

Income Changes and Intimate Partner Violence: Evidence from Unconditional Cash Transfers in Kenya*

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This version: July 2018

*We are deeply grateful to Justin Abraham, Faizan Diwan, Conor Hughes, Victoria Isika, and James Reisinger for outstanding project management and data analysis. We further thank the study participants for generously giving their time; Marie Collins, Channing Jang, Bena Mwangeli, Joseph Njoroge, Kenneth Okumu, James Vancel, and Matthew White for excellent research assistance; Allan Hsiao and Emilio Dal Re for data and code auditing; the team of *GiveDirectly* (Michael Faye, Raphael Gitau, Piali Mukhopadhyay, Paul Niehaus, Joy Sun, Carolina Toth, Rohit Wanchoo) for fruitful collaboration; Petra Persson for designing the intrahousehold bargaining and domestic violence module; Channing Jang, Urša Krenk, Michala Riis-Vestergaard, Christopher Roth, Anna Tompsett, and seminar participants at various institutions for comments and discussion. All errors are our own. This research was supported by NIH Grant R01AG039297 and Cogito Foundation Grant R-116/10 to Johannes Haushofer.

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Abstract

We use a randomized controlled trial to study the impact of unconditional cash transfers on intimate partner violence (IPV) in western Kenya. Cash transfers to women of on average USD 709 PPP led to a significant 0.25 SD increase in a female empowerment index, while transfers to men led to a non-significant increase of 0.09 SD, with no significant difference between these effects. Physical violence was significantly reduced regardless of whether transfers were sent to the woman (0.26 SD) or the man (0.18 SD). In contrast, sexual violence was reduced significantly after transfers to the woman (-0.22 SD), but not the man (-0.10 SD, not significant). Our theoretical framework suggests that physical violence is reduced after transfers to the wife because her tolerance for it decreases, and is reduced after transfers to the husband because he has a distaste for it. We observe a large and significant spillover effect of transfers on domestic violence: non-recipient women in treatment villages show a 0.19 SD increase in the female empowerment index, driven by a 0.16 SD reduction in physical violence. Together, these results suggest that poverty alleviation through unconditional cash transfers can decrease IPV both in recipient and neighboring households.

JEL codes: O12, C93, D12, D13, D14

1. Introduction

Forty-two percent of women in Kenya aged 20–44 report having experienced physical or sexual violence from their current partner; estimates for other countries range from 16 percent (Dominican Republic) to 75 percent (Bangladesh; Hindin, Kishor, and Ansara 2008). An important question in understanding and addressing IPV is whether and how it responds to changes in economic variables for either partner. In this paper, we consider the effect on domestic violence of income changes through unconditional cash transfers to either spouse in rural Kenya. We focus on violence perpetrated by the husband against the wife because it accounts for the majority of violence, both in this context and in others.

Economic models of domestic violence make differing predictions regarding the effect of changes in either spouse’s income. When the wife’s income increases, violence may decrease if the extra income improves the wife’s outside option (Farmer and Tiefenthaler 1997; Tauchen, Witte, and Long 1991; Eswaran and Malhotra 2011). Conversely, violence may increase if the husband wants to extract some of the additional income from her or otherwise align outcomes with his preferences (Eswaran and Malhotra 2011; Tauchen, Witte, and Long 1991; Tankard 2016). In line with these differing predictions, the evidence regarding the effect of changes in the wife’s income on IPV is mixed: a number of studies report reductions in domestic violence after cash or in-kind transfers to women (Bobonis, Gonzalez-Brenes, and Castro 2013; Rivera-Rivera et al. 2004; Angelucci 2008; Hidrobo and Fernald 2013; Hidrobo, Peterman, and Heise 2016).¹ On the other hand, several studies report increased violence in some household types (e.g. cash transfers to households where men have traditional views on gender roles, Angelucci 2008) and after some interventions (e.g. an economic empowerment program, Tankard 2016).²

¹A related literature has shown reductions in IPV after improvements in women’s outside options due to changes in divorce laws or reductions in the wage gap (Stevenson and Wolfers 2006; Aizer 2010).

²Women may also receive more non-violent threats from their partners as a result of participating in such programs (Bobonis 2009).

The first goal of this paper is to shed further light on the effect of changes in the wife’s income on IPV.

When the husband’s income increases, theory also suggests possible effects on IPV in both directions. Violence may increase if the husband derives utility from it and now can “afford” more of it (Farmer and Tiefenthaler 1997; Tauchen, Witte, and Long 1991; Eswaran and Malhotra 2011). Conversely, violence may decrease if the husband dislikes violence (Eswaran and Malhotra 2011) or if transfers to the husband improve the wife’s outside option (e.g. through divorce settlements; Farmer and Tiefenthaler 1997). However, the effect of changes in the husband’s income on IPV has not been measured empirically. The second goal of this paper is therefore to provide causal evidence on this effect. In doing so, we also provide a direct comparison of the effects of transfers to the husband vs. the wife on IPV.

A further unresolved question about the effect of cash transfers on domestic violence is whether they affect not only recipient, but also non-recipient households. On standard economic models, such spillovers would only occur in the presence of economic spillovers. In contrast, social norms may respond to cash transfers in both recipient and non-recipient households even in the absence of economic spillovers. If IPV is reduced in recipient households due to improvements in the wife’s bargaining power or her outside option (?), this reduction might translate into a change in the perceived prevalence and/or perceived justifiability of IPV.³ If non-recipients are motivated to conform to these norms, we might expect a change in IPV even in non-recipient households and in the absence of economic spillovers. The third goal of this paper is therefore to measure the effect of income changes on IPV in non-recipient households.

We address these questions in the context of a randomized controlled trial on unconditional cash transfers with 1500 households in western Kenya. Effects of the program on economic and psychological wellbeing variables have already been reported in a previous paper (Haushofer and Shapiro 2016). That

³In social psychology, perceived prevalence is referred to as descriptive norm, while perceived justifiability is referred to as prescriptive norm (Tankard and Paluck 2016).

paper used a gatekeeper strategy, i.e. it first tested effects of the program on a set of index variables, and then explored those indices in more detail that survived correction for multiple comparisons. We found significant effects on the female empowerment index that survived correction for multiple comparisons across all index variables, but this effect could not be further explored due to space constraints. This is the purpose of the present paper.

Between 2011–2013, the NGO *GiveDirectly, Inc.* made unconditional cash transfers of on average USD 709 PPP, corresponding to about two years of per capita expenditure, to households in western Kenya using the mobile money system *M-Pesa*. Recipients were chosen for meeting a basic means test criterion, did not expect the transfers, and were explicitly informed that they were unconditional. Randomization was carried out at several levels: we first randomly chose 60 treatment and 60 control villages, and then randomly assigned half of eligible households in each treatment village to be “treatment households” and the other half to be “spillover households”. Among married or cohabiting treatment households, we further randomized whether the transfer was sent to the man or the woman. Additional randomization arms were the magnitude of the transfer (USD 404 PPP vs. USD 1525 PPP) and the timing of the transfer (lump-sum transfer vs. nine monthly installments); however, in this paper, we focus on the randomization of recipient gender. All analyses reported here were specified in pre-analysis plans, available at <https://www.socialscisceregistry.org/trials/19/>.

Our results show significant effects of transfers on the incidence of IPV. Pooling female and male recipient households, transfers led to a 0.17 standard deviation (SD) increase in a female empowerment index, significant at the 5 percent level. This effect stemmed from reductions in both physical (0.21 SD) and sexual violence (0.16 SD). In female recipient households, the effect on the female empowerment index was 0.25 SD, significant at the 1 percent level, driven by reductions in physical (0.26 SD) and sexual (0.22 SD) violence. The effect on the female empowerment index in male recipient households was 0.09 SD, which is not statistically different from zero, and not different from the effect on the female empowerment index in female recipient households.

However, women in male recipient households report a 0.18 SD reduction in physical violence, significant at the 5 percent level. In contrast, sexual violence was not significantly reduced when the husband received money (0.10 SD reduction, not significant).⁴

What do these empirical results tell us about the underlying channels driving IPV in our setting, and how can we use our findings to improve policymaking? We construct a theory in which, following the literature, violence can be instrumental or expressive. That is, the husband may use violence to extract income from the wife and increase his private consumption (instrumental), or the husband may derive inherent pleasure or distaste from violent actions (expressive). The theory shows that equilibrium violence balances the husband's demand for it, and the wife's tolerance of it. In particular, the husband's demand is a combination of the extractiveness of violence and the husband's pleasure or distaste for it. The wife's tolerance of violence is a combination of her views about its acceptability, and the resources she has to leave a bad marriage. Our theory disentangles these channels by taking advantage of our unique experimental design: giving transfers to both the wife and the husband means that we have information not only about the sign of each impact, but also the *relative* magnitudes. The signs of our impacts suggest that in our context, violence is both instrumental and expressively distasteful: i.e., husbands use violence to extract resources, but otherwise dislike violence on average. When violence is reduced after transfers to the wife, our theory suggests it is because her tolerance for it decreases; when it is reduced after transfers to the husband, it is because he has a distaste for it. Numerical calibration of the model suggests that violence is always weakly decreasing in transfers to the husband, but shows an inverted U-shaped response to transfers to the wife when the husband is wealthy: initially, the additional consumption the hus-

⁴Social desirability bias or reciprocity is unlikely to account for the improvements in treatment households because participants were informed by the survey team that the survey was independent of the intervention. Participants thus had no incentive to deceive field officers. The fact that several important outcomes, such as health and education, did not show treatment effects suggests that social desirability bias or reciprocity motives did not play an important role.

band can extract through violence is large enough to outweigh his distaste for it, but as the wife’s income grows, so does her empowerment, until equilibrium violence is determined by her participation constraint. The reason that this mechanism is more likely to apply when the husband is rich is that his desire to extract income from the wife decreases in his income, so that the point where her participation constraint rather than his distaste for violence binds becomes lower. We present a numerical example which concretely illustrates how these channels interact, and how they are affected by changes to spousal income. One of the most interesting insights is about small versus large transfers: We suggest that if large transfers are used, they may result in a larger reduction in IPV when given to the husband. This is because giving a large transfer to the wife will also make her a more profitable source of extraction through violence. However, transfers to the husband always reduce his demand for violence, because of his moderate distaste for it. On the other hand, if small transfers are used, they lead to larger reductions in violence when given to the wife because they both give the wife resources to leave bad marriages, and shift her views on the acceptability of violence.

Our two-stage randomization design allows us to study the spillovers of transfers on non-recipients in the same villages by comparing “spillover” to “pure control” households. We find a large and significant spillover effect: non-recipient women in treatment villages show an increase of 0.19 SD in the female empowerment index, driven by a 0.16 SD reduction in physical violence, although no significant reduction in sexual violence (-0.11 SD). These findings suggest that the reduction of IPV through cash transfers in recipient households may lead to a change in social norms, which extends beyond these households. In line with this hypothesis, we find suggestive evidence for a change in social norms around violence: women in both treatment and spillover households are somewhat less likely to view IPV as permissible, although these effects are weak and mostly not statistically significant.

