Cash transfers, polygamy, and intimate partner violence: Experimental evidence from Mali[1]

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Abstract: Cash transfer programs primarily targeting women in Latin America and East Africa have reduced intimate partner violence (IPV), but knowledge gaps remain on how impacts differ by program features and context. Using a randomized control trial, we investigate the IPV impacts of Mali's national cash transfer program (Jigisémèjiri), which primarily targets men in a West African context where nearly 40 percent of households are polygamous. The program causes significant decreases in IPV in polygamous households – where physical violence decreases by 7 percentage points, emotional violence decreases by 12 percentage points, and controlling behaviors decrease by 16 percentage points -- but has limited effects in non-polygamous households. Evidence on mechanisms suggests that improvements in household well-being decrease men's stress and anxiety, leading to larger reductions in disputes in polygamous households. Results suggest that transfer programs can reduce IPV even when women are not directly targeted, but effects depend on household structure.

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1. Introduction

Recent multi-country studies show that intimate partner violence (IPV) is widespread and common around the world (Devries et al. 2013; WHO 2013). The consequences of IPV are extensive and include the direct physical and mental harm of women that hinders their ability to reach their full potential (Mary Ellsberg et al. 2008; Kapiga et al. 2017). While these consequences are well documented, there is less evidence on policies and programs that are effective in reducing IPV in the developing world.

Emerging evidence from recent studies shows that several cash transfer programs decreased physical IPV by 5-11 percentage points, on average, although some subgroups of women were found at risk for an increase in violence (Angelucci 2008; Bobonis, González-Brenes, and Castro 2013; Hidrobo and Fernald 2013; Hidrobo, Peterman, and Heise 2016; Haushofer and Shapiro 2016; Perova and Vakis 2013; Roy et al. 2017). Given that cash transfer programs are currently implemented in over 130 countries, reaching approximately 718 million people globally, they represents a promising policy approach to reducing IPV worldwide (Buller et al. 2018). However, the existing evidence focuses on cash transfers to women and is drawn largely from Latin America and East Africa, leaving knowledge gaps on how impacts on IPV differ by program features and context. Of particular relevance to West Africa, where transfer programs are growing quickly, little is known about cash transfers targeted to household heads (a common design feature throughout Africa), particularly in environments with diverse household structures such as polygamy (which is widespread in West Africa).

Whether the impacts of cash transfers on IPV differ by targeting and household structure depends on the pathways through which reductions occur. A recent mixed-methods review of cash transfers and IPV (Buller et al. 2016) identifies three pathways supported by the literature– i) improved economic security of the household and emotional wellbeing of its members; ii) reduced intrahousehold conflict between men and women; and iii) increased women's empowerment. The first relates to an emerging literature on the psychology of poverty, showing that poverty affects individuals' mental health and cognitive function (Mani et al. 2013; Haushofer and Fehr 2014), increasing stress and negative affective states that are risk factors for men perpetrating IPV. Thus, cash transfers may decrease IPV by reducing poverty, thereby reducing stress and improving the emotional well-being of household members including men. The second pathway focuses specifically on conflict that arises from stretched resources and tight budgets. Cash transfers may decrease IPV by reducing arguments over spending money, such as arguments that arise from women having to ask for money for daily needs when men do not have enough to give. Cash transfers targeted to women could reduce women's need to ask for money, while cash transfers targeted to men could increase men's ability to provide it without conflict. Lastly, cash transfers that are targeted to women may decrease IPV by increasing women's bargaining power. Economic models of this last pathway are based on non-cooperative bargaining models where individuals' bargaining power depends on their threat point or out-of-marriage options (Farmer and Tiefenthaler 1997; Tauchen, Witte, and Long 1991). If cash transfers are targeted to women and remain in their control, the transfers increase women's income and thus their threat points, improving their bargaining power in the relationship to reduce IPV.

Not all of these pathways are likely to generalize across targeting criteria and household structure. Of the pathways described above, the third is unlikely to occur when cash transfers are targeted to men. Moreover, transfers targeted to men could increase men's bargaining position relative to women's, potentially leading to increases in IPV. This leaves an empirical question of whether the first two

pathways alone can lead to reductions in IPV. In addition, household structure, and in particular polygamy, could affect how the pathways play out (Mccloskey, Williams, and Larsen, n.d.; Barr et al. 2017). The effects of cash on IPV could differ if stress or conflict are higher (or lower) in polygamous households, or if intrahousehold dynamics differ such that the inflow of new resources leads to more (or less) conflict. If men have multiple wives with different status, the pathways may play out differently for each of them.

We contribute evidence to these knowledge gaps by investigating the impacts on IPV of the national cash transfer program in Mali, *Jigisémèjiri*. The *Jigisémèjiri* program targets household heads -- who are primarily men -- in a context where nearly 40% of households are polygamous. Using a randomized control trial, we analyze impacts disaggregated by polygamy and, within polygamous households, by rank of wife, to test whether household structure affects the impacts of cash transfers. We collect detailed data on men's emotional well-being, relationship dynamics, and women's bargaining power, in order to shed light on potential mechanisms.

We find that, on average, there are small reductions in IPV from the Mali cash transfer program ranging from 3 percentage points (non-significant) for physical violence to 6 percentage points (significant) for emotional violence and controlling behaviors. This small average effect masks large statistically significant reductions in violence in polygamous households. For these households, the prevalence of physical violence decreases by 7 percentage points, emotional violence by 12 percentage points, and controlling behaviors by 16 percentage points. These reductions in violence are particularly strong among second (and later) wives, who face the highest rates of violence in the absence of the program. Consistent with these results, analysis of mechanisms reveals that the cash transfer program led to significant reductions in men's stress and anxiety, and larger reductions in reported disputes among polygamous households compared to non-polygamous households. We find no evidence that *Jigisémèjiri* increased female bargaining power across domains related to labor and mobility, which is not surprising given the targeting of primarily male household heads as the main beneficiary.

We then explore why there are differences in impacts between polygamous and non-polygamous households. Polygamous households in the control group face higher rates of violence than non-polygamous households, and this higher baseline is one possible contributing factor for the higher reductions in violence in polygamous households. While observable characteristics of polygamous households explain the increased rates of physical violence, the differences in emotional violence and controlling behavior persist after controlling for observables. Similarly, interactions between treatment and these observables characteristics explain the treatment effect of the Jigisémèjiri program on physical violence but not the treatment effects on controlling behavior and emotional violence. While we cannot conclusively determine the reason why Jigisémèjiri has larger effects on emotional violence in controlling behavior in polygamous households even after accounting for observable differences, the pattern is consistent with differences in distribution of or communication regarding transfers in polygamous households – possibly owing to lower cooperation – leading to differences in pathways for IPV impacts; or lower initial conditions of polygamous households in terms of IPV, men's emotional well-being, and disputes leading to greater potential for impact than in non-polygamous households.

The remainder of the paper is organized as follows. We begin by outlining our study context and the intervention that we assess in Section 2. We then describe the data available to us in Section 3 and our estimation strategy in Section 4. Section 5 presents our main results, while in Section 6 we explore

plausible mechanisms that underlie these. Section 7 discusses possible explanations for our findings in polygamous households, and Section 8 concludes.

2. Study background

a. Study context

i. Gender and polygamy in Mali

Gender inequality in Mali is high. As of 2014, Mali was categorized as having "very high" levels of gender discrimination in social institutions and ranked as the fourth most unequal among 108 ranked countries (Social Institutions & Gender Index 2014). According to the Malian National Assembly's Family Code passed in 2011, men are considered "head of the household," with sole family and parental authority, and women are legally required to obey their husbands (OECD Development Centre, n.d.). Reports of IPV in Mali are also high, with nearly four in ten women age 15-49 having experienced physical violence from partners in their lifetimes and about a quarter of women experiencing physical violence in the last 12 months (CPS et al. 2012).

Polygamy is legal both under Mali's Marriage Code and under Islam, the predominant religion in the country (OECD Development Centre, n.d.). Men are permitted to marry up to four women. In the 2012 Demographic and Health Survey (DHS), about 35% of women aged 15-49 in Mali were in a polygamous union, and 19% of men aged 15-49 had at least two wives; half of married women age 45-49 were in a polygamous marriage (CPS et al. 2012). Marriages in Mali can be civil or religious. In case of civil marriage – which is rare in rural areas – the marriage is recorded as either monogamous or polygamous on the marriage certificate; if recorded as monogamous, the husband may not marry another woman if the first marriage has not been dissolved or without the wife's consent to change the marriage from monogamous to polygamous. In religious marriages, the only condition concerning the number of spouses is that the husband must be able to support the needs of any additional wife – although anecdotally men are typically not prevented from taking additional wives due to insufficient means (Canada: Immigration and Refugee Board of Canada 2014). According to the 2012 DHS (CPS et al. 2012), polygamy is significantly more common in rural areas and is highest in the region of Sikasso (where 44% of women are polygamous). Polygamy is also more common among women with low educational attainment (38% polygamous among women with no education). Although the top quintile of households in terms of wealth has the lowest rate of polygamous marriage (23% of women), there is no clear association between polygamy and wealth in the bottom four quintiles (with the highest proportion of women in polygamous marriages, 41%, in the middle quintile).

ii. Relationship between polygamy, IPV, and intrahousehold dynamics in Sub-Saharan Africa

Evidence from diverse contexts in Sub-Saharan Africa – including Mali – shows positive associations between polygamous marriage and prevalence of IPV (Bove and Valeggia 2009; Jewkes, Levin, and Penn-Kekana 2002; Karamagi et al. 2006; Abramsky et al. 2011; González-Brenes 2004; Kimuna and Djamba 2008; Hayes and van Baak 2017; McCloskey, Williams, and Larsen 2005; Behrman 2018). Studies largely do not distinguish if this association is causal or driven by characteristics associated with both IPV and

polygamy – for example, rural residence, women's low educational attainment, larger age gap between spouses, or attitudes toward IPV (Bove and Valeggia 2009; Gibson and Mace 2007; Rani, Bonu, and Diop-Sidibe 2004). However, Behrman (2018) shows that polygamy in Nigeria remains associated with higher prevalence of physical, sexual, and emotional IPV even after controlling for observable characteristics. [3]

Some studies also suggest that interactions between household members are generally poorer in polygamous households. Barr et al. (2017) find that, in experimental games in Nigeria, cooperation and altruism are lower amongst members of polygamous households than monogamous households.[4] Bove and Valeggia (2009) find, across Sub-Saharan Africa, less spousal communication and weaker emotional ties in polygamous marriages. Bove, Vala-Haynes, and Valeggia (2014) further find, in rural Mali, that dynamics between spouses differ for senior wives and junior wives – in particular, a weaker emotional bond with wives inherited through the levirate, the tradition of a widow marrying her dead husband's brother, more likely to be the case for junior wives – although favoritism toward a junior wife can increase as the senior wife ages. In general, evidence suggests that senior wives have higher bargaining power, as reflected in better education and health outcomes of their children (Clignet 1970; Kazianga and Klonner 2009; Matz 2016) and higher payouts from their husbands in laboratory games (Munro et al. 2010). Again, it is challenging to distinguish whether these differences in spousal interactions by marriage type or co-wife rank are driven by characteristics of partners that select into polygamous marriage or the state of being in a polygamous marriage itself.[5]

In a qualitative study specifically on intimate partner relationships in the region of Sikasso in Mali (Lees et al. 2018) – a companion piece to this quantitative paper – respondents describe both monogamous and polygamous marriages as characterized by male authority and limited power for women to influence decisions, particularly in financial matters of the household. Men describe their responsibility to ensure that the household is financially stable; women's descriptions of unhappy relationships focus on a lack of financial support by their husbands. Respect for a man by his wife or co-wives, tightly linked to his sense of masculinity, is described as accepting his decisions and unequal power. Although expectations of male authority differ little between polygamous and monogamous marriages, a hierarchy amongst co-wives is described in polygamous marriages, with the first wife typically maintaining authority over the second wife and a closer relationship with the husband – although this dynamic can be reversed when the first wife becomes older. In terms of IPV, in both monogamous and polygamous marriages, physical IPV is described as a consequence of disputes and tensions in

[3] A small set of studies employ structural estimation or theoretical modelling to isolate the causal role of polygamy and find effects on household demographic and economic outcomes that could plausibly increase the vulnerability of women in polygamous relationships to IPV. Tertilt (2005) simulates the counterfactual effects of polygamy on an economy-wide model in which monogamy is enforced and finds that polygamy increases the average age gap between spouses – a risk factor for IPV. Akresh, Chen, and Moore. (2016) show that agricultural production can be more efficient in polygamous households – which may increase the benefits of maintaining a cooperative equilibrium relative to a noncooperative equilibrium and thus shape a woman's threat point.

