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# Women's Use of Family Planning Services: An Experiment on the Husband's Involvement*

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**Abstract**

Despite the increased availability of family planning services (FPS) in low-income countries, their use remains low, especially in rural sub-Saharan Africa. To investigate to what extent this is explained by the husband's involvement in the decision process, we use an experiment in rural Tanzania in which couples choose between two payments, one being conditional on attending a family planning meeting at a health center. Experimentally varying the husband's involvement, we find that FPS are more likely chosen in treatments that involve the husband. Exploring potential mechanisms, we show that this is driven by couples where the wife (incorrectly) believes that the husband disapproves of contraceptives. We also find that involving the husband increases the wife's expectation that the family planning meeting will be attended. Both findings suggest that initiating communication between spouses could reduce demand constraints.

Keywords: Household bargaining, family planning, incomplete information, Tanzania
JEL Classification: C7, D1, D8, J13



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## 1. Introduction

Family planning (FP) aims to help couples have their desired number of children and control the spacing and timing of births. This has important benefits for couples and their children in low- and middle-income countries (LMICs).[1] Large efforts have been made to provide family planning services (FPS) at low costs in LMICs (UNFPA, 2010). However, women's unmet need for FP remains high in most countries in sub-Saharan Africa, particularly in rural areas (UN DESA, 2015; Izugbara et al., 2018).[2] This lack of progress suggests that important constraints remain on the demand side (Ashraf, Field and Lee, 2014).

Several field experiments have analyzed whether the low uptake of FPS can be explained by the degree of the husband's involvement in the decision process, but the evidence is mixed. First, Ashraf, Field and Lee (2014) found that involving the husband lowers the uptake of contraceptives at a local private health clinic. This is in line with the idea that bypassing the husband could increase women's uptake of contraceptives where men want more children and have higher bargaining power than women, as is the case in many low-income countries (Doepke and Tertilt, 2018; World Bank, 2012). Second, other studies found a positive effect of the husband's involvement (Fisek and Sumbuloglu, 1978; Terefe and Larson, 1992; Wang et al., 1998; McCarthy, 2019), which they attribute to better information about FP, a change in men's attitudes, and better spousal communication about FP.[3]

The conflicting findings of these studies could be due to the different stage in the decision-process on which they focus. Specifically, Ashraf, Field and Lee (2014) gave direct access to free contraceptives and randomized the husband's involvement in the decision to take up the offer of contraceptives. In the other studies, the husband's involvement was randomized at an earlier stage where couples were provided with information about FP in their homes, i.e. before they were offered any contraceptives. In this paper, we will look at an even earlier stage: *whether couples choose to get in touch with the health system to receive information about FP.*

This decision has not been studied yet and is important for the following reasons. First, in rural areas contraceptives are mostly distributed through FPS offered at health centers, and therefore a decision needs to be made to visit a health center. Second, even though many people might already have been in touch with health centers and received some information about FP (e.g., as part of post-natal care), knowledge about FP and the continuity of the use of modern contraceptives remains low. The discontinuation of contraceptives can indicate that women are not able to make free and informed decisions when it comes to contraceptives (FP2020, 2018), have inaccurate beliefs

[1] Households with more children have less capacity to increase income and accumulate assets, and children in such households get a lower share of the scarce resources (including education, healthcare and food) (Canning and Schultz, 2012). Low birth-spacing may also increase mortality and under-nutrition of siblings (Rutstein, 2005).

[2] The WHO defines women with an unmet need for FP as "those who are fecund and sexually active but are not using any method of contraception, and report not wanting any more children or wanting to delay the next child" (World Health Organization, 2018).

[3] There are also several qualitative and observational studies that identify the husbands' lack of involvement as a main barrier for the uptake of contraceptives (see, e.g., Lasee and Becker, 1997; Sharan and Valente, 2002; Shattuck et al., 2011; Hartmann et al., 2012).

about the efficacy of contraceptives (Miller, Paula and Valente, 2020), or suffer side effects. This emphasizes the need for regular visits to the health center to ensure that women find a FP method they are satisfied with (FP2020, 2018; Zimmerman et al., 2021). Third, visiting the nearest health center in rural areas requires planning, due to (in most cases substantial) travel needs and the fact that, at most health centers, FP meetings are organized at fixed times and days. This adds a layer of complexity caused by the uncertainty that the plan to visit the health center will be carried out successfully.

The involvement of the husband at this stage could influence the outcome in several ways. First, spouses could have different preferences about FPS, caused by factors such as fertility preferences, current contraceptive use, knowledge about FP, and time preferences. Second, they might have incomplete information about each other's preferences, as they tend to have little communication about FP. As a result, women might be reluctant to use FPS if they believe that their husband disapproves of them. However, if the husband actually supports the use of FPS, involving the husband would increase their use (Lasee and Becker, 1997). Third, the uncertainty that plans to visit the health center can be carried out could create an important barrier for the uptake of FPS. This could be alleviated if the involvement of the husband reduces this uncertainty.

In this paper, we investigate whether and why the husband's involvement influences a couple's *plan to take up FPS offered at the local health center*. To do so, we use data from a lab-in-the-field experiment in rural Tanzania in which couples choose between two payments, one being conditional on attending a FP meeting at a local health facility. The experiment models the first stage of the FP decision-making process, i.e. whether to plan to go to the local health facility, where contraceptives are delivered. Couples are randomly allocated to one of three treatments where only the wife, only the husband or both spouses together make the decisions. Comparing the decisions made across these treatments allows us to analyze the causal effect of the husband's involvement.

We find that involving the husband increases the likelihood that FPS are chosen. Using a theoretical framework, we explore three different mechanisms that can explain this result. First, we do not find evidence of the husband having a stronger preference for FPS than the wife. Second, we find that the positive effect of the husband's involvement is driven by women who believe that their husband does not approve of couples using contraceptives. This finding indicates that information about spousal preferences is incomplete, which makes the effect of the husband's involvement dependent on women's beliefs about their husband's preferences. Finally, we also find that the wife is less certain about whether the plan to attend a FP meeting will be carried out successfully when the husband is not involved in the decision. This would lower the expected value of the conditional payment when she makes the decision alone, hence making it less attractive.

Using data collected after the experiment, we find that most couples who needed to attend a FP meeting to receive a payment attended such a meeting, without any difference across treatments. Furthermore, once at the FP meeting, a majority of couples received contraceptives, again without any difference across treatments. As we will explain in more detail, both findings provide evidence against a potential social desirability bias, which might have confounded the treatment effects.

Finally, using the treatments as instrumental variables, we find that the condition to attend a FP meeting significantly increases contraceptive use one month after the experiment.

Our paper contributes to two strands of literature. First, it relates to the literature on household bargaining over fertility and contraceptive use. Several studies focus on bargaining over the number of children to have (Klawon and Tiefenthaler, 2001; Rasul, 2008; Kim and Radoias, 2014; Hener, 2015; Doepke and Kindermann, 2019). Some experimental studies look at the effect of male involvement on the uptake of contraceptives, on which they find mixed evidence (Fisek and Sumbuloglu, 1978; Terefe and Larson, 1992; Wang et al., 1998; Ashraf, Field and Lee, 2014; McCarthy, 2019). Our study differs from these studies in at least two ways. We focus on the uptake of FPS offered by the existing public health system. Moreover, we are particularly interested in whether the involvement of the husband influences couples' plans to use FPS.

Second, we relate to an emerging literature on incomplete information within the household. While a growing number of studies demonstrates that information asymmetries over income and choice set matter for household decision-making (Castilla and Walker, 2013; Munro et al., 2014; Hoel, 2015; Jakiela and Ozier, 2016), these papers remain silent about the potential effect of *incomplete information about spousal preferences*. A few studies, however, do provide evidence of incomplete information about spousal preferences (Bateman and Munro, 2005; Afzal et al., 2018), but remain silent about the consequences this might have for household decision-making. When decisions are made individually and without communication between spouses, decisions are based on beliefs about spousal preferences, which might be inaccurate. In this paper, we demonstrate empirically and theoretically how such beliefs can interact with the effect of the husband's involvement in household decisions.

The remainder of the article proceeds as follows. Section 2 provides details of the experimental design. Section 3 presents the main results and Section 4 explores the mechanisms. Section 5 extends the analysis by using data on contraceptive use after the experiment. Section 6 discusses the results and concludes.

## 2. Design

In this section, we present the setting and the experimental design, including a description of the experimental tasks, treatments, predictions and how the experiment was implemented.

### 2.1 Setting

We conducted our study in Tanzania, which has seen a steady increase in the use of contraceptives by women aged 15-49, from 20% in 2004-05 to 32% in 2015-16 (TNBS and ICF Macro, 2016). The unmet need for FP, in contrast, has been at around 22% for two decades.

A variety of governmental and non-governmental organizations have tried to increase the uptake of FPS in the country (e.g., USAID supported 17 organizations (USAID, 2018)). Tanzanian policy on FP and contraceptive use aimed to increase modern contraceptive use to 45% by 2020 (United

Republic of Tanzania, 2016). In order to do so, one of the objectives was to reduce demand-side constraints, by increasing men's acceptability of FP. Multiple targets were used, of which the most important ones include an increase in spousal communication, a change of harmful gender norms to make FP the responsibility of both men and women, and a reduction in gender-based violence which negatively correlates with the use of contraceptives. Our focus on the involvement of men in the decision-making process is very much in line with the government's assessment and action plan.

For our study, we focus on the Lake zone of Tanzania, which has the highest unmet need for FP in the country (30%). In this region, we are interested in the rural population where contraceptive use tends to be lower (TNBS and ICF Macro, 2016). We selected Misungwi district, which is located 47 kilometers south of Mwanza city and where ninety percent live in rural settlements (TNBS, 2015). Agriculture is the main economic activity in this district, followed by livestock keeping, small-scale mining and petty trade of agricultural and livestock products. It is ethnically very homogenous with most households belonging to the Sukuma tribe, which is patrilineal. This makes that husbands tend to have strong decision-making power in most household decisions.

### 2.2 Experimental task

To identify the effect of the husband's involvement on the use of FPS, we experimentally varied the involvement of the husband in the decision-making process. For this, we brought couples to a field lab where they responded to financial incentives when deciding whether to make use of FPS offered at their nearest health facility. The experiment simulates this decision by asking couples to make a series of choices between two options, *A* and *B*. Option *B* was only paid if the wife or the couple had attended a family planning meeting before the payment date, while option *A* did not have this condition. The chosen option was paid out one month after the experiment. This captures an important feature of the decision-making process, where a visit to the nearest health center in rural areas requires planning. In other words, when couples chose between the two options, they decided whether to plan a visit to the health center.[4]

We used a list of five pairs of choices, in which we kept option *A* constant and gradually increased option *B*. The difference between options *A* and *B* varied from -TZS 4,000 to +TZS 4,000 (approx. US$ 1.8). We used a series of five pairs instead of only one pair to increase variation among the couples, as several couples might switch their choice from *A* to *B* within the series of pairs (see Table A.1).

We used the FP meetings that local health facilities already organized every weekday. The participants were informed about when these meetings took place (day and time) prior to making their decisions. These meetings consist of two parts. In the first part, health staff present information about health-related topics including the benefits of FP and child nutrition. In the second part of the meeting, the participants can attend an *individual* meeting with the nurse where

[4]To avoid that the decisions might be confounded by potential liquidity constraints or lack of trust that payments would be made in the future, option *A* was paid at the same time as option B.

they are given information about different contraceptive methods and have the opportunity to receive free contraceptives. These meetings are more tailored to the individual needs than the first part which only contains more general information. The conditionality imposed in $B$ was only satisfied if the participants attended the individual meeting.