One concern with these spillover findings is that treatment and spillover households were surveyed twice, while pure control households were surveyed once. It is possible that being surveyed at baseline raised awareness of domestic

violence in treatment and spillover households, and led to a change in its incidence simply for this reason, and independently of the cash transfer (?). To rule out this possibility, we conducted a separate “survey effects” experiment, in which we asked whether a survey in the absence of any other treatment reduces subsequent reports of IPV. Specifically, we re-administered the same survey to the pure control group two years after the initial endline survey, and additionally administered the survey to a new sample of 500 households, randomly chosen from the same population, at the same time. Because neither group receive any interventions other than the survey, this design allows us to estimate the effects of the initial survey in the pure control group on responses in the second administration of that same survey. We find no evidence of survey effects; the coefficients are economically small and statistically insignificant.

The remainder of this paper is structured as follows. Section 2 describes the intervention, the experimental design, and the econometric approach. Section 3 presents the impacts of the program on IPV. Section 4 presents the theoretical model. Section 5 concludes.

2. Intervention, Experimental Design, and Econometric Approach

The intervention, experimental design, and econometric approach used in this study have previously been described by us elsewhere (Haushofer and Shapiro 2016), and are briefly summarized here. We refer the reader to the companion paper for details.

2.1 Intervention

GiveDirectly, Inc. (*GD*; www.givedirectly.org) is an international NGO founded in 2009 whose mission is to make unconditional cash transfers to poor households in developing countries. At the time of the study, eligibility was determined by living in a house with a thatched (rather than metal) roof. Recipients were informed that they would receive a transfer of KES 25,200 (USD

404 PPP), and that this transfer was unconditional and one-time. Recipients were provided with a *Safaricom* SIM card and had to register it for the mobile money service *M-Pesa* in the name of the designated transfer recipient.

2.2 Design and timing: Main study

An overview of the design and timeline is shown in Figure 1. Among the 120 villages with the highest proportion of thatched roofs in Rarieda district, Kenya, 60 were randomly chosen to be treatment villages. Within these villages, half of all eligible households were randomly chosen to be treatment households, while the other half were control households. A household was eligible if it had a thatched roof. This process resulted in 503 treatment households and 505 spillover households in treatment villages at baseline. Villages had an average of 100 households, of which an average of 19 percent were surveyed, and an average of 9 percent received transfers. The transfers amounted to an average of 10 percent of aggregate baseline village wealth (excluding land).

Among treatment households, we further randomized whether the transfer went to the husband or the wife (in dual-headed households). In addition, 137 households in the treatment group were randomly chosen to receive “large” transfers of KES 95,200 (USD 1,525 PPP, USD 1,000 nominal) per household, while the remaining 366 treatment households received “small” transfers of KES 25,200 (USD 404 PPP, USD 300 nominal) per household. Finally, we randomly assigned the transfer to be delivered either as a lump-sum amount or as a series of nine monthly installments. We only consider the 173 monthly recipient and 193 lump-sum recipient households that did not receive large transfers, because large transfers were not unambiguously monthly or lump-sum. The total amount of each type of transfer was KES 25,200 (USD 404 PPP).

We conducted a baseline survey with all treatment and spillover households before they received the first transfer, and an endline after the end of transfers.

Households received the first transfer an average of 9.3 months before endline, the last transfer an average of 4.4 months before endline, and the mean transfer an average of 6.9 months before endline.⁵ The order in which villages were surveyed at baseline was randomized, and at endline it followed the same order. In a small number of households, the endline survey was administered before the final transfer was received. These households are nevertheless included in the analysis to be conservative (intent-to-treat).

Control villages were surveyed only at endline; in these villages, we sampled 432 “pure control” households from among eligible households. Because these pure control households were selected into the sample just before the endline, the thatched-roof criterion was applied to them about one year later than to households in treatment villages. This fact potentially introduces bias into the comparison of households in treatment and control villages; however, we showed in our previous paper (Haushofer and Shapiro 2016) that this bias was negligible, amounting to 5 households, or 1.1 percent of the sample. For this reason, and because the IPV variables, in contrast to most others studied in our previous paper, show within-village spillover effects, we use across-village treatment effect estimates for the direct treatment effect in this paper.

⁵The mean transfer date is defined as the date at which half of the total transfer amount to a given household has been sent.

2.3 Design and timing: Survey effects study

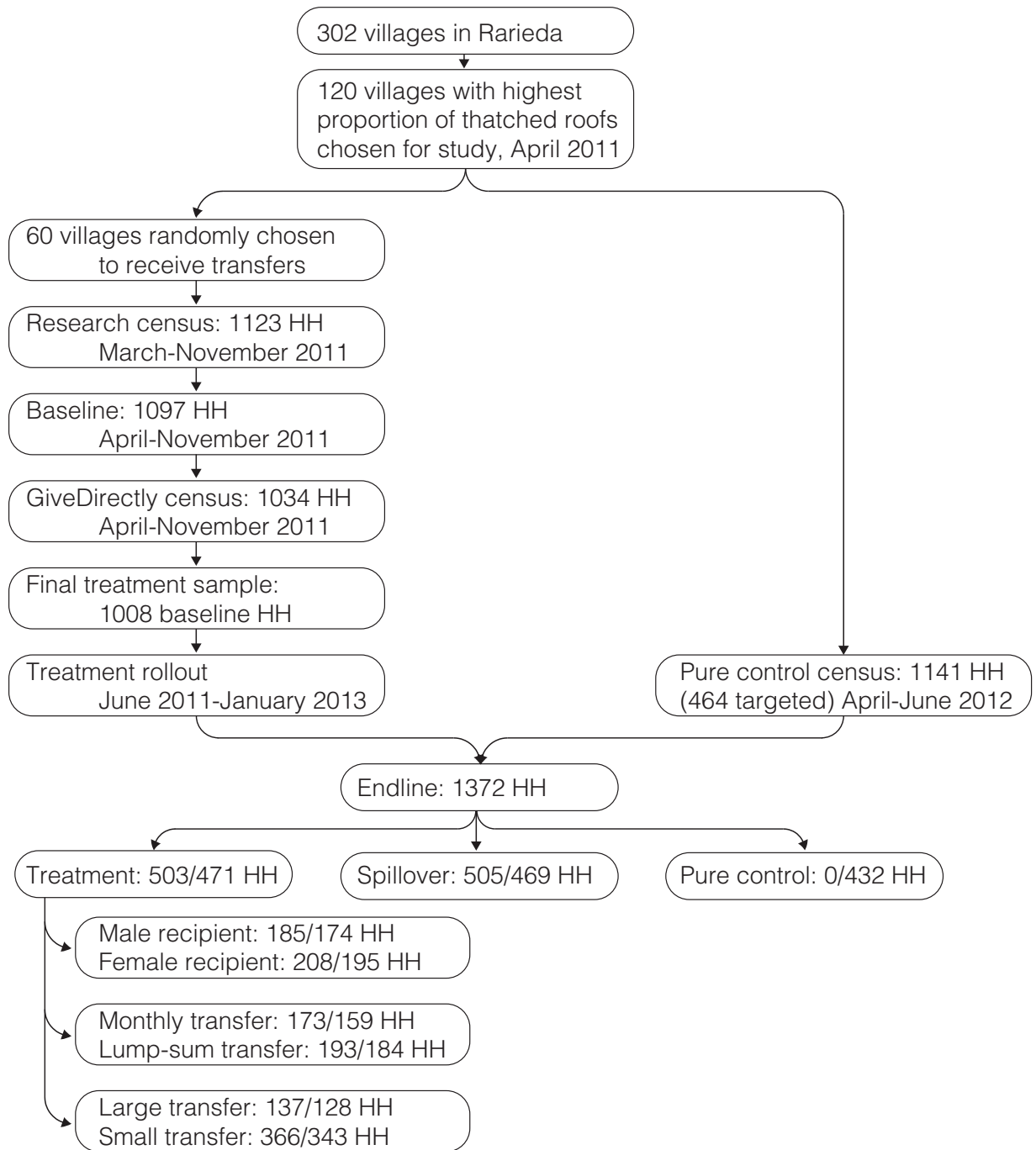
In the main study, the treatment and spillover households were surveyed both at baseline and endline, while the pure control households were surveyed at endline only. This difference could introduce bias in the estimation of across-village treatment and spillover effects if the first survey affects subsequent reports. To address this potential confound, we conducted a separate “survey effects” study in 2015, in which we directly test for the presence of such survey effects in this sample. Specifically, in 2015, we returned to administer a second endline survey to the households that originally participated in the endline survey; in addition, we used our original 2012 census of pure control villages to identify households that had been eligible to participate in the 2012 survey, but that had not previously been surveyed. There were 428 such households. We administered the same survey to this set of households in 2015 as to households involved in the original endline. Neither of these two groups of households received an intervention; the only difference between them is the number of surveys they completed, and comparison of the two groups therefore allows us to identify the effect on outcomes of interest of having previously been surveyed.⁶

2.4 Data and Variables

In each surveyed household, we collected two survey modules: a household module, which collected information about assets, consumption, income, food security, health, and education; and an individual module, which collected information about psychological wellbeing, intrahousehold bargaining and domestic violence, and economic preferences. The two surveys were administered on different (usually consecutive) days. The household survey was administered to any household member who could give information about the outcomes in question for the entire household; this was usually one of the primary members. The individual survey was administered to both primary members

⁶For this comparison to identify the effect of interest, having been surveyed previously must not affect the propensity of being surveyed a second time. We address this issue below.

Figure 1: Timeline of study



Notes: Timeline and treatment arms. Numbers with slashes designate baseline/endline number of households in each treatment arm. Male vs. female recipient was randomized only for households with co-habiting couples. Large transfers were administered by making additional transfers to households that had previously been assigned to treatment. The lump-sum vs. monthly comparison is restricted to small transfer recipient households.

of the household, that is, husband and wife, for double-headed households; and to the single household head otherwise. During individual surveys, particular care was taken to ensure privacy; respondents were interviewed by themselves, without the interference of other household members, especially the spouse.

In this study, we focus on the female empowerment and IPV outcomes; impacts on other outcome categories have been reported in our previous paper (Haushofer and Shapiro 2016). The IPV module was adapted from the Demographic & Health Survey (DHS).⁷ Our outcomes of interest are reports by the woman in the household about violence perpetrated against her by the man, since most violence occurs in this direction, and reports by the woman are least likely to be subject to reporting bias. We report both individual outcome variables, as well as summary indices. These indices are created and grouped as follows:

The physical violence index is the weighted standardized average of dummy variables indicating if in the preceding six months the woman was pushed or shaken; slapped; punched; kicked, dragged, or beaten by the husband; whether he twisted her arm or pulled her; tried to choke or burn her; or threatened to attack her. In the tables in the paper, we report the index and a subset of the constituent variables.

The sexual violence index is the weighted standardized average of dummy variables indicating if in the preceding six months the husband forced the woman to have sexual intercourse, or perform sexual acts.

The female empowerment index is the weighted standardized average of a violence index and an attitude index, which in turn are constructed as follows. The violence index is a weighted standardized average of the physical and sexual violence indices described above, and an additional emotional violence index.⁸ The attitude index is a weighted standardized average of a male-focused attitudes index and a justifiability of violence index.⁹ These indices

⁷We thank Petra Persson for assistance in the creation of this module.

⁸The emotional violence index is the weighted standardized average of dummy variables indicating if in the preceding six months the man was jealous if the woman talked to other men; accused her of being unfaithful; forbade her meeting friends; limited contact with her family; didn't trust her with money; or threatened to hurt her.

⁹The justifiability of violence index is the sum of dummy variables indicating if the

are not all presented separately because the focus of this paper is on physical and sexual violence.