[4] Although evidence indicates co-wives may cooperate with each other in certain instances and compete in others (Kazianga and Klonner 2009; Matz 2016; Yanca and Low 2004; Madhavan 2001), Barr et al. (2017) find cooperation between co-wives is particularly low.

[5] Barr et al. (2017) do not find behavioral differences between monogamous and polygamous husbands when playing with individuals from other households, suggesting that selection bias is unlikely to be driving the differences in behavior within household, unless the selection is on characteristics that only affect behavior within the household.

relationships – while sexual IPV is explained in terms of men's authority and control over women's sexuality, sanctioned by gender norms. Although the descriptions of what underlies IPV do not differ meaningfully between the types of marriages, disputes and tensions are described as being higher in polygamous marriages. In some situations, men are asked to resolve conflicts between co-wives, leading to extra tensions in polygamous marriages. Greater tensions are also indicated between husbands and their younger wives.

iii. Cash transfers and polygamy

Barr et al. (2017) show that there are meaningful differences in intrahousehold cooperation between monogamous and polygamous households: when given the opportunity to hide resources, members of polygamous households are more inclined to compromise household efficiency in order to maintain their individual control over the resources than monogamous counterparts. This has implications for the effects of interventions that provide resources to poor households. Because polygamous husbands are less inclined to cooperate with each of their wives compared with monogamous husbands, if husbands are the recipients of cash transfers, less of the resources may go to wives (and their children) in polygamous households than in monogamous households. Differences in status between co-wives within polygamous marriages may also lead to differences in resource allocation across co-wives. This in turn may have implications for the pathways relating cash transfers to IPV described in Section 1 – for example, in terms of how the transfer might translate to improving the household's economic well-being and men's emotional state, how the transfers might be allocated toward daily needs and thus lead to changes in disputes, or how the cash transfer might increase spouses' relative bargaining power – indicating that these may play out differently for polygamous and monogamous marriages, as well as differently for co-wives within polygamous marriages.

b. Study design

i. Intervention

In 2014, the Government of Mali began implementing "*Programme de Filets Sociaux (Jigisémèjiri)*," its national cash transfer program aimed at reducing poverty and improving human capital accumulation. To accomplish these goals, an integrated model—composed of cash transfers (CT), accompanying measures (AM), and preventive nutrition packages (PNP) targeted to children under 5 years and pregnant women—was developed. The program initially operated in six regions (Sikasso, Segou, Mopti, Koulikoro, Kayes, Gao) and the District of Bamako, and the CT component reached approximately 62,000 poor households.

The CT is valued at 10,000 FCFA per month scheduled to be paid every quarter over a 3-year period (the equivalent of USD 18.02/month, or 9 percent of beneficiary household's monthly consumption). Heads of household, mostly male, are the main beneficiaries of the CT and are given a beneficiary identity card; a substitute is also identified in case the head of household is unavailable to collect the money.[6] The CT is paid either via mobile money or banks, depending on the region. The AM consists of two training

[6] The program selected and enrolled beneficiaries prior to the start of the intervention, but did not continuously enroll beneficiaries afterward. Thus, if beneficiary households subsequently split, a new household head was not identified as an additional beneficiary.

sessions per month conducted by nongovernmental organizations (NGOs) in each intervention village. The AM sessions are organized into groups of themes, with each group covered for a period of 6 months.[7] Although the CT was targeted to poor households based on geographical and community based targeting, the AM was not targeted and was available to any household in communes that were selected for the program. At the time of the data collection used in this study, the PNP component had not yet been rolled out, and thus it is not a focus of this study.

Targeting of households for the CT component was as follows. Quotas were first developed at the commune level, based on the percentage malnourished and the percentage of extreme poor households within the commune. These quotas were then split proportionally by village (in terms of village population), to obtain village quotas. Households within villages were chosen on the basis of four criteria related to (1) food security, (2) ownership of agricultural equipment, livestock, and land, (3) "reliability" of income, (4) household composition (at least 3-10 household members total, with at most 1-2 working adults). These households were selected within villages, through a two-stage process: first, village committees created a list of households meeting these criteria; second, commune committees assembled whole villages to validate the list. The criteria above were used to select households, with preference for those who met more than one, until the village quota was met. Households were defined primarily on the basis of recognizing the authority of a common head.

ii. Randomized design

In order to allow rigorous and independent impact evaluation, the Government of Mali collaborated with research partners International Food Policy Research Institute (IFPRI) and *Institut de recherché pour le développement* (IRD) to implement a two-stage randomized control trial in five regions of Mali: Sikasso, Koulikoro, Kayes, Segou, Mopti. Two government specifications were taken into account: (1) Out of 96 eligible communes, it was possible to retain a control group of 20 communes that would not receive the interventions until 2 years after the initial program roll-out; (2) amongst the remaining 76 communes, the government needed to purposively select 19 communes in which PNP could be delivered, in consultation with a national technical committee. Thus, in the first stage, 96 communes were randomly assigned to 76 treatment communes and 20 control communes. Randomization was stratified by region, and within each region approximately 20 percent of the eligible communes were randomly assigned to be in the control arm. In the second stage, within each of 19 treatment communes deemed eligible for PNP, half of villages were randomly assigned to receive PNP and the other half to not receive PNP.[8] Per above, as PNP had not yet been rolled out at the time of the survey rounds used in this study, only the first-stage randomization (treatment vs. control) is used here.

3. Data

a. Sample design

Data for this study consist of a baseline survey that was conducted from September 2014–February 2015, before the start of the *Jigisémèjiri* program; and a midline survey that was conducted from August 2016–November 2016, before the control group was rolled into the program.

[7] Details on the distribution of CT and AM are in Appendix A.
[8] Appendix B provides details on how the randomization was conducted.

The baseline sample was designed to include households from the 96 communes that are part of the impact evaluation. However, due to security issues, only 90 of the 96 communes were surveyed at baseline. The study sampling frame consisted of households selected as CT beneficiaries that additionally had a child aged 6 to 23 months at the time of the baseline survey. This meant that sample households in both Treatment and Control communes have met all the eligibility criteria for receipt of the CT and are therefore very similar at baseline. The rationale for further restricting the Treatment and Control samples to households with a child aged 6 to 23 months at baseline was that child nutrition outcomes are most responsive to intervention in the "first 1,000 days" of life (conception to about 2 years of age). The sampling procedure for the baseline survey used a two-stage probability proportional to size sampling (PPS) method so that each beneficiary household in the commune had the same probability of being sampled.[9] In total 3,080 households across 90 communes were sampled at baseline.

The midline sample is composed of two parts, a panel sample that follows a random subset of the same households surveyed at baseline, and a cross-section sample that draws a new sample of households. The panel sample – the sample used in this study - is designed to capture household level outcomes including intrahousehold relationships and the cross-section sample is designed to capture child nutrition outcomes. The panel sample was designed to resurvey a random sample of 2,560 households from the baseline survey, of which 2,446 were successfully resurveyed for a success rate of 96 percent.

Households in both the panel and cross-section samples were defined consistent with the government's definition of a household. Thus, household members included individuals who recognized the authority of a common household head, in addition to living in the same communal residence and sharing meals.[10]

b. Survey and outcome measures

The panel sample at midline was administered a survey composed of four questionnaires—household, mother-child, decisionmaker and spouse, and anthropometry. Household, mother-child, and anthropometry were all part of the baseline survey. The decisionmaker and spouse questionnaires were added to the panel survey in order to better understand how the main decisionmaker of the household makes decisions and his/her relationship with other members of the family, in particular his/her spouse.

We selected the "decisionmaker" by first asking the household head, "Who in the household usually makes decisions about general expenses and income?" If the person named was not present or was older than 70, then the individual in the household who was reported to make most of the decisions when the main decisionmaker is gone was selected as the "decisionmaker," provided he or she was present that week and less than 70 years old. The spouse of the selected decisionmaker was selected as the "spouse of decisionmaker." If there was more than one eligible female spouse for a male decisionmaker, as was the case in polygamous households, then we excluded the mother of the index child (who was administered the mother-child questionnaire) and randomly sampled from the remaining wives to select the "spouse of decisionmaker."

[9] See Appendix C for details on sampling.

[10] In particular, the manual defined a household as "a group of people who live in the same communal residence, sharing the same meals, and who respond to the authority of a man or woman recognized as head of the household". In French: "Un ménage est constitué d'un groupe de personnes vivant dans la même concession, partageant le même repas, et qui répondent de l'autorité d'un homme ou une femme qui reconnut comme le chef du ménage."

The decisionmaker questionnaire consisted of modules on productive activities, decisionmaking with respect to productive activities and revenue, relationships and disputes, stress and anxiety, cognitive tests, time preference, self-esteem, and female status (only administered to women). The spouse questionnaire consisted of a subset of these modules. The questionnaires were administered to the main decisionmaker and his or her spouse separately to ensure privacy.

Our main outcomes of interest are those related to IPV and potential pathways. At midline, the IPV questions were administered to one female in the household through the decisionmaker questionnaire or the spouse questionnaire.[11] IPV was measured using the internationally validated WHO Violence Against Women instrument (WHO 2016) and administered following the WHO protocol on ethical guidelines for conducting research on women's experience with IPV (M Ellsberg et al. 2001)[12]. The WHO instrument asks multiple behaviorally specific questions on a range of abusive acts, a technique shown to maximize disclosure (Cohen, Kamarck, and Mermelstein 1983). We focused on two types of violence: emotional (4 questions) and physical (6 questions), and controlling behaviors (7 questions) from partner. For each act of violence or behavior, women were asked if their current husband had done this in the last 12 months.

From these questions two types of outcome measures are constructed. The first are binary indicators for any emotional violence experienced in the past 12 months, any physical violence experienced in the past 12 months, and any controlling behaviors experienced in the past 12 months. Each is coded as 1 if the woman responded that she had experienced any of the acts within each category (see Appendix D for the questions and categorizations) and 0 otherwise. The second type are indices for emotional violence, physical violence, and controlling behaviors. These indices are constructed by first creating normalized indicators (using the mean and standard deviation of the control group) with a mean zero and standard deviation of one for each question within each category (Kling, Liebman, and Katz 2007), which ensures that variables with higher variance do not contribute disproportionately to the total index. We then sum these normalized indicators within each category and renormalize the final indices so each again has standard deviation of one.

One pathway through which transfers may affect IPV is through decreases in intrahousehold conflict. To examine whether the program led to improvements in marital quality we construct three indicators using female responses to the decisionmaker or spouse questionnaire: the prevalence of disputes between spouses in eleven areas (food expenses, non-food expenses, livestock purchases, agricultural purchases, purchases for microenterprises, child nutrition, child health, child education, child discipline, travel outside the plot, her employment, domestic work), an index of relationship capital (which consists of reports of how often the couple laugh together, calmly discuss something, confide in each other, and go out to a leisure event), and an index of relationship trust (if she respects her spouse, if her spouse respects her, if she has confidence that her spouse takes actions in her best interest, and feels comfortable telling her spouse when she's not in agreement with him). While the variables considered

[11] The decisionmaker and spouse questionnaire were not administered at baseline. IPV questions were instead administered to the mother of the index child.