### 2.3 Treatments

To test the effect of the husband's involvement on the uptake of FPS offered at local health facilities, we organized three between-subject treatments to which the couples were randomly allocated. In these treatments, only the wife, only the husband or both spouses together made the decisions, called "Wife Decision" (WD), "Husband Decision" (HD), and "Joint Decision" (JD), respectively. We brought both spouses to the experiment to ensure that spouses had the same information about the action set. In this manner, the only element that differs across the three between-subject treatments is who is involved in the decision-making.

To ensure that the participants could freely choose the option they preferred in the WD and HD treatments, we provided "plausible deniability" of responsibility for any outcome in these treatments. In all three between-subject treatments, the participants had a 9% probability of getting a random outcome, i.e., where their decisions were made irrelevant. In this way, it was difficult for the participant's spouse to infer from the outcome what the participant's decisions were. This procedure was clearly explained to all participants in the first half of the explanations, where all couples were present, and before they knew which treatment they were assigned to. The probability was the same across all treatments but created plausible deniability only in WD and HD since both spouses observed the decisions made in JD. While this procedure does not entirely remove the pressure to align preferences with their spouse - unless all participants are willing to lie to their spouse about their decisions - we expect it to reduce some of this pressure.[5]

In addition to these between-subject treatments, we organized four within-subject treatments where we varied the level of payments (high or low) and who needed to attend the FP meeting (the wife only or the wife and the husband together). We refer to the two latter within dimensions as "Wife FPS" and "Couple FPS", respectively.[6] In total, participants made 20 decisions (see Table A.1 in Appendix A). The participants were told, that at the end of the experiment, we would randomly select one outcome from their decisions and the "plausible deniability option" for implementation.

[5]See Ashraf (2009) who used a similar procedure to introduce plausible deniability, with a probability of 11% to receive the random outcome.

[6]The within-variation on who had to attend the FP meeting allows us to analyze whether the between-subject treatment effects depend on this dimension. This is important, as coordination costs could be larger where both spouses need to attend the meeting. At the same time, having the husband present at the meeting might be reassuring for the wife because she knows that her husband approves of her receiving contraceptives. On the other hand, it might also give the husband control over the decision to accept contraceptives at the health facility. The variation of the payment level allows us to test whether there are any income effects. More specifically, in half of the decisions, we increased the payments in options A and B by TZS 4,000 (see pairs 6-10 and 16-20 in Table A.1 in Appendix A). Adding variation in payment levels allows us to disentangle an effect of increased cost/income with the "Couple FPS" from the mere effect of having both spouses attend the meeting.

### 2.4 Predictions

To develop predictions on the treatment differences in the likelihood that option $B$ is chosen, we use the following theoretical model. Consider a household with two decision-makers, $s \in \{w,h\}$, where $w$ represents the wife and $h$ represents the husband. The household needs to choose $x \in \{A,B\}$. $A$ is the payment they receive without needing to attend a FP meeting and $B$ is the payment that is conditional on attending a FP meeting.

Spouse $s$ has complete preferences over the two options that can be represented by a *personal utility function* $u_s(x)$. We allow for the spouses to have caring preferences and define their *ultimate utility function* as:

$$U_s(x) = (1-\gamma_s)u_s(x) + \gamma_s u_{-s}(x) \tag{1}$$

where $0 \leq \gamma_s \leq 0.5$. We refer to $\gamma_s$ as the "caring parameter". The higher $\gamma_s$, the more spouse $s$ takes his or her partner's preferences (i.e., the partner's personal utility function, $u_{-s}(x)$) into account in their ultimate utility function. $\gamma_s$ is set to be equal to or lower than 0.5 as it is commonly assumed that people do not care more about their spouse than about themselves (on this see, e.g., Browning, Chiappori and Weiss (2014)). Costs associated with attending the FP meeting, such as transport or opportunity costs, are implicitly taken into account in the personal utility functions where they reduce $u_s(B)$. As these costs are orthogonal to treatment, we do not discuss them further here.

We use the collective model as developed by Chiappori (1988, 1992) where the household maximizes a weighted sum of the ultimate utility functions of both spouses. This model formalizes the notion of bargaining power and shows how a change in bargaining power can change the household decision outcome (Blundell, Chiappori and Meghir, 2005). The model thus allows us to predict the effect of including the husband in the decision-making process, assuming that doing so would decrease the wife's bargaining power in the household decision. The household decision can be derived as the solution to:

$$\begin{aligned} &\max_x \ \theta U_w(x) + (1-\theta)U_h(x) \\ &\text{s.t. } x \in \{A,B\} \end{aligned} \tag{2}$$

where $0 \leq \theta \leq 1$ is exogenously given and reflects the wife's bargaining power in the household decision. We assume that the less we involve the husband in the decision, the more bargaining power the wife has. More specifically, $\theta = 1$ in WD, $\theta = 0$ in HD, and $0 \leq \theta \leq 1$ in JD. Note that when one of the spouses has all the bargaining power, the decision only depends on his or her ultimate utility function.

In the following, we focus on the likelihood that $B$ is chosen over $A$, and how it changes with the wife's bargaining power, $\theta$. If the spouses have the same preference ordering, there are no treatment differences. If, however, the spouses have different preference orderings, an increase in the wife's bargaining power will increase the likelihood that her preferred option is chosen. This leads to the following predictions.

**Prediction 1** *If the spouses have the same preferences, there are no treatment effects. Thus,* $WD = JD = HD$.

**Prediction 2** *If the spouses have different preferences, and the wife prefers B (A) and the husband prefers A (B), the likelihood that B is chosen weakly decreases (increases) with a larger involvement of the husband. Thus,* $WD \geq (\leq) JD \geq (\leq) HD$.

### 2.5 Implementation

A few weeks before the experiment, we conducted a household survey with a sample of 750 couples from 30 hamlets, randomly selected in Misungwi District, in Northern Tanzania.[7] We interviewed both spouses of each selected couple, separately and in private, to collect general socio-demographic characteristics, and information on fertility preferences, contraceptive use and intra-household communication about family planning. To conduct the interviews, we used same-gender enumerator-interviewee pairs. We used these survey data to organize the selection of the couples, test whether treatments were balanced and undertake a heterogeneity analysis of the treatment effects. We excluded all couples where the wife was pregnant when they completed the survey or where either the husband or the wife reported to be infecund.

Each experimental session was organized in exactly the same way. Couples were convened at a central location (e.g., a classroom or a community center in the hamlet), and the spouses were seated apart to avoid communication with each other or any other participant. We started each session with some general information about how the experiment would be conducted (no talking, no phones, informed consent, anonymity, etc.). Then the couples went through a non-incentivized task to elicit their individual time preferences. Thereafter, we provided information about the main task, as well as the content of the FP meetings. Couples were then randomly allocated to one of the three treatments (WD, JD, or HD) and called one at a time to make the decisions in private with an enumerator. Here, we again used same-gender enumerator-interviewee pairs. In WD we had one female enumerator, in HD we used one male enumerator, and in JD we used one female and one male enumerator. For the detailed experimental instructions see Appendix D.

To test the participants' understanding of the instructions, the enumerator asked a set of control questions for decision pairs 1-10 and 11-20. Specifically, respondents were asked which option required them to attend a FP meeting, who needed to attend the meeting, who was paid, and what would happen at the FP meeting. If the participants answered incorrectly, an additional short explanation was given. After having gone through all control questions, the enumerator recorded

[7] In each selected hamlet, we selected a random sample of 40 couples where the wife was below 40 years of age and had at least one living child. If fewer than 40 couples were available in a hamlet, we selected all of them. We included both couples who were married and couples who were living together but were not married in our sample. Regardless of their marital status, we use the terms "spouses", "husband" and "wife" when referring to them. The experiment reported in this paper is part of a larger project on reproductive health in Tanzania. The household survey is used in other articles, but the results from the experiment are only reported here. As one of the purposes of the project was to study the use of reproductive health services (maternal health care, pre-natal and post-natal care), the women interviewed needed to have at least one living child.

whether they thought the participant had a sufficient understanding of the task. 92% were thought to have a sufficient understanding.

Each spouse received a TZS 5,000 show-up fee (approx. US$ 2.3) and had the opportunity to earn more during the experiment. On average, each couple earned TZS 19,600 (approx. US$ 9) including the show-up fee, corresponding to about one week's worth of household income. The show-up fee was paid on the day of the experiment, while the remaining payment was paid one month later.

After all decisions were made, we privately asked participants how likely they thought it was that they would attend a FP meeting, that their spouse would attend the meeting, and that they would ask for contraceptives at the meeting, if option *B* was selected for payment. These questions were asked of all decision-makers (wife in WD, husband in HD, and both in JD) regardless of the decision they had made.[8]

At the end of the experiment, we randomly selected one outcome from the 20 decisions and the "plausible deniability option" for payment. If a decision was selected in which *B* was chosen, the wife was given a form that had to be completed and signed by the nurse at the closest health center (the participants were informed about which health center they should attend at the beginning of the session). We used this to verify whether the payment condition of option *B* was fulfilled (see Appendix D.2 for an illustration of the form). To ensure that it was the woman (or couple) that participated in the experiment that attended the FP meeting, the nurse filled out the name of the woman who attended, and the name of her husband if he joined her. When we paid the participant one month after the experimental session, we checked whether the name on the form corresponded with the name of the participant who was given the form. To do this check, we used the second part of the form that was completed and retained by the nurse.

The second part of the form also included some questions on the uptake of contraceptives which were answered by the nurse. In addition, when we revisited women to give their payments, we asked them some questions in private about their uptake of contraceptives. In this way, we collected data on whether the FP meeting was attended, whether contraceptives were taken up at the meeting (reported by nurses at the health facilities and the participants), and if so which type of contraceptive (reported by the nurse).

We revisited each hamlet one month after the experimental session to make the individual payments to the participants. For this, we used the following procedure. If one of the decision pairs 1 to 10 (see Table A.1) was chosen (i.e., only the wife was paid), only the wife was invited to come and receive the payment. If one of the decision pairs 11 to 20 was chosen (i.e, both spouses were paid), both spouses were invited to come and receive the payment. If only one of the spouses showed up, he or she would receive the payments of both spouses. Payments were always made in private. With the "Couple FPS", however, spouses would always receive the same payment and hence could infer each other's payment.

[8]Note that due to the procedure followed to ensure "plausible deniability" all respondents face a non-zero chance that option *B* is selected, even the respondents who always chose option *A*.

## 3. Results

In this section, we first describe the sample before presenting the main treatment effects.

### 3.1 The sample

In total, we organized 51 experimental sessions in 30 hamlets. 14 health facilities were involved in the study. They were located between 15 minutes and 2 hours driving (by motorbike) away from the hamlets, as estimated by local hamlet leaders. 673 couples were invited to the experiment, of which 525 couples participated (78% show-up rate). We do not find any significant differences in observable characteristics between couples that participated and couples that did not participate in the experiment (see Table A.2 in Appendix A).[9]

Table 1 presents a balance test of important characteristics of the participants by treatment. As can be seen, the treatments are well-balanced in terms of observable characteristics. Panel A reports socio-demographic characteristics. The husbands are generally older and have more years of education than the wives. The couples have, on average, three children aged 12 or younger. The proportion of Catholics is higher among the wives while the proportion of respondents without any religion is higher among the husbands. About 40% of women and 55% of men are employed outside of the household, and 10% of women and 20% of men are self-employed. Nearly 80% of women and 90% of men had been growing agricultural crops in the last season. The most common crops were maize, followed by sweet potatoes, cassava, and rice. More than 70% of the households own cattle or pack animals or smaller animals (such as sheep, goats, and rabbits). Most respondents belong to the Sukuma tribe (more than 96%).