To measure psychological wellbeing, we use a number of standard questionnaires which are described in more detail in our original paper (Haushofer and Shapiro 2016).

Finally, to measure norms related to violence, we survey wives about whether they believe husbands have the right to beat their wives under different circumstances. The violence norms index variable is a weighted standardized average of these variables.

2.5 Integrity of experiment

We have previously reported that our study had good baseline balance on most outcomes of interest, and therefore do not repeat this discussion here (Haushofer and Shapiro 2016). The female empowerment index did not show differences across treatment groups at baseline.

Due primarily to registration issues with *M-Pesa*, 18 treatment households had not received transfers at the time of the endline, and thus only 485 of the 503 treatment households were in fact treated. We deal with this issue by using an intent-to-treat approach.

We had low levels of attrition; overall, 940 of 1,008 baseline households (93.3 percent) were surveyed at endline. We have shown previously that our results are unlikely to be affected by this attrition (Haushofer and Shapiro 2016).

To ensure no cherry-picking of results from these many outcomes, we wrote a pre-analysis plan (PAP) for this study, which is published and time-stamped at <https://www.socialscisceregistry.org/trials/19> (Casey, Glenner-

woman or man deem it justified for the man to hit the woman if she goes out without telling him; neglects the children; argues with him; refuses to have sex with him; or burns the food. The male-focused attitudes index is the sum of dummy variables indicating if the woman or man think that “the important decisions in the family should be made only by the men of the family”; “the wife has the right to express her opinion even when she disagrees with what her husband is saying”; “a wife should tolerate being beaten by her husband in order to keep the family together”; “a husband has the right to beat his wife”; and “it is more important to send a son to school than it is to send a daughter”.

ster, and Miguel 2012; see also Rosenthal 1979; Simes 1986; Horton and Smith 1999). In the PAP, we specify the variables to be analyzed, the construction of indices, our approach to dealing with multiple inference, the econometric specifications to be used, and the handling of attrition.

2.6 Econometric approach

2.6.1 Direct and spillover effects of cash transfers

Because we found a positive spillover effect on the female empowerment index in our previous paper, we here focus on across-village treatment effects. The main specification to capture the direct impact of cash transfers on recipient households, and the village-level spillover effect, is

$$y_{vhiE} = \beta_0 + \beta_1 T_{vh} + \beta_2 S_{vh} + \varepsilon_{vhiE} \quad (1)$$

Here, where y_{vhiE} is the outcome of interest for household h in village v , measured at endline ($t = E$); index i is included for outcomes measured at the level of the individual respondent, and omitted for outcomes measured at the household level. T_{vh} is a treatment indicator that takes value 1 for households which received a cash transfer (“treatment households”) and 0 otherwise. S_{vh} is a dummy variable that takes value 1 for spillover households and 0 otherwise. ε_{vhiE} is the error term. The omitted category is pure control households. Thus, β_1 identifies the treatment effect for treated households relative to pure control households, and β_2 identifies within-village spillover effects by comparing spillover households to pure control households. To account for possible correlation in outcomes within villages, the error term is clustered at the village level.

To analyze the across-village treatment effect for households in which the transfer was received by the wife vs. the husband, we estimate:

$$y_{vhiE} = \beta_0 + \beta_1 T_{vh}^F + \beta_2 T_{vh}^M + \beta_3 T_{vh}^W + \beta_4 S_{vh} + \beta_5 PC_{vh}^{\text{SINGLE}} + \varepsilon_{vhiE} \quad (2)$$

Here, T_{vh}^x indicates whether the transfer recipient is female (T_{vh}^F), male (T_{vh}^M), or that the gender of the recipient could not be randomized because the household only had one head (most commonly in the case of widows/widowers) (T_{vh}^W). PC_{vh}^{SINGLE} is an indicator for pure control households with a single head. Thus, the omitted category is cohabiting pure control households. β_1 identifies the treatment effect when the wife in the household receives the transfer, and β_2 identifies the treatment effect when the husband receives the transfer. Standard errors are again clustered at the village level. The randomizations on monthly vs. lump-sum transfers and large vs. small transfers are not the focus of this paper and are therefore not shown here.

2.6.2 Survey effects

Our basic specification to capture the effect of having been previously surveyed is:

$$y_{vhiE_2} = \alpha_v + \beta_0 + \beta_1 D_{vh} + \varepsilon_{vhiE_2} \quad (3)$$

Here, y_{vhi} is the outcome of interest for household h in village v , measured in the second endline ($t = E_2$). The sample is restricted to households in control villages. D_{vh} is a dummy variable that takes value 1 for pure control households that were surveyed in the first endline, and 0 for control village households that were not surveyed in the first endline. α_v is a village fixed effect. Thus, β_1 identifies the effect of having been previously surveyed. The error term is clustered at the household level when the outcomes are measured at the individual level.

3. Results

We first discuss the reduced-form results before interpreting them in light of our theoretical model. In all results tables, each row corresponds to one outcome variable, listed on the left. Column 1 shows the pure control group mean and standard deviation of that variable. The remaining columns present

results from the following estimations: the main treatment effects analysis; separate regressions comparing transfers to women vs. men, and the p -value for the within-village difference between transfers to the female vs. the male. In some tables, we present columns for the within-village spillover effect, and the survey effect. The final column shows the number of observations in the main sample, i.e. excluding the survey effects sample.

3.1 Reduced-form results

The main results are shown in Table 1. We find high baseline levels of domestic violence: Column 1 shows that large proportions of women in the pure control group report that their partner pushed or shook (26 percent), slapped (33 percent), punched (15 percent), or kicked, dragged, or beat (15 percent) them. Similarly, we find high baseline levels of sexual violence; 12 percent of women report having been forced to have sexual intercourse in the preceding six months, and 9 percent report having been forced to perform sexual acts.

Column 2 shows a 0.17 SD increase in female empowerment in treatment relative to pure control households. This effect is mainly driven by a reduction in physical violence by 0.21 SD; and by a reduction of 0.16 SD in sexual violence. Among the individual variables, we find a decrease in being pushed or shaken by the husband by 7 percentage points relative to a control group mean of 27 percent (a 26 percent reduction); being slapped by the husband (11 percentage point decrease relative to 33 percent control group mean, a 33 percent reduction); being punched (6 percentage point decrease relative to 15 percent control group mean, a 39 percent reduction); and being kicked, dragged, or beaten (8 percentage point decrease relative to 15 percent control group mean, a 51 percent reduction). For sexual violence, we observe a reduction in the incidence of forced sexual intercourse by 5 percentage points relative to a control group mean of 12 percent (a 39 percent decrease), significant at the 10 percent level, and a 5 percentage point reduction in the incidence of being forced to perform sexual acts relative to a control group mean of 9 percent (a 52 percent

reduction).¹⁰

Distinguishing between male and female recipient households, the treatment effect on female empowerment is driven by female recipient households, which experience a 0.29 SD increase in female empowerment relative to pure control households (column 3). The coefficient is positive (0.10 SD) even in male recipient households, but not significantly different from zero (column 4). We cannot reject equality of the male and female recipient coefficients (column 5). The physical violence index in female recipient households shows a significant reduction of 0.26 SD, and the sexual violence index by 0.22 SD. Male recipient households show no significant decrease in sexual violence (-0.10 SD), but we observe a significant 0.18 SD reduction in physical violence in these households. The individual variables for physical violence show highly significant reductions in female recipient households.¹¹ In male recipient households, the reduction in physical violence is driven by a 10 percentage point reduction in being slapped by the husband relative to a control group mean of 33 percent (a 32 percent reduction), and a 9 percentage point reduction in being kicked, dragged, or beaten relative to a control group mean of 15 percent (a 59 percent reduction). In female recipient households, rape is reduced by 7 percentage points or 56 percent, and the incidence of other sexual acts is reduced by 6 percentage points or 66 percent. Male recipient households show reductions as well, but these are not significant.

Thus, we find a large and highly significant increase in female empowerment in female recipient households, and no significant decrease in male recipient households. In fact, the individual coefficients in male recipient households largely point in the direction of a decrease in IPV, and the decrease in physical violence is significant at the 5 percent level. These results are broadly consistent with the finding by (?) showing that transfers to the woman rather

¹⁰For brevity, we do not present the results on having one's arm twisted or hair pulled (6 percentage point decrease relative to 16 percent control group mean, a 36 percent reduction, statistically significant) and husbands trying to choke or burn their spouses, or threatening to attack them (small and non-significant reductions).

¹¹Not shown are significant reductions in being choked or burned, having one's arm twisted or hair pulled, and a non-significant reduction in threats.

than the man increase the woman's bargaining power.

Table 1: Effects of cash transfers on violence

	(1)	(2)	(3)	(4)	(5)	(6)
	Control	Treatment	Female	Male	Female vs.	
	mean (SD)	(across village)	recipient	recipient	male p-value	N
<i>Female empowerment index</i>	0.00 (1.00)	0.17** (0.07)	0.25*** (0.08)	0.09 (0.10)	0.10	1010
<i>Physical violence index</i>	-0.00 (1.00)	-0.21*** (0.07)	-0.26*** (0.08)	-0.18** (0.09)	0.39	1010
Pushed or shook you	0.27 (0.45)	-0.07** (0.03)	-0.09** (0.04)	-0.05 (0.04)	0.29	1010
Slapped you	0.33 (0.47)	-0.11*** (0.04)	-0.13*** (0.04)	-0.10** (0.04)	0.48	1010
Punched you	0.15 (0.36)	-0.06** (0.03)	-0.08*** (0.03)	-0.05 (0.03)	0.51	1010
Kicked, dragged, or beat you	0.15 (0.36)	-0.08*** (0.03)	-0.08*** (0.03)	-0.09*** (0.03)	0.67	1010
<i>Sexual violence index</i>	-0.00 (1.00)	-0.16** (0.08)	-0.22*** (0.08)	-0.10 (0.10)	0.23	1010
Forced sexual intercourse	0.12 (0.33)	-0.05* (0.03)	-0.07** (0.03)	-0.03 (0.03)	0.29	1010
Forced sexual acts	0.09 (0.29)	-0.05** (0.02)	-0.06*** (0.02)	-0.03 (0.03)	0.21	1010

Notes: OLS estimates of treatment effects. Outcome variables are listed on the left. For each outcome variable, we report the coefficients of interest and their standard errors in parentheses. Column (1) reports the mean and standard deviation of the control group for a given outcome variable. Column (2) reports the basic treatment effect calculated across villages, i.e. comparing treatment households to pure control households. Columns (3) and (4) report the effect of transfers to the husband and wife in the household, respectively, compared to pure control. Column (5) reports p -values for the difference between transfers to the husband and wife, using village-level fixed effects. Column (6) reports the sample size. The sample is restricted to co-habiting couples. The unit of observation is the individual; we analyze the responses of the wife. The last row shows joint significance of the coefficients in the corresponding column from SUR estimation. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

3.1.1 Spillover and survey effects

Column 2 of Table 2 shows that these positive effects on female empowerment are not restricted to treatment households: compared to pure control households, spillover households show a 0.19 SD increase in female empowerment, significant at the 5 percent level and equal in magnitude to the direct effect on treatment households (0.17 SD). The result is driven by a reduction in physical violence by 0.16 SD. Thus, strikingly, the receipt of cash transfers by a subset of households in the village appears to have a similarly large overall effect on neighboring households which did not receive transfers.