[12] This included ensuring adequate training of interviewers, guaranteeing privacy during interviews, ensuring informed consent and confidentiality of responses, and interviewing only one woman per household so that other household members were not aware that survey questions involved IPV. Referral services could not be arranged as they did not exist in most areas surveyed.

by Kling, Liebman, and Katz (2007) were continuous, several of the variables included in the relationship capital and relationship trust indices were ordinal. For these variables, we create a series of binary variables out of each ordinal variable so that values of 1 always reflect greater relationship capital or trust, and then create an index out of these binary variables. See appendix F for more detail. Another pathway through which CTs may affect IPV is through improvements in the emotional well-being of its household members. At midline, we collected information from the main decisionmaker on his/her level of anxiety or worry across 14 domains[13], stress using Cohen's Perceived Stress Scale (PSS) (Rosenberg 1965), and self-esteem using the Rosenberg Self-Esteem instrument (Hidrobo et al. 2018). Using the same technique described above for the relationship quality indices, we create indices for male decisionmakers of worry and low self-esteem. For stress of the male decisionmaker, we also create an index in addition to using the internationally validated 40-point scale indicator, which is constructed by adding up responses to the 10 items in the PSS instrument.

Our indicator for whether a household is classified as polygamous or non-polygamous is based on the household head's marital status at baseline. Response options for the head of "married living together with spouse, polygamous" and "married separated, polygamous" were categorized as "polygamous." All other response options, including "never married / single," "married living together with spouse, monogamous," "married, separated, monogamous," "free union," "widowed," and "separated/divorced" were categorized as non-polygamous.[14]

c. Estimation sample, attrition, and balance of baseline characteristics

Our sample for estimating impacts of *Jigisémèjiri* on IPV draws on women who were either the selected decisionmakers in their households or the selected spouses and who completed the relevant questionnaire at midline. Similar to WHO norms, we restrict women in our estimation sample to be less than 50 years old at midline, when violence is more prevalent. We also restrict the sample to women who were in the baseline data and married at baseline in order to avoid selection into the household or marriage due to the program. Thus our eligible sample is composed of 1,550 women less than 50 years old who were in the baseline data and married at baseline. To qualify to answer the IPV module, women had to be living with their husbands in the last 12 months and alone at the time of the interview. Of the 1550 eligible sample, 1,457 were living with their husbands at midline and 1,261 were alone at the time of the interview (See appendix E). As revealed in tables 1 and 2, selection into the sample due to living with husband is not correlated with treatment in the full sample or in the subsample of non-polygamous households[15]. However, it is correlated with treatment in polygamous households, with women from treated households being less likely to live with their husbands in the last 12 months. At the same time,

[13] Domains include health, relationship with other household members, accidents and disasters, problems with people from other ethnic groups, security issues due to terrorism, not enough money for basic needs, not enough money for other spending, not enough money for medicine, inability to educate children, difficulty finding a job, laziness of children or spouse, alcohol consumption of children or spouse, death of a family member, debts to others.

[14] Our categorization of the household uses the head's baseline status to avoid capturing potential endogenous response to treatment, but a head classified as non-polygamous at baseline will not necessarily remain non-polygamous thereafter.

[15] We use the term "non-polygamous" rather than "monogamous", since the sample of non-polygamous households includes some households where the household head was not married. This, is however, rare: 98 percent of the heads of households classified as non-polygamous were married.

most of the selection into the sample occurs from being alone at the time of the interview. It is then reassuring to note that a woman living with her husband *and* being alone at the time of the interview is not correlated with treatment for the full sample or subsample of non-polygamous and polygamous households. We further examine the potential role of selection when discussing our main results in section 5.

Table 1 also provides baseline characteristics of women in the sample and their partners across treatment and control groups. Women in our sample are on average 32 years old, very few are literate (only 5 percent), and most are the spouse of the household head, although in approximately 19 percent of cases they are the daughter-in-law. Husbands are on average 12 years older than their wives and a slightly higher percentage are literate (17 percent in the treatment group and 12 percent in the control group. Nearly 40 percent of the sample (37 percent in the treatment group and 39 percent in the control group) is in a polygamous marriage. There are no statistically significant differences in baseline characteristics between the treatment and control group.

Table 2 shows baseline characteristics across the treatment and control group for the subsamples of non-polygamous and polygamous households. In non-polygamous households, household structure differs across treatment and control groups, with treatment households having significantly more children 0-5 years and 6-14 years. Husbands from the treatment group in non-polygamous households are also more likely to be literate. In polygamous households, baseline characteristics of the women respondent are different across treatment and control households. In particular, women in treatment households compared to control households are younger and more likely to be the daughter-in-law of the household head and not the spouse. They are also more likely to be literate. Accordingly, we control for these predetermined observable differences in our empirical specifications.

4. Evaluation design

We consider the effects of the treatment (*T*) on outcome *Y* on woman *i* in commune *j*, focusing on women under age 50 who were married at baseline who were listed as the decisionmaker or spouse of the decision-maker and were alone at the time of the interview (the requirement to answer the IPV module).

$$Y_{ij} = \beta T_j + X'_{ij}\delta + \varepsilon_{ij} \qquad (1)$$

Standard errors are clustered at the commune level, which is the same level at which treatment was assigned. Given that communes are relatively isolated, the possibility for spillover effects on untreated communes is relatively limited. We include a vector of control variables (X) that includes region fixed effects, a quadratic in age, whether the respondent was the spouse of the decisionmaker, whether she was literate, and household size, all as defined at baseline.[16]

As previously mentioned, we are particularly interested in whether the effects of polygamy vary by the household's polygamy status at baseline ($Poly_{ij}$). We consider a woman polygamous if the household's decisionmaker (as reported in the baseline) or the spouse of the decisionmaker was in a polygamous union during the baseline survey. Measuring polygamy status at baseline ensures that our estimates are

[16] While McKenzie (2012) points out that an ANCOVA specification which controls for the woman's level of the dependent variable at baseline increases efficiency when outcomes are not strongly autocorrelated, we do not have measures of most of our dependent variables of interest at baseline.

unaffected by any effects of the treatment on polygamy (if, say, the transfer allows men to take more wives).

We then estimate equation 1 separately for polygamous and non-polygamous households. To test whether the interaction with polygamy ($\beta_2 T_j \times Poly_{ij}$) is significant we combine both subgroups and estimate the following equation:

$$Y_{ij} = \beta_1 T_j + \beta_2 T_j \times Poly_{ij} + X'_{ij}\delta + Poly_{ij} \times X'_{ij}\gamma + \varepsilon_{ij} \qquad (2)$$

We include interactions of polygamy with each control variable, given the possibility that the effects of polygamy may vary by these baseline characteristics.

5. Results

Table 3 shows our core results, examining the effects of treatment on physical violence, emotional violence, and controlling behavior. Aggregating the non-polygamous and polygamous samples, the overall treatment effect on prevalence of physical violence is statistically insignificant and small in magnitude (2.5 percentage points), while the effects on prevalence of emotional violence and controlling behavior are statistically significant and modest in size (6 percentage point reductions in each). In terms of indices, in aggregate, there is an insignificant reduction of 0.11 standard deviations for physical violence and emotional violence, and a significant 0.19 standard deviation reduction in controlling behavior.

However, the overall effects mask considerable heterogeneity. Disaggregations by whether women are in non-polygamous or polygamous marriages show a consistent pattern. Among women in non-polygamous marriages, there are *no* statistically significant impacts of treatment on physical violence, emotional violence, or controlling behavior, as measured by prevalence or indices. For women in polygamous marriages, treatment significantly reduces *all* prevalence and index measures for physical and emotional violence, and controlling behaviors. Specifically, within polygamous marriages, treatment significantly reduces prevalence of physical IPV by 7 percentage points (or 0.25 standard deviations in terms of the index), prevalence of emotional IPV by 13 percentage points (or 0.32 standard deviations in terms of the index), and prevalence of controlling behavior by 15 percentage points (or 0.32 standard deviations in terms of the index). For all indicators, the difference in treatment effect between the women in non-polygamous and polygamous marriages is statistically significant. The mean in the control group is also higher for women in polygamous marriages than non-polygamous marriages for all indicators, reflecting that treatment caused greater reductions in physical IPV, emotional IPV, and controlling behaviors for women who experienced higher rates of violence in the absence of intervention.

To assess the robustness of our results, table 4 examines the impact of Jigisémèjiri on individual indicators of IPV and controlling behavior that constitute the measures of overall prevalence and indices. We find broad decreases in most of the individual IPV indicators among women in polygamous marriages and only one decrease in the IPV indicators among women in monogamous marriages, suggesting that our core results were not driven by a few idiosyncratic measures. Specifically, in polygamous households we find decreases in each measure of physical violence (slapped or threw something that could hurt her; pushed her or shoved her or pulled her hair; kicked her, dragged her or

beat her up; choked or burnt her on purpose) except for being hit. For emotional violence, we find decreases in rates of insults, belittling, and things done by her husband to scare or intimidate her. For controlling behavior, we find decreases in restrictions of contact with family, insistence on knowing where she is at all times, being ignored, getting angry if she speaks with another man, and expecting her to ask for permission before seeking health care for herself.

Given the concentration of effects among polygamous women, we next examine whether the effects vary between first wives and second (and later) wives in table 5. Note that the rates of violence in the control group are higher among second wives: 30 percent of second (or later) wives in the control group face physical violence (versus 7 percent of first wives), 45 percent face emotional violence (versus 24 percent of first wives), and 72 percent face controlling behavior (versus 66 percent of first wives). Among first wives we only observe significant reductions in controlling behaviors as a result of the treatment, while for second (or later) wives we observe large and significant reductions in all measures of violence and controlling behaviors. The reductions are significantly larger in magnitude among second (or later) wives compared to first wives for physical and emotional violence.

While we only have data on IPV on women with whom the enumerators could speak privately, we do not believe that selection bias drives these results. Table 2 shows that in polygamous households, treated women exhibit a lower rate of living with their spouse at midline (among the households in our estimation sample, all of whom were married at baseline). If the transfer enables women in violent marriages to live apart from their spouse, then our estimate if anything underestimates the effect of the treatment on violence. Moreover, conditional on living with a spouse, both treatment and control women answer IPV questions at the same rate (89.6 percent of treatment households and 89.1 percent of control households). Appendix G presents Lee (2009) bounds on these results, suggesting further that the main results are not driven by selection into responding to the IPV section.

6. Mechanisms

We explore potential mechanisms through which *Jigisémèjiri* led to decreases in IPV, presenting suggestive evidence linked to the pathways discussed in the introduction. First, we consider the pathway related to cash transfers improving economic security and emotional well-being of men. Hidrobo et al. (2018) find that the *Jigisémèjiri* program increased food security, as well as savings and assets. Table 6 shows the effects on household level economic outcomes for our sample of interest, disaggregated by polygamy. Consistent with the results in Hidrobo et al. (2018), the cash transfer program leads to significant improvements in household assets but not the value of consumption.[17] More importantly, there are no significant differences across polygamous and monogamous households in the size of the impact, suggesting that there were similar improvements in household's economic wellbeing across both groups.[18]

[17] We examine effects on both levels and using the inverse hyperbolic sin transformation -- IHS(y) = ln(y + sqrt(1+y^2) – which is similar to the log transformation, but with the advantage that it is defined at zero. Hidrobo et al. (2018) show that the lack of significant impact on consumption is plausibly due to the long lag between midline data collection and the previous cash transfer.

[18] The difference in point estimates in the treatment effect between polygamous and non-polygamous households is large in levels, albeit not statistically significant at traditional levels. The difference between these estimates and the estimates using the IHS transformation suggest that there are larger effects on polygamous households with high assets, whose contribution to the estimation is smaller when we take logs.