Panel B reports statistics on fertility preferences. About 20% of men and 30% of women do not want to have any more children.[10] Among the respondents who want to have more children, most of them want to wait at least two years before having another child. Thus, the need for family planning is high.[11] On average, men and women want to have six children (with a median of 6 for women and 5 for men).

We find considerable within-couple differences in fertility preferences. In 26% of the couples, one of the spouses does not want more children while the other either wants more children or is undecided (in 8.5% of the couples the husband does not want more children while the wife wants more or is undecided, and in 17.9% of the couples the wife does not want more children, while the husband wants more or is undecided). Furthermore, of the couples where both spouses want more children, 37% disagree about when to have the next child. 20.0% are couples where the husband

[9] With 449 couples we interviewed both spouses, while with 52 couples we only interviewed the wife and with 24 couples we only interviewed the husband. The participants who did not take part in the household survey were asked for some basic information after the experimental session (including age, education and religion). In total, 18 women and 41 men were interviewed in this way.

[10] This is in line with the recent Demographic and Health survey (2016). In the Lake region (both urban and rural pooled), to which our study region belongs, 29.5% of currently married women aged 15-49 and 21.8% of all currently married men do not want any more children.

[11] We define someone to have a need for family planning if the respondent does not want any more children or wants to wait at least two years before having more children.

Table 1: Balance table of observable characteristics

| | Wife Decision | | Joint Decision | | Husband Decision | | |
|---|---|---|---|---|---|---|---|
| | Mean/% | N | Mean/% | N | Mean/% | N | F-test |
| **Panel A: Socio-economic characteristics** | | | | | | | |
| Age, H | 35.6 | 172 | 36.0 | 168 | 35.8 | 173 | 0.943 |
| Age, W | 29.1 | 170 | 30.0 | 174 | 29.1 | 175 | 0.451 |
| Education, H | 5.7 | 171 | 5.8 | 167 | 5.4 | 173 | 0.457 |
| Education, W | 5.2 | 169 | 5.0 | 174 | 5.5 | 174 | 0.403 |
| Catholic, H | 30.8 | 172 | 31.0 | 168 | 26.4 | 174 | 0.579 |
| Catholic, W | 43.5 | 170 | 40.8 | 174 | 36.0 | 175 | 0.353 |
| Number of children | 3.0 | 165 | 3.0 | 163 | 3.1 | 173 | 0.755 |
| Employed, H | 49.7 | 159 | 55.0 | 151 | 55.6 | 162 | 0.515 |
| Employed, W | 40.9 | 164 | 42.8 | 159 | 33.7 | 172 | 0.203 |
| Self-employed, H | 15.1 | 159 | 24.5 | 151 | 21.6 | 162 | 0.107 |
| Self-employed, W | 12.2 | 164 | 8.8 | 159 | 15.1 | 172 | 0.214 |
| **Panel B: Fertility preferences** | | | | | | | |
| Do not want more children, H | 19.5 | 159 | 20.5 | 151 | 17.3 | 162 | 0.756 |
| Do not want more children, W | 27.4 | 164 | 30.2 | 159 | 27.3 | 172 | 0.812 |
| Want to wait two years or more, H | 67.6 | 102 | 59.8 | 87 | 57.4 | 115 | 0.280 |
| Want to wait two years or more, W | 62.2 | 111 | 59.4 | 106 | 53.8 | 117 | 0.432 |
| Need for FP, H | 62.9 | 159 | 55.0 | 151 | 58.0 | 162 | 0.360 |
| Need for FP, W | 69.5 | 164 | 69.8 | 159 | 64.0 | 172 | 0.435 |
| Desired number of children, H | 6.1 | 142 | 5.7 | 131 | 6.2 | 138 | 0.335 |
| Desired number of children, W | 5.8 | 156 | 5.8 | 154 | 5.9 | 164 | 0.710 |
| H does not want more children, W does | 9.9 | 151 | 8.8 | 137 | 7.0 | 158 | 0.643 |
| W does not want more children, H does | 16.6 | 151 | 19.0 | 137 | 18.4 | 158 | 0.855 |
| H wants to wait two years or more, W does not | 15.4 | 78 | 17.5 | 63 | 26.2 | 84 | 0.194 |
| W wants to wait two years or more, H does not | 14.1 | 78 | 19.0 | 63 | 17.9 | 84 | 0.709 |
| **Panel C: Contraceptive use** | | | | | | | |
| Use modern FP, H | 10.1 | 159 | 8.6 | 151 | 11.1 | 162 | 0.761 |
| Use modern FP, W | 30.5 | 164 | 24.5 | 159 | 24.4 | 172 | 0.362 |
| Use LARC, H | 5.0 | 159 | 4.0 | 151 | 4.9 | 162 | 0.889 |
| Use LARC, W | 7.3 | 164 | 7.5 | 159 | 7.6 | 172 | 0.996 |
| **Panel D: Communication and beliefs related to FP** | | | | | | | |
| Both report to discuss FP with spouse | 45.0 | 151 | 46.0 | 137 | 38.6 | 158 | 0.370 |
| H believes W approves of contraceptives | 48.4 | 159 | 46.4 | 151 | 48.8 | 162 | 0.901 |
| W believes H approves of contraceptives | 56.7 | 164 | 54.1 | 159 | 53.5 | 172 | 0.823 |
| H believes W disapproves of contraceptives | 10.7 | 159 | 13.9 | 151 | 8.6 | 162 | 0.328 |
| W believes H disapproves of contraceptives | 25.6 | 164 | 22.0 | 159 | 25.6 | 172 | 0.689 |
| Joint $\chi^2$-statistics | | | | | | | 42.75 |
| p-value | | | | | | | 0.5251 |

*Note:* The table displays sample averages for each characteristic. "H" refers to the husband and "W" to the wife. "FP" is an abbreviation for "family planning". "Need for FP" is an indicator variable taking the value 1 if the respondent either does not want more children or wants to wait at least two years before having another child. "Use modern FP" takes the value 1 if the respondent reports using the pill, injectables, IUDs, or implants. LARC is an abbreviation for "long-acting reversible contraception" and includes implants and IUDs. "Employed" takes the value 1 if the respondent reports having worked for someone else in the past 12 months, including on someone else's farm, business or for an organization or company (such as school, government and bank). "Self-employed" takes the value 1 if the respondent reports running a business other than farming (such as a shop, fishing, driver, and builder). The total number of observations is 525. Some variables include only a sub-sample: "Want to wait to years or more" includes participants that want more children. The last column presents the two-sided p-value of an ANOVA. The joint $\chi^2$-statistics is from a multinominal regression using the Treatment as the dependent variable and the characteristics as independent variables.

wants to delay the next child by at least 2 years and the wife does not, and 16.9% are couples where the wife wants to delay the next child by at least 2 years and the husband does not.

Panel C displays current use of contraceptives (see Table A.3 in Appendix A for past and intended use of contraceptives). We present information on the use of modern contraceptives and the use of long-acting reversible contraceptives (LARC).[12] 26.5% of the wives report using modern contraceptives and 7.5% use LARC. This is 16.5 percentage points higher than the percentage of couples where the husband reported that they used modern contraceptives. In other words, in only 38% of the couples where the wife reports using modern contraceptives, the husband also reports using modern contraceptives. Among these couples, 24% of the women report that the husband does not know that they are using contraceptives. Thus intentional hiding of contraceptive use does not seem to drive all the reporting differences between men and women.

Of the women who are not currently using contraceptives, 8% used modern contraceptives (2% used LARC) in the past and 46.5% believe that they will use contraceptives in the future (15.6% plan to use LARC and 5% to sterilize). Interestingly, while fewer men plan to use contraceptives in the future (26.4%), more men than women plan to do a sterilization (10.4%). For more details, see Table A.3 in Appendix A.

Panel D presents statistics on within-couple communication about FP and beliefs about the spouse's opinion on contraceptives. In 43% of the couples, both spouses reported that they discussed FP with each other. 54.7% of the women and 47.9% of the men believe that their spouse approves of contraceptives, while 24.4% of the women and 11% of the men believe that their spouse disapproves.

Panel C in Table A.3 in Appendix A shows that 61% of the women and 27.5% of the men reported ever discussing FP with a nurse at a health center. Of these, 83.1% of the women and 70.8% of the men had the discussion in the past year, and most are either completely or somewhat satisfied with the services they received. Even if a substantial proportion of women discussed FP at the health center, many of them in the past year, only 26.5% of them are using modern contraceptives and the unmet need for FP remains high. One of the most commonly cited reasons for not using contraceptives is fear of side effects (29%). Moreover, there is a lack of knowledge about FP among both men and women. As an example, 34% of women and 61% of men do not know whether injectables are effective in avoiding pregnancy, and nearly 20% of both men and women believe that the pill causes infertility (for more details, see Table A.4 in Appendix A). This suggests that neither women nor men have sufficient knowledge about FP and are in need of more information before they would start or continue using contraceptives.

[12]The participants are asked whether they themselves or their spouse are doing something or using any method to delay or avoid getting pregnant. We define "modern contraceptives" as contraceptives that give women a reliable means to control their fertility. These methods include the pill, injectables, intrauterine devices (IUD), implants, and sterilization. We do not include male condoms as women are often unable to enforce their use. If we had included condoms in modern contraceptives, 35% of women would report using modern contraceptives. LARCs include IUDs and implants. We allowed couples who already used modern contraceptives to participate in the experiment because it might still be interesting for them to attend the FP meeting. For example, a couple might want to obtain better information about contraceptives, or simply receive an updated checkup by the nurse; or a woman who uses contraceptives without her husband being aware might want to convince him that using contraceptives is a good thing to do.

### 3.2 Main treatment effects

To investigate the effect of the husband's involvement on the likelihood that FPS are chosen, we estimate the following regression:

$$y_c = \alpha + \beta_1 (\text{JD})_c + \beta_2 (\text{HD})_c + \rho_s + X_c + \varepsilon_c \quad (3)$$

where $y_c$ is the proportion of the 20 decisions where couple $c$ chose FPS (henceforth referred to as "proportion"). $\alpha$ is a constant and $(\text{JD})_c$ and $(\text{HD})_c$ are treatment indicator variables taking the value 1 if couple $c$ was assigned to JD and HD, respectively. WD is used as the base treatment. $\rho_s$ captures session-fixed effects, $X_c$ is a set of control variables and $\varepsilon_c$ is the error term.[13]

Table 2 reports the results. In column (1), we include only the treatment indicator variables. In columns (2)–(4), we sequentially add session fixed effects, socio-economic controls, and fertility controls.[14] We find that involving the husband significantly increases the proportion of the decisions where FPS are chosen and that this effect is robust across the different specifications. The proportion is 11.7-13.4 percentage points higher in HD than in WD and is 9.7-11.4 percentage points higher in JD than in WD. There is no difference in the proportion between the two treatments where the husband is involved.

To test the robustness of these results, we undertake the following additional analyses. First, the results are robust across the different within-subject treatments, as shown in Table A.5 in Appendix A.[15] Second, they are also robust to only including couples with a sufficient understanding of the task and who do not switch more than once (see Table A.6 in Appendix A).[16] It even increases the point estimates and the statistical significance of the effects. Third, even though the estimates are very similar when we add controls, it should be noted that adding controls reduces the sample by 15% (from 525 to 431 couples). One might therefore wonder whether removing the couples for which we do not have background information influences the estimates. To obtain an idea of whether that might be the case, we remove the controls from the regression in column (4) in Table 2. The results are presented in column (5) of Table A.6 in Appendix A and are again very similar. Fourth, 9% of the couples in our sample are polygamous (evenly distributed across treatments, $p > 0.764$ from F-test, see Table A.3 in Appendix A). As polygamous and monogamous couples might behave differently, it is important to test whether the results are influenced by the inclusion of polygamous couples. Column (4) in Table A.6 in Appendix A shows the regression results with

[13] This specification focuses on the between-subject treatments. For the influence of within-subject treatments, see the demand curves presented in Figure A.1 in Appendix A.