As described above, one potential concern about this result is that both the treatment and spillover households were surveyed twice, while the pure control households were only surveyed once (at endline). To rule out that being surveyed affects responses in a subsequent survey, we compare pure control households which were surveyed twice to pure control households which were surveyed once in column 3 of Table 2. We find no significant effects on any outcomes, except for an *increase* in reporting sexual violence as a result of being surveyed twice in the pure control group. Note, however, that this effect is only significant at the 10 percent level, and goes in the conservative direction, i.e. it shows a decrease in female empowerment as a result of more than one survey round. In addition, the overall female empowerment index is not significant. We thus conclude that survey effects are unlikely to have affected the findings on female empowerment reported above, and that they can therefore be attributed to the cash transfers.

3.2 Mechanisms for direct effects

3.2.1 Instrumental vs. expressive violence

We now turn to the mechanisms that might drive the reduced-form effects that we describe above. We first discuss possible mechanisms for the *direct* effects in this section, before turning to a possible mechanism for spillover effects in the next section.

In our model, violence can be either or both instrumental, i.e. used to

Table 2: Effects of cash transfers on violence: spillover and survey effects

	(1) Control mean (SD)	(2) Spillover effect	(3) Survey effect	(4) N
<i>Female empowerment index</i>	0.00 (1.00)	0.19** (0.08)	-0.04 (0.09)	1010
<i>Physical violence index</i>	-0.00 (1.00)	-0.16** (0.07)	0.00 (0.09)	1010
Pushed or shook you	0.27 (0.45)	-0.06* (0.03)	-0.22 (0.24)	1010
Slapped you	0.33 (0.47)	-0.09** (0.03)	0.12 (0.16)	1010
Punched you	0.15 (0.36)	-0.04 (0.03)	-0.28 (0.28)	1010
Kicked, dragged, or beat you	0.15 (0.36)	-0.04 (0.03)	-0.14 (0.17)	1010
<i>Sexual violence index</i>	-0.00 (1.00)	-0.11 (0.08)	0.20* (0.10)	1010
Forced sexual intercourse	0.12 (0.33)	-0.03 (0.03)	0.26 (0.19)	1010
Forced sexual acts	0.09 (0.29)	-0.03 (0.02)	0.18 (0.21)	1010

Notes: OLS estimates of spillover and survey effects. Outcome variables are listed on the left. For each outcome variable, we report the coefficients of interest and their standard errors in parentheses. Column (1) reports the mean and standard deviation of the control group for a given outcome variable. Column (2) reports the spillover effect, i.e. comparing spillover households to pure control households. Column (3) reports survey effects comparing pure control households to a new sample of households in control villages who had not previously been surveyed. Note that this comparison uses results from endline 2. Column (4) reports the sample size. The sample is restricted to co-habiting couples. The unit of observation is the individual; we analyze the responses of the wife. The last row shows joint significance of the coefficients in the corresponding column from SUR estimation. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

extract resources, or expressive, i.e. directly affecting the husband's utility. When violence is expressive, it can either increase his utility, e.g. because he enjoys it or uses it to release frustration, or it can decrease his utility, e.g. because of caring motives. For instance, it may be the case that sexual violence is at least partly enjoyable for husbands who engage in it, while physical violence may on average be more likely to be disliked by husbands. It is more difficult to make predictions for emotional violence, which could be seen as positive or negative by men who dislike physical violence (positive if it prevents escalation to physical violence, or negative if it shares features with physical violence). We therefore focus on physical and sexual violence. In what follows, we argue that our data are consistent with a model in which i. husbands use violence instrumentally, ii. husbands dislike physical violence, iii. husbands are either indifferent towards sexual violence or enjoy it on average, and iv. the wife's reservation constraint binds.

To see this, first consider transfers to the husband. For such transfers, we find a reduction in physical violence, but not sexual violence. This pattern of results is inconsistent with models in which violence is not instrumental, because in this case the husband already engages in the minimum or maximum possible level of violence, and transfers to him generate no motive to change the level of violence. The lack of a change in sexual violence after transfers to the husband is also inconsistent with an instrumental model in which the husband dislikes violence (unless the income and substitution effects cancel exactly). However, it is consistent with an instrumental model where the husband either is indifferent to sexual violence, or derives positive utility from it on average. Conversely, the reduction in physical violence after transfers to the husband is inconsistent with instrumental models in which the husband is indifferent towards it or derives positive utility from it. Instead, it suggests that husbands derive negative utility from physical violence.

Thus, the effects of transfers to the husband suggest that violence is used instrumentally, and that husbands derive negative utility from physical violence, and weakly positive utility from sexual violence. Are these results consistent with the effects of transfers to the wife? For such transfers, we observe re-

ductions in both physical and sexual violence. Notice first that the effect of transfers to the wife when the husband dislikes violence and uses it instrumentally is ambiguous, as shown above. In particular, transfers to the wife can reduce violence in this case regardless of whether her reservation utility binds because the same amount of violence now buys the husband more consumption (income effect). If violence does not affect the husband’s utility directly, or if the husband derives positive utility from it (as might be the case with sexual violence), transfers to the wife can reduce violence only through the change in her reservation utility. Thus, a decrease in sexual violence is consistent with a husband who (weakly) enjoys such violence, but reduces it after transfers to her because of her now stricter reservation utility constraint. Notice that in addition to a binding reservation utility constraint, this reduction also requires that the increase in the wife’s reservation utility is larger than her increase in utility from the extra consumption enabled by the transfer.

In sum, we observe a pattern of empirical results that is consistent with a model in which violence is used instrumentally by husbands. Husbands must dislike physical violence and be indifferent towards sexual violence or derive positive utility from it. In addition, the wife’s reservation utility constraint has to bind on average, and her increase in consumption utility after transfers to her must be lower than the increase in her reservation utility. All of these assumptions are plausible in the Kenyan setting.

3.2.2 Psychological wellbeing

As an additional test of the relationships described above, we investigate whether and how changes in domestic violence are reflected in psychological wellbeing. Before doing so, two caveats are in order. First, this question cannot be answered causally here; instead, we simply ask whether treatment effects on IPV are mirrored in treatment effects on wellbeing in either partner. Second, psychological wellbeing correlates with other variables than IPV (e.g. consumption), and therefore changes in wellbeing may also reflect changes in these other variables.

With these caveats in place, we can consider treatment effects on psycho-

logical wellbeing. Tables 3 and 4 show effects of transfers on psychological well-being of the wife and the husband, respectively.

Recall that transfers to women reduce both sexual and physical violence. Are these changes reflected in the wife's psychological well-being? Indeed, for female respondents who received transfers, we find a large and significant direct treatment effect of 0.44 SD on the index of psychological well-being, driven by a reduction in stress and increases in happiness, life satisfaction, and optimism. Recall further that we observe a decrease in physical violence when husbands receive transfers. This effect, too, is mirrored in women's psychological wellbeing, with a 0.40 SD increase in the index of psychological wellbeing among women whose husbands received transfers. In addition, the spillover effect is positive and significant for psychological well-being among female respondents, with a 0.20 SD increase.

Our model suggests that husbands may derive negative utility from violence. If psychological wellbeing is closely linked to IPV, this claim makes the somewhat counterintuitive prediction that husbands should experience an increase in psychological wellbeing when transfers are made to their wife, because these transfers reduce IPV to the greatest extent. Indeed, we observe a 0.24 SD increase in the husband's overall psychological wellbeing when his wife receives a transfer. In contrast, we observe no significant effects of transfers to the husband on his level of psychological wellbeing. One possible reason for this result is that, to the extent the husband's psychological wellbeing decreases in IPV, the effect on IPV of transfers to the husband is much smaller than that of transfers to the wife.

Table 3: Effects of cash transfers on psychological wellbeing (female reports)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Control mean (SD)	Treatment (across village)	Spillover effect	Survey effect	Female recipient	Male recipient	Female vs. male p-value	N
<i>Psychological well-being index</i>	−0.00 (1.00)	0.42*** (0.10)	0.20** (0.09)	−0.06 (0.08)	0.44*** (0.10)	0.40*** (0.12)	0.57	1189
Depression (CESD)	27.34 (9.41)	−1.37* (0.72)	−0.25 (0.83)	0.15 (0.83)	−1.00 (0.87)	−1.11 (0.97)	0.79	1189
Stress (Cohen)	0.00 (1.00)	−0.25*** (0.09)	−0.06 (0.09)	0.07 (0.08)	−0.21* (0.11)	−0.20* (0.12)	0.78	1189
Happiness (WVS)	−0.00 (1.00)	0.37*** (0.08)	0.13 (0.09)	−0.11 (0.08)	0.34*** (0.09)	0.30*** (0.10)	0.62	1189
Life satisfaction (WVS)	0.00 (1.00)	0.35*** (0.11)	0.18 (0.11)	0.05 (0.08)	0.25** (0.11)	0.42*** (0.14)	0.06*	1189
Trust (WVS)	−0.00 (1.00)	−0.13 (0.08)	−0.18** (0.08)	−0.22*** (0.08)	−0.15 (0.10)	−0.15 (0.10)	0.96	1189
Locus of control	0.00 (1.00)	0.00 (0.08)	−0.13 (0.08)	−0.01 (0.09)	0.06 (0.10)	−0.12 (0.10)	0.15	1189
Optimism (Scheier)	−0.00 (1.00)	0.18** (0.08)	0.10 (0.08)	−0.02 (0.08)	0.21* (0.12)	0.15 (0.10)	0.68	1189
Self-esteem (Rosenberg)	0.00 (1.00)	−0.09 (0.09)	−0.06 (0.09)	0.09 (0.08)	0.03 (0.10)	−0.23** (0.11)	0.03**	1189

Notes: OLS estimates of treatment, spillover, and survey effects. Outcome variables are listed on the left. For each outcome variable, we report the coefficients of interest and their standard errors in parentheses. Column (1) reports the mean and standard deviation of the control group for a given outcome variable. Column (2) reports the basic treatment effect calculated across villages, i.e. comparing treatment households to pure control households. Column (3) reports the spillover effect, i.e. comparing control households in treatment villages to control households in control villages. Column (4) reports survey effects comparing control households in control villages to a new sample of households in control villages who had not previously been surveyed. Note that this comparison uses results from endline 2. Columns (5) and (6) report the effect of transfers to the wife and husband in the household, respectively, compared to pure control. Column (7) reports p -values for the difference between transfers to the husband and wife, using village-level fixed effects. Column (8) reports the total sample size, including all treatment, spillover and pure control households. The sample is restricted to co-habiting couples. The unit of observation is the individual; we analyze the responses of the wife. The last row shows joint significance of the coefficients in the corresponding column from SUR estimation. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table 4: Effects of cash transfers on psychological wellbeing (male reports)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Control	Treatment	Spillover	Survey	Female	Male	Female vs.	
	mean (SD)	(across village)	effect	effect	recipient	recipient	male p-value	N
<i>Psychological well-being index</i>	0.00 (1.00)	0.12 (0.10)	-0.16 (0.11)	-0.02 (0.09)	0.24* (0.12)	-0.01 (0.12)	0.12	951
Depression (CESD)	25.92 (9.77)	-1.43 (1.10)	-0.23 (1.18)	-0.14 (0.86)	-2.05* (1.24)	-0.26 (1.25)	0.12	951
Stress (Cohen)	0.00 (1.00)	-0.12 (0.10)	0.23* (0.13)	-0.10 (0.09)	-0.18 (0.13)	-0.14 (0.12)	0.98	951
Happiness (WVS)	0.00 (1.00)	0.13* (0.08)	0.08 (0.09)	-0.08 (0.09)	0.18 (0.11)	0.10 (0.11)	0.47	951
Life satisfaction (WVS)	0.00 (1.00)	0.07 (0.11)	-0.13 (0.12)	-0.08 (0.09)	0.11 (0.12)	0.04 (0.14)	0.73	951
Trust (WVS)	-0.00 (1.00)	0.08 (0.11)	0.06 (0.10)	-0.00 (0.09)	0.15 (0.13)	0.01 (0.13)	0.12	951
Locus of control	-0.00 (1.00)	-0.10 (0.09)	-0.03 (0.09)	0.05 (0.10)	-0.15 (0.11)	0.00 (0.12)	0.41	951
Optimism (Scheier)	-0.00 (1.00)	0.18* (0.10)	0.06 (0.11)	0.03 (0.10)	0.19 (0.12)	0.09 (0.13)	0.45	951
Self-esteem (Rosenberg)	0.00 (1.00)	0.03 (0.10)	0.01 (0.09)	0.11 (0.09)	0.10 (0.13)	-0.02 (0.12)	0.44	951

