Dear Selection Committee,

My name is Fatima Aqeel and I am an Assistant Professor of Economics at Colgate University. I am writing to apply for the REStat fellowship for the NBER Summer Institute for the summer of 2022. I believe this fellowship would be a great fit for someone of my background and career stage, who would benefit immensely from the academic access that the fellowship provides.

I received my Ph.D. from Boston University in 2020. My research lies at the intersection of development and labor economics, with a special focus on the economics of gender. My job market paper investigated the effects of a reform that removed restrictions to medical school entry for female applicants in urban Pakistan. I found that female medical graduates were more likely to practice post-reform, which may be the result of more motivated students being selected, or of medicine becoming a more female-friendly field.

Some of my current research builds on the effects of this reform. In a collaborative project with a coauthor in Pakistan (Hadia Majid, LUMS University), I am studying impact of the changing gender composition in medicine on productivity and health outcomes. Using funding from the Shahid Hussain Foundation in Pakistan, we are currently fielding a survey of Pakistani medical doctors. The information we collect will allow us to determine how the field of medicine was altered by upstream changes in medical school admissions.

In a separate research project with colleagues at Colgate University, Carolina Castilla and David Murphy, I examine the impacts of an alcohol abuse treatment program on intimate partner violence. Our randomized-controlled trial (RCT) was conducted in rural Kenya with funding from the Mind, Body and Brain Initiative at Colgate University. Households randomly assigned to an alcohol abuse treatment program experienced a lower likelihood of sexual IPV on both the extensive and intensive margins. Interestingly, we find that the change in actions accompanied a change in beliefs, as men assigned to treatment were also less likely to approve of wife-beating when denied sex.

Building on the strand of partner relationships, I am also working on a project that uses a unique dataset of marriage advertisements over two decades to understand how men and women search for long-term partners. I find that the characteristics sought in partners are highly gendered: men value physical traits, and women value a stable occupation. Interestingly, the traits men and women emphasize about themselves are exactly symmetrical to what the other gender values. Men are also more likely to explicitly demand traits in women, whereas women mention their own traits. Finally, in this marriage market which emphasizes traditional gender roles, women's demands decrease dramatically with age, even among educated women.

In line with my research interests, the sessions I would most be interested in attending are Development Economics, Education, Health Care and Health Economics.

Thank you very much for considering my application, and I look forward to your response.

Sincerely,

Fatima Aqeel

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Fatima Aqeel

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EMPLOYMENT

Assistant Professor of Economics, Colgate University, July 2020

EDUCATION

Ph.D., Economics, Boston University, Boston MA, September 2020
Dissertation Title: *Essays in Development Economics*
Dissertation Committee: Samuel Bazzi, Dilip Mookherjee, and Daniele Paserman

B.A., Economics, Brown University (*with honors)*, Providence, RI, 2012

FIELDS OF INTEREST

Development Economics, Labor Economics

WORKING PAPERS

"Removing Barriers to Entry in Medicine: Evidence from Pakistan", September 2021 [submitted].
"Alcohol and Intimate Partner Violence", with Carolina Castilla and David Murphy, April, 2022.
"Searching for Spouses in a Developing Country", January, 2022.
"Educational Investment and Marriage Success: Evidence from Pakistan", January 2021.
"Can Male Dominated Industries Bring Jobs for Women? Evidence from Indonesia", July 2020.

WORK IN PROGRESS

"The Structural Impact of Changing Gender Compositions in Medicine", with Hadia Majid
"Taking Primary Health Care to Rural Homes: The Role of Community Health Workers"

PRESENTATIONS

NEUDC, Evanston IL, October 2019
Human Capital Initiative, Boston University, Boston MA, November 2019
Colgate University Department of Economics Brown Bag, Virtual, March 2021
Liberal Arts College Development Economics Group Meeting, Virtual, March 2021
Colgate University Department of Economics Brown Bag, December 2021
Lahore University of Management and Sciences, May 2022 (planned)

FELLOWSHIPS AND AWARDS

Mind Body Brain Initiative Fund, 2022 (joint with David Murphy and Carolina Castilla)
Shahid Hussain Foundation Award, 2021 (joint with Hadia Majid)
Rosenstein-Rodan Prize for Best Paper in Development Economics, 2019
Human Capital Initiative Research Fellow, Global Development Policy Center, 2018
Boston University Summer Fellowship, 2014-2019

Boston University Graduate Student Fellowship, 2014-2019
Pakistani Student Scholarship, 2008-2012, Brown University
Karen T. Romer Undergraduate Teaching and Research Assistant Award, 2011, Brown University
Omicron Epsilon Delta honor society in economics, 2012
Chase Manhattan Fund for Sponsored Research Assistantship, 2010-2012, Brown University