[14] Distance to the nearest health center might matter, as they determine travel costs. The session fixed effects we include in the regressions control for distance to the health center, because all participants in a session were recruited from the same hamlet.

[15] A comparison of the within-subject treatments (see Table A.8 in Appendix A) shows that (i) in the high payment condition, the effect of the husband's involvement is stronger when both spouses need to attend the FP meeting, and (ii) in the condition where only the wife needs to attend the FP meeting ("Wife FPS"), the effect of the husband's involvement is weaker in the high payment condition.

[16] 7-10% of the couples switched more than once in a price list, and 92% of the couples had a sufficient understanding. As can be seen in Table A.3 in Appendix A, there are no differences in understanding and multiple switching across treatments.

Table 2: Effect of involving the husband on the proportion of decisions where family planning services (FPS) are chosen

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Joint Decision | 0.108*** | 0.100** | 0.097** | 0.114*** |
| | (0.040) | (0.040) | (0.040) | (0.042) |
| Husband Decision | 0.117*** | 0.121*** | 0.127*** | 0.134*** |
| | (0.038) | (0.039) | (0.038) | (0.041) |
| Session fixed effects | No | Yes | Yes | Yes |
| Socio-economic controls | No | No | Yes | Yes |
| Fertility controls | No | No | No | Yes |
| JD=HD | 0.788 | 0.533 | 0.393 | 0.563 |
| Control mean | 0.695 | 0.695 | 0.695 | 0.695 |
| Observations | 525 | 525 | 486 | 444 |
| $R^2$ | 0.024 | 0.175 | 0.193 | 0.238 |

*Notes:* The table reports OLS regressions. Dependent variable: the proportion of decisions where family planning services (FPS) are chosen. Independent variables: "JD" (indicator variable taking the value 1 for couples in Joint Decision) and "HD" (indicator variable taking the value 1 for couples in Husband Decision). "Session fixed effects": indicator variables used for each of the sessions of the experiment. "Socio-economic controls" include age, education and religion of both spouses, a wealth index, and the number of children. "Fertility controls" include the use of modern contraceptives, whether the husband has a need for FP, whether the wife has a need for FP, whether the husband and wife both report to have discussed family planning in the past year, whether the husband believes that their wife approves of contraceptive use, whether the wife believes that their husband approves of contraceptive use. Standard errors clustered at the session level in parentheses. For the extended table, see Table B.1 in Appendix B. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

[a]: two-sided p-values of a Wald test, with the null hypothesis being that the coefficients of "JD" and "HD" are the same.

[b]: Mean in "Wife Decision" (WD).

monogamous couples only. The results are again robust. Finally, we add experimenter fixed effects in Table A.7 in Appendix A. As different enumerators were used in the WD and HD treatments (only female enumerators were involved in WD, and only male enumerators were involved in HD), we cannot control for experimenter effects for the comparison between WD and HD. However, as all enumerators were involved in JD, we can control for experimenter effects for the pairwise comparisons between JD and each of the other treatments. As can be seen from Table A.7 in Appendix A, the results remain robust.

## 4. Mechanisms

So far, we found that involving the husband increases the likelihood that FPS are chosen. This result indicates that $pr(U_h(B) > U_h(A)) > pr(U_w(B) > U_w(A))$. In this section, we explore potential mechanisms that might explain why women and men evaluate options $A$ and $B$ differently. More specifically, the positive effect of involving the husband can be driven by one of the following mechanisms:

1. The husband gets more personal utility from FPS than his wife.
2. The wife incorrectly believes that her husband disapproves of contraceptives.

3. The wife expects that the plan to use FPS is less likely to be fulfilled when the husband is not involved.

In the rest of this section, we will look for supporting evidence on each of the three mechanisms. We will also develop our theoretical model to incorporate the role of beliefs about spousal preferences (second mechanism) and uncertainty about whether the FP meeting will be attended (third mechanism).[17]

### 4.1 Does the husband have a stronger preference for FPS?

Involving the husband in the decision could increase the likelihood that FPS are chosen if the husband gets more personal utility from FPS than his wife. Recall that the ultimate utility function is defined as $U_s = (1-\gamma_s)u_s(x) + \gamma_s u_{-s}(x)$. Thus, involving the husband increases the likelihood that $B$ is chosen, if $u_h(B) > u_w(B)$.

To find evidence for this mechanism, we look into three possible sources of spousal differences in FPS preferences: (i) fertility preferences, awareness of contraceptive use, and unmet need for FP, (ii) knowledge about FP, and (iii) hyperbolic time preferences. We explore each of them in turn.

#### 4.1.1 Fertility preferences, awareness of contraceptive use, and unmet FP need

It is plausible that if an individual has a need for family planning (i.e., does not want more children or wants to delay having more children), this individual is more likely to prefer FPS. In our sample, we observe important differences in fertility preferences between men and women. As reported in Table 1, more women than men do not want more children. There are also important within-couple differences. In 26% of the couples in our sample, one of the spouses (in 17.8% this is the husband) does not want more children while the other does or is undecided. In couples where both spouses want more children, there is also important heterogeneity in how long they want to wait with getting the next child.

Within-couple differences in fertility preferences might translate into within-couple differences in preferences for FPS. For example, the husband might have a stronger preference for FPS than his wife if he has weaker fertility preferences than his wife, e.g., when the husband does not want another child while the wife does. If the positive effect of the involvement of the husband is driven by the husband's preference for FPS, we should find that this effect is stronger among couples where the husband has a weaker fertility preference (than his wife) than among couples where the spouses have the same fertility preferences or the wife has weaker fertility preferences than her husband.

To test this, we interact the treatment variables with spousal preference differences. The results are reported in column (1) in Table 3. In this column, "Var" takes the value one if the husband has a need for family planning while the wife does not (15% of the couples). "Var" is zero whenever the husband and the wife have the same preferences or the wife has weaker fertility preferences than the husband. First, we note that if the husband *does not* have weaker fertility preferences than

[17] Some of the analyses in this section were not pre-specified in our pre-analysis plan. The idea of inaccurate beliefs is discussed in Appendix A.1. of the pre-analysis plan.

his wife, involving the husband still increases the likelihood that FPS are chosen (as can be seen by the positive and significant coefficients on "JD" and "HD"). If the husband has weaker fertility preferences, the treatment differences become larger (but not significantly so). Thus, differences in fertility preferences do not appear to be driving the treatment differences.

Table 3: The effect of involving the husband on the uptake of family planning services by fertility preferences, unawareness of contraceptive use, and unmet need for family planning

| | Var = | | |
|---|---|---|---|
| | (1) Fertility preferences | (2) Aware of FP | (3) Unmet need for FP |
| JD | 0.103** | 0.133** | 0.122** |
| | (0.043) | (0.052) | (0.047) |
| HD | 0.130*** | 0.127*** | 0.126*** |
| | (0.045) | (0.047) | (0.047) |
| Var | 0.004 | 0.001 | 0.005 |
| | (0.098) | (0.111) | (0.081) |
| JD X Var | 0.053 | -0.127 | -0.073 |
| | (0.139) | (0.150) | (0.107) |
| HD X Var | 0.014 | 0.042 | 0.027 |
| | (0.102) | (0.128) | (0.104) |
| Control mean[a] | 0.697 | 0.688 | 0.688 |
| Observations | 444 | 444 | 444 |
| $R^2$ | 0.236 | 0.243 | 0.237 |

*Notes:* The table reports OLS regressions with session fixed effects. Dependent variable: the proportion of decisions in which family planning services (FPS) are chosen. Independent variables: treatment variables "JD" and "HD", and the set of control variables as defined in Table 2. Note that columns (1) and (3) do not include controls for spousal fertility preferences and column (2) does not include controls for contraceptive use. "Var" is an indicator variable taking the value 1 if the husband has weaker fertility preferences than the wife in column (1), if the husband is not aware of the wife using modern contraceptives in column (2), and if the husband has an unmet need for FP and the wife does not in column (3). "JD X Var" is the interaction term between the treatment indicator variable Joint Decision and "Var". "HD X Var" is the interaction term between the treatment indicator variable Husband Decision and "Var". Standard errors clustered at the session level in parentheses. For the extended table, see Table B.2 in Appendix B. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
[a]: mean in Wife Decision (WD) when "var" is set to 0.

The link between the husband's fertility preferences and his preference for FPS could depend on whether he is aware that his wife already uses modern contraceptives. Table 1 shows that husbands – compared to their wife – are less likely to report that they use modern contraceptives. This implies that even where spouses have the same fertility preferences, the husband may have a stronger preference for FPS than the wife if he does not know that they are using contraceptives. To test whether this could explain the positive effect of the husband's involvement in the decision, we interact the treatment variables with the husband's unawareness of contraceptive use (in column (2) in Table 3). The husband's unawareness of contraceptive use is defined as an indicator variable taking the value one if the wife reports using modern contraceptives while the husband does not, zero otherwise. This is the case in 16% of the couples. If the husband's unawareness of contraceptive use is driving our results, we would expect the interaction terms in Table 3 to be positive and significant. As can be seen, the interaction term with JD is negative, and the interaction term

with HD is far from significant, suggesting that the husband's awareness of contraceptive use is not driving the results.

A third factor that might influence the treatment effects is the husband's unmet need for FP which combines his fertility preferences and awareness of contraceptive use. In particular, if the husband has an unmet need for FP while the wife does not (either because of differences in fertility preferences or different reporting of contraceptive use), involving the husband might increase the uptake of FPS. In Table 3, "unmet need for FP" is an indicator variable taking the value one if the husband has an unmet need for FP while the wife does not (22% of couples), zero otherwise. We again expect the interaction terms to be positive and significant if these couples are driving the results. As can be seen, this is not the case, suggesting that this factor does not drive the positive effect of the husband's involvement.

#### 4.1.2 Knowledge about FP

Men might have lower knowledge about the benefits and costs of FP than their wives. This is in line with, e.g., Ashraf et al. (2020) who showed that men have lower knowledge about reproductive health risks (mostly related to labor and delivery outcomes) than women. If men have a need for knowledge, their lower knowledge might translate into a stronger preference for FPS, where knowledge can be obtained.

To test whether this mechanism explains the positive effect of the husband's involvement, we use data from the survey, in which we asked the respondents a set of "knowledge" questions about FP. These questions range from the efficacy of contraceptives to pregnancy risks (see Table A.4 in Appendix A). For each statement, a relatively large fraction of both women and men answer that they do not know whether the statement is true or not. 65% of women and 83% of men answer "do not know" on at least one of the five statements. Women are significantly less likely to give this answer than men (1.6 times vs. 2.2 times, $p < 0.001$ from a two-sided t-test).

To investigate whether the lack of knowledge about FP influences the treatment effects, we interact the treatments with the difference in knowledge between the husband and the wife. If lack of knowledge is driving the treatment effects, we expect small or no treatment differences when the husband has an equal or larger amount of knowledge about FP than the wife. Further, we expect the interaction terms to be positive and significant, which would indicate that husbands with less knowledge about FP are driving the results. Table 4 displays the results. In column (1), we interact the treatment variables with an indicator variable taking the value one if the husband answers "do not know" more frequently than the wife (55% of couples). In column (2), we use the difference in "do not know" answers between the husband and the wife when the husband answers "do not know" more frequently than the wife (it is zero otherwise). The average difference is 1.2 questions (with a standard deviation of 1.4). As can be seen, neither of the interaction terms are significant, suggesting that a lack of knowledge is not driving the results.

