percent of endowment assigned to wife: husband		0.409 (0.390)		
Percent of endowment assigned to wife: joint		-0.431 (0.460)		
Absolute difference: Joint allocation to wife - wife allocation to wife			0.757* (0.398)	
Absolute difference: Husband allocation to wife - wife allocation to wife				0.901** (0.373)
Number of observations	1,024	1,024	1,024	1,024
<i>Marginal effects for main variable of interest</i>				
(1) Strong WTP for spouse to control resources	-0.362*** (0.048)	-0.365*** (0.049)	-0.116* (0.061)	-0.138** (0.057)
(2) Weak WTP for spouse to control resources	-0.202*** (0.027)	-0.204*** (0.027)	-0.066* (0.035)	-0.079** (0.033)
(3) Weak WTP for resource control	0.192*** (0.025)	0.193*** (0.025)	0.063* (0.033)	0.076** (0.031)
(4) Strong WTP for resource control	0.372*** (0.050)	0.376*** (0.050)	0.119* (0.063)	0.142** (0.059)
<b><i>Panel B: Uganda</i></b>				
Percent of endowment assigned to wife: wife	1.686*** (0.156)	1.606*** (0.160)		
Percent of endowment assigned to wife: husband		-0.157 (0.177)		
Percent of endowment assigned to wife: joint		0.566*** (0.210)		
Absolute difference: Joint allocation to wife - wife allocation to wife			0.404** (0.183)	
Absolute difference: Husband allocation to wife - wife allocation to wife				0.251 (0.155)
Number of observations	2,363	2,363	2,363	2,363
<i>Marginal effects for main variable of interest</i>				
(1) Strong WTP for spouse to control resources	-0.365*** (0.032)	-0.347*** (0.033)	-0.090** (0.041)	-0.055 (0.034)
(2) Weak WTP for spouse to control resources	-0.027*** (0.006)	-0.026*** (0.006)	-0.007** (0.003)	-0.004 (0.003)
(3) Weak WTP for resource control	0.102*** (0.010)	0.097*** (0.010)	0.026** (0.012)	0.016 (0.010)
(4) Strong WTP for resource control	0.290*** (0.026)	0.275*** (0.027)	0.071** (0.032)	0.044 (0.027)

Note: WTP stands for willingness to pay. The dependent variable can acquire four ordered values which map onto the following willingness to pay task decisions: (1) Spouse, Spouse; (2) Spouse, Self; (3) Self, Spouse; and (4) Self, Self. These categories translate into a price paid for resource control (as a share of the endowment) of -0.5, 0, 0, and 0.5 respectively. See Appendix Figure 1 and Table A1 in Appendix A for more information about the ordered variable. Independent variables are from the dictator game task. Control variables are as in Table 3. Robust standard errors are in parentheses. \*\*\* Significant at the 1% level, \*\* 5% level, \* 10% level.

**Appendix Table 6: Relationship between Experimental Measures: Ordered logit model, Husband Responses**

	(1)	(2)	(3)	(4)
<i>Dependent variable is</i>				
Category of willingness to pay for resource control				
<b>Panel A: Ghana</b>				
Percent of endowment assigned to wife: wife	-2.215*** (0.335)	-1.621*** (0.401)		
Percent of endowment assigned to wife: husband		-0.012 (0.331)		
Percent of endowment assigned to wife: joint		-1.323*** (0.443)		
Absolute difference: Joint allocation to wife - wife allocation to wife			-0.429 (0.502)	
Absolute difference: Husband allocation to wife - wife allocation to wife				0.591 (0.364)
Number of observations	1,024	1,024	1,024	1,024
<i>Marginal effects for main variable of interest</i>				
(1) Strong WTP for spouse to control resources	0.447*** (0.065)	0.325*** (0.079)	0.089 (0.104)	-0.121 (0.074)
(2) Weak WTP for spouse to control resources	0.065*** (0.014)	0.047*** (0.014)	0.013 (0.016)	-0.018 (0.011)
(3) Weak WTP for resource control	-0.255*** (0.037)	-0.185*** (0.046)	-0.052 (0.061)	0.070 (0.043)
(4) Strong WTP for resource control	-0.257*** (0.042)	-0.187*** (0.047)	-0.051 (0.059)	0.069 (0.043)
<b>Panel B: Uganda</b>				
Percent of endowment assigned to wife: wife	-2.187*** (0.176)	-1.759*** (0.196)		
Percent of endowment assigned to wife: husband		-0.147 (0.165)		
Percent of endowment assigned to wife: joint		-1.560*** (0.232)		
Absolute difference: Joint allocation to wife - wife allocation to wife			-1.362*** (0.238)	
Absolute difference: Husband allocation to wife - wife allocation to wife				-0.507*** (0.157)
Number of observations	2,363	2,363	2,363	2,363
<i>Marginal effects for main variable of interest</i>				
(1) Strong WTP for spouse to control resources	0.488*** (0.035)	0.385*** (0.040)	0.318*** (0.054)	0.116*** (0.036)
(2) Weak WTP for spouse to control resources	0.002 (0.007)	0.003 (0.005)	-0.001 (0.005)	-0.000 (0.002)
(3) Weak WTP for resource control	-0.145*** (0.012)	-0.114*** (0.013)	-0.097*** (0.017)	-0.035*** (0.011)
(4) Strong WTP for resource control	-0.345*** (0.028)	-0.274*** (0.031)	-0.220*** (0.038)	-0.081*** (0.025)