REFEREE EXPERIENCE

Journal of Human Resources, Journal of the Japanese and International Economies, Studies in Microeconomics

RESEARCH WORK EXPERIENCE

Research Assistant to Patricia Cortes, Questrom Business School, 2019, Boston
Research Assistant to Martin Fiszbein, Department of Economics, 2019, Boston
Research Assistant to Mahesh Karra, 2018, Global Development Policy Center, Boston University
Research Assistant to Chris Udry, Daniel Keniston, David Atkin, Yale University Innovations for Poverty Action, 2012-2014, New Haven
Research Assistant to David Atkin, Eric Verhoogen, Amit Khandewal, Azam Chaudhry Lahore School of Economics, 2013-2014, Karachi, Pakistan
Research Assistant to David N. Weil, Ph.D., Brown University Dept. of Economics, 2010-2012, Providence

TEACHING EXPERIENCE

Seminar in Gender and Development, Colgate University, 2022
Introduction to Economics, Colgate University, 2020-2021
Gender in the Economy, Colgate University, 2021-2022
Teaching Fellow, Introduction to Microeconomics, Boston University, 2015-2018

CITIZENSHIP/VISA STATUS: Pakistan/H1-B

REFERENCES

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Fatima Aqeel

Removing Barriers to Entry in Medicine: Evidence from Pakistan (Job Market Paper)

I study how the removal of entry barriers for women in higher education affects labor force participation and occupational structure. In 1992 Pakistan equalized admissions criteria for women and men applying to medical schools. First, I show that the reform induced a rapid increase in the female proportion of medical graduates and registered doctors. Second, I use variation across birth cohorts to show that equalizing admissions criteria caused an increase in women medical graduates' (MG) labor force participation, a marginal increase in overall MG labor force participation, and an earnings increase for male MG who are presumably of higher ability post-reform. Higher female representation in medicine led to greater diversity among specialized doctors, but led to a greater concentration of doctors in urban districts relative to rural districts. I also find suggestive evidence of higher formal health care utilization by mothers in areas with more women doctors. Overall my results indicate that removing admissions restrictions did not adversely affect doctor work probability, but it did have important distributional consequences downstream.

Alcohol and Intimate Partner Violence, with Carolina Castilla and David Murphy

Intimate partner violence (IPV) is closely associated with alcohol abuse, and substantially lowers the well-being of those who experience it. We estimate the causal effect of alcohol abuse on IPV by conducting a randomized-controlled trial (RCT) in rural Kenya, where IPV rates are higher than the global average. Treated households attended a series of group counseling workshops and couples therapy sessions. Non-treated households in close proximity are likely to benefit from treatment spillovers, and are part of a spillover control group. Pure control households are in separate villages. Treatment substantially lowered sexual IPV, with smaller or no effects on physical and emotional IPV. The number of treated households experiencing sexual IPV decreased by 0.33 standard deviations relative to the control mean, while the frequency of aggression decreased by 0.3 standard deviations. Interestingly, men were also 11 percentage points less likely to agree that wife-beating is justified when a wife refuses sex. Treatment session transcripts reveal that alcohol abuse and IPV were often mentioned together by couples, causing treatment to lower both.

Searching for Spouses in a Developing Country

I study how women and men search for marriage partners in a developing country marriage market. Using a unique data set of marriage advertisements spanning two decades, I find distinct spousal search patterns based on who searches. First, marriage demands are highly gendered: men search for physical features and women for stable occupations. Women emphasize their own physical features and men emphasize their occupation, suggesting that both sides of the market are well-informed. Second, women make fewer demands in prospective partners than men do, and their demands decrease relatively rapidly with age. Women's time-bound fecundity constrains their marriage search in a market with strong gender norms. Education does not matter as much as age does for females, though there is suggestive evidence that a positive education shock could make women more selective about their partners.

Alcohol and Intimate Partner Violence*

Carolina Castilla, Fatima Aqeel, David Murphy

Version date: April 20, 2022

Intimate partner violence (IPV) is closely associated with alcohol abuse, and substantially lowers the well-being of those who experience it. We estimate the causal effect of alcohol abuse on IPV by conducting a randomized-controlled trial (RCT) in rural Kenya, where IPV rates are higher than the global average. Treated households attended a series of group counseling and couples therapy sessions. Non-treated households in close proximity are likely to benefit from treatment spillovers, and are part of a spillover control group, while pure control households were in separate villages. Treatment substantially lowered sexual IPV, with smaller or no effects on physical and emotional IPV. The number of treated households experiencing sexual IPV decreased by 0.33 standard deviations relative to the control mean, while the frequency of aggression decreased by 0.3 standard deviations. Interestingly, men were also 11 percentage points less likely to agree that wife-beating is justified when a wife refuses sex. Treatment session transcripts reveal that alcohol abuse and IPV were commonly mentioned together by couples, suggesting a program to lower alcohol abuse may inadvertently reduce IPV as well.