Table 4: The effect of involving the husband on the uptake of family planning services by within-couple differences in knowledge about family planning

| | Dummy (1) | Number (2) |
|---|---|---|
| JD | 0.168** | 0.136** |
| | (0.069) | (0.053) |
| HD | 0.108 | 0.115** |
| | (0.065) | (0.055) |
| Less knowledge | 0.068 | 0.006 |
| | (0.057) | (0.022) |
| JD X Less | -0.102 | -0.017 |
| | (0.088) | (0.030) |
| HD X Less | 0.039 | 0.016 |
| | (0.071) | (0.025) |
| Control mean[a] | 0.667 | 0.667 |
| Observations | 444 | 444 |
| $R^2$ | 0.249 | 0.241 |

*Notes:* The table reports OLS regressions with session fixed effects. Dependent variable: the proportion of decisions in which family planning services (FPS) are chosen. Independent variables: treatment variables "JD" and "HD", and the set of control variables as defined in Table 2. "Less knowledge" is an indicator variable taking the value 1 if the husband replies "do not know" to more questions than the wife in column (1) and a discrete variable indicating the difference in "do not know" answers between the husband and the wife when the husband answers "do not know" more often. "JD X Less" is the interaction term between the treatment indicator variable Joint Decision and "Less knowledge". "HD X Less" is the interaction term between the treatment indicator variable Husband Decision and "Less knowledge". Standard errors clustered at the session level in parentheses. For extended table, see Table B.3 in Appendix B. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
[a]: mean in Wife Decision (WD) when "var" is set to 0.

#### 4.1.3 Hyperbolic time preferences

As option ***B*** is conditional on attending a FP meeting at the local health center, it can be used as a commitment device. This implies that the husband might have a stronger preference for FPS if he benefits more from its use as a commitment device than his wife. To test this, we look at the participants' time preferences. It has been demonstrated that people might have a preference for commitment if they have hyperbolic time preferences, i.e. they are more patient in the future than in the present (see, e.g. Ashraf, Karlan and Yin, 2006).

We elicit time preferences by asking the participants to choose between a hypothetical smaller reward the day after the experiment or a larger reward after one month (referred to as "near time" frame). The same question was also asked for a "later time" frame (six versus seven months) to identify potential reversals in time preferences (see Section D.3 of the Appendix for more details).

We define an individual to have hyperbolic time preferences if the estimated discount rate is higher in the near time frame than the later time frame.

We do not find any gender differences in discount rates. On average, husbands and wives have a discount rate of 9.8% and 10.3%, respectively, in the nearer time frame, (p-value from two-sided t-test 0.394). In the later time frame, women are slightly more patient than men with a monthly discount rate of 8.8% and 9.7%, respectively (p-value from two-sided t-test 0.063). More women than men display hyperbolic time preferences (30.5% vs 25.0%, respectively; two-sided t-test $p = 0.049$).

Table 5: The effect of involving the husband on the uptake of family planning services by hyperbolic time preferences

| | Treatments | | | Heterogeneity |
|---|---|---|---|---|
| | (1) WD | (2) HD | (3) JD | (4) |
| Hyperbolic, W | -0.164 | | -0.074 | |
| | (0.149) | | (0.154) | |
| Hyperbolic, H | | -0.043 | -0.070 | |
| | | (0.123) | (0.218) | |
| JD | | | | 0.108** |
| | | | | (0.046) |
| HD | | | | 0.137*** |
| | | | | (0.050) |
| H hyperbolic, W not | | | | -0.020 |
| | | | | (0.083) |
| JD X H hyper., W not | | | | 0.078 |
| | | | | (0.087) |
| HD X H hyper., W not | | | | -0.015 |
| | | | | (0.114) |
| Control mean[a] | 0.793 | 0.771 | 0.805 | 0.703 |
| Observations | 151 | 155 | 134 | 437 |
| $R^2$ | 0.554 | 0.576 | 0.442 | 0.260 |

*Notes:* The table reports OLS regressions with session fixed effects. Dependent variable: the proportion of decisions in which family planning services (FPS) are chosen. Independent variables: treatment variables "JD" and "HD", the set of control variables as defined in Table 2, and the wife's discount rates in the near and later time frame (columns (1), (3), and (4)) and the husband's discount rates in the near and later time frame (columns (2)-(4)). "Hyperbolic, W" is an indicator variable taking the value 1 if the wife has a higher discount rate in the near time frame than in the later time frame. "Hyperbolic, H" is defined correspondingly for the husband. "H hyperbolic, W not" is an indicator variable taking the value 1 if the husband has hyperbolic time preferences while the wife does not. "JD X H hyper., W not" is the interaction term between the treatment indicator variable Joint Decision and "H hyperbolic, W not". "HD X H hyper., W not" is the interaction term between the treatment indicator variable Husband Decision and "H hyperbolic, W not". Standard errors clustered at the session level in parentheses. For extended table, see Table B.4 in Appendix B. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

[a]: mean in Wife Decision (WD) when "Hyperbolic, W" = 0 in column (1), mean in Husband Decision (HD) when "Hyperbolic, H" = 0 in column (2), mean in Joint Decision (JD) when "Hyperbolic, W" = 0 and "Hyperbolic, H" = 0 in column (3), mean in "WD" when "H hyperbolic, W not" = 0 in column (4).

If participants used option B as a commitment device, we should find that the proportion of decisions where FPS is chosen is higher among the participants with hyperbolic time preferences. We test this in columns (1)-(3) in Table 5. As can be seen, the coefficients are negative and not

significant, indicating that the choice of FPS is not used as a commitment device in the individual treatments. Therefore, we do not expect that a difference in hyperbolic time preferences between the husband and the wife influences the treatment differences. This is indeed what we find in column (4). Given that we are looking for a mechanism behind the positive effect of husband's involvement on the choice of FPS, we focus on the case where the husband has hyperbolic time preferences and the wife has not. As can be seen by the insignificant interaction terms, this is not driving the treatment effects.

### 4.2 Inaccurate beliefs

The second explanation for the positive effect of the husband's involvement assumes that women have inaccurate beliefs about their husband's preferences for FP. In patriarchal societies in low-income countries, FP is often a contentious topic, which might generate spousal disagreement or even conflict. This makes it difficult for women to initiate a conversation about this topic (Mosha, Ruben and Kakoko, 2013; Amo-Adjei et al., 2017). As a result, there tends to be little discussion or communication among spouses about FP. In Panel C of Table 1, we see that only 43% of the couples reported that they discussed FP with their partner in the past year. This could make beliefs about spousal preferences inaccurate.

To see how the treatment predictions change when the wife has inaccurate beliefs about her husband's preferences, we rewrite the wife's ultimate utility function in Equation (1) as:

$$U_w(x) = (1-\gamma_w)u_w(x) + \gamma_w E_{u\in U} u_h(x) \tag{4}$$

where $E$ is the expectation operator over a set $U$ of utility functions for $h$. We assume that incomplete information is only a problem when the decision is made individually by the wife, as there is no communication between the spouses. In JD, in contrast, both spouses will get to know each other's preferences as they make the decision together.

When discussing beliefs, we refer to beliefs about the personal preference ordering of the spouse. If the wife has inaccurate beliefs, it means that she believes that the husband gets more personal utility from $A$ than $B$, while the opposite is true. As long as $E_{u\in U} u_h(B) < u_h(B)$, having inaccurate beliefs lowers the likelihood that the wife chooses $B$. Thus, if there is no conflict in the household, inaccurate beliefs might lead to Pareto-dominated choices when the decision is made individually. For example, if $u_s(B) > u_s(A)$ for both spouses, but the wife has inaccurate beliefs, the likelihood that $B$ is chosen is lower when the decision is made by the wife than when it is made jointly or by the husband (assuming that he has accurate beliefs). In this case, if inaccurate beliefs lead the wife to choose $A$ instead of $B$, both spouses would have been better off if the decision had been $B$.

Thus, the theory shows that if the wife incorrectly expects her husband to prefer $A$, involving the husband increases the likelihood that FPS are chosen. We will look for evidence that supports this prediction. In the survey conducted before the experiment, we asked the participants whether they believed that their spouse agreed with the use of contraceptives. Even though this is not a

measure of the wife's beliefs about their husband's preferences over options *A* and *B*, there is a clear link between attending a FP meeting and the use of contraceptives (the couples need to attend such a meeting to receive free contraceptives). Therefore, we use this measure as a proxy for the wives' beliefs about their husband's preferences over the two options.[18] Overall, as shown in Table 1, 55% of the women in our sample believe that their husband approves of contraceptives, and 24% believe that their husband disapproves. The remaining category includes women who either do not know or believe that the spouse is indifferent.

If women's beliefs are behind the positive effect of the husband's involvement, we should find that this effect is strongest among couples where the wife believes that her husband disapproves of contraceptives. To test this, we interact the treatment variables with women's beliefs. Table 6 displays the results. We report results for the overall proportion of decisions where FPS are chosen in column (1), the proportion for "Wife FPS" (i.e., where only the wife had to attend a FP meeting) in column (2), and the proportion for "Couple FPS" (i.e., where both the wife and the husband had to attend a FP meeting) in column (3). We report the results for each condition separately, to verify whether the effects differ between both conditions.

Two findings are worth noting. First, the coefficients of "JD" and "HD" are positive and statistically significant in all columns. This indicates that among couples where the wife does not believe that her husband approves of contraceptives, involving the husband increases the proportion of decisions where FPS are chosen. In JD, the proportion is between 21.1 and 26.0 percentage points higher than in WD, and in HD, the proportion is 22-23 percentage points higher. Second, the coefficients of the interaction terms "JD X Beliefs" and "HD X Beliefs" are negative and statistically significant. This indicates that the differences between the WD treatment and each of the other treatments are significantly smaller when the wife believes that her husband approves of contraceptives.[19]

These results suggest that women incorrectly believe that their husband disapproves of contraceptives, which makes women less likely to choose FPS if their husband is not involved in the decision. Note that we do not have data on the true preferences of each spouse, and can therefore not directly test whether beliefs are accurate. However, we do have data on the desired number of children of each spouse as well as their beliefs about the desired number of children of their spouse. We expect that the desired number of children correlates closely with preferences about options *A* and *B*.[20] We find that in 57% of the couples, the wife reports not knowing how many children her husband

[18]The question asked whether they thought that their spouse agreed with *couples in general* using contraceptives. In this way, we avoided that they had to think about their own relationship, which might bias reporting. Moreover, we did not ask directly about their beliefs about their spouse's preference over options *A* and *B* because this could either bias their decisions in the experiment if we elicited these beliefs *before* the decisions were made, or the beliefs themselves could be biased if we elicited them *after* the decisions were made.

[19]In Table 6, the "Wife's beliefs" indicator variable takes the value 0 either if the wife believes that the husband disapproves of contraceptives, or if she does not know. As a robustness test, we do the same analysis only with couples where the wife either believes that the husband approves or disapproves. As can be seen in Table A.9 in Appendix A, the results are robust.

[20]The main reason why we did not use beliefs about the desired number of children in the regression is that in 57% of the couples, the wife reported not knowing the husband's preferences, making it difficult to compare with the husband's reported number of children.