Table 7 examines whether the cash transfer program led to improvements in men's emotional wellbeing which is hypothesized to result from improved economic security. We find statistically significant decreases for the overall sample in men's Perceived Stress Scale and in the anxiety (worry) scale and index. Although differences across non-polygamous and polygamous households are not statistically significant at conventional levels, these reductions are driven mainly by male decision-makers in polygamous households for whom reductions in stress and anxiety and increases in self-efficacy are all significant and nearly double in size compared to reductions in non-polygamous households. The companion qualitative work (Lees et al. 2018) indicates that the cash transfers had a direct impact on both non-polygamous and polygamous households in terms of increased resources and less stress, reducing tensions between husbands and wives, particularly for men who felt able to fulfill their roles as household head. While the qualitative work is not designed to detect differences in magnitudes between these types of households, men in both polygamous and non-polygamous households spoke of being happier. Taken together, Tables 6 and 7 along with the qualitative work suggest that *Jigisémèjiri* resulted in similar improvements in economic well-being for polygamous and non-polygamous households, these translated to improvements in men's emotional well-being in both types of households, but improvements in men's emotional well-being were likely larger in polygamous households.

Next, we assess evidence for the pathway related to cash transfers reducing intrahousehold conflict due to stretched resources and tight budgets. Table 8 examines treatment effects on measures of conflict, as well as related measures of relationship quality, disaggregated by polygamy. Although not statistically significant at conventional levels, the signs of the coefficients reveal that disputes are reduced and relationships between spouses improve in polygamous households. The same is not true for non-polygamous households where the signs of the coefficients show near zero impact or positive impacts on disputes and negative impacts on trust. These differences in patterns result in large and statistically significant differences in impact across polygamous and non-polygamous households in the dispute and trust indicators. Thus, findings suggest that the cash transfer reduced disputes and increased trust significantly more in polygamous than non-polygamous households.

Finally, to explore whether *Jigisémèjiri* improved a woman's threat point, we analyze the impact of the program on two empowerment domains: economic resources and mobility. Descriptive evidence from related work (Hidrobo et al. 2018) reveals that that the transfer is physically collected by men, it is by and large not shared with other household members, and decisions about its use are predominantly made by men.[19] Moreover, as discussed in section 3b, the beneficiary list was not updated after the program began, so women married to male heads in beneficiary households would lose program benefits if they were to leave the marriage, rather than gain benefits as new household heads. Accordingly, the program effects on women's outside option are likely to be minimal. Furthermore, Table 9 indicates that there are no impacts on women's employment or mobility in either the non-polygamous or polygamous samples. Lees et al. (2018) also find that there is little effect of the program on women's agency to challenge gender norms, such as in terms of decision making and control around sexual and financial matters.

[19] While the transfer could theoretically improve control of assets and bargaining power of women in female-headed households, our sample of female-headed households is too small to estimate these effects.

Overall, our suggestive evidence supports the possibility that improved economic security of the household and emotional well-being of men underlies the impacts of *Jigisémèjiri* on IPV, while also indicating that reductions in poverty-related conflict and resulting improvements in relationships may play a role. Consistent with the impacts on IPV, these mechanisms play out primarily in polygamous marriages. As described in Section 2, respondents in companion qualitative work (Lees et al. 2018) describe physical IPV as primarily the result of tensions, disputes, stress, and men's low self-esteem, aligning with this explanation. As posited in the introduction, we do not find evidence suggesting that increases in women's threat points drive reductions in IPV.

7. Understanding the effects on polygamous households

In this section we explore potential reasons for why we see larger impacts of cash transfers on IPV in polygamous households – specifically, why similar impacts on household level economic indicators in polygamous and non-polygamous households appear to translate to larger improvements in men's emotional well-being and larger reductions in disputes in polygamous households. One potential reason is that polygamous households are different from non-polygamous households in other observable and unobservable ways that lead to these differences in impact. For example, if polygamous households tend to be larger or poorer than non-polygamous households, on average, it is possible that similar changes in household-level economic security could translate to differential changes in male heads' emotional well-being. A second potential explanation is that the institution of polygamous marriage itself – and its associated dynamics – leads to different distributions of or communication regarding the cash transfer across household members (Barr et al. 2017), even with similar economic effects at the household level; differences in distribution or communication between polygamous and non-polygamous households could lead to differences in effects on conflict. A third possible explanation is that the prevalence of IPV, stress, and disputes is higher in polygamous households – whether due to correlates of polygamy or due to the institution of polygamy itself – and thus there is simply greater potential for an intervention to reduce these in polygamous households than non-polygamous. While we cannot disentangle these three explanations or comprehensively explore any of them, we look more closely into suggestive evidence on each.

a. Differences due to observable correlates of polygamy

We begin by examining differences in a set of observable characteristics (not exhaustive, due to data limitations) between polygamous and non-polygamous households at baseline in Table 10. The first two columns of table 10 show the raw means across the two groups, the third column shows the difference in means, and the fifth column shows the coefficients from a multivariate regression of all covariates on an indicator for being polygamous. Compared to women in non-polygamous marriages, women in polygamous marriages are 2 years older, have an age gap (husband age – wife age) that is 1.8 years greater, and live in households with 4.1 more members. Polygamous households are also more likely to be Muslim, have a higher value of assets, but less per capita value of consumption. When estimating the correlation of the observable characteristics with polygamy in a multivariate regression, variables that remain significantly correlated with polygamy are the respondent being the spouse of the household head, household size, and the household being Muslim.

Accordingly, in table 11 we examine the extent to which the differential treatment effects on IPV among women in polygamous marriages can be explained by these observable differences between polygamous and non-polygamous households. In particular, we interact the variables that were

significant in the multivariate regression in Table 10 with the treatment indicator. We find that the differential reduction in physical violence in polygamous households is entirely explained by other characteristics of polygamous households: primarily, treatment had the strongest effect on women in households with more members. By contrast, the differential reduction in emotional violence is only partially explained by other observable characteristics and the differential reduction in controlling behavior remains unexplained by observable differences between polygamous and non-polygamous households. This exercise thus suggests that this small set of observable characteristics, and in particular household size, can explain the differential effect of treatment on physical violence, but does not explain the differential effects on other forms of violence or behaviors.

b. Differences due to differential resource distribution or communication under polygamy

We next explore whether the institution of polygamous marriages leads to differences in the distribution of or communication regarding the cash transfer – owing to differences in cooperation – which may lead to differences in impacts on IPV. With caveats that selection into polygamy (in addition to the institution of polygamy itself) could also lead to differences in distribution or communication and that we do not have clean measures of "cooperation," as suggestive evidence we analyze descriptive statistics on household's experience with the program. These include who received the cash, whether it was shared with others, and whether other members (and in particular the mother of the index child) knew about the program. We assume that, if the mother of index child was informed about the program, it was through the household head, and thus there is some communication across household members. Table 12 reveals that in both non-polygamous and polygamous households, men are the main beneficiaries of the program and the main decisionmakers with respect to the transfer. Approximately 51 percent report distributing part of the cash transfer to other household members for household or individual purchases in both types of households. However, non-polygamous households are significantly more likely than polygamous households to distribute the cash to a female for household or individual purchases (17 percent versus 12 percent). In terms of knowledge of transfer, most mothers of the index child knew about the program and knew that they had received the transfer in the last 24 months, although many fewer knew the date of the last transfer. Mothers' knowledge about the transfer does not vary by polygamy status.

Table 12 reveals that across both types of households women directly benefit very little from the transfer, providing more evidence that the empowerment pathway is not what is driving impacts. However, to the extent that the transfer is shared across female household members, this occurs more in non-polygamous households than polygamous households. A process evaluation that accompanied this impact evaluation (Zongrone et al. 2018) also suggests that women in non-polygamous households were more involved with the transfer – in terms of providing input on how to use and manage it and alerting the household head of household needs – than those in polygamous households, reflecting greater communication in non-polygamous households. We remain agnostic as to whether sharing or communication with females leads to more or less conflict in the household, but note that for this to explain our polygamy results, not sharing or communicating would have to lead to less conflict in the household. An example would be if men's lower communication with wives in polygamous marriages (Bove and Valeggia 2009) counterintuitively makes them freer to use the transfers as they wish. Potentially this arrangement could lead to cash transfers reducing men's stress more in polygamous households than in non-polygamous households, if communicating about the transfer leads to stress in negotiating how to use it.

c. Differences due to greater initial IPV, stress, and conflict in polygamous marriages

We finally explore whether – in the absence of intervention – IPV, stress, and conflict are higher in polygamous than non-polygamous households, which may imply greater potential for an intervention to reduce these in polygamous households. Table 3 reveals that physical IPV, emotional IPV, and controlling behaviors are all more prevalent among polygamous control households (column 2) than non-polygamous control households (column 1). Table 4 reveals the same pattern for nearly all individual acts of IPV. Table 7 shows that emotional well-being is worse among men in polygamous control households than in non-polygamous control households, according to nearly all indicators including anxiety and low self-esteem. Table 8 reveals on average higher disputes, lower relationship quality, and lower relationship trust among polygamous households than non-polygamous households. Moreover Table 5 shows that, within polygamous control households, physical IPV, emotional IPV, and controlling behaviors are all more prevalent among second or later wives than among first wives. Taken together, these indicate that the treatment caused larger improvements in the subgroups that were worse off in the absence of intervention, in terms of IPV, men's emotional well-being, and conflict, supporting the hypothesis that differential potential for impact could play a role. We unfortunately do not, however, have the baseline data on IPV needed to provide more direct evidence of this mechanism.

8. Conclusion

Given that one in three women globally is a victim of IPV in her lifetime (Devries et al. 2013), it is important to find scalable interventions that reduce IPV. Cash transfer programs are a promising tool given their scalability and global relevance. While previous evidence shows that cash transfer programs reduced IPV on average, this evidence has focused on cash transfer programs targeted to women that mainly come from programs in Latin America. Thus, knowledge gaps remain on whether cash transfer programs that target household heads (mainly men) in other regions of the world with different household structures also lead to reductions in IPV.

This study uses a randomized control trial design to investigate whether Mali's national cash transfer program, *Jigisémèjiri*, leads to reductions in IPV. Like many programs in Africa, *Jigisémèjiri* targets household heads who are mainly men, in a context where nearly 40 percent of households are polygamous. We find that the program causes significant decreases in IPV, which are mainly concentrated in polygamous households. In particular, we find that in polygamous households the prevalence of physical violence decreases by 7 percentage points, emotional violence decreases by 12 percentage points, and controlling behaviors decrease by 16 percentage points. These reductions in violence are significantly different from the impacts on non-polygamous households and are particularly strong among second (and later) wives, who face the highest rates of violence in the absence of intervention. Using data collected on the emotional wellbeing of the perpetrator (men in this case) and marital quality, we investigate potential mechanisms and find significant reductions in men's stress and anxiety among polygamous households and larger reductions in reported disputes in polygamous households compared to non-polygamous households. We find little evidence of improvements in women's threat points, which is not surprising in our context where men usually receive the transfer and make decisions about its use.

We explore potential reasons for why we find larger impacts in polygamous households – in particular whether these effects are due to other observable differences across polygamous and non-polygamous households; whether differences in the distribution of or communication regarding transfers, plausibly

determined by the institution of polygamy, lead to differences in how the program affects conflict; and whether impacts are simply strongest where there was greatest potential in terms of the highest prevalence of IPV, male stress and anxiety, and disputes in the absence of intervention. Our suggestive evidence indicates all of these possibilities: some observable characteristics of polygamous households (and in particular larger household size) fully explain the large impacts of the program on physical violence, but do not fully explain the impacts on emotional violence or controlling behaviors; polygamous households distribute the transfer differently, with women less likely to directly benefit; polygamous households from the control group have higher prevalence of IPV, men's stress and anxiety, and disputes than non-polygamous households from the control group, and within polygamous households, second and later wives report higher IPV than first wives.