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I. Introduction

While IPV affects one in four women globally, the share of women affected in developing countries is higher than the global average, lying between 30%-33% on the African continent and in South-east Asia[1]. One of the triggers of IPV is considered to be aggression due to alcohol consumption (Castilla and Murphy, 2022; Chalfin et al., 2021), which has also been rising rapidly in developing countries (Walls et al., 2020). Though the exact reason for the connection is less well-understood, possibilities include alcohol triggering stress in the house (Heath et al., 2020a), and altering behaviours such as self-control (Schilbach, 2019). The outcome, however, is that the economic and social well-being of the individuals who experience IPV is significantly lowered, be it in their ability to work, to earn an income or to be healthy (Angelucci, 2008; Luca et al., 2015).

In this paper we consider the results of a randomized controlled trial (RCT) to establish the causal effect of alcohol consumption on IPV. The intervention included two stages. In the first stage, we invited individuals randomly assigned to the treatment group to participate in structured discussion and experience sharing in group counseling sessions. This follows from studies suggesting that peer effects can greatly incentivize self control (Battaglini et al., 2005, 2017; Buechel et al., 2018), and may explain (in part) the success of various twelve step programs, such as Alcoholics Anonymous (Kelly et al., 2020). The second stage of the intervention was based on spousal counseling, in which therapists held numerous behavioral therapy and individualized goal-setting sessions at individual homesteads. Studies show that individual counseling can be an effective tool to decrease alcohol consumption in a developing country context (Nadkarni et al., 2017, 2019), while "family system approaches" can generate foundations for achieving sobriety by reducing codependency and creating healthy relationships within the household (Kaufman and Pattison, 1981).

The households in this study come from data collected in a 2020 baseline survey, in which all households in thirty surveyed villages that have cohabiting spouses, are

[1] https://www.who.int/news/item/09-03-2021-devastatingly-pervasive-1-in-3-women-globally-experience-violence

55 years old or younger, and have at least one alcohol-using spouse are randomized into treatment, spillover control, or pure control groups. Households are not included based on any motivation to decrease alcohol use or IPV. We randomly selected ten villages to serve as a pure control group, and then randomized households in the remaining twenty treatment villages into a treatment group (55%) which directly received treatment, and a spillover control group (45%) which captured potential information spillovers (Murphy, 2022a).

Additionally, we collected detailed information in both the baseline and endline surveys about beliefs correlated with IPV, as well as actual reported IPV. We capture beliefs by asking respondents about scenarios when they consider wife-beating to be appropriate, including when the husband is denied sex, or when a child is neglected. Actual experiences with IPV include questions on if the respondent's partner forced them to have sex, hit them, or harassed them on the phone, as a few examples. Within the household, a female enumerator conducted the survey with the female spouse and the male enumerator with the male spouse privately and concurrently. The goal was to elicit responses about intimate partner violence as privately and safely as possible.

Our results show that treatment substantially reduces specific forms of IPV. We measure exposure to violence on the extensive margin using a summary index measure similar to (Heath et al., 2020a). Treatment reduces the number of households experiencing sexual violence by 0.33 standard deviations relative to the control group mean. On the intensive margin, the frequency of sexual violence drops by 0.3 standard deviations relative to the control group mean. The results are consistent 2 months and 6 months after the treatment was initiated, and are similarly large for the spillover control group which was exposed to treatment indirectly through informational networks. The spillover effect implies that local group counseling and therapy programs can have amplified effects.

Interestingly, the reduction in sexual violence is accompanied by a change in beliefs post-treatment. In particular, men assigned to treatment are 11-12 percentage points (pp) less likely to believe that beating a wife is justified if she refuses sex. The magnitude of the effect is relatively unaltered if men received either group counseling or therapy. This suggests that the observed change in actions can be

traced to a deeper change in attitudes after treatment. Digging deeper into the content of counseling and therapy reveals that conversations around alcohol use were frequently accompanied by conversations on IPV. For example, one respondent mentioned that her own drinking is triggered by "constant family violence, resulting from her husband's drinking habit". It is comprehensible, therefore, that IPV would be affected by our alcohol treatment program.