Table 6: The effect of involving the husband on the uptake of family planning services by the wife's beliefs about the husband's preferences

| | All | Wife FPS | Couple FPS |
|---|---|---|---|
| | (1) | (2) | (3) |
| JD | 0.235*** | 0.211*** | 0.260*** |
| | (0.069) | (0.076) | (0.067) |
| HD | 0.227*** | 0.225*** | 0.228*** |
| | (0.064) | (0.068) | (0.064) |
| Wife's beliefs | 0.197*** | 0.226*** | 0.168** |
| | (0.073) | (0.073) | (0.077) |
| JD X Beliefs | -0.216** | -0.227** | -0.204** |
| | (0.083) | (0.088) | (0.083) |
| HD X Beliefs | -0.167** | -0.192** | -0.142* |
| | (0.072) | (0.074) | (0.076) |
| Control mean[a] | 0.580 | 0.577 | 0.583 |
| Observations | 444 | 444 | 444 |
| $R^2$ | 0.254 | 0.249 | 0.246 |

*Notes:* The table reports OLS regressions with session fixed effects. Dependent variable: the proportion of decisions in which family planning services (FPS) are chosen. Independent variables: The treatment variables "JD" and "HD", and the control variables as defined in Table 2. "Wife's beliefs" is an indicator variable taking the value 1 if the wife believes that the husband approves of contraceptives, zero otherwise. "JD X Beliefs" is the interaction term between the treatment indicator variable Joint Decision and "Wife's beliefs". "HD X Beliefs" is the interaction term between the treatment indicator variable Husband Decision and "Wife's beliefs". Column (1) reports results for the proportion of decisions where FPS are chosen across all decisions, column (2) reports results for "Wife FPS" (where only the wife has to attend the family planning (FP) meeting), and column (3) reports results for "Couple FPS" (where both the wife and the husband have to attend the FP meeting). Standard errors clustered at the session level in parentheses. For the extended table, see Table B.5 in Appendix B. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

[a]: mean in Wife Decision (WD), when "Wife's beliefs" is equal to 0.

wants, and out of the couples where the wife does report how many children she thinks her husband wants, she overestimates the number in 43% of the couples. Moreover, among the couples where the wife makes an estimate on how many children her husband wants, there is a negative correlation between the number of children she believes her spouse wants and whether she believes her spouse approves of contraceptives (spearman's $\rho = -0.266$, $p = 0.001$). Both observations taken together suggest that women's beliefs about their spouse's approval of contraceptives are downward biased, as we assumed when interpreting the regression results above.

In sum, these observations together with the significant interaction terms in the regressions support that the positive effect of the husband's involvement is driven by women's inaccurate beliefs about their husband's preferences.

### 4.3 The wife's expected utility of $B$

Our model so far ignored any possible actions taken after the experiment. However, it might be that our participants anticipated any post-experimental actions when making their decisions in the lab. The third and last mechanism that we explore assumes that the wife's expected utility of option B, $Eu_w(B)$, might be lower in WD than in the other treatments because she anticipates post-experimental actions. Note that this is different from the previous mechanism where we assumed there was certainty about the utility of option B and uncertainty about the husband's preferences.[21]

Specifically, if option $B$ is chosen, it is possible that the husband does not allow their wife to attend the FP meeting or does not join their wife when this is a condition, i.e. with the couple FPS. In that case, they do not receive any payment, and option B becomes less attractive. The perceived likelihood that the conditionality is fulfilled is reduced in the WD treatment as women are often unable to make decisions on their own about their mobility or have limited access to resources. Note that these are typical measures of women's empowerment and bargaining power (Malapit et al., 2019; Bandiera et al., 2020).[22] For example, in our sample, only 10% of the women can decide alone whether to visit their family or friends. If women have limited mobility and access to resources, their expected utility of $B$ might be lower in WD, since they would have to negotiate with their husband to use household resources or leave the house to visit the local health center.

In our model, this would be captured as follows. Assume that the wife assigns probability $0 \leq p \leq 1$ that she attends the FP meeting and probability $(1-p)$ that she does not. Then, the expected utility from choosing option $B$, assuming that she obtains no utility if the conditionality is not fulfilled, is:

$$Eu_w(B) = pu_w(B) + (1-p)u_w(0) = pu_w(B)$$

This implies that a lower expectation that the conditionality is fulfilled leads to a lower likelihood that option $B$ is chosen. When the decision is made jointly in JD we assume that the likelihood that the conditionality is fulfilled, if $B$ is chosen, is higher than in WD. This is the case, as the husband would not choose option $B$ if he was unwilling to approve women's mobility or the use of household resources needed to visit the health center and thus fulfill the conditionality.

To obtain an idea of the expectation that the conditionality is fulfilled, we asked the participants how likely it was that they would attend a FP meeting if option $B$ was selected for payment. At

[21] This bears some resemblance to a potential "undoing problem", which complicates intra-household experiments (Munro, 2018). In many couple experiments there is a risk that decisions can be undone after the experiment. For example, a husband who disagrees with the decisions made by their wife can reallocate economic resources received in an experiment. That husbands can claim transfers from their wife is supported by Anderson and Baland (2002) who document how women use local saving groups to protect savings from their husband's claims. It is important to clarify that while the decisions made in our lab experiment cannot be undone, some actions taken after the experiment can change the utility of options A and B.

[22] Women's empowerment and bargaining power can be measured in several ways. The DHS typically focuses on household decision-making, including whether the woman can decide whether to visit family and friends. The Women's Empowerment in Agriculture Index (WEAI) is a standardized measure of women's empowerment that includes the productive sphere in agricultural settings. Access to resources is part of this index. For a review of measures of bargaining power and empowerment, see Doss (2013).

that point, participants had made all decisions but the selection of the decision was not made yet, hence the participants did not know yet whether they would need to attend a FP meeting to receive the payment. All participants who made a decision (i.e. women only in WD, men only in HD, and both spouses in JD) answered this question, even the ones who never chose option ***B***. Note that the plausible deniability mechanism we used made these participants face a non-zero chance that they would need to attend a FP meeting to receive the payment.

To elicit the individual expectation that the conditionality would be fulfilled, we asked whether it was "very unlikely", "unlikely", "neither unlikely nor likely", "likely", or "very likely" that (i) the wife and (ii) the husband would attend the FP meeting if option ***B*** was chosen for payment. In the following, we have converted these alternatives into a scale from 1 to 5, where 1 indicates "very unlikely" and 5 "very likely". The elicited beliefs are highly correlated with the choice of FPS (spearman's $\rho > 0.5$, $p < 0.001$ for both types of conditionalities).

In general, the expectation that the conditionality will be fulfilled is high with most respondents finding it likely or very likely that they will attend the FP meeting if option ***B*** was chosen for payment. Table 7 tests whether the expectations differ between WD and JD, and between HD and JD for women's and men's beliefs, respectively. First, we observe that the husband's beliefs do not vary between treatments. For the wife's beliefs, there is no difference in expectations when only she needs to attend the FP meeting ("Wife FPS"). If both the wife and the husband need to attend the FP meeting ("Couple FPS"), we find that the wife's expectations about the husband's attendance are significantly higher in JD than in WD ($p = 0.031$). This indicates that the uncertainty about fulfilling the conditionality of the "Couple FPS" is larger in WD than in JD. This might reduce the likelihood that the wife chooses FPS in WD compared to JD and HD. However, as there are no differences between treatments in expectations for "Wife FPS", it is unlikely that uncertainty about the attendance of the FP meeting can explain the full treatment effects.

The expected utility of option ***B*** may also be lower for women who suffer from intimate partner violence (IPV), especially if they believe that there is a chance that the husband may become violent if she committed herself to visit the health center (by choosing option B) without consulting him. Table A.10 in Appendix A shows that being subjected to IPV does not affect the treatment differences.

## 5. Attendance of FP meeting and contraceptive use

In this section, we extend the analysis by looking at behavior *after* the decisions are made in the lab. Specifically, we test i) whether the FP meeting is attended and whether contraceptives are chosen at the FP meeting if option ***B*** is chosen for payment and ii) whether the uptake of contraceptives is higher if option ***B*** is chosen. For these analyses, we use data collected by the nurse at the health center and data reported by the participants when they received the payments.

Table 7: Effect of making a joint decision on beliefs about attending family planning meetings

| | **Panel A: W's beliefs about attending FPS** | | | |
|---|---|---|---|---|
| | Wife FPS | | Couple FPS | |
| | (1) W attend | (2) H attend | (3) W attend | (4) H attend |
| JD | 0.230 | -0.026 | 0.456 | 0.510** |
| | (0.223) | (0.245) | (0.290) | (0.230) |
| Control mean[a] | 4.249 | 2.364 | 4.073 | 3.948 |
| Observations | 287 | 287 | 235 | 286 |
| $R^2$ | 0.318 | 0.258 | 0.326 | 0.287 |
| | **Panel B: H's beliefs about attending FPS** | | | |
| | Wife FPS | | Couple FPS | |
| | (1) W attend | (2) H attend | (3) W attend | (4) H attend |
| JD | -0.245 | -0.281 | -0.074 | -0.170 |
| | (0.154) | (0.288) | (0.145) | (0.165) |
| Control mean[a] | 4.443 | 2.891 | 4.680 | 4.682 |
| Observations | 291 | 290 | 288 | 291 |
| $R^2$ | 0.259 | 0.229 | 0.255 | 0.244 |

*Notes:* The table reports OLS regressions with session fixed effects. Dependent variable: the reported belief on a scale from 1 to 5 about whether the wife or the husband will attend the family planning (FP) meeting if option ***B*** is chosen for payment for "Wife FPS" (where only the wife has to attend the FP meeting, columns (1)-(2)) and "Couple FPS" (where both the wife and the husband have to attend the FP meeting, columns (3)-(4)). Panel A shows the wife's beliefs with Wife Decision (WD) as base treatment, and Panel B shows the husband's beliefs with Husband Decision (HD) as base treatment. Independent variables: The treatment variable "JD" and the control variables as defined in Table 2. Standard errors clustered at the session level in parentheses. For the extended table, see Table B.6 in Appendix B. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. In column (3) in Panel A there is a drop in observations caused by a misunderstanding of one of the enumerators who interpreted the question as if the wife would attend the FP meeting *without* her husband.
[a]: mean in Wife Decision (WD) in Panel A and Husband Decision (HD) in Panel B.

### 5.1 The FP meeting

In this section, we look at the treatment effects on i) the attendance of the FP meeting, conditional on option ***B*** being chosen for payment and on ii) contraceptive use conditional on attending the FP meeting. This analysis tells us whether the husband's involvement matters for the fulfillment of the condition of option ***B*** and whether the husband's involvement or presence at the FP meeting affects the uptake of contraceptives.

Overall, 82% of the couples comply with the conditions. Slightly more couples comply with the "Wife FPS" condition than with the "Couple FPS" condition (86% vs 79%, two-sided t-test $p = 0.082$). The first two rows of Table 8 compare these proportions by treatment. In these two rows, the sample sizes are the number of couples in each treatment where option ***B*** was chosen for payment. Involving the husband in the lab increases the likelihood that a FP meeting is attended (especially in JD) for both "Wife FPS" and "Couple FPS". This result is in line with the wife's expectations about the attendance of the FP meeting (see section 4.3): it is more likely that the

FP meeting is attended if the decision in the lab is made jointly than if the decision is made by the wife alone.