Note: WTP stands for willingness to pay. The dependent variable can acquire four ordered values which map onto the following willingness to pay task decisions: (1) Spouse, Spouse; (2) Spouse, Self; (3) Self, Spouse; and (4) Self, Self. These categories translate into a price paid for resource control (as a share of the endowment) of -0.5, 0, 0, and 0.5 respectively. See Appendix Figure 1 and Table A1 in Appendix A for more information about the ordered variable. Independent variables are from the dictator game task. Control variables are as in Table 3. Robust standard errors are in parentheses. \*\*\* Significant at the 1% level, \*\* 5% level, \* 10% level.

**Appendix Table 7: Correlation of Experimental Measures with Survey Measures: Ghana, Husband Responses**

	Wife's access to resources index	Decision making index	Agreement index	Psychological violence incidence index	Physical violence incidence index
<b><i>Panel A: Model 1</i></b>					
Pays to control resources	0.067 (0.096)	-0.270*** (0.101)	-0.057 (0.108)	0.074 (0.090)	-0.051 (0.078)
Pays to have spouse control resources	0.018 (0.069)	-0.125* (0.068)	0.006 (0.073)	0.023 (0.074)	0.030 (0.075)
R-squared	0.030	0.020	0.011	0.027	0.024
<b><i>Panel B: Model 2</i></b>					
Percent of endowment assigned to wife: wife	0.148 (0.161)	-0.221 (0.172)	0.110 (0.198)	0.535*** (0.174)	-0.024 (0.116)
Percent of endowment assigned to wife: husband	0.095 (0.194)	0.072 (0.202)	0.012 (0.174)	0.021 (0.201)	-0.148 (0.141)
Percent of endowment assigned to wife: joint	0.111 (0.222)	0.358 (0.229)	0.131 (0.215)	-0.478* (0.257)	0.117 (0.249)
R-squared	0.031	0.016	0.012	0.041	0.024
<b><i>Panel C: Model 3</i></b>					
Absolute difference: Joint allocation to wife - husband allocation to wife	0.240 (0.237)	-0.449* (0.230)	0.149 (0.224)	0.174 (0.303)	-0.141 (0.192)
R2	0.031	0.014	0.011	0.027	0.026
<b><i>Panel D: Model 4</i></b>					
Absolute difference: Husband allocation to wife - wife allocation to wife	-0.001 (0.190)	-0.050 (0.199)	0.313* (0.187)	0.066 (0.183)	-0.201 (0.167)
R-squared	0.030	0.013	0.014	0.028	0.025
Number of observations	1,024	1,024	1,024	1,024	1,024

Note: OLS estimates of each survey index as a function of the experimental variables included in each model. All regressions also include the following household level control variables: food security measure, household income, and household savings. They also include the following individual level control variables: age group, years of schooling, whether the individual reports any personal income, and individual savings. Husband responses are used for agreement and decision making. Robust standard errors are in parentheses. \*\*\* Significant at the 1% level, \*\* 5% level, \* 10% level.