To our knowledge, our results are the first rigorous evidence showing impacts of a national cash transfer program that target household heads on IPV. Some caveats are worth noting. First, while polygamy is common in West Africa, this is not the case in many other regions of the world. Given that impacts are concentrated in polygamous households, questions remain on whether our results would generalize to other settings where polygamy rates are low, but women share a similar low level of empowerment (and high rates of IPV) to women in our sample of polygamous households. Second, the Jigisémèjiri program was a bundled program that included accompanying measures (AM) sessions or trainings, and we are not able to separate out the impact of the cash from the AM sessions. While the AM sessions were not mandatory and the proportion of households attending was considerably lower than the proportion receiving the transfer (Hidrobo et al. 2018) – in addition to the sessions focusing minimally on violence or intra-household relations – it is possible that the AM sessions contributed to the decrease in IPV. Third, our sample restrictions mean that we cannot estimate the effect of the treatment on a representative sample of beneficiaries in the treatment villages in Mali. As we explain in section 3c, given that we only attempted to ask IPV questions to women in the eligible sample (less than 50 years old and married at baseline), we cannot assess the impacts of the treatment on unmarried or older women. Moreover, we only successfully collected IPV data on women who remained married and were able to be questioned alone at midline. We also asked the IPV questions to the household head or spouse (but not counting the mother of the index child), so our sample is correspondingly somewhat older than the average female in a beneficiary household (conditional on being under age 50). While we present Lee bounds in appendix G to assess the impact of possible selection on internal validity, we point out that this particular sample of women affects the generalizability of our results.

Bearing in mind these caveats, we nonetheless believe that our findings have important policy implications. While we cannot propose a single definitive theory for why the treatment differentially reduces violence in polygamous households, our results suggest that changes in women's empowerment are not necessary conditions for improving women's wellbeing. That is, we find that when transfers are given to the households of women in polygamous marriages – especially second and higher wives, who are not considered empowered by traditional measures – their lives get better, even though they largely do not receive the transfer themselves, have a say in how it is spent, and are do not show improvements in mobility or economic empowerment. Our paper thus joins recent studies that find that women's wellbeing can be improved by transfers, even when measures of their empowerment do not increase (Blattman et al 2014; Haushofer and Shapiro 2013; Roy et al 2015). That being said, these findings are driven by polygamous households in our sample, suggesting that further research is needed on how these dynamics depend on context. Moreover, targeting household heads, and in

particular men, reinforces gender norms and male authority (Lees et al. 2018). If impacts of cash transfers on men's emotional wellbeing are not sustained once the transfer program ends, and there are no sustained impacts on women's empowerment, then it is likely that relationship dynamics will also revert to the way things were before the program (Roy et al. 2017). Thus, a key policy implication of our findings is that the lives of vulnerable women can improve if their husbands are made better off, but that these effects may depend on household structure and likely depend on continued interventions.

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Tables

Table 1: Baseline summary statistics by intervention arm

	N	Mean Control	Mean Treatment	P-value of diff.	Normalized difference
Has lived with spouse in last 12 months	1,550	0.95	0.94	0.34	-0.06
Has lived with spouse in last 12 months, and alone to answer IPV questions	1,550	0.79	0.82	0.56	0.07
Respondent's age	1,261	32.04	31.97	0.89	-0.01
Respondent is household head or spouse	1,261	0.77	0.76	0.69	-0.03
Respondent is child or child-in-law of household head	1,261	0.20	0.21	0.92	0.01
Respondent is literate	1,261	0.04	0.05	0.51	0.04
Respondent was away at least one month in the last year	1,261	0.06	0.07	0.85	0.01
Husband's age	1,241	44.51	44.50	0.98	-0.00
Husband is literate	1,208	0.12	0.17	0.11	0.13
Husband was away at least one month in the last year	1,208	0.15	0.15	0.96	-0.00
Polygamous marriage	1,261	0.39	0.37	0.57	-0.05
Household size	1,261	10.19	10.29	0.83	0.02
Number of children 0 to 5 years	1,261	2.70	2.81	0.42	0.07
Number of children 6 to 15 years	1,261	3.09	3.05	0.82	-0.02
Household head is muslim	1,261	0.82	0.92	0.20	0.31
Log value of assets	1,197	12.17	12.14	0.84	-0.02
Log value of total consumption per capita	1,171	8.81	8.81	0.99	-0.00

P-values are reported from Wald tests on the equality of means of control and each treatment for each variable.
Standard errors are clustered at the commune level

Table 2: Baseline summary statistics by intervention arm

	Non-polygamous households					Polygamous households				
	N	Mean Control	Mean Treat	P-value of diff.	Normalized diff	N	Mean Control	Mean Treat	P-value of diff.	Normalized diff
Has lived with spouse in last 12 months	981	0.94	0.95	0.93	0.01	569	0.96	0.92	0.04	-0.17
Has lived with spouse in last 12 months, and alone to answer IPV questions	981	0.75	0.82	0.23	0.16	569	0.86	0.82	0.32	-0.12
Respondent's age	789	30.41	31.43	0.21	0.13	472	34.54	32.89	0.03	-0.21
Respondent is household head or spouse	789	0.74	0.76	0.52	0.07	472	0.83	0.75	0.07	-0.19
Respondent is child or child-in-law of household head	789	0.24	0.20	0.36	-0.10	472	0.14	0.21	0.05	0.19
Respondent is literate	789	0.05	0.04	0.59	-0.04	472	0.02	0.05	0.04	0.19
Respondent was away at least one month in the last year	789	0.05	0.06	0.59	0.05	472	0.09	0.08	0.82	-0.03
Husband's age	777	42.44	43.22	0.49	0.07	464	47.64	46.70	0.41	-0.10
Husband is literate	753	0.11	0.16	0.08	0.14	455	0.14	0.18	0.34	0.13
Husband was away at least one month in the last year	753	0.14	0.15	0.63	0.03	455	0.16	0.14	0.61	-0.06
Polygamous marriage	789	0.00	0.00			472	1.00	1.00		
Household size	789	8.34	8.83	0.17	0.14	472	13.03	12.79	0.70	-0.05
Number of children 0 to 5 years	789	2.22	2.41	0.07	0.18	472	3.45	3.48	0.88	0.02
Number of children 6 to 15 years	789	2.26	2.52	0.06	0.15	472	4.35	3.95	0.14	-0.18
Household head is muslim	789	0.76	0.91	0.18	0.40	472	0.90	0.94	0.46	0.16
Log value of assets	749	12.09	11.92	0.45	-0.11	448	12.30	12.52	0.17	0.15
Log value of total consumption per capita	737	8.94	8.88	0.48	-0.09	434	8.62	8.70	0.45	0.12

P-values are reported from Wald tests on the equality of means of control and each treatment for each variable.
Standard errors are clustered at the commune level

Table 3: Impact of treatment on IPV

	Mean of control, non-poly	Mean of control, poly	Overall effect	N	Effect on Non-polyg	N	Effect on Polyg	N	Diff polyg vs non
Any physical violence	0.121	0.177	-0.025	1261	0.008	789	-0.071	472	-0.079
	(0.025)	(0.036)	(0.027)		(0.029)		(0.035)**		(0.037)**
Index of physical violence	-0.049	0.075	-0.114	1261	-0.029	789	-0.245	472	-0.216
	(0.071)	(0.103)	(0.068)		(0.070)		(0.088)***		(0.084)**
Any emotional violence	0.241	0.336	-0.059	1261	-0.023	789	-0.124	472	-0.101
	(0.033)	(0.045)	(0.035)*		(0.035)		(0.050)**		(0.047)**
Index of emotional violence	-0.113	0.174	-0.108	1261	0.016	789	-0.311	472	-0.327
	(0.065)	(0.110)	(0.086)		(0.071)		(0.139)**		(0.127)**
Any controlling behavior	0.523	0.681	-0.056	1261	-0.000	789	-0.157	472	-0.156
	(0.038)	(0.044)	(0.033)*		(0.047)		(0.045)***		(0.066)**
Index of controlling behavior	-0.077	0.119	-0.193	1261	-0.106	789	-0.320	472	-0.214
	(0.077)	(0.092)	(0.076)**		(0.083)		(0.110)***		(0.124)*

Sample = women under age 49 who were married at baseline who were listed as the decisionmaker or spouse of decision-maker and were able to be asked the IPV module in private.
All indices normalized to have standard deviation one. Standard errors in parenthesis, clustered at the commune level. * p<0.1 ** p<0.05; *** p<0.01

Table 4: Individual-level outcomes (binary)

	Mean of control, non-poly	Mean of control, poly	Overall effect	N	Effect on Non-polyg	N	Effect on Polyg	N	Diff polyg vs non
Tries to keep you from seeing your friends	0.075	0.088	-0.009	1258	0.002	786	-0.017	472	-0.018
	(0.020)	(0.027)	(0.019)		(0.020)		(0.030)		(0.032)
Tries to restrict contact with your family	0.080	0.153	-0.045	1253	-0.015	783	-0.091	470	-0.075
	(0.021)	(0.034)	(0.020)**		(0.021)		(0.035)**		(0.038)**
Insists on knowing where you are at all times	0.364	0.396	-0.078	1255	-0.047	786	-0.122	469	-0.075
	(0.037)	(0.047)	(0.044)*		(0.055)		(0.063)*		(0.081)
Ignores you and treats you indifferently	0.103	0.143	-0.045	1253	-0.032	786	-0.070	467	-0.039
	(0.023)	(0.033)	(0.024)*		(0.024)		(0.042)*		(0.047)
Gets angry if you speak with another man	0.279	0.327	-0.056	1253	-0.025	785	-0.095	468	-0.070
	(0.034)	(0.044)	(0.031)*		(0.038)		(0.047)**		(0.055)
Is often suspicious that you are unfaithful	0.092	0.125	-0.040	1258	-0.036	787	-0.036	471	0.000
	(0.022)	(0.031)	(0.019)**		(0.018)**		(0.037)		(0.041)
Expects you to ask his permission before seeking health care for yourself	0.397	0.491	-0.064	1260	-0.026	789	-0.137	471	-0.111
	(0.037)	(0.047)	(0.036)*		(0.042)		(0.052)***		(0.061)*
Insulted you or made you feel bad about yourself	0.149	0.204	-0.026	1257	-0.001	786	-0.075	471	-0.074
	(0.027)	(0.038)	(0.023)		(0.028)		(0.030)**		(0.040)*
Belittled or humiliated you in front of other people	0.057	0.142	-0.025	1255	0.012	786	-0.083	469	-0.095
	(0.018)	(0.033)	(0.025)		(0.022)		(0.039)**		(0.037)**
Done things to scare or intimidate you on purpose	0.126	0.204	-0.053	1258	-0.015	788	-0.115	470	-0.100
	(0.025)	(0.038)	(0.031)*		(0.027)		(0.050)**		(0.047)**
Threatened to hurt you or some one you care about	0.029	0.071	-0.005	1259	0.010	788	-0.025	471	-0.035
	(0.013)	(0.024)	(0.016)		(0.015)		(0.029)		(0.030)
Slapped you or thrown something at you that could hurt you	0.057	0.098	-0.030	1258	-0.003	787	-0.074	471	-0.070
	(0.018)	(0.028)	(0.019)		(0.021)		(0.027)***		(0.030)**
Pushed you or shoved you or pulled your hair	0.046	0.044	-0.020	1260	-0.015	788	-0.028	472	-0.013
	(0.016)	(0.019)	(0.013)		(0.015)		(0.016)*		(0.016)
Hit you with his fist or with something else that could hurt you	0.075	0.081	-0.011	1256	-0.010	787	-0.006	469	0.004
	(0.020)	(0.026)	(0.017)		(0.018)		(0.033)		(0.035)

Kicked you, dragged you or beat you up	0.017	0.053	-0.018	1255	0.001	784	-0.048	471	-0.050
	(0.010)	(0.021)	(0.010)*		(0.010)		(0.015)***		(0.016)***
Choked or burnt you on purpose	0.035	0.053	-0.015	1248	0.001	778	-0.043	470	-0.043
	(0.014)	(0.021)	(0.017)		(0.017)		(0.020)**		(0.018)**

Sample = women under age 49 who were married at baseline who were listed as the decisionmaker or spouse of decision-maker and were able to be asked the IPV module in private. Standard errors in parenthesis, clustered at the commune level. * $p<0.1$ ** $p<0.05$; *** $p<0.01$