Notes: OLS estimates of treatment, spillover, and survey effects. Outcome variables are listed on the left. For each outcome variable, we report the coefficients of interest and their standard errors in parentheses. Column (1) reports the mean and standard deviation of the control group for a given outcome variable. Column (2) reports the basic treatment effect calculated across villages, i.e. comparing treatment households to pure control households. Column (3) reports the spillover effect, i.e. comparing control households in treatment villages to control households in control villages. Column (4) reports survey effects comparing control households in control villages to a new sample of households in control villages who had not previously been surveyed. Note that this comparison uses results from endline 2. Columns (5) and (6) report the effect of transfers to the wife and husband in the household, respectively, compared to pure control. Column (7) reports p -values for the difference between transfers to the husband and wife, using village-level fixed effects. Column (8) reports the total sample size, including all treatment, spillover and pure control households. The sample is restricted to co-habiting couples. The unit of observation is the individual; we analyze the responses of the husband. The last row shows joint significance of the coefficients in the corresponding column from SUR estimation. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

3.3 Mechanisms for spillover effects: Norm change?

One of the main findings of this study that call for an explanation is the large spillover effect on IPV, which is equal in magnitude to the direct effect. A prominent possibility to explain this effect is that the transfers changed social norms. Psychologists distinguish between prescriptive and descriptive norms, where the former refer to preferences over outcomes, and the latter over perceived actual outcomes. Our survey measured prescriptive norms by asking both husbands and wives whether husbands have the right to beat their wives in general, and in response to particular events, such as neglecting the children. Results on these variables are reported in Table 5. We find no significant direct or spillover effects on the index variable. However, some individual coefficients point in the direction of a change towards less permissive norms around violence, and women in spillover households are 7 percentage points less likely to think that men have the right to beat them for going out without telling them, a 22 percent reduction relative to a control group mean of 32 percent; and are 6 percentage points less likely to think men have the right to beat them for refusing sex, a 22 percent reduction relative to a 28 percent control group mean. Thus, we observe suggestive evidence that prescriptive norms among women around the husband's right to violence change in favor of the woman. Appendix Table B1 shows that husbands do not show a similar change in prescriptive norms, suggesting that to the extent our empirical effects operate through prescriptive norms, they do so by husbands incorporating the wife's prescriptive norms around violence into their decisions. Section 4.5 presents a simple extension of our theoretical model which shows how changes in both prescriptive and descriptive norms around violence could translate into changes in equilibrium levels of violence.

Table 5: Effects of cash transfers on violence norms (female reports)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Control	Treatment	Spillover	Survey	Female	Male	Female vs.	
	mean (SD)	(across village)	effect	effect	recipient	recipient	male p-value	N
<i>Violence norms index</i>	-0.00 (1.00)	0.07 (0.08)	0.11 (0.08)	0.09 (0.09)	0.13 (0.09)	0.02 (0.10)	0.53	1010
Wife should tolerate being beaten	0.27 (0.44)	-0.05 (0.04)	-0.06 (0.04)	-0.01 (0.04)	-0.07 (0.05)	-0.04 (0.05)	0.50	1010
Husband has the right to beat	0.48 (0.50)	-0.00 (0.04)	-0.01 (0.04)	0.01 (0.04)	-0.02 (0.05)	0.03 (0.06)	0.20	1010
Right to beat: Going out without telling him	0.32 (0.47)	-0.03 (0.04)	-0.07** (0.04)	-0.03 (0.05)	-0.06 (0.04)	-0.01 (0.05)	0.47	1010
Right to beat: Neglecting the children	0.53 (0.50)	0.05 (0.04)	0.02 (0.04)	0.02 (0.04)	0.03 (0.05)	0.07 (0.05)	0.98	1010
Right to beat: Arguing with him	0.54 (0.50)	-0.05 (0.04)	-0.03 (0.04)	-0.06 (0.05)	-0.08* (0.05)	-0.00 (0.05)	0.20	1010
Right to beat: Refusing to have sex	0.28 (0.45)	-0.05 (0.03)	-0.06* (0.03)	-0.05 (0.04)	-0.05 (0.04)	-0.06 (0.04)	0.78	1010
Right to beat: Burning the food	0.15 (0.36)	-0.02 (0.03)	-0.02 (0.03)	-0.03 (0.04)	-0.02 (0.04)	-0.03 (0.03)	0.26	1010

Notes: OLS estimates of treatment, spillover, and survey effects. Outcome variables are listed on the left. For each outcome variable, we report the coefficients of interest and their standard errors in parentheses. Column (1) reports the mean and standard deviation of the control group for a given outcome variable. Column (2) reports the basic treatment effect calculated across villages, i.e. comparing treatment households to pure control households. Column (3) reports the spillover effect, i.e. comparing control households in treatment villages to control households in control villages. Column (4) reports survey effects comparing control households in control villages to a new sample of households in control villages who had not previously been surveyed. Note that this comparison uses results from endline 2. Columns (5) and (6) report the effect of transfers to the wife and husband in the household, respectively, compared to pure control. Column (7) reports *p*-values for the difference between transfers to the husband and wife, using village-level fixed effects. Column (8) reports the total sample size, including all treatment, spillover and pure control households. The sample is restricted to co-habiting couples. The unit of observation is the individual; we analyze the responses of the wife. The last row shows joint significance of the coefficients in the corresponding column from SUR estimation. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

4. Theoretical framework

Our theory is designed to study two questions: First, what can we learn about the motives for domestic violence from how it responds to spousal income? Second, under what circumstances is a transfer to the wife more effective in reducing violence than a transfer to the husband, and vice versa?

We build on existing models of domestic violence which treat violence as either “instrumental” or “expressive”. In instrumental models, violence is used to extract resources from the spouse, increasing the husband’s consumption and increasing that of the wife. Thus, violence enters utility indirectly, through its effect on consumption (Tauchen, Witte, and Long 1991; ?; Farmer and Tiefenthaler 1997).¹² In expressive models, violence is modeled as entering the perpetrating spouse’s utility directly (Tauchen, Witte, and Long 1991): the husband may experience pleasure by asserting dominance or releasing stress through violence; or he may have an inherent distaste for violence. Expressive violence therefore directly enters his utility, even if it does not change his consumption.

We set up a flexible framework which allows for both instrumental and expressive motives. In this setup, changes in spousal income may affect the incidence of violence through at least three channels: by affecting the degree to which the husband extracts income from the wife; the degree to which the husband has a direct taste or distaste for violence; and the degree to which the wife tolerates violence instead of leaving the marriage. Tolerance reflects empowerment, both in the sense that the wife may not have enough resources to escape, and in the sense that she views domestic violence as acceptable.

Our theory yields two sets of results. The first set describes how the sign of the impact of cash transfers to the husband and to the wife shed light on whether violence is instrumental and/or expressive. In our case, our empirical

¹²Some authors use the term “extractive” violence to refer specifically to the extraction of resources (?). This is a specific example of instrumental violence, which is a broader concept and can also include violence to control the wife’s behavior and achieve control of decisions in the household (Hidrobo, Peterman, and Heise 2016). We focus on extractive instrumental violence because other types of instrumental violence can be expressed as extractive as long as transfers are possible.

results show that transfers to husband and to the wife both reduced violence. Our theory shows that it must be the case that violence is extractive and that the husband has a direct distaste for it. The second set describes how the *relative* magnitudes of the impact of transfers to the wife versus the husband shed light on whether violence is more effectively reduced by decreasing the husband’s demand for it, or by decreasing the wife’s tolerance of it. We find that...

4.1 General set-up

Consider a one-period, two-person household in which husband (H) and wife (W) earn separate, exogenously-given incomes, y_H and y_W .¹³ Both spouses have increasing and concave utility functions ($u' > 0$ and $u'' \leq 0$). In addition to private consumption, each may also derive (dis)utility from violence, either indirectly, through the effects of violence on consumption, or directly. First, the husband may use domestic violence instrumentally, to increase his private consumption by extracting income from his wife. Let $f(v, y_W)$ be a function describing how much income a husband using violence level v extracts from a wife with income y_W . We assume that $f(\cdot, \cdot)$ is weakly increasing in both arguments ($\frac{\partial f}{\partial v} \geq 0$ and $\frac{\partial f}{\partial y_W} \geq 0$).¹⁴

Second, domestic violence can be expressive, i.e. H may derive direct (dis)utility from violence. Let $g(v)$ denote the husband’s (dis)utility from IPV. When $g' > 0$, we say that violence is expressively pleasurable: the husband derives more direct utility from higher levels of violence. Conversely, when $g' \leq 0$, violence is expressively distasteful: the husband derives less direct

¹³We study exogenous incomes since our experiment gives unconditional cash transfers to H and W .

¹⁴In addition, $f(\cdot) \leq y_W$, $f(0, y_W) = 0$, and $f(v, 0) = 0$. We rule out $\frac{\partial f}{\partial v} \leq 0$ based on inconsistency with our observation of the existence violence in the status quo, and our empirical finding that transfers to the husband reduce violence. If violence is not extractive, and it exists in the status quo, then husbands must get direct utility from it. But then transfers to the husband cannot reduce violence. Thus, the relevant part of $f(v, y_W)$ for our study must involve $\frac{\partial f}{\partial v} \geq 0$. Violence could reduce an endogenous y_W , but the quantity of the experimental cash transfer is exogenous.

utility from higher levels of violence.¹⁵ If $g' = 0$, we say that violence is not expressive.

The wife derives disutility from violence, both directly and indirectly through the reduction in her consumption, if violence is used to extract her resources. Let $h(v, y_W)$ describe the wife's direct disutility from violence. In contrast to $g(v)$, $h(v, y_W)$ is always increasing in violence v .¹⁶ The husband's choice of v must satisfy the wife's participation constraint, P_W . Let $\bar{u}_W(y_W)$ denote the wife's outside option, and assume that it is weakly increasing in her income. Assume further that $\bar{u}_W(y_W) \leq u_W(y_W)$, so that $v = 0$ always satisfies W 's participation constraint.¹⁷

The husband has all the bargaining power, so the equilibrium level of violence is the solution to the following program:¹⁸

$$\begin{aligned} \max_v \quad & u_H(y_H + f(v, y_W)) + g(v) \\ \text{s.t. } P_W : \quad & u_W(y_W - f(v, y_W)) - h(v, y_W) \geq \bar{u}_W(y_W) \end{aligned} \quad (5)$$

Crucially, observe that the wife's participation constraint P_W does not necessarily bind in equilibrium. This is because the husband may experience direct disutility from violence ($g'(v) < 0$), so that his unconstrained choice of violence is lower than the level that binds P_W . However, if the husband derives direct utility from violence ($g'(v) \geq 0$), then P_W binds in equilibrium because he exerts as much violence as the wife will tolerate without leaving. Notationally, we denote the unconstrained maximizer for H , v^H (H 's preferred level of violence), and the level of violence that exactly binds P_W , v^W (W 's maximal tolerance of violence).