**Appendix Table 8: Correlation of Experimental Measures with Survey Measures: Uganda, Husband Responses**

	Wife's access to resources index	Decision making index	Agreement index	Marital quality index	Intimate partner violence incidence index
<b><i>Panel A: Model 1</i></b>					
Pays to control resources	0.014 (0.016)	-0.075 (0.055)	0.050 (0.056)	-0.113* (0.059)	-0.008 (0.042)
Pays to have spouse control resources	0.035*** (0.013)	0.207*** (0.046)	0.040 (0.047)	-0.052 (0.044)	-0.080*** (0.031)
R-squared	0.026	0.050	0.014	0.029	0.026
<b><i>Panel B: Model 2</i></b>					
Percent of endowment assigned to wife: wife	-0.090*** (0.023)	-0.051 (0.087)	-0.152* (0.085)	-0.064 (0.088)	0.151*** (0.058)
Percent of endowment assigned to wife: husband	0.023 (0.025)	0.012 (0.096)	0.023 (0.094)	0.153* (0.090)	-0.025 (0.066)
Percent of endowment assigned to wife: joint	-0.004 (0.032)	0.176* (0.106)	0.059 (0.118)	0.189* (0.108)	0.012 (0.080)
R-squared	0.030	0.038	0.015	0.031	0.026
<b><i>Panel C: Model 3</i></b>					
Absolute difference: Joint allocation to wife - husband allocation to wife	0.065** (0.031)	0.206* (0.108)	0.148 (0.114)	0.128 (0.112)	0.008 (0.079)
R-squared	0.027	0.039	0.014	0.029	0.025
<b><i>Panel D: Model 4</i></b>					
Absolute difference: Husband allocation to wife - wife allocation to wife	-0.052** (0.022)	0.083 (0.098)	-0.071 (0.083)	0.014 (0.086)	0.154*** (0.058)
R-squared	0.027	0.037	0.014	0.031	0.027
Number of observations	2,363	2,363	2,363	2,363	2,363

Note: OLS estimates of each survey index as a function of the experimental variables included in each model. All regressions also include the following household level control variables: food security measure, household income, and household savings. They also include the following individual level control variables: age group, years of schooling, whether the individual reports any personal income, and individual savings. Husband responses are used for marital quality and decision making. Robust standard errors are in parentheses. \*\*\* Significant at the 1% level, \*\* 5% level, \* 10% level.

**Appendix Table 9: Correlation of Willingness to Pay for Resource Control with Survey Measures: Ordered Logit Model, Ghana, Wife Responses**

	<i>Survey measure</i>				
	Wife's access to resources index	Decision making index	Agreement index	Psychological violence incidence index	Physical violence incidence index
<i>Dependent variable is category of willingness to pay for resource control</i>					
Survey measure	0.010 (0.055)	0.009 (0.060)	-0.094** (0.046)	0.073 (0.054)	-0.073 (0.080)
Number of observations	1,024	1,024	1,024	1,024	1,024
<i>Marginal effects for main variable of interest</i>					
(1) Strong WTP for spouse to control resources	-0.002 (0.008)	-0.001 (0.009)	0.015** (0.007)	-0.011 (0.008)	0.011 (0.012)
(2) Weak WTP for spouse to control resources	-0.001 (0.005)	-0.001 (0.005)	0.008** (0.004)	-0.007 (0.005)	0.007 (0.007)
(3) Weak WTP for resource control	0.001 (0.005)	0.001 (0.005)	-0.008** (0.004)	0.006 (0.005)	-0.006 (0.007)
(4) Strong WTP for resource control	0.002 (0.009)	0.001 (0.010)	-0.015** (0.007)	0.012 (0.009)	-0.012 (0.013)

Note: WTP stands for willingness to pay. Each column presents estimates of an ordered logit model of willingness to pay for resource control as a function of the survey measure presented in that column. The dependent variable can acquire four ordered values which map onto the following willingness to pay task decisions: (1) Spouse, Spouse; (2) Spouse, Self; (3) Self, Spouse; and (4) Self, Self. These categories translate into a price paid for resource control (as a share of the endowment) of -0.5, 0, 0, and 0.5 respectively. See Appendix Figure 1 and Table A1 in Appendix A for more information about the ordered variable. Control variables are as in Table 4. Robust standard errors are in parentheses. \*\*\* Significant at the 1% level, \*\* 5% level, \* 10% level.