Table 5: Polygamous women only

	Mean of control, first wife	Mean of control, wife 2+	Effect on first wife	N	Effect on wife 2+	N	Diff, first wife vs 2+
Any physical violence	0.069	0.302	-0.010	241	-0.154	227	-0.152
	(0.034)	(0.064)	(0.037)		(0.063)**		(0.077)*
Index of physical violence	-0.182	0.372	-0.067	241	-0.446	227	-0.392
	(0.075)	(0.197)	(0.077)		(0.156)***		(0.181)**
Any emotional violence	0.241	0.453	-0.054	241	-0.204	227	-0.164
	(0.057)	(0.069)	(0.061)		(0.068)***		(0.093)*
Index of emotional violence	-0.066	0.461	-0.164	241	-0.466	227	-0.323
	(0.122)	(0.186)	(0.123)		(0.185)**		(0.171)*
Any controlling behavior	0.655	0.717	-0.133	241	-0.181	227	-0.042
	(0.063)	(0.062)	(0.071)*		(0.066)***		(0.098)
Index of controlling behavior	-0.012	0.285	-0.261	241	-0.394	227	-0.148
	(0.118)	(0.144)	(0.140)*		(0.140)***		(0.181)

Sample = women under age 49 who were in polygamous marriages at baseline who were listed as the decisionmaker or spouse of decision-maker and were able to be asked the IPV module in private. All indices normalized to have standard deviation one. Standard errors in parenthesis, clustered at the commune level. * p<0.1 ** p<0.05; *** p<0.01

Table 6: Impact of treatment on household level economic wellbeing

	Mean of control, non-poly	Mean of control, poly	Overall effect	N	Effect on Non-polyg	N	Effect on Polyg	N	Diff polyg vs non
Total value of consumption (IHS tranformation), per capita	9.88	9.67	0.09	1165	0.10	737	0.07	428	-0.02
	(0.05)	(0.05)	(0.06)		(0.07)		(0.06)		(0.07)
Value of total consumption in past 30 days (FCFA), per capita	11,490.32	9,083.31	757.37	1165	710.04	737	842.39	428	132.35
	(501.69)	(472.86)	(506.45)		(630.31)		(555.52)		(641.57)
Total value of assets (IHS tranformation)	13.21	13.69	0.24	1185	0.27	740	0.25	445	-0.02
	(0.11)	(0.11)	(0.07)***		(0.09)***		(0.11)**		(0.14)
Total value of assets (FCFA)	535,568.82	691,392.41	82,118.45	1185	53,924.18	740	131,466.06	445	77,541.88
	(41,654.16)	(52,365.57)	(36,681.98)**		(40,258.08)		(62,522.11)**		(67,055.33)

Standard errors in parenthesis, clustered at the commune level. * $p<0.1$ ** $p<0.05$; *** $p<0.01$

Table 7: Impact of treatment on male spouse's emotional wellbeing

	Mean of control, non-poly	Mean of control, poly	Overall effect	N	Effect on Non-polyg	N	Effect on Polyg	N	Diff polyg vs non
Perceived stress scale (0-40)	15.935	15.824	-1.338	1143	-1.053	714	-1.873	429	-0.820
	(0.457)	(0.589)	(0.791)*		(0.909)		(0.866)**		(0.845)
Standardized stress index	-0.014	0.005	-0.196	1143	-0.134	714	-0.301	429	-0.167
	(0.072)	(0.099)	(0.121)		(0.138)		(0.141)**		(0.140)
Anxiety (worry) scale (0-42)	24.779	25.971	-2.849	1143	-2.070	714	-4.126	429	-2.056
	(0.860)	(1.067)	(1.133)**		(1.172)*		(1.522)***		(1.409)
Anxiety (worry) index	0.057	0.159	-0.273	1143	-0.203	714	-0.390	429	-0.187
	(0.078)	(0.098)	(0.103)***		(0.107)*		(0.142)***		(0.134)
Low self esteem scale (0-30)	7.961	8.471	-0.526	1143	-0.293	714	-0.996	429	-0.702
	(0.336)	(0.420)	(0.357)		(0.394)		(0.547)*		(0.601)
Low self esteem index	-0.088	0.013	-0.124	1143	-0.079	714	-0.222	429	-0.144
	(0.080)	(0.105)	(0.089)		(0.091)		(0.140)		(0.149)

Sample = male spouses who were listed as the main decisionmaker in the household. Standard errors in parenthesis, clustered at the commune level. * $p<0.1$ ** $p<0.05$; *** $p<0.01$

Table 8: Impact of treatment on women's reported relationship quality

	Mean of control, non-poly	Mean of control, poly	Overall effect	N	Effect on Non-polyg	N	Effect on Polyg	N	Diff polyg vs non
Any dispute	0.299	0.354	-0.022	1260	0.021	789	-0.087	471	-0.108
	(0.035)	(0.045)	(0.043)		(0.041)		(0.057)		(0.042)**
Dispute index	-0.051	0.033	0.020	1260	0.137	789	-0.136	471	-0.273
	(0.052)	(0.115)	(0.076)		(0.091)		(0.102)		(0.117)**
Relationship quality scale (0-16)	8.324	8.089	0.272	1242	0.179	776	0.407	466	0.228
	(0.269)	(0.362)	(0.270)		(0.352)		(0.376)		(0.492)
Relationship quality index	0.035	-0.035	0.077	1242	0.051	776	0.116	466	0.066
	(0.076)	(0.102)	(0.072)		(0.093)		(0.108)		(0.141)
Relationship trust scale (0-12)	10.701	10.221	-0.030	1261	-0.204	789	0.281	472	0.485
	(0.130)	(0.181)	(0.154)		(0.139)		(0.268)		(0.265)*
Relationship trust index	0.061	-0.207	-0.043	1261	-0.140	789	0.133	472	0.273
	(0.073)	(0.111)	(0.098)		(0.092)		(0.169)		(0.169)

Sample = women under age 49 who were married at baseline who were listed as the decisionmaker or spouse of decision-maker and were able to be asked the IPV module in private. Relationship quality and relationship trust coded so that higher numbers = better relationship. All indices normalized to have standard deviation one. Standard errors in parenthesis, clustered at the commune level. * $p<0.1$ ** $p<0.05$; *** $p<0.01$

Table 9: Impact of treatment on women's empowerment

	Mean of control, non-poly	Mean of control, poly	Overall effect	N	Effect on Non-polyg	N	Effect on Polyg	N	Diff polyg vs non
Was employed/engaged in productive activity in the last 12 months, female	0.810	0.947	0.030	1261	0.056	789	-0.017	472	-0.073
	(0.030)	(0.021)	(0.028)		(0.044)		(0.023)		(0.053)
Total hours worked in the last week	24.301	29.216	-1.416	1105	-2.447	694	-0.288	411	2.159
	(2.221)	(2.555)	(2.567)		(2.820)		(3.520)		(3.678)
Mobility scale (0-30)	8.529	9.027	0.379	1261	0.539	789	0.263	472	-0.276
	(0.325)	(0.430)	(0.339)		(0.378)		(0.501)		(0.548)
Mobility Index	-0.027	0.053	0.085	1261	0.118	789	0.058	472	-0.060
	(0.075)	(0.095)	(0.078)		(0.090)		(0.111)		(0.127)

Sample = women under age 49 who were married at baseline who were listed as the decisionmaker or spouse of decision-maker and were able to be asked the IPV module in private. Relationship quality and relationship trust coded so that higher numbers = better relationship. All indices normalized to have standard deviation one. Standard errors in parenthesis, clustered at the commune level. * $p<0.1$ ** $p<0.05$; *** $p<0.01$

Table 10: Correlates of polygamy

	Non-Polyg	Polyg	Difference in means	N	Coefficient from regression on polygamy
Respondent's age	31.21	33.29	2.08	1261	0.002
	[7.44]	[7.93]	(0.51)***		(0.002)
Respondent is household head or spouse	0.76	0.77	0.02	1261	0.161
	[0.43]	[0.42]	(0.03)		(0.036)***
Respondent is literate	0.04	0.04	0.00	1261	0.009
	[0.21]	[0.21]	(0.01)		(0.066)
Respondent was away at least one month in the last year	0.05	0.08	0.03	1261	0.087
	[0.23]	[0.28]	(0.02)		(0.054)
Age at first marriage	16.51	16.46	-0.05	1200	0.005
	[2.63]	[2.61]	(0.15)		(0.005)
Age gap, M-F	11.81	13.64	1.83	1241	0.003
	[7.88]	[7.88]	(0.48)***		(0.002)
Husband is literate	0.15	0.17	0.02	1208	-0.004
	[0.36]	[0.38]	(0.02)		(0.036)
Husband was away at least one month in the last year	0.15	0.15	-0.00	1208	0.029
	[0.36]	[0.35]	(0.02)		(0.037)
Household size	8.72	12.84	4.12	1261	0.050
	[3.69]	[4.80]	(0.28)***		(0.004)***
Log value of assets	11.96	12.46	0.50	1197	0.010
	[1.48]	[1.49]	(0.10)***		(0.010)
Log value of total consumption per capita	8.89	8.68	-0.21	1171	-0.011
	[0.67]	[0.67]	(0.05)***		(0.022)
Household head is muslim	0.87	0.93	0.06	1261	0.092
	[0.33]	[0.25]	(0.03)*		(0.046)**
Constant					-0.511
					(0.222)**
R^2					0.27
N					1,049

Standard deviations in brackets in columns 1 and 2. Standard errors in parenthesis in columns 3 and 5, clustered at the commune level. Column 5 displays coefficients from a regression of each of the variables in the table on polygamy. * $p<0.1$ ** $p<0.05$; *** $p<0.01$

Table 11: Impacts of treatment on IPV, controlling for differential effect of observables

	Any physical violence	Any physical violence	Any emotional violence	Any emotional violence	Any controlling behavior	Any controlling behavior
Treatment	0.008	0.190	-0.023	0.014	-0.000	-0.165
	(0.029)	(0.076)**	(0.035)	(0.128)	(0.047)	(0.140)
Polygamous marriage	0.018	-0.018	0.339	0.332	0.554	0.642
	(0.352)	(0.360)	(0.374)	(0.380)	(0.421)	(0.419)
Treatment X Polygamous marriage	-0.079	0.004	-0.101	-0.050	-0.156	-0.194
	(0.037)**	(0.043)	(0.047)**	(0.045)	(0.066)**	(0.074)**
Respondent is household head or spouse		0.069		0.012		-0.140
		(0.051)		(0.085)		(0.086)
Treatment X Respondent is household head or spouse		-0.057		0.004		0.136
		(0.054)		(0.087)		(0.092)
Household size		0.025		0.018		-0.001
		(0.006)***		(0.009)*		(0.009)
Treatment X Household size		-0.017		-0.012		0.006
		(0.004)***		(0.008)		(0.008)
Household head is muslim		0.031		-0.005		0.013
		(0.036)		(0.072)		(0.060)
Treatment X Muslim		0.001		0.073		0.010
		(0.051)		(0.085)		(0.084)
R^2	0.04	0.05	0.04	0.05	0.07	0.07
N	1,261	1,261	1,261	1,261	1,261	1,261

Standard errors in parenthesis clustered at the commune level. * $p<0.1$ ** $p<0.05$; *** $p<0.01$

All regressions control for respondent characteristics (age, age squared, whether respondent is spouse, whether she is literate), household size, and region indicators

Table 12: Decisionmaking and intrahousehold distribution of the transfer in treatment communes by polygamous status

	N	Mean Non-polyg	Mean Polyg	P-value of diff.
Main beneficiary is male	925	0.92	0.89	0.24
Main recipient is male	942	0.91	0.90	0.80
Only men are main decisionmakers with respect to transfer	942	0.83	0.84	0.56
Part of transfer is distributed to other household member	942	0.51	0.51	0.86
Part of transfer is distributed to female household member	942	0.17	0.12	0.05
Last transfer created conflict in household over use	942	0.02	0.01	0.15
Worried that other non-household members may know a/b transfer and ask for some	942	0.07	0.06	0.72
Index mother had knowledge of the Jigisemjiri program	883	0.94	0.92	0.17
Index mother had knowledge that household received transfer in last 24 months	883	0.90	0.88	0.17
Index mother had knowledge on the date household received the last transfer	883	0.63	0.67	0.29

Sample is composed of households in the IPV analysis who are in the treatment arm.
P-values are reported from Wald tests on the equality of means of non-polygamous and polygamous households for each variable.
Polygamy status is defined at the household level at baseline. Standard errors are clustered at the commune level.