Table 8: Use of family planning services and uptake of contraceptives

| | All | | WD | | JD | | HD | | WD vs JD | WD vs HD | JD vs HD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | % | N | % | N | % | N | % | N | p-value | p-value | p-value |
| Wife FPS, attended FP meeting | 86.0 | 157 | 80.8 | 52 | 95.5 | 44 | 83.6 | 61 | 0.030 | 0.697 | 0.061 |
| Couple FPS, attended FP meeting | 79.0 | 229 | 73.4 | 64 | 85.4 | 89 | 76.3 | 76 | 0.067 | 0.698 | 0.138 |
| Wife FPS, modern contraceptives | 71.2 | 125 | 70.7 | 41 | 75.7 | 37 | 68.1 | 47 | 0.628 | 0.791 | 0.451 |
| Couple FPS, modern contraceptives | 69.1 | 181 | 67.3 | 52 | 70.8 | 72 | 68.4 | 57 | 0.677 | 0.902 | 0.769 |
| Wife FPS, LARC | 12.8 | 125 | 9.8 | 41 | 16.2 | 37 | 12.8 | 47 | 0.401 | 0.662 | 0.658 |
| Couple FPS, LARC | 20.4 | 181 | 25.0 | 52 | 22.2 | 72 | 14.0 | 57 | 0.721 | 0.150 | 0.239 |

*Note:* The table reports the means for attending a family planning (FP) meeting if option ***B*** was chosen for payment, receiving modern contraceptives at the FP meeting and receiving long-term contraceptives at the FP meeting in each treatment (columns (1)-(3)) and reports the p-value for two-sided t-tests of whether the means are different across treatments (columns (4)-(6)). The two first rows include all couples for which option ***B*** was chosen for payment, while uptake of contraceptives only includes couples who attended a FP meeting. "LARC" is an abbreviation for "long-acting reversible contraceptives".

Next, we investigate what happens once the wife or the couple are at the FP meeting. 70% of the wives that attended a FP meeting received modern contraceptives. The presence of the husband at the FP meeting does not affect the uptake of contraceptives (no difference between "Couple FPS" and "Wife FPS", two-sided t-test $p = 0.690$). As can be seen from the third and fourth rows of Table 8, the use of contraceptives does also not vary across the between-subject treatments. The husband does not seem to have an influence on the use of contraceptives, once they attend the FP meeting.

Different types of contraceptives can be received at the FP meeting. To ensure continuity, the use of a LARC (implants or IUDs) is important. 17% of the women attending a FP meeting received a LARC. As can be seen from the two last rows in Table 8, the uptake of LARC does not depend on whether the husband is involved in the decision in the lab, but it does depend on whether the husband attended the FP meeting (12.8% with "Wife FPS" and 20.4% with "Couple FPS", two-sample, two-sided t-test $p = 0.083$).

In sum, once option ***B*** is chosen for payment, most couples attend a FP meeting. Once at the meeting, most couples receive contraceptives, and a non-negligible fraction of them receive LARC. These findings can also be interpreted as evidence against a potential social desirability bias that might confound the treatment effects. It is plausible that the participants wanted to appear more in favor of using FPS than they actually are in order to "please" our research team, if they assumed that we care about contraceptive use (remember that their decisions were recorded by one of the enumerators). Such bias might increase the overall proportion of decisions where FPS are chosen, and confound the treatment differences if this bias is stronger among the husbands than among the wives in our sample.

The husbands who choose FPS only to please us would then try to make sure that their choice does not translate into reduced fertility. They could do so by i) not attending a FP meeting, ii) not accepting any contraceptives at the meeting, or iii) only accepting short-term contraceptives

at the meeting. As we have seen, the involvement of the husband does not reduce the likelihood of a FP meeting being attended or the uptake of contraceptives. We take this as evidence against a social desirability bias that might affect our results.[23]

### 5.2 The effect of the choice of FPS on contraceptive use

We observed that a large proportion of the couples for which option *B* was chosen for payment attended a FP meeting, and once at the FP meeting a large proportion chose contraceptives. It is interesting to test whether having to attend a FP meeting to receive the payment translates into an increase in contraceptive use. Note that the couples for which option *A* was chosen could still have taken up contraceptives outside the experiment. To test this, we need to deal with potential endogeneity that might bias the estimate of the effect of FPS services. To do so, we exploit the random assignment to treatments and the finding that the involvement of the husband increased the uptake of FPS. This allows us to use the treatment assignment as an instrumental variable for the choice of FPS.

Table 9: Contraceptive use after the experiment

| | Exogenous | | | IV | | |
|---|---|---|---|---|---|---|
| | (1) All | (2) Wife FPS | (3) Couple FPS | (4) All | (5) Wife FPS | (6) Couple FPS |
| Choose FPS | 0.627*** | 0.652*** | 0.610*** | 0.401*** | 0.453*** | 0.477*** |
| | (0.057) | (0.073) | (0.062) | (0.146) | (0.152) | (0.182) |
| Observations | 404 | 220 | 283 | 404 | 220 | 283 |
| | | | | Treatment selection | | |
| | (1) All | (2) Wife FPS | (3) Couple FPS | (4) All | (5) Wife FPS | (6) Couple FPS |
| Choose FPS | | | | | | |
| JD | | | | 0.523*** | 0.104 | 0.718*** |
| | | | | (0.196) | (0.261) | (0.235) |
| HD | | | | 0.650*** | 0.797*** | 0.632*** |
| | | | | (0.185) | (0.276) | (0.202) |
| Observations | 404 | 220 | 283 | 404 | 220 | 283 |

*Note:* Columns (1)-(3) report OLS regressions with hamlet fixed effects. Dependent variable: the proportion of women using contraceptives after the experiment. Independent variables: whether the participants had to attend a family planning (FP) meeting to receive payment, and the set of controls as defined in Table 2. Columns (4)-(6) report extended linear regressions where the treatments ("JD" and "HD" (as defined in Table 2)) are used as instruments for family planning services (FPS), implemented in STATA with the "eregress" command. The two-sided p-value of a joint hypothesis test on the coefficients of both instrumental variables being zero is 0.0010 ($\chi^2 = 13.79$) in column (4), 0.0082 ($\chi^2 = 9.60$) in column (5) and 0.0005 ($\chi^2 = 15.18$) in column (6). Standard errors clustered at the hamlet level in parentheses. For the extended table, see Table B.7 in Appendix B. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

To test whether the uptake of contraceptives is influenced by the selection of FPS, we regress

[23]For women, it is difficult to disentangle social desirability bias from the effect of low mobility and control over resources. However, we can compare the reports of women and nurses on the uptake of contraceptives at the FP meeting. If women report a higher uptake of contraceptives than nurses, this can be an indication of a social desirability bias. Among the couples who attended the family planning meeting, 79% of the women reported that they received contraceptives, which is very close to the 78% as reported by the nurses (spearman's $\rho = 0.94$, $p < 0.001$).

contraceptive use - as reported on the payment date - on the selection of FPS.[24] Table 9 displays the results. In columns (1)-(3) the selection of FPS is treated as exogenous. To deal with potential endogeneity, in columns (4)-(6) we instrument the selection of FPS by the experimental treatments. As shown by the first stage, the choice of FPS is higher when the husband is involved (i.e. in both JD and HD) with the exception of "JD" when the condition is "Wife FPS" (see column (5)).[25]

Table 9 shows that the choice of FPS increases contraceptive use significantly. When treating FPS as exogenous, the likelihood that contraceptives are chosen increases by around 60 percentage points if option *B* is chosen for payment. The size of this effect is around 20 percentage points smaller when taking into account potential endogeneity bias.

## 6. Discussion and conclusion

In this paper, we report the results of an experiment in which couples can choose a payment conditional on receiving FPS at a local health facility. We find that involving the husband increases the likelihood that couples choose FPS. Most couples that need to attend FPS to receive a payment, visit the health center; and once there, most of them choose to continue or start to use contraceptives. In sum, our study demonstrates that the husband has a very strong influence in the first stage of the decision-making process, which is essential for the uptake of FPS and modern contraceptives.

Using a household model that assumes complete information about spousal preferences and complete certainty about the fulfillment of the conditionality, our finding that the husband's involvement increases the likelihood that FPS are chosen, can only be explained if men have stronger preferences for FPS than women. We do not find evidence for this assumption. In a next step, we extend our theoretical model and test two alternative mechanisms that could explain the positive effect of the husband's involvement. First, we show theoretically that inaccurate beliefs about spousal preferences can explain the observed treatment effects. We find strong evidence in support of this mechanism: the positive effect of involving the husband is driven by couples where the wife believes that the husband does not approve of contraceptives. Second, we consider the role of the wife's expectations concerning the likelihood that a FP meeting is attended. We find some support for this mechanism: the expectation that the "Couple FPS" payment condition is fulfilled is larger when the husband is involved in the decisions in the lab.

Our results are in line with several qualitative and observational studies that describe how the non-involvement of husbands and the lack of communication between spouses can create substantial

[24] A few participants were not interviewed when we visited them to give their payment. This was the case where the option chosen gave a zero payment to both the wife and the husband (2.9% of the couples). Despite this, one of these women still attended the payment session, even though no payment was given. The rest are excluded from the analysis. In addition, 14% of the remaining couples did not show up to receive payment. Of these, 10 women had attended the FP meeting and we therefore use the report from the nurse. The remaining couples are excluded from the analysis, implying that about 10% are excluded from this analysis.

[25] Note that the use of the plausible deniability mechanism might have decoupled for some participants the link between the treatments and the final selection of the payment, which might have weakened the treatment effects in the first stage.

barriers for the uptake of contraceptives (see, e.g., Lasee and Becker (1997), Sharan and Valente (2002), Shattuck et al. (2011), Hartmann et al. (2012), Mosha, Ruben and Kakoko (2013), and Amo-Adjei et al. (2017)). Lasee and Becker (1997) show, using DHS data from Kenya, that the wife's beliefs about whether the husband approves of family planning and communication between spouses are highly correlated with contraceptive use, and that the wife's beliefs about the husband's preferences are more likely to be correct if the couple discusses family planning. Our analysis confirms that initiating communication among spouses is a sufficient condition to increase the likelihood that FPS are chosen (JD forces the couples to communicate). In sum, our study has not only provided experimental evidence that supports the policy advice from these studies to stimulate communication among spouses. It has also generated new insights into *why* and *when* it could increase the uptake of contraceptives. In particular, we demonstrated that the effect of a lack of communication or the non-involvement of the husband risks creating inaccurate beliefs about spousal preferences, which could make women reluctant to use FPS. It is also clear from our analysis that a policy that stimulates communication among spouses would only be effective where spouses do not have substantially different preferences about FPS.

Our study also complements the insights generated by other experimental studies on the husband's involvement. Ashraf, Field and Lee (2014) demonstrated that bypassing the husband could increase women's uptake of contraceptives where men want more children and have higher bargaining power than women. However, this might lower women's subjective well-being, due to increased spousal dissatisfaction. In a more recent study, Ashraf et al. (2020) showed that increasing the husband's knowledge about maternal health costs reduces pregnancy rates without affecting spousal satisfaction. Treating husbands not only lowers their desired fertility; it also leads to more frequent communication about family planning, and higher marital satisfaction. They also find that husbands have more accurate beliefs about their wife's fertility preferences. McCarthy (2019) found that the husband's involvement reduces pregnancy rates, but not where there is recent IPV. We do not investigate the effect of the husband's involvement on knowledge or spousal satisfaction. Further, in contrast with McCarthy (2019), we do not find that the husband's involvement interacts with IPV. Our results demonstrate that the husband's involvement has the potential to increase the uptake of contraceptives, by correcting women's beliefs about their husband's fertility preferences.