**Appendix Table 10: Correlation of Willingness to Pay for Resource Control with Survey Measures: Ordered Logit Model, Ghana, Husband Responses**

	<i>Survey measure</i>				
	Wife's access to resources index	Decision making index	Agreement index	Psychological violence incidence index	Physical violence incidence index
<i>Dependent variable is category of willingness to pay for resource control</i>					
Survey measure	-0.011 (0.056)	-0.061 (0.057)	0.003 (0.072)	-0.010 (0.063)	-0.048 (0.041)
Number of observations	1,024	1,024	1,024	1,024	1,024
<i>Marginal effects for main variable of interest</i>					
(1) Strong WTP for spouse to control resources	0.002 (0.012)	0.013 (0.012)	-0.001 (0.015)	0.002 (0.013)	0.010 (0.008)
(2) Weak WTP for spouse to control resources	0.000 (0.002)	0.002 (0.002)	-0.000 (0.002)	0.000 (0.002)	0.002 (0.001)
(3) Weak WTP for resource control	-0.001 (0.007)	-0.007 (0.007)	0.000 (0.009)	-0.001 (0.008)	-0.006 (0.005)
(4) Strong WTP for resource control	-0.001 (0.007)	-0.007 (0.007)	0.000 (0.008)	-0.001 (0.007)	-0.006 (0.005)

Note: WTP stands for willingness to pay. Each column presents estimates of an ordered logit model of willingness to pay for resource control as a function of the survey measure presented in that column. The dependent variable can acquire four ordered values which map onto the following willingness to pay task decisions: (1) Spouse, Spouse; (2) Spouse, Self; (3) Self, Spouse; and (4) Self, Self. These categories translate into a price paid for resource control (as a share of the endowment) of -0.5, 0, 0, and 0.5 respectively. See Appendix Figure 1 and Table A1 in Appendix A for more information about the ordered variable. Control variables are as in Table 4. Robust standard errors are in parentheses. \*\*\* Significant at the 1% level, \*\* 5% level, \* 10% level.

**Appendix Table 11: Correlation of Willingness to Pay for Resource Control with Survey Measures: Ordered Logit Model, Uganda, Wife Responses**

	<i>Survey measure</i>				
	Wife's access to resources index	Decision making index	Agreement index	Marital quality index	Intimate partner violence incidence index
	<i>Dependent variable is category of willingness to pay for resource control</i>				
Survey measure	-0.986*** (0.144)	-0.117*** (0.043)	-0.092** (0.038)	-0.263*** (0.048)	0.513*** (0.149)
Number of observations	2,363	2,363	2,363	2,363	2,363
<i>Marginal effects for main variable of interest</i>					
(1) Strong WTP for spouse to control resources	0.218*** (0.031)	0.026*** (0.010)	0.021** (0.009)	0.058*** (0.010)	-0.115*** (0.033)
(2) Weak WTP for spouse to control resources	0.017*** (0.004)	0.002** (0.001)	0.002** (0.001)	0.005*** (0.001)	-0.009*** (0.003)
(3) Weak WTP for resource control	-0.062*** (0.009)	-0.008*** (0.003)	-0.006** (0.003)	-0.017*** (0.003)	0.033*** (0.010)
(4) Strong WTP for resource control	-0.173*** (0.025)	-0.021*** (0.007)	-0.016** (0.007)	-0.046*** (0.008)	0.091*** (0.026)

Note: WTP stands for willingness to pay. Each column presents estimates of an ordered logit model of willingness to pay for resource control as a function of the survey measure presented in that column. The dependent variable can acquire four ordered values which map onto the following willingness to pay task decisions: (1) Spouse, Spouse; (2) Spouse, Self; (3) Self, Spouse; and (4) Self, Self. These categories translate into a price paid for resource control (as a share of the endowment) of -0.5, 0, 0, and 0.5 respectively. See Appendix Figure 1 and Table A1 in Appendix A for more information about the ordered variable. All control variables are as in Table 5. Robust standard errors are in parentheses. \*\*\* Significant at the 1% level, \*\* 5% level, \* 10% level.

**Appendix Table 12: Correlation of Willingness to Pay for Resource Control with Survey Measures: Ordered logit model, Uganda, Husband Responses**

	<i>Survey measure</i>				
	Wife's access to resources index	Decision making index	Agreement index	Marital quality index	Intimate partner violence incidence index
	<i>Dependent variable is category of willingness to pay for resource control</i>				
Survey measure	-0.305** (0.136)	-0.255*** (0.043)	-0.014 (0.038)	-0.040 (0.050)	0.490*** (0.165)
Number of observations	2,363	2,363	2,363	2,363	2,363
<i>Marginal effects for main variable of interest</i>					
(1) Strong WTP for spouse to control resources	0.072** (0.032)	0.060*** (0.010)	0.003 (0.009)	0.010 (0.012)	-0.116*** (0.039)
(2) Weak WTP for spouse to control resources	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.002)
(3) Weak WTP for resource control	-0.022** (0.010)	-0.018*** (0.003)	-0.001 (0.003)	-0.003 (0.004)	0.036*** (0.012)
(4) Strong WTP for resource control	-0.050** (0.022)	-0.041*** (0.007)	-0.002 (0.006)	-0.007 (0.008)	0.080*** (0.027)