Appendix

Appendix A: Program components

Cash transfers (CT) are paid either using mobile money or banks, depending on the region. In most of Sikasso (excluding Kibila and Boura), Koulikoro, and Bamako, Orange Money delivers the CT. In Segou and in the remainder of Sikasso (Kibila and Boura only), the CT is delivered by Banque Nationale de Development Agricole (BNDA). In Kayes and Mopti, Banque Malienne de Solidarité (BMS) delivers the TM. In order to receive payments via banks, the beneficiaries or their substitute must present their beneficiary card and identification card to bank agents. For mobile money, an Orange money account is opened for beneficiaries, and beneficiaries receive a free SIM card. Payments are made electronically to mobile accounts, and beneficiaries or their substitutes can withdraw their money at distribution sites upon presentation of their beneficiary card and identification card. In cases where a payment is missed by the government in one quarter, a double payment is made in the following quarter.

The accompanying measures (AM) training sessions are conducted by nongovernmental organizations (NGOs) in each intervention village. The curriculum for these sessions is developed by the government, which then conducts regional training for the NGOs on each group of themes just before its 6-month term. The NGO adapts messages to the regional context with input from health center doctors, translates them to the local language with assistance from village-level and circle-level health staff, develops a dissemination strategy (which can include images or radio) validated by the government office at the circle level, and trains fieldworkers. In total, four groups of themes had been developed for the first three years of the program (see Appendix Table A.1). The CT distribution is also used as an opportunity to present information, as some beneficiaries who do not attend the sessions are present.

Appendix Table A.1: Accompanying measures topics

Groups of themes	Themes
1	1. Use of Cash Transfer for essential needs
	2. Exclusive Breastfeeding
	3. Prevention of Ebola Virus Disease
2	4. Complementary feeding (including PNP cooking demonstration sessions)
	5. Beneficiaries participation in organizations of the social and solidarity economy (mutual health, associations and cooperatives)
3	6. Prenatal and postnatal consultations
	7. Nutrition practices of women, in particular pregnant women
	8. Children's rights—Feeding, sick and malnourished children.
	9. Children's rights - Vaccination calendar for children and mothers
	10. Children's rights – Birth registration
4	11. Children's rights – Importance of children and teenagers' education, in particular young girls' education.
	12. Family Economy and stock management
	13. Water –Hygiene and Wash
	14. Respiratory Infections of Children – IRA
	15. Promotion of the free health care services in the health insurance scheme – RAMED for TM beneficiaries.

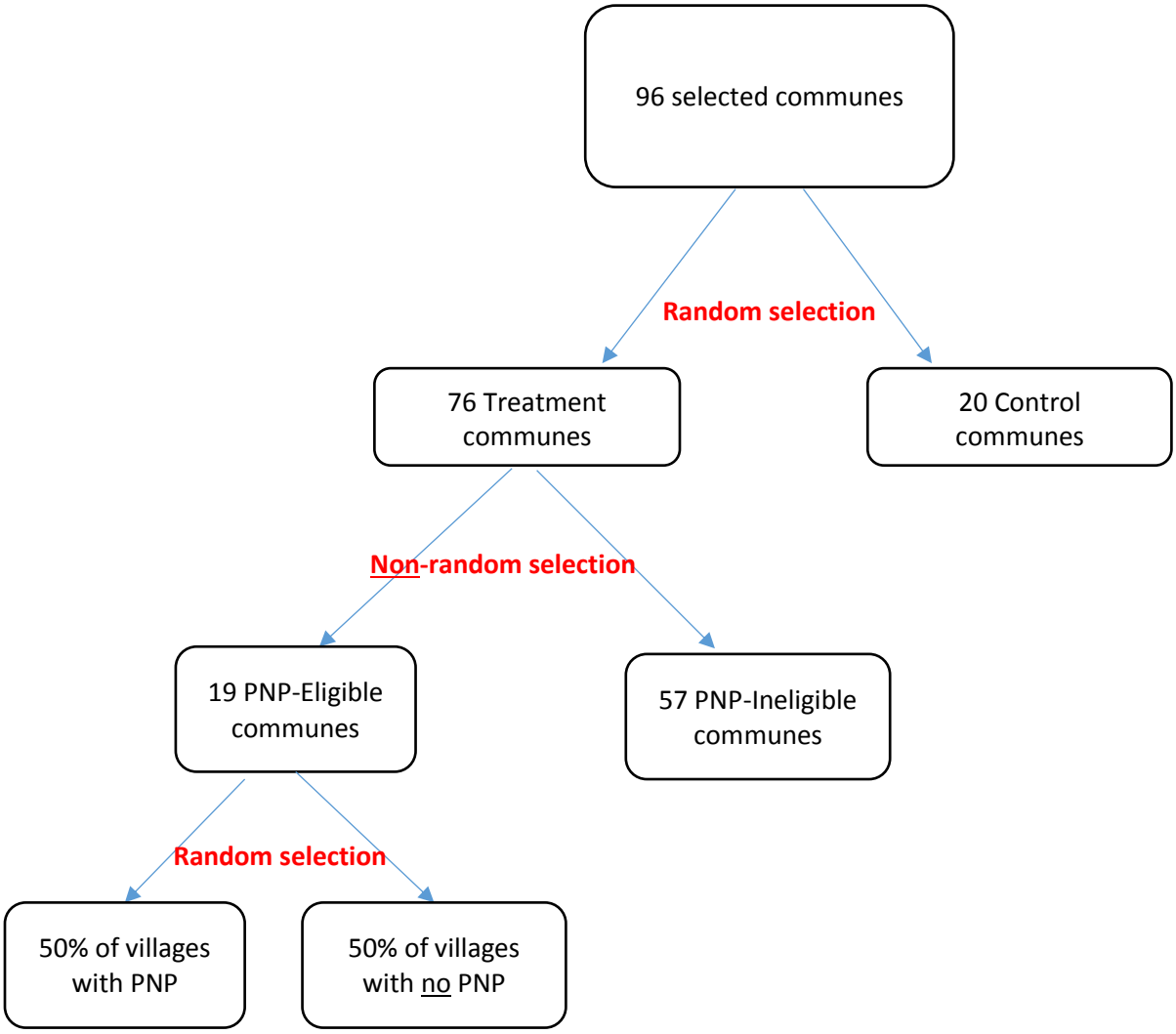
Appendix B: Details on Randomization

The first-stage randomization of communes to Treatment vs. Control occurred in a July 2014 meeting between government officials and the evaluation team, using colored beads drawn from a bag. For each region, a number of green beads corresponding to the number of intended Treatment communes and a number of red beads corresponding to the number of Control communes were put inside a closed bag. As the name of each study commune in the region was read aloud, officials took turns drawing a bead from the bag without being able to see inside; the commune was assigned to Treatment if green was drawn, and it was assigned to Control if red was drawn.

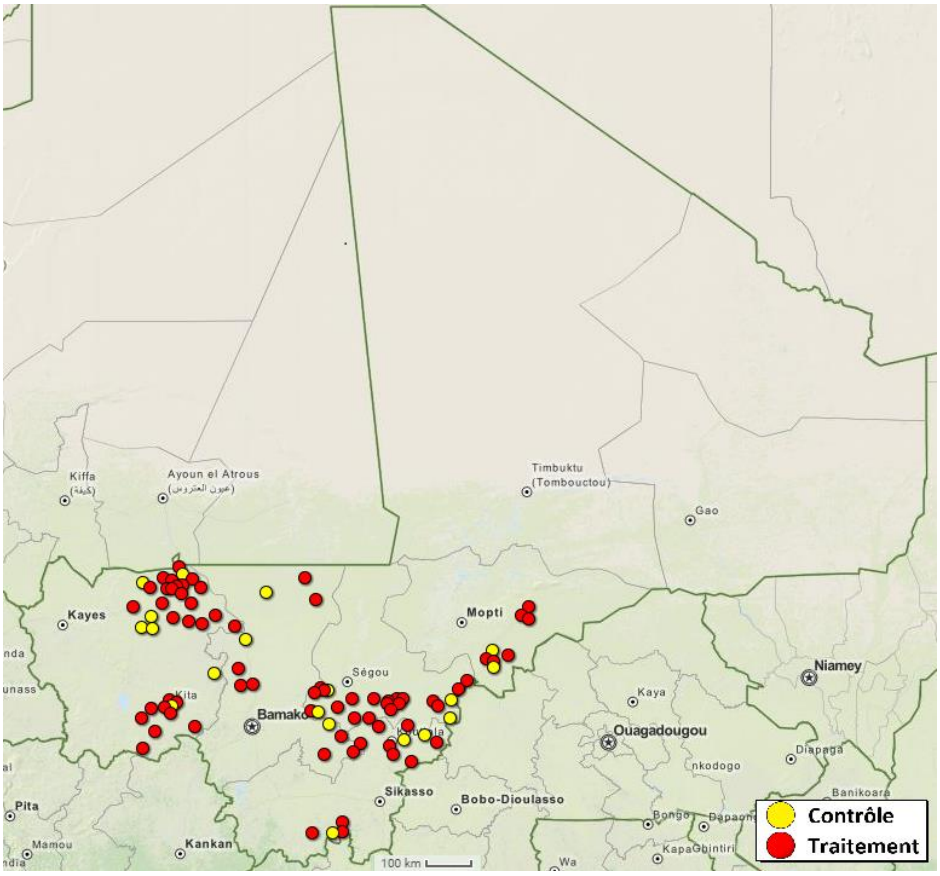
The second-stage randomization of villages to PNP or Non-PNP occurred in the following months, in public meetings within each PNP-Eligible Treatment commune. To maximize transparency and public acceptance, community leaders, including village chiefs, were in attendance. Government officials supervised these meetings and explained the rationale to all present, with a member of the evaluation team also present in many cases. In each meeting, a number of paper slips corresponding to half the number of total villages in the commune indicated receipt of PNP in the first year, and a number of paper slips corresponding to the remaining half indicated receipt of PNP the following year. These were placed face down on a table visible to everyone present. As each village name was read aloud, a village leader would come forward and draw a face-down slip of paper which assigned the village to either "PNP" in the first year or to PNP the following year ("Non PNP"), depending on which paper was drawn.

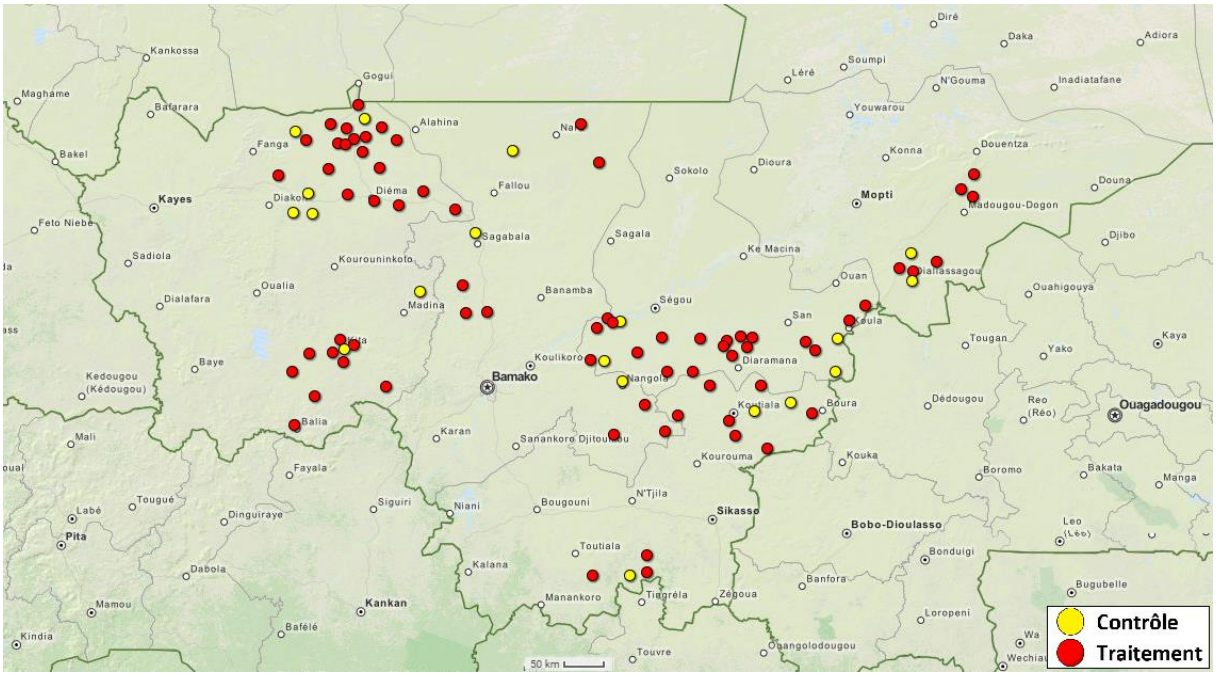
The evaluation design is summarized in Appendix Figure B.1. Within each region, the breakdown on the number of Treatment and Control communes was chosen to be roughly proportional, so that about 20 percent of each region's communes would be Control, as summarized in Appendix Table 2. A map of the distribution of the study communes (Appendix Figure B.2) reveals that treatment and control communes are well spread out across the five southern regions of Mali.