¹⁵For clean predictions and exposition, we do not consider nonmonotonic $g(\cdot)$. However, we do not need global monotonicity – we are really studying $g'(\cdot)$ in the neighborhood around the status quo level of violence.

¹⁶We assume that $h(0, y_W) = 0$.

¹⁷Otherwise it would be impossible to keep W in the relationship and this problem would have no solution.

¹⁸We assume $\frac{\partial^2 f}{\partial v^2} < 0$ and $\frac{\partial^2 g}{\partial v^2} < 0$ for concavity, which ensures existence and uniqueness.

4.2 Determining the motives for violence

We now ask what we can learn from the responses of violence to experimental cash transfers about the underlying motives for violence. Let c_s denote the private consumption of spouse $s \in \{H, W\}$. Since this is a one-period model (no savings, investment, or credit), it is optimal for each spouse to consume whatever income he/she has. Recall that $f(v, y_W)$ is the amount of W 's income H extracts from her with violence v . Thus, normalizing prices to 1:

$$\begin{aligned} c_H &= y_H + f(v, y_W) \\ c_W &= y_W - f(v, y_W) \end{aligned}$$

We immediately rule out the case where violence is neither instrumental nor expressive ($f_v = 0$ and $g_v = 0$), because then, in our framework, there would never be any violence. This is inconsistent with baseline and control group levels of violence, which are high. The remaining cases are: violence is either instrumental ($f_v > 0$) or not ($f_v = 0$), and violence is either expressively pleasurable ($g_v > 0$), expressively distasteful ($g_v < 0$), or not expressive ($g_v = 0$). Our first set of results describes the implications these cases have for the impact of transfers to the husband and to the wife on violence.

Lemma 1. *If $g'(v) \geq 0$, then an increase in y_H has no effect on the equilibrium level of violence.*

If the husband derives utility from violence, transfers to him will not affect violence. The intuition is as follows. If $g'(v) \geq 0$, then H 's utility is strictly increasing in v (because either $g'(v) > 0$ and $\frac{\partial f}{\partial v} \geq 0$, or $g'(v) = 0$ and $\frac{\partial f}{\partial v} > 0$). Thus, H 's unconstrained maximizer, v^H , is the maximum possible level of violence. This means that the equilibrium level of violence is disciplined only by W 's tolerance of it, so that $v^* = v^W$, the level that makes W exactly indifferent between staying and leaving. But v^W is determined by W 's income y_W (because H has all the bargaining power), her disutility from violence $h(\cdot, \cdot)$, and her outside option $\bar{u}_W(y_W)$, which depends only on her own income. Therefore, a change in y_H cannot change v^W .

Note that enrichments of our model in which a change in y_H changes violence all involve an *increase* in violence. For example, if transfers are allowed, the husband could “buy” violence from the wife. Or, if the wife has some bargaining power, so that she gets some of the increase in y_H , then an increase in y_H weakly increases the husband’s desire to extract, if $g'(v) > 0$. Thus, Lemma 1 can be generalized as: if $g'(v) \geq 0$, then an increase in y_H cannot decrease violence.

Given that we find that cash transfers to H *do not increase* violence, we rule out $g'(v) \geq 0$, and conclude that it is most likely that $g'(v) < 0$. That is, husbands appear to derive direct disutility from violence.

Conditional on $g'(v) < 0$, what can we infer about $f(v, y_W)$?

Lemma 2. *If $g'(v) < 0$ and $\frac{\partial f}{\partial v} = 0$, then $v^* = 0$, i.e. H never chooses positive levels of violence.*

If violence is distasteful but not instrumental, then H ’s utility is strictly decreasing in violence. But then we should never observe violence. Since we do, we must conclude that violence, while distasteful, enables H to extract some income from W and thereby increase his private consumption.

In light of Lemmas 1 and 2, we focus on $\frac{\partial f}{\partial v} > 0$, $\frac{\partial g}{\partial v} < 0$ as the relevant case: violence is instrumental and expressively distasteful.

Lemmas 1 and 2 are summarized in Table 6, which describes the effect of a transfer to the husband on equilibrium violence for each of our cases.

Table 6: Effect of Transfer to Husband on Violence			
	Expressive distaste: husband dislikes violence ($g'(v) < 0$)	Not expressive ($g'(v) = 0$)	Expressive pleasure: husband likes violence ($g'(v) > 0$)
Not instrumental ($f'(v) = 0$)	no effect $v^* = 0$	no effect $v^* = 0$	no effect $v^* = v^W$
Instrumental ($f'(v) > 0$)	increase or decrease $v^* = v^H$ or v^W	no effect $v^* = v^W$	no effect $v^* = v^W$

4.3 The impact of transfers to H and W on violence when violence is instrumental and expressively distasteful

The empirically observed sign of the effect of a transfer to H on violence enables us to identify the instrumental and expressive roles of violence. However, we also want to know: do transfers to H and W reduce violence because they reduce H 's overall demand for it, or because they reduce W 's tolerance of it? This section shows how we can use both the signs and relative magnitudes of our effects to answer this question.

There are two cases for the equilibrium level of violence: (i) the husband's preferred level of violence is greater than the wife's maximally tolerated violence, $v^H > v^W$; and (ii) $v^H \leq v^W$. In case (i), equilibrium violence is disciplined by W 's (in)tolerance of it, so that $v^* = v^W$, P_W binds, and W is left with no rents, while in case (ii), equilibrium violence is disciplined by H 's distaste for it, net of extractive value, so that $v^* = v^H$ and P_W is slack: W is left with some rents because the utility gains to H from extracting more of his wife's income for private consumption are outweighed by his distaste for violence. Observe that the more sharply H 's distaste increases in violence ($g'(v) \ll 0$), the more H is disciplined by his own distaste for violence, rather than by his wife's (in)tolerance of it, and the more likely we are to be in case (ii). Thus, to characterize how transfers to H and W affect violence in equilibrium, we must first characterize how they affect H and W 's preferred and maximally tolerated levels of violence, v^H and v^W .

4.3.1 Effect of transfers on husband's preferred and wife's maximally-tolerated violence

H 's unconstrained maximizer v^H is characterized by the first-order condition for H 's utility with respect to v :

$$\frac{\partial u_H}{\partial c}(y_H + f(v^H, y_W)) \frac{\partial f}{\partial v}(v^H, y_W) = -\frac{\partial g}{\partial v}(v^H) \quad (6)$$

W 's maximum tolerance v^W is characterized by her binding participation constraint P_W :

$$u_W(y_W - f(v^W, y_W)) - h(v^W, y_W) = \bar{u}_W(y_W) \quad (7)$$

We now examine how v^H and v^W move with respect to y_H .

Result 1. (i) *A transfer to the husband always decreases his preferred level of violence v^H .*

(ii) *A transfer to the husband never affects the wife's maximally tolerated violence v^W .*

The intuition behind Result 1(i) is the following. A transfer to the husband leaves the wife's income unchanged, so the profitability of violence is unchanged, and H 's own income (and therefore private consumption) has increased. Because violence is costly (distasteful), H 's ideal level of violence falls.¹⁹

Result 1(ii) is explained as follows: When H 's income increases, this does not affect W 's maximal tolerance, since her participation only depends on her private consumption (which is just a portion of her own income), her inherent intolerance of IPV, and her outside option, where her ability to leave the marriage is a function of her own income.

Result 2 describes how v^H and v^W respond to y_W .

Result 2. (i) *A transfer to the wife increases the husband's preferred level of violence v^H if violence and income are complements in the extractive technology (i.e. $\frac{\partial f}{\partial v \partial y_W} > 0$): the amount of income H can extract from W for a given level of violence increases in her income.*

(ii) *A transfer to the wife decreases the wife's maximally tolerated violence v^W if violence and income are complements in the extractive technology, W 's intolerance $h(v, y_W)$ increases strongly in her income, and/or her outside option $\bar{u}_W(y_W)$ increases strongly in her income.*

The intuition for Result 2(i) is as follows: if the extractive return to violence

¹⁹A concrete interpretation of this result is that an increase in H 's consumption that is not obtained through violence may decrease his stress and thereby decrease his impulse to release stress through violence.

is much higher when the wife is wealthier, then H 's utility gains from increased consumption will outweigh his distaste for violence, and v^H increases.

Moreover, under strong complements, a given level of violence extracts much more from a wife with higher income y_W . This means that the wife's utility at the pre-income-increase level of violence is now lower, reducing her tolerance. Further, a transfer to the wife reduces her maximally-tolerated violence if the increase in income exposes her to norms that are less tolerant of IPV, or empowers her to feel less tolerant of IPV. Again, this is because she has less utility at the pre-income-increase level of violence. Finally, if the increase in income gives her more resources to leave a bad marriage, W 's maximal tolerance v^W will also fall.

To sum up: the husband's demand for violence always decreases in his own income, while an increase in the wife's income may increase his demand if the returns to extractive violence are much higher for wealthier wives. The wife's maximal tolerance for violence decreases in her own income if her income is sufficiently empowering, and is unaffected by a change in her partner's income. However, since equilibrium violence is the minimum of the husband's demand for violence and the wife's maximal tolerance for violence, it is not enough to understand the effect of spousal transfers on the level of v^H and v^W . The next step is to characterize the effect of spousal transfers on the conditions under which v^H or v^W is the minimum, and under which equilibrium violence goes up or down following these transfers.

4.3.2 Effect of transfers on equilibrium violence

To understand when transfers to H and W decrease or increase *equilibrium* violence, however, we also need to understand how increases in y_H and y_W affect whether v^H is greater than v^W (so that $v^* = v^W$), or whether v^W is greater than v^H (so that $v^* = v^H$). In other words, equilibrium violence balances H 's demand for violence with W 's tolerance of it, and changes in spousal income affect violence by affecting this balance.

Table 7 presents the four theoretical possibilities for the effect of an increase in y_H or y_W (*pre* and *post* refer to before and after an increase in either spouse's

income).

Table 7: Effect of Transfers on Violence in Equilibrium: Possibilities

	$v^{H,post} > v^{W,post}$	$v^{H,post} < v^{W,post}$
$v^{H,pre} > v^{W,pre}$	(A) $v^{*,pre} = v^{W,pre}$ $v^{*,post} = v^{W,post}$ P_W^{pre} binds, P_W^{post} binds	(B) $v^{*,pre} = v^{W,pre}$ $v^{*,post} = v^{H,post}$ P_W^{pre} binds, P_W^{post} slack
$v^{H,pre} < v^{W,pre}$	(C) $v^{*,pre} = v^{H,pre}$ $v^{*,post} = v^{W,post}$ P_W^{pre} slack, P_W^{post} binds	(D) $v^{*,pre} = v^{H,pre}$ $v^{*,post} = v^{H,post}$ P_W^{pre} slack, P_W^{post} slack

Results 3 and 4 show how we can combine observations of violence in the status quo with comparisons of the relative magnitudes of a transfer to the husband and to the wife on the incidence of violence to infer which case we are dealing with, and through which channel(s) the spousal transfers are affecting equilibrium violence.