Note: WTP stands for willingness to pay. Each column presents estimates of an ordered logit model of willingness to pay for resource control as a function of the survey measure presented in that column. The dependent variable can acquire four ordered values which map onto the following willingness to pay task decisions: (1) Spouse, Spouse; (2) Spouse, Self; (3) Self, Spouse; and (4) Self, Self. These categories translate into a price paid for resource control (as a share of the endowment) of -0.5, 0, 0, and 0.5 respectively. See Appendix Figure 1 and Table A1 in Appendix A for more information about the ordered variable. Control variables are as in Table 5. Robust standard errors are in parentheses. \*\*\* Significant at the 1% level, \*\* 5% level, \* 10% level.

**Appendix Table 13: Correlation of Husband and Wife Experimental Measures with Survey Measures: Ghana**

	<i>Category mean</i>	Wife's access to resources index	Decision making index	Agreement index	Psychological violence index	Physical violence index
<b><i>Panel A: Willingness to pay</i></b>						
1 <i>Omitted category: Agree to maximize resources</i>	0.345					
2 Both pay for spouse to control resources	0.069	-0.009 (0.120)	-0.032 (0.141)	0.001 (0.140)	-0.090 (0.125)	0.082 (0.120)
3 Both pay for resource control	0.031	0.019 (0.170)	-0.210 (0.199)	-0.019 (0.118)	0.300* (0.226)	0.077 (0.108)
4 Both pay for wife to control resources	0.062	0.226 (0.130)	0.005 (0.148)	0.071*** (0.102)	-0.107* (0.111)	-0.037 (0.062)
5 Both pay for husband to control resources	0.030	0.258 (0.190)	0.165 (0.165)	0.313 (0.085)	-0.190 (0.139)	-0.030 (0.072)
6 Husband pays for wife to control resources, wife efficient	0.181	-0.055 (0.092)	-0.152 (0.089)	-0.026** (0.120)	0.093 (0.105)	0.049 (0.082)
7 Husband pays for husband to control resources, wife efficient	0.078	0.010 (0.133)	-0.361 (0.130)	0.244 (0.080)	0.099 (0.115)	-0.067 (0.097)
8 Wife pays for wife to control resources, husband efficient	0.107	-0.005 (0.111)	0.118 (0.105)	-0.050 (0.110)	0.011 (0.106)	-0.047 (0.152)
9 Wife pays for husband to control resources, husband efficient	0.097	0.020 (0.114)	-0.009 (0.118)	0.112 (0.090)	-0.072 (0.110)	0.110 (0.179)
R-squared		0.043	0.035	0.030	0.040	0.029
<b><i>Panel B: Dictator games</i></b>						
1 <i>Omitted category: Both say self should receive more</i>	0.223					
2 Both say husband should receive more	0.146	-0.147 (0.100)	0.221* (0.117)	-0.069 (0.097)	-0.055 (0.102)	0.060 (0.094)
3 Both say wife should receive more	0.389	-0.022 (0.083)	0.109 (0.086)	-0.017 (0.074)	-0.066 (0.087)	0.005 (0.099)
4 Both say their spouse should receive more	0.242	0.072 (0.094)	0.137 (0.095)	-0.032 (0.102)	-0.193** (0.091)	-0.047 (0.093)
R-squared		0.042	0.024	0.022	0.037	0.027
Number of observations		1,024	1,024	1,024	1,024	1,024

Note: Dependent variables are standardized indices of variables in each category as described in Appendix F. All regressions include the following household level control variables: food security measure, household income, and household savings. They also include the following individual level control variables for the wife: age group, years of schooling, whether the individual reports any personal income, and individual savings. Robust standard errors are in parentheses. \*\*\* Significant at the 1% level, \*\* 5% level, \* 10% level.