More broadly, our findings indicate that where information about spousal preferences is incomplete, existing household models should incorporate individual *beliefs* about spousal preferences as an additional parameter. This increases the complexity of household models, and broadens the set of potential effects of the involvement of the husband. It also opens the door to potential efficiency losses when decisions are made individually. In our setting, characterized by large gender inequality and inaccurate beliefs about spousal preferences, this translates in a positive effect of the husband's involvement on the uptake of the opportunities offered. Our results suggest that reaching out to women might be less effective if the husband is not involved. In particular, there is a considerable risk that opportunities offered to women remain then underutilized.

The results presented in this paper point to several avenues for future research. First, we

need more theoretical and empirical research on the role of incomplete information in household bargaining to achieve a better understanding of household decision-making. Why is there incomplete information in the household and how can this be modeled theoretically? In what domains do we observe incomplete information between spouses? Second, further research on intra-household communication about fertility preferences is necessary to increase our understanding of intra-household decision-making and its effect on contraceptive use. For example, more evidence is needed on the conditions under which such communication takes place and could be facilitated. Finally, it is likely that communication influences efficiency in household decision-making in other domains as well where spouses potentially (think they) disagree. While we focused on contraceptives on which we know there tends to be little discussion among spouses in patriarchal societies in low-income countries, similar questions can be asked about other domains where there is little communication among spouses.

## References

**Afzal, Uzma, Giovanna D'Adda, Marcel Fafchamps, and Farah Said.** 2018. "Intrahousehold Consumption Allocation and Demand for Agency: A Triple Experimental Investigation." National Bureau of Economic Research, NBER Working Paper Series 24977.

**Amo-Adjei, Joshua, Michael Mutua, Sherine Athero, Chimaraoke Izugbara, and Alex Ezeh.** 2017. "Improving Family Planning Services Delivery and Uptake: Experiences from the "Reversing the Stall in Fertility Decline in Western Kenya Project"." *BMC Research Notes*, 10(1): 498.

**Anderson, Siwan, and Jean Marie Baland.** 2002. "The Economics of Roscas and Intrahousehold Resource Allocation." *The Quarterly Journal of Economics*, 117(3): 963–995.

**Ashraf, Nava.** 2009. "Spousal Control and Intra-household Decision Making: An Experimental Study in the Philippines." *American Economic Review*, 99(4): 1245–1277.

**Ashraf, Nava, Dean Karlan, and Wesley Yin.** 2006. "Tying Odysseus to the Mast: Evidence From a Commitment Savings Product in the Philippines." *Quarterly Journal of Economics*, 121(2): 635–672.

**Ashraf, Nava, Erica Field, Alessandra Voena, and Roberta Ziparo.** 2020. "Maternal Mortality Risk and Spousal Differences in the Demand for Children." National Bureau of Economic Research, NBER Working Paper Series 28220.

**Ashraf, Nava, Erica Field, and Jean Lee.** 2014. "Household Bargaining and Excess Fertility: An Experimental Study in Zambia." *American Economic Review*, 104(7): 2210–2237.

**Bandiera, Oriana, Niklas Buehren, Robin Burgess, Markus Goldstein, Selim Gulesci, Imran Rasul, and Munshi Sulaiman.** 2020. "Women's Empowerment in Action: Evidence from a Randomized Control Trial in Africa." *American Economic Journal: Applied Economics*, 12(1): 210–59.

**Bateman, Ian, and Alistair Munro.** 2005. "An Experiment on Risky Choices Amongst Households." *The Economic Journal*, 115(502): 176–189.

**Blundell, Richard, Pierre-André Chiappori, and Costas Meghir.** 2005. "Collective Labor Supply With Children." *Journal of Political Economy*, 113(6): 1277–1306.

**Browning, Martin, Pierre-André Chiappori, and Yoram Weiss.** 2014. *Economics of the Family*. New York: Cambridge University Press.

**Canning, David, and T. Paul Schultz.** 2012. "The Economic Consequences of Reproductive Health and Family Planning." *The Lancet*, 380(9837): 165–171.

**Castilla, Carolina, and Thomas Walker.** 2013. "Is Ignorance Bliss? The Effect of Asymmetric Information between Spouses on Intra-Household Allocations." *American Economic Review*, 103(3): 263–268.

**Chiappori, Pierre-Andre.** 1988. "Rational Household Labor Supply." *Econometrica*, 56(1): 63–90.

**Chiappori, Pierre-André.** 1992. "Collective Labor Supply and Welfare." *Journal of Political Economy*, 100(3): 437–467.

**Doepke, Matthias, and Fabian Kindermann.** 2019. "Bargaining Over Babies: Theory, Evidence, and Policy Implications." *American Economic Review*, 109(9): 3264–3306.

**Doepke, Matthias, and Michèle Tertilt.** 2018. "Women's Empowerment, the Gender Gap in Desired Fertility, and Fertility Outcomes in Developing Countries." *AEA Papers and Proceedings*, 108: 358–362.

**Doss, Cheryl.** 2013. "Intrahousehold Bargaining and Resource Allocation in Developing Countries." *World Bank Research Observer*, 28(1): 52–78.

**Fisek, Nusret H, and K Sumbuloglu.** 1978. "The Effects of Husband and Wife Education on Family Planning in Rural Turkey." *Studies in Family Planning*, 9(10/11): 280–285.

**FP2020.** 2018. "FP2020 The Arc of Progress." FP2020.

**Hartmann, Miriam, Kate Gilles, Dominick Shattuck, Brad Kerner, and Greg Guest.** 2012. "Changes in Couples' Communication as a Result of a Male-Involvement Family Planning Intervention." *Journal of Health Communication*, 17(7): 802–819.

**Hener, Timo.** 2015. "Do Couples Bargain over Fertility?" *Annals of Economics and Statistics*, 117/118: 211–231.

**Hoel, Jessica B.** 2015. "Heterogeneous Households: A Within-Subject Test of Asymmetric Information Between Spouses in Kenya." *Journal of Economic Behavior & Organization*, 118: 123–135.

**Izugbara, Chimaraoke, Frederick Wekesah, Joshua Amo-Adjei, and Zacharie Tsala Dimbuene.** 2018. "Family Planning in East Africa: Trends and Dynamics." African Population and Health Research Center, Nairobi, Kenya.

**Jakiela, Pamela, and Owen Ozier.** 2016. "Does Africa Need a Rotten Kin Theorem? Experimental Evidence from Village Economies." *Review of Economic Studies*, 83(1): 231–268.

**Kim, Younoh, and Vlad Radoias.** 2014. "Intra Marriage Bargaining Power and Fertility Decisions for Women in Developing Countries." Towson University, Department of Economics 2014-06.

**Klawon, Emily, and Jill Tiefenthaler.** 2001. "Bargaining Over Family Size: The Determinants of Fertility in Brazil." *Population Research and Policy Review*, 20(5): 423–440.

**Lasee, Ashraf, and Stan Becker.** 1997. "Husband-Wife Communication About Family Planning and Contraceptive Use in Kenya." *International Family Planning Perspectives*, 23(1): 15–33.

**Malapit, Hazel Jean L., Esha Sraboni, Agnes R. Quisumbing, and Akhter U. Ahmed.** 2019. "Intrahousehold Empowerment Gaps in Agriculture and Children's Well-being in Bangladesh." *Development Policy Review*, 37(2): 176–203.

**McCarthy, Aine Seitz.** 2019. "Intimate Partner Violence and Family Planning Decisions: Experimental Evidence from Rural Tanzania." *World Development*, 114: 156–174.

**Miller, Grant, Aureo de Paula, and Christine Valente.** 2020. "Subjective Expectations and Demand for Contraception." National Bureau of Economic Research, NBER Working Paper Series 27271.

**Mosha, Idda, Ruerd Ruben, and Deodatus Kakoko.** 2013. "Family Planning Decisions, Perceptions and Gender Dynamics Among Couples in Mwanza, Tanzania: A Qualitative Study." *BMC Public Health*, 13(523).

**Munro, Alistair.** 2018. "Intra-household Experiments: A Survey." *Journal of Economic Surveys*, 32(1): 134–175.

**Munro, Alistair, Bereket Kebede, Marcela Tarazona-Gomez, and Arjan Verschoor.** 2014. "Autonomy and Efficiency. An Experiment on Household Decisions in Two Regions of India." *Journal of the Japanese and International Economies*, 33: 114–133.

**Rasul, Imran.** 2008. "Household Bargaining over Fertility: Theory and Evidence from Malaysia." *Journal of Development Economics*, 86(2): 215–241.

**Rutstein, S. O.** 2005. "Effects of Preceding Birth Intervals on Neonatal, Infant and Under-Five Years Mortality and Nutritional Status in Developing Countries: Evidence from the Demographic and Health Surveys." *International Journal of Gynecology and Obstetrics*, 89(SUPPL. 1): S7–S24.

**Sharan, Mona, and Thomas W Valente.** 2002. "Spousal Communication and Family Planning Adoption: Effects of a Radio Drama Serial in Nepal." *International Family Planning Perspectives*, 28(1): 16–25.

**Shattuck, Dominick, Brad Kerner, Kate Gilles, Miriam Hartmann, Thokozani Ng'ombe, and Greg Guest.** 2011. "Encouraging Contraceptive Uptake by Motivating Men to Communicate About Family Planning: The Malawi Male Motivator Project." *American Journal of Public Health*, 101(6): 1089–1095.

**Terefe, Almaz, and Charles P Larson.** 1992. "Modern Contraception Use in Ethiopia: Does Involving Husbands Make a Difference?" *American Journal of Public Health*, 83(11): 1567–1571.

**TNBS.** 2015. "2012 Population and housing census." Tanzania National Bureau of Statistics, Dar es Salaam, Tanzania.

**TNBS and ICF Macro.** 2016. "Tanzania Demographic and Health Survey and Malaria Indicator Survey 2015-2016." Dar es Salaam: Tanzania National Bureau of Statistics and ICF Macro.

**UN DESA.** 2015. "Trends in Contraceptive Use Worldwide 2015." *United Nations Department of Economic and Social Affairs.*

**UNFPA.** 2010. "How Universal is Access to Reproductive Health? A Review of the Evidence." UNFPA.

**United Republic of Tanzania.** 2016. "The National Road Map Strategic Plan to Improve Reproductive, Maternal, Newborn, Child & Adolescent Health in Tanzania (2016-2020)." *Ministry of health, community development, gender, elderly and children.*

**USAID.** 2018. "Family Planning and Reproductive Health Tanzania." *https://www.usaid.gov/sites/default/files/documents/1860/Family_Planning_Fact_Sheet_AUG_2018.pdf.*

**Wang, Caroline C, Eric Vittinghoff, Li Hua, Wah Yun, and Zhou M Rong.** 1998. "Reducing Pregnancy and Induced Abortion Rates in China: Family Planning With Husband Participation." *American Journal of Public Health*, 88(4): 646–648.

**World Bank.** 2012. "World Development Report 2012 : Gender Equality and Development." *https://openknowledge.worldbank.org/handle/10986/4391.*

**World Health Organization.** 2018. "Unmet Need for Family Planning." *http://www.who.int/reproductivehealth/topics/family_planning/unmet_need_fp/en/.*

**Zimmerman, Linnea A., Dana O. Sarnak, Celia Karp, Shannon N. Wood, Caroline Moreau, Simon P.S. Kibira, and Fredrick Makumbi.** 2021. "Family Planning Beliefs and Their Association with Contraceptive Use Dynamics: Results from a Longitudinal Study in Uganda." *Studies in Family Planning*, Forthcoming.

**Highlights**

- Men can both promote and inhibit the uptake of family planning services
- We test this in a lab experiment, experimentally varying the husband's involvement
- Involving the husband increases the uptake of family planning services
- Effect is driven by couples where the wife believes (incorrectly) that the husband disapproves of contraceptives

**Author statement**

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