Appendix Figure B.1: Two-stage randomized evaluation design



Appendix Figure B.2: Maps of study communes in evaluation design





Appendix C: Details on sample design

The sampling procedure for the baseline survey used a two-stage probability proportional to size sampling (PPS) method. In the first stage, villages were sampled based on their "population" size (where population refers to total number of CT beneficiary households), and in the second stage, the same number of households within each selected village were randomly sampled. With this process, larger villages in terms of total number of beneficiaries had a higher probability of being sampled in the first stage; and in the second stage, beneficiary households in larger villages had a smaller probability of being sampled. The second stage compensated for the first stage, so that each beneficiary household in the commune had the same probability of being sampled. Given that the Second level randomization of PNP was at the village level, sample size calculations for the comparison of child outcomes in PNP villages to Non-PNP villages showed more villages required in PNP-Eligible communes. Thus, the number of villages selected per commune depended on the treatment status of the commune. The final number of villages targeted to be sampled in each commune was 8 in Control communes, 5 in PNP-Ineligible Treatment communes, and 10 in PNP-Eligible Treatment communes. Within each of the selected villages, 5 beneficiary households with children age 6 to 23 months were sampled to meet the baseline sample size requirements (see baseline report for more details). In total, 3,175 households across 96 communes were planned to be sampled at baseline. Due to security issues, only 3,080 households across 90 communes were actually sampled and form part of the baseline data.

Appendix D: IPV questions

LIRE A HAUTE VOIX :Maintenant, je voudrais vous poser quelques questions à propos de certains aspects des relations à l'intérieur du couple. Je sais que certaines de ces questions sont très personnelles. Cependant, vos réponses sont très importantes pour nous aider à comprendre la situation des femmes au Mali. Je vous garantis que vos réponses resteront complètement confidentielles et ne seront répétées à personne. Si quelqu'un arrivait pendant que nous discutons, nous passerons à un autre sujet.

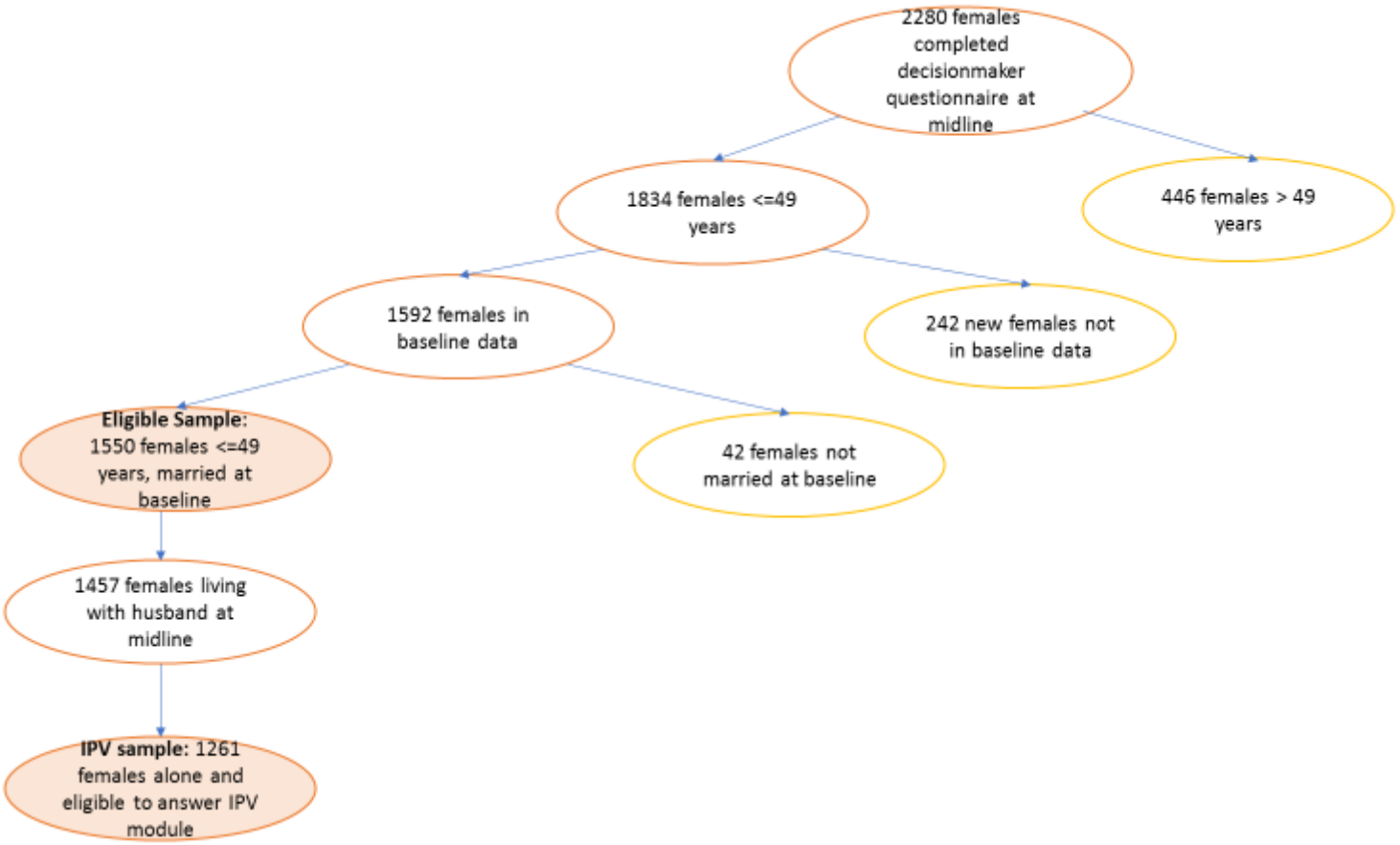
IK10 : A poser seulement si la mère est seule ou en présence d'enfants de moins de 59 mois.
1=Oui elle est seule ou seulement avec ses enfants moins de 59 mois
2=Non elle n'est pas seule [CAPI→NEXT SECTION]

		IK11. En pensant à votre conjoint, est-ce qu'au cours des 12 derniers mois, vous pouvez dire que : 1=Oui 2=Non 98=Refus de répondre 99=Ne sait pas
a	Il essaie de vous empêcher de voir vos amies?	
b	Il essaie de restreindre vos contacts avec les membres de votre famille?	
c	Il insiste pour savoir où vous êtes tout le temps?	
d	Il vous ignore et vous traite avec indifférence?	
e	Il se fâche lorsque vous parlez avec un autre homme?	
f	Il vous suspecte souvent d'être infidèle?	
g	Il attend de vous que vous lui demandiez la permission avant de recourir au système de soin pour votre santé ?	
h	Il ne vous fait pas confiance avec l'argent	
I	Il vous insulte ou vous rabaisse ?	
J	Il vous dit ou fait quelque chose pour vous humilier devant d'autres personnes ?	
K	Il vous fasse des choses pour vous faire peur ou pour vous intimider (par sa façon de vous regarder, de crier ou de casser des objets) ?	
l	Il menace de vous faire mal ou faire du mal à quelqu'un que vous aimez ?	

ENQUETEUR DIRE : Les questions suivantes concernent des choses qui arrivent à beaucoup de femmes et que votre conjoint pourrait vous avoir fait.

		IK13. Est-ce qu'il est déjà arrivé, au cours des 12 derniers mois, que votre conjoint : 1=Oui 2=Non 98=Refus de répondre
A	Vous gifle ou vous jette quelque chose dessus qui pourrait vous blesser ?	
B	vous pousse, vous bouscule ou vous tire les cheveux ?	
C	vous frappe avec ses poings ou autres objets pour vous blesser ?	
D	vous donne les coups de pieds, te traine ou te bat ?	
E	vous choque ou vous brime intentionnellement ?	

Appendix E: IPV sample



Appendix F: Construction of Indices For Categorical Variables

Several of the variables included in our relationship quality and relationship trust index are categorical. For instance, for the question "Do you respect your spouse?", the possible responses were most of the time, sometimes, rarely and never. We transform the response to this question into three binary variables:

- Respect spouse rarely, sometimes, or most of the time
- Respect spouse sometimes or most of the time
- Respect spouse most of the time

Note that after this transformation, the more values of 1 the respondent gives, the greater the relationship trust. We prefer this transformation to treating the categorical variables as continuous, which assumes a constant marginal effect of going from never to rarely, from rarely to sometimes, and from sometimes to most of the time. If the marginal effect of each change is indeed not constant, treating the categorical variable as continuous would throw away important information by weighting each incremental change equally.

We do the same for each categorical variable included in the index, then combine these into an index by standardizing each binary variable (using the mean and standard deviation of the control group) and summing the standardized variables, in the same way as the other indices.

Appendix Figure G: Treatment X Polygamous Effects on Assets , by Quantile

Values in 10,000 CFA

Appendix G: Lee Bounds on IPV Results

DEPENDENT VARIABLE	Any physical violence			Index of physical violence		
Sample	Full	Poly	Non-Poly	Full	Poly	Non-Poly
lower	-0.033	-0.011	-0.066	-0.122*	-0.06	-0.221**
	[0.025]	[0.030]	[0.042]	[0.064]	[0.078]	[0.112]
upper	-0.004	0.025	-0.048	0.022	0.107	-0.221
	[0.047]	[0.061]	[0.074]	[0.164]	[0.139]	[0.449]
Observations	2,439	1,529	910	2,439	1,529	910
	Any emotional violence			Index of emotional violence		
	Full	Poly	Non-Poly	Full	Poly	Non-Poly
lower	-0.069**	-0.04	-0.111**	-0.125*	-0.012	-0.296**
	[0.033]	[0.040]	[0.056]	[0.070]	[0.079]	[0.129]
upper	-0.04	-0.004	-0.093	0.008	0.134	-0.215
	[0.046]	[0.060]	[0.071]	[0.167]	[0.123]	[0.323]
Observations	2,439	1,529	910	2,439	1,529	910
	Any controlling behavior			Index of controlling behavior		
	Full	Poly	Non-Poly	Full	Poly	Non-Poly
lower	-0.082*	-0.039	-0.142*	-0.232***	-0.180*	-0.307**
	[0.044]	[0.055]	[0.073]	[0.077]	[0.097]	[0.126]
upper	-0.053	-0.003	-0.124**	-0.111	-0.039	-0.239
	[0.039]	[0.053]	[0.057]	[0.132]	[0.159]	[0.206]
Observations	2,439	1,529	910	2,439	1,529	910

*Sample = women under age 49 who were married at baseline who were listed as the decisionmaker or spouse of decision-maker and were able to be asked the IPV module in private. All indices normalized to have standard deviation one. Standard errors in parenthesis. * p<0.1 ** p<0.05; *** p<0.01*