**Appendix Table 14: Heterogeneity of Correlation of Willingness to Pay Measures with Survey Measures: Ghana, Wife Responses**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Interaction term: Schooling					Interaction term: Savings				
	<i>Dependent variable is</i>									
	Wife's access to resources index	Decision making index	Agreement index	Psychologic al violence incidence index	Physical violence incidence index	Wife's access to resources index	Decision making index	Agreement index	Psychologic al violence incidence index	Physical violence incidence index
<b><i>Interaction term: None X ...</i></b>										
Pays to control resources	0.0205 (0.23)	0.125 (1.34)	-0.0597 (-0.68)	-0.0257 (-0.30)	-0.0869 (-1.27)	0.0393 (0.35)	0.318* (2.48)	-0.0464 (-0.38)	-0.0929 (-0.86)	-0.00575 (-0.07)
Pays to have spouse control resources	0.0729 (0.78)	0.0423 (0.44)	0.0526 (0.59)	-0.0563 (-0.59)	0.132 (0.95)	0.0846 (0.71)	0.0406 (0.35)	-0.0373 (-0.29)	-0.198 (-1.86)	0.214 (0.99)
<b><i>Interaction term: Any X ...</i></b>										
Pays to control resources	0.347 (1.93)	0.0951 (0.52)	0.0108 (0.08)	0.0197 (0.10)	0.232 (0.69)	0.130 (1.15)	-0.0630 (-0.60)	-0.0477 (-0.52)	0.0467 (0.40)	-0.0377 (-0.24)
Pays to have spouse control resources	0.0285 (0.19)	0.284 (1.61)	0.138 (1.22)	-0.354** (-3.00)	-0.0675 (-0.65)	0.0419 (0.40)	0.161 (1.34)	0.170* (2.21)	-0.0702 (-0.63)	-0.0378 (-0.65)
P-value Pays to control: None = Any	0.101	0.886	0.659	0.834	0.338	0.564	0.0212	0.993	0.369	0.851
P-value Pays to have spouse control: None = Any	0.805	0.230	0.555	0.0512	0.270	0.788	0.467	0.166	0.406	0.263
R-squared	0.0389	0.0172	0.0175	0.0340	0.0270	0.0364	0.0226	0.0178	0.0345	0.0239
Number of Observations	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024

Note: The model includes responses from the willingness to pay for resource control task. Dependent variables are standardized indices of variables in each category. All regressions include the following household level control variables: food security measure, household income, and household savings. They also include the following individual level control variables: age group, years of schooling, whether individual reports any personal income, and individual savings. Robust standard errors are in parentheses. \*\*\* Significant at the 1% level, \*\* 5% level, \* 10% level.

**Appendix Table 15: Heterogeneity of Correlation of Dictator Game Measures with Survey Measures: Uganda, Wife Responses**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Interaction term: Schooling				Interaction term: Savings					
	<i>Dependent variable is</i>									
	Wife's access to resources index	Decision making index	Agreement index	Marital quality index	Intimate partner violence incidence index	Wife's access to resources index	Decision making index	Agreement index	Marital quality index	Intimate partner violence incidence index
<b><i>Interaction term: None X ...</i></b>										
Percent of endowment assigned to wife: wife	-0.152** (-2.78)	-0.0252 (-0.13)	0.0993 (0.50)	-0.632** (-3.10)	0.135 (0.90)	-0.0933* (-2.28)	-0.458** (-2.85)	-0.141 (-1.03)	-0.239 (-1.71)	-0.0608 (-0.64)
Percent of endowment assigned to wife: husband	-0.0563 (-0.85)	0.208 (0.96)	0.0742 (0.31)	-0.188 (-0.80)	-0.0960 (-0.51)	0.0200 (0.46)	0.168 (0.95)	0.0958 (0.64)	0.194 (1.21)	-0.0491 (-0.47)
Percent of endowment assigned to wife: joint	0.0237 (0.30)	-0.00293 (-0.01)	-0.128 (-0.45)	0.256 (1.02)	0.0322 (0.16)	-0.00152 (-0.03)	-0.0457 (-0.22)	-0.0174 (-0.09)	-0.141 (-0.72)	-0.0534 (-0.44)
<b><i>Interaction term: Any X ...</i></b>										
Percent of endowment assigned to wife: wife	-0.0712** (-2.77)	-0.393*** (-4.08)	-0.190* (-2.01)	-0.251** (-2.73)	0.147* (2.35)	-0.0754** (-2.69)	-0.268** (-2.69)	-0.157 (-1.45)	-0.369*** (-3.48)	0.262*** (3.53)
Percent of endowment assigned to wife: husband	0.0412 (1.53)	0.201 (1.90)	0.0297 (0.29)	0.111 (1.13)	-0.0288 (-0.42)	0.0299 (0.98)	0.226* (2.10)	-0.00388 (-0.03)	-0.0319 (-0.29)	-0.0362 (-0.42)
Percent of endowment assigned to wife: joint	-0.0153 (-0.45)	0.0556 (0.47)	0.112 (0.88)	-0.00555 (-0.04)	0.00191 (0.02)	-0.0178 (-0.47)	0.0986 (0.80)	0.135 (0.91)	0.153 (1.08)	0.0311 (0.29)
P-value Wife: None = Any	0.182	0.0958	0.184	0.0879	0.942	0.718	0.312	0.928	0.461	0.00740
P-value Husband: None = Any	0.175	0.980	0.862	0.239	0.739	0.851	0.779	0.604	0.247	0.923
P-value Joint: None = Any	0.647	0.850	0.439	0.353	0.893	0.804	0.549	0.526	0.225	0.602
R-squared	0.0405	0.0317	0.0160	0.0683	0.0253	0.0448	0.0323	0.0173	0.0681	0.0288
Number of Observations	2,363	2,363	2,363	2,363	2,363	2,363	2,363	2,363	2,363	2,363