Result 3. *If violence is high in the status quo, and an increase in y_H reduces violence more than an equivalent increase in y_W , then the world is in Case B and transfers to the husband reduce equilibrium violence by decreasing his demand for violence.*

The proof for Result 3 is as follows. Recall from Result 1 that a change in y_H does not affect the wife's maximally tolerated level of violence, v^W . If we were in Case A, where $v^{*,pre} = v^{W,pre}$ and $v^{*,post} = v^{W,post}$, then an increase in y_H would lead to no change in equilibrium violence: $v^{*,pre} = v^{*,post} = v^W$. This rules out Case A. The only way for Case C to arise is if the increase in y_H caused the husband's preferred level of violence v^H to increase (because pre-treatment, $v^H < v^W$, while post-treatment, $v^H > v^W$, where v^W remains unchanged by Result 1). But we know from Result 1 that an increase in y_H always decreases v^H . This rules out Case C.

Finally, Case D only arises when H has a high distaste for violence: $v^{*,pre} = v^{H,pre}$ means that H is demanding strictly less violence than W tolerates in the status quo. Thus, baseline levels of violence would be low, and there wouldn't be much room for violence to be reduced. This contradicts high incidence of violence in the status quo. This leaves Case B, where the wife's participation

constraint binds in the status quo and her intolerance of violence determines the equilibrium level. A transfer to the husband reduces the husband's demand for violence so that his demand now determines the equilibrium level, and the wife's participation constraint slackens and she is left with some rents.

Result 4. *If violence is high in the status quo, an increase in y_W reduces violence more than an equivalent increase in y_H , and violence and income are complements in the extractive technology, then the world is in Case A and transfers to the wife reduce equilibrium violence by decreasing her tolerance of it, through empowerment and/or resources.*

Cases C and D contradict a high baseline level of violence (since pre-treatment, H 's preferred level of violence leaves W with rents). In Case B, $v^{*,pre} = v^{W,pre}$ but $v^{*,post} = v^{H,post}$. Thus, for an increase in y_W to lead to a decrease in violence in Case B, it must be that $v^{W,pre} < v^{H,post}$, where $v^{W,pre} < v^{H,pre}$. However, Result 2(i) tells us that if violence and income are complements in the extractive technology, then an increase in y_W causes H 's preferred level of violence to increase, so that $v^{H,post} > v^{H,pre} > v^{W,pre}$. This rules out Case B and leaves Case A: an increase in y_W reduces violence because the wife's intolerance of it determines the equilibrium level, and an increase in her wealth decreases her tolerance, through empowerment and/or through an increase in resources which enable her to leave an abusive marriage.

In the next section, we present a numerical example to clarify the insights from the theory, especially Results 3 and 4 regarding the effect of spousal transfers on equilibrium violence. In particular, the example illustrates how the theory can be used to back out the importance of different channels – the husband's distaste for violence, how extractive violence is, how transfers to the wife can increase her empowerment and resources to leave a bad marriage – from empirical observations. In addition, the example shows some results which cannot be cleanly formalized in the general framework, but which are nevertheless robust to large variety of parameter choices.

4.4 An Example

Consider the following functional forms:

1. Utility: $u_H(c) = u_W(c) = \log(c)$, $y_H, y_W \gg 1$
2. Extraction (instrumental violence), parametrized by ε : $f(v, y_W) = \varepsilon v y_W$,
 $\varepsilon \in [0, 1]$, $v \in [0, 1]$
3. Distaste (expressive violence), parametrized by δ : $g(v) = \log(1 - \delta v)$,
 $\delta \in [0, 1]$
4. Empowerment, parametrized by π : $h(v, y_W) = \log(v + \pi v y_W + 1)$, $\pi \in [0, 1]$
5. Resources/Outside Option, parametrized by r : $\bar{u}_W(y_W) = u_W(r y_W)$,
 $r \in [0, 1]$

Then the constrained maximization problem is:

$$\begin{aligned} & \max_v \quad \log(y_H + \varepsilon v y_W) + \log(1 - \delta v) \\ \text{s.t.} \quad & \log((1 - \varepsilon v)y_W) - \log(v + \pi v y_W + 1) \geq \log(r y_W) \end{aligned} \quad (9)$$

The unconstrained maximizer for H and the binding level of violence for W are:

$$v^H = \max \left\{ \frac{1 - \delta \frac{y_H}{y_W}}{\delta(1 + \varepsilon)}, 0 \right\}$$

$$v^W = \frac{1 - r}{1 + r + \pi r y_W} \in [0, 1]$$

Observe that the husband's preferred level of violence v^H decreases in his income, y_H , increases in her income, y_W , decreases in the extractive power of violence, ε , and decreases in his distaste for violence, δ . The wife's maximally tolerated level of violence decreases in her income, y_W , in empowerment, π , and

in resource strength, r . It is unaffected by changes in the husband's income, y_H .

The condition under which the wife's participation constraint P_W binds and $v^* = v^W = \min\{v^H, v^W\}$ is:

$$(1 + r) \left(1 - \frac{\delta y_H}{y_W} \right) + \pi r (y_W - \delta y_H) > \delta (1 + \varepsilon) (1 - r)$$

Observe that a transfer to y_H makes this inequality less likely to hold—that is, a transfer to y_H slackens the wife's participation constraint, which means that the husband's demand for violence is lower than the wife's maximal tolerance for it, and $v^* = v^H$. Thus, a transfer to the husband increases his private consumption and thereby reduces his demand for violence, and this is what leads to a fall in equilibrium violence (our Result 3). On the other hand, an increase in y_W makes this inequality more likely to hold—a transfer to the wife increases her empowerment and resources, causing P_W to bind at a lower level of violence, so that it is the wife's decreased tolerance for violence that leads to a fall in equilibrium violence (our Result 4).

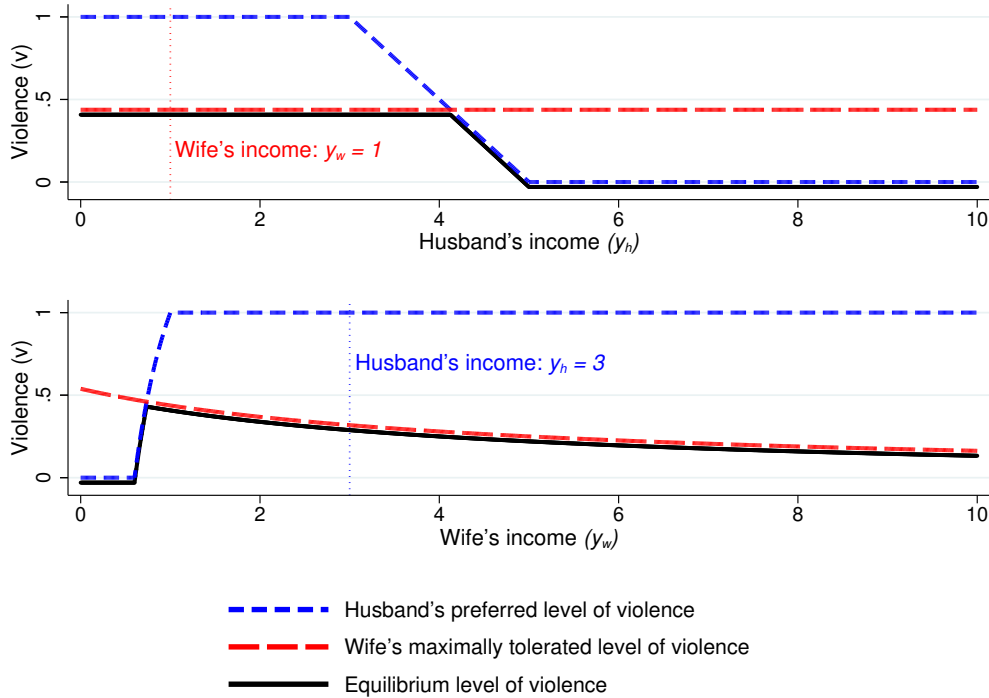
The numerical exercise is as follows. We consider different strengths of each of the four channels: distaste δ , extractiveness ε , empowerment π , and resource strength r , for different levels of husband and wife income (the relative income is what matters). We plot $v^H(y_H, y_W)$ and $v^W(y_H, y_W)$ given the parameter environment. The lower envelope is equilibrium violence. We seek the parameter environment that best matches our empirical patterns:

1. Empirically, an increase in y_H reduced violence. Hence, equilibrium violence must be strictly decreasing over some range of y_H .
2. An increase in y_W reduced violence. Hence, equilibrium violence must be strictly decreasing over some range of y_W .
3. An increase in y_W qualitatively reduced violence by more than an equivalent increase in y_H .

Requiring the patterns from the theory to be consistent with our empirical observations yields Figure 2, a parameter environment where the husband

has moderate distaste for violence ($\delta = 0.2$), violence is highly extractive ($\varepsilon = 1$), and an increase in the wife's income increases her empowerment and outside option ($\pi = 1$, $r = 0.3$). The blue line is the husband's demand for violence $v^H(y_H, y_W)$, the red line is the wife's maximal tolerance for violence $v^W(y_H, y_W)$, and the black line is the lower envelope $v^* = \min\{v^H, v^W\}$.²⁰

Figure 2: Numerical example of the impact of changes in husband's or wife's income on preferred and equilibrium levels of violence



The top panel shows how equilibrium violence changes when $y_W = 1$ and the husband's income y_H ranges from less than to more than his wife's. Observe that when the husband's income is less than about 4, he wishes to use violence to extract income from his wife, but her participation constraint binds and her tolerance determines the equilibrium level. Thus, we know from Result 1 that changes in y_H will not affect violence in equilibrium. When the husband is

²⁰Note that we cap the husband's demand for violence at 1 in our figure when it exceeds the wife's tolerance, for better presentation.

wealthier ($y_H \gtrsim 5$), he has “enough” private consumption, and his moderate distaste for violence outweighs the amount he could extract from his relatively poor wife. Thus, his demand determines the equilibrium level of violence, and when the husband is much wealthier, his demand is zero.

The bottom panel shows how equilibrium violence changes when $y_H = 3$ and the wife’s income y_W ranges from less than to more than her husband’s. Observe that as the wife becomes relatively wealthier, her husband’s demand for violence increases, because the value of extracting from her increases. However, at the same time, her tolerance for violence decreases – her higher income means she is more empowered and has a higher outside option. Thus, equilibrium violence is determined by the husband’s (low) demand when the wife is relatively poor, but is then determined by the wife’s (decreasing) tolerance. Thus, violence in equilibrium falls as the wife’s income increases beyond $y_W \approx 1$.

If $y_H = 3$ and $y_W = 1$, the top panel shows that a unit increase in the husband’s income leads no reduction in equilibrium violence, while the bottom panel shows that a unit increase in the wife’s income leads to a reduction in equilibrium violence. This is because, at these initial income levels and in this parameter environment, a transfer to the wife increases her empowerment by more than the same transfer to the husband reduces his demand.