Note: The model includes responses from the dictator game task. Dependent variables are standardized indices of variables in each category. All regressions include the following household level control variables: food security measure, household income, and household savings. They also include the following individual level control variables: age group, years of schooling, whether individual reports any personal income, and individual savings. Robust standard errors are in parentheses. \*\*\* Significant at the 1% level, \*\* 5% level, \* 10% level.

**Appendix Table 16: Heterogeneity of Correlation of Willingness to Pay Measures with Survey Measures: Uganda, Wife Responses**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Interaction term: Schooling				Interaction term: Savings					
						<i>Dependent variable is</i>				
	Wife's access to resources index	Decision making index	Agreement index	Marital quality index	Intimate partner violence incidence index	Wife's access to resources index	Decision making index	Agreement index	Marital quality index	Intimate partner violence incidence index
<b><i>Interaction term: None X ...</i></b>										
Pays to control resources	-0.115** (-3.26)	0.0859 (0.76)	0.00158 (0.01)	-0.297* (-2.26)	0.0925 (1.03)	-0.0859*** (-3.39)	0.247** (2.71)	0.0244 (0.29)	-0.187* (-2.27)	-0.00577 (-0.09)
Pays to have spouse control resources	0.0161 (0.51)	0.212 (1.93)	0.212 (1.82)	0.0762 (0.67)	0.0431 (0.62)	0.0460* (2.07)	0.465*** (5.23)	0.111 (1.41)	0.0726 (0.93)	-0.0439 (-0.84)
<b><i>Interaction term: Any X ...</i></b>										
Pays to control resources	-0.0520** (-3.05)	0.149* (2.53)	0.0288 (0.48)	-0.317*** (-5.29)	0.00209 (0.05)	-0.0430* (-2.24)	0.0710 (1.16)	0.00657 (0.09)	-0.401*** (-5.39)	0.0388 (0.75)
Pays to have spouse control resources	0.0579*** (4.29)	0.254*** (4.81)	0.103* (1.97)	0.0394 (0.82)	-0.109** (-3.21)	0.0551*** (3.75)	0.120* (2.24)	0.123* (2.06)	0.0342 (0.64)	-0.107** (-2.87)
P-value Pays to control: None = Any	0.108	0.618	0.839	0.888	0.367	0.175	0.108	0.870	0.0555	0.586
P-value Pays to have spouse control: None = Any	0.224	0.728	0.393	0.765	0.0500	0.731	0.000864	0.908	0.684	0.323
R-squared	0.0573	0.0311	0.0169	0.0800	0.0273	0.0621	0.0367	0.0182	0.0819	0.0268
Number of Observations	2,363	2,363	2,363	2,363	2,363	2,363	2,363	2,363	2,363	2,363

Note: The model includes responses from the willingness to pay for resource control task. Dependent variables are standardized indices of variables in each category. All regressions include the following household level control variables: food security measure, wealth measure, household income, and household savings. They also include the following individual level control variables: age group, schooling, individual income, and individual savings. Robust standard errors are in parentheses. \*\*\* Significant at the 1% level, \*\* 5% level, \* 10% level.