The numerical example also illustrates a suggestive insight from our theory regarding the impact of small versus large income transfers in settings where the husband and wife are both poor but the wife is even poorer, violence is extractive but distasteful, and an increase in the wife’s income increases her empowerment. Based on our theory, we suggest that if large transfers are feasible, they may increase IPV to a greater degree when given to the husband H . This is because giving a large transfer to the wife will also make her a more profitable source of extraction through violence. However, transfers to the husband always reduce his demand for violence, because of his distaste for it. On the other hand, if only small transfers are feasible, they may reduce IPV to a greater degree when given to the wife. These transfers empower her and decrease her tolerance for violence, without causing the husband’s

demand for violence to overwhelm this empowerment by making her a target for extraction.

4.5 Spillovers and Norms

In the following we describe a simple mechanism based on social norms that would produce spillovers for untreated households. Assume that the direct utility of IPV for the husband can be decomposed into two terms. The first term is the (dis)utility term $g(v)$ discussed above. The second term reflects social norms. For simplicity, we model the norm as the average level of domestic violence in the village, \bar{v} . Any deviation from the social norm creates a disutility for the husband (for example, through stigma from non-conformity). Let the husband's utility be given by:

$$u_H(c_H) + g(v) - (v - \bar{v})^2$$

where \bar{v} denotes the average level of IPV in the village. We square the disutility term to allow for disutility both when the husband engages in more violence than is the norm, but also when he engages in less violence.

The constraints are the same as mentioned above. The husband's maximization problem can then be written as:

$$\begin{aligned} \max_v \quad & u_H(y_H + f(v, y_w)) + g(v) - (v - \bar{v})^2 \\ \text{s.t.} \quad & u_W(y_W - f(v, y_w)) - h(v, y_W) \leq \bar{u}_W(y_W) \end{aligned}$$

It is straightforward to see that a decrease in the average level of domestic violence in a village from \bar{v} to $\bar{v}' < \bar{v}$ decreases violence in a given household. If $v > \bar{v}$, a decrease in \bar{v} makes the deviation from the social norm more painful, and thus H 's preferred level of violence, v^H , decreases. If $v < \bar{v}$, H originally exerts less domestic violence than the social norm. If the social norm decreases, H has the opportunity to decrease domestic violence even more because the deviation has become less painful. Thus, the effect of a change in the social

norm on equilibrium violence is weakly negative.

As described above, psychologists distinguish between descriptive norms, which describe perceptions of actual outcomes, from prescriptive norms, which describe desired outcomes. Our modeling approach extends easily to these settings: if the husband incurs disutility from violating descriptive norms, his utility would decrease in deviations of his level of violence from $\phi(\bar{v})$, where $\phi(\cdot)$ maps levels of violence to perceptions, with $\phi' > 0$. Similarly, if the husband incurs disutility from violating prescriptive norms, his utility would decrease in deviations of his level of violence from an analogous function describing “acceptable” levels of violence in the village. Importantly, prescriptive norms can integrate preferences over desired levels of violence of both women and men, making it possible that changes in women’s attitudes towards violence affect husband’s preferred levels of violence.

We could also have used a similar approach for the wife’s utility, where she incurs additional disutility $\max\{v - \bar{v}, 0\}$ or $(v - \bar{v})$. That is, W incurs additional disutility if she experiences more violence than average and nothing additional otherwise, or she can even derive positive utility from experiencing less violence than average. In both types of cases, a decrease in \bar{v} decreases her tolerance of violence. Again this line of reasoning extends easily to both descriptive and prescriptive norms.

5. Conclusion

Intimate partner violence is a widespread phenomenon with significant welfare costs. It has previously been shown that cash transfers can be effective in reducing domestic violence, suggesting that IPV is at least partly a consequence of poverty (Bobonis, Gonzalez-Brenes, and Castro 2013; Rivera-Rivera et al. 2004; Angelucci 2008; Hidrobo and Fernald 2013; Hidrobo, Peterman, and Heise 2016). We extend this literature in several ways. First, our transfers are randomly allocated to either the husband or the wife, allowing us to distinguish the effects on IPV of increases in either spouse’s income. Second, to achieve conceptual clarity, we construct a theory in which violence may be

both extractive and expressive. We show that the impact of spousal transfers on the incidence of violence varies by the extractiveness and expressiveness of violence. In particular, we generate predictions regarding the differential impact on violence of transfers to the wife versus transfers to the husband. We find that transfers to women and men both reduce the incidence of physical IPV. Our theory shows that this result implies that violence is extractive but also distasteful. Transfers to the husband lower violence by reducing his demand for it, while transfers to the wife lower violence by reducing her tolerance for it. We use a numerical example based on the theory to illustrate how the relative magnitude of the impacts can tell us whether the wife’s empowerment effect outweighs the husband’s demand effect, or vice versa.

Finally, while previous studies have focused on the direct impact of transfers on recipient households, we study both recipients and non-recipients to quantify spillover effects. We find large and significant reductions in IPV as a result of cash transfers, strengthening the evidence that transfers are a promising intervention to reduce IPV. Some of these effects are present not only when transfers are made to the woman, but also when they are made to the man; however, the impacts for transfers to the man are smaller and restricted to certain types of physical violence. In addition, we find large spillovers of cash transfers on IPV in non-recipient households. This effect is of the same magnitude as the direct effect. Because we observe few economic spillovers (Haushofer and Shapiro 2016), this finding suggests that cash transfers lead to social changes that caused this reduction in non-recipient household IPV. The reduction in IPV in spillover households suggests that cash transfers may have affected social norms around IPV. In line with this view, we find suggestive evidence of changes in social norms regarding the justifiability of violence. These effects are weak, however, and require replication.

From a policy perspective, these findings have implications for the targeting of cash transfers and the development of IPV reduction programs. First, in terms of targeting, they suggest that although cash transfers can reduce IPV regardless of who receives the transfer, transfers to female recipients are likely to be more effective, at least from the point of view of reducing IPV. In our

previous work, we found few differences between male and female recipient households on other outcome dimensions; it is thus possible that transfers to the woman weakly dominate transfers to the man from the social planner's perspective. The spillover effects also have implications for targeting: they suggest that to maximize impacts on IPV per dollar spent, it may be optimal to *not* treat all households in a given location with cash transfers. Of course due to the large positive direct impacts and lack of spillovers of cash transfers on other dimensions, such selectivity also has a welfare cost; future studies might vary the proportion of households treated in a particular location to find the optimal targeting density for a given set of policy preferences.

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Appendix

A. Theoretical Appendix

A1 Proof of Result 1

Implicitly differentiating the condition characterizing v^H , we see that:

$$\frac{\partial v^H}{\partial y_H} = \frac{-\frac{\partial^2 u_H}{\partial c^2}}{\frac{\partial^2 u_H}{\partial c^2} \left(\frac{\partial f}{\partial v}\right)^2 + \frac{\partial^2 f}{\partial v^2} \left(\frac{\partial u_H}{\partial c}\right) + \frac{\partial^2 g}{\partial v^2}} \quad (\text{A1})$$

$$\frac{\partial v^H}{\partial y_W} = \frac{-\frac{\partial^2 u_H}{\partial c^2} \frac{\partial f}{\partial v} \frac{\partial f}{\partial y_W} - \left(\frac{\partial u_H}{\partial c}\right) \frac{\partial f}{\partial v \partial y_W}}{\frac{\partial^2 u_H}{\partial c^2} \left(\frac{\partial f}{\partial v}\right)^2 + \frac{\partial^2 f}{\partial v^2} \left(\frac{\partial u_H}{\partial c}\right) + \frac{\partial^2 g}{\partial v^2}} \quad (\text{A2})$$

Note that the denominator is the same in both expressions, and is negative due to risk aversion, weak concavity of $f(v, y_W)$ in v , and concavity of $g(v)$. Clearly, H 's most preferred level of violence is always decreasing in his income y_H , while the impact of an increase in y_W is determined by the sign of $\frac{\partial f}{\partial v \partial y_W}$, that is, the strength of complementarity or substitutability between the use of violence and the wife's wealth in how much income can be extracted from her.

Because y_H does not appear in W 's participation constraint, it's clear that a transfer to y_H cannot affect the level of violence at which P_W binds. Implicitly differentiating the condition characterizing v^H with respect to y_W , we see that:

$$\frac{\partial v^W}{\partial y_W} = \frac{\frac{\partial u_W}{\partial c} \left[1 - \frac{\partial f}{\partial y_W}\right] - \frac{\partial h}{\partial y^w} - \frac{\partial \bar{u}_W}{\partial y^w}}{\frac{\partial u_W}{\partial c} \left(\frac{\partial f}{\partial v}\right) + \frac{\partial h}{\partial v}} \quad (\text{A3})$$

B. Additional Tables

Table B1: Effects of cash transfers on violence norms (male reports)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Control	Treatment	Spillover	Survey	Female	Male	Female vs.	
	mean (SD)	(across village)	effect	effect	recipient	recipient	male p-value	N
<i>Violence norms index</i>	0.00 (1.00)	-0.05 (0.09)	-0.10 (0.09)	-0.06 (0.10)	-0.06 (0.11)	-0.02 (0.10)	0.78	881
Wife should tolerate being beaten	0.13 (0.33)	0.01 (0.03)	-0.01 (0.03)	0.05 (0.04)	0.01 (0.04)	0.00 (0.04)	0.66	881
Husband has the right to beat	0.26 (0.44)	0.04 (0.04)	0.04 (0.04)	0.09* (0.05)	0.03 (0.05)	0.06 (0.04)	0.84	881
Right to beat: Going out without telling him	0.15 (0.35)	0.00 (0.03)	0.02 (0.03)	-0.04 (0.05)	-0.01 (0.04)	0.02 (0.04)	0.39	881
Right to beat: Neglecting the children	0.32 (0.47)	0.01 (0.04)	0.06 (0.04)	-0.05 (0.05)	0.04 (0.05)	-0.04 (0.05)	0.13	881
Right to beat: Arguing with him	0.35 (0.48)	0.00 (0.04)	0.01 (0.04)	-0.00 (0.05)	0.02 (0.05)	-0.02 (0.05)	0.27	881
Right to beat: Refusing to have sex	0.08 (0.28)	0.02 (0.02)	0.03 (0.03)	0.04 (0.04)	0.02 (0.03)	0.02 (0.03)	0.70	881
Right to beat: Burning the food	0.06 (0.23)	-0.00 (0.02)	0.03 (0.03)	0.01 (0.03)	-0.00 (0.02)	0.01 (0.02)	0.66	881

Notes: OLS estimates of treatment, spillover, and survey effects. Outcome variables are listed on the left. For each outcome variable, we report the coefficients of interest and their standard errors in parentheses. Column (1) reports the mean and standard deviation of the control group for a given outcome variable. Column (2) reports the basic treatment effect calculated across villages, i.e. comparing treatment households to pure control households. Column (3) reports the spillover effect, i.e. comparing control households in treatment villages to control households in control villages. Column (4) reports survey effects comparing control households in control villages to a new sample of households in control villages who had not previously been surveyed. Note that this comparison uses results from endline 2. Columns (5) and (6) report the effect of transfers to the wife and husband in the household, respectively, compared to pure control. Column (7) reports p -values for the difference between transfers to the husband and wife, using village-level fixed effects. Column (8) reports the total sample size, including all treatment, spillover and pure control households. The sample is restricted to co-habiting couples. The unit of observation is the individual; we analyze the responses of the wife. The last row shows joint significance of the coefficients in the corresponding column from SUR estimation. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.