Other forms of IPV are affected to varying degrees. The number of household experiencing any form of physical violence is not substantially lowered by treatment. However, the frequency of physical violence decreases by 0.31 pp standard deviations relative to the control mean 2 months after treatment. Six months after treatment began the frequency of physical violence was 0.21 standard deviations lower than the control mean. Meanwhile, emotional violence is not significantly affected by treatment.

Our results consistently show decreases in sexual violence between partners, and little to no effect in physical and emotional violence. In the psychology literature, the attention-allocation model implies that alcohol affects human behavior by making individuals near-sighted. Alcohol can enable aggression by focusing attention on salient, provocative cues and diminish attention towards less salient cues that inhibit aggression (Giancola and Corman, 2007). In the economics literature, higher discount rates are associated with alcoholism and substance abuse (Chabris et al., 2008). Higher discount rates render an immediate reward of aggression more attractive than a distant cost. In both cases, the difference between salient and non-salient cues, and immediate rewards versus delayed costs of sexual violence may be larger than those of physical or emotional violence.

This study contributes to literature on IPV in four different ways. First, it establishes a causal relationship between alcohol use and IPV. Since IPV and alcohol often exist in a vicious cycle in households, the causal effect of alcohol on IPV can be challenging to estimate. To this end, (Luca et al., 2015) exploits variation in alcohol prohibition laws across Indian states, and (Luca et al., 2019) uses variation in legal drinking ages. Both studies uncover a negative relationship between the ease of drinking and violence against women. Examining the Oportunidades program in Mexico, (Angelucci, 2008) finds that small cash transfers to women re-

duced IPV whereas larger cash transfers to women increased IPV, presumably to control a greater amount of money. We add to this literature by using an RCT to estimate the causal effect of an alcohol treatment program on IPV, as well as to estimate spillover effects of such treatment programs on households nearby.

More recently and in a context similar to ours, (Heath et al., 2020b) find that IPV is substantially reduced with a reduction in alcohol consumption in polygamous partnerships, but not in monogamous partnerships. We build on this literature by showing that while overall IPV is not necessarily affected by alcohol reduction, specific types of IPV are substantially reduced. This may be due to the nature of the treatment, and due to how alcohol consumption interacts with different forms of violence. In a recent study based in India, (Hartmann et al., 2021) examine the effect of incentives and counseling in reducing IPV, but they omit questions about sexual IPV due to the sensitive nature of these questions. Our results on the causal effect of alcohol reduction on sexual IPV are therefore particularly informative.

Second, we are one of the first studies examining IPV and alcohol use to show that treatment can lead to a change in beliefs and a change in behaviors. The literature cited above examines mainly changes in actions. Our study adds to the literature by showing that the change in behaviors is consistent with a strong change in attitudes after treatment. This is also important from a policy viewpoint: while alcohol taxes and laws affect actions, treatments such as counseling may additionally impact deeper, underlying beliefs.

Finally, responses to IPV-related questions, as for other forms of violence, are prone to under-reporting due to their sensitive and traumatizing nature. We aim to limit the extent of under-reporting by separately speaking to the household head and their spouse in a private manner, which we hope mitigated under-reporting. In a follow-up to the study we will conduct a list experiment to estimate the extent of under-reporting that exists (Castilla and Murphy, 2022).

The remainder of the paper is structured as follows. In section II. we provide background on alcohol and IPV. In section III. we outline our experimental design and and discuss the data, including baseline tables. In section IV. we provide our empirical strategy and estimating equations, leading to a discussion of our results in section V. and conclusion in section VI..

II. Alcohol and Intimate Partner Violence

A large literature documents the positive relationship between alcohol abuse and violent behavior. This relationship only became stronger in the pandemic (Chalfin et al., 2021), presumably as a result of a higher risk of drinking and staying at home. In light of several high profile college assault cases, researchers examined the link between alcohol and assault in college. This literature finds that alcohol increases sexual desire, risk-taking, aggression and is positively associated with the assault of female students (Abbey et al., 2014; Testa and Livingston, 2009).

The risk of violence around alcohol consumption is not limited to college students alone. Survey evidence suggests that rapists consume alcohol in over 50% of reported incidents (Seto and Barbaree, 1995). In experimental research, those who consumed alcohol were more likely to find another male's use of force to obtain sex acceptable, compared to sober participants. This effect was stronger among men who were predisposed to hostility towards women. Finally, those who experience alcohol related IPV tend to experience more severe IPV. Among couples over the age of 18 in the US who reported IPV, those who experienced severe IPV were twice as likely to mention that the incident involved alcohol than couples who experienced mild IPV (McKinney et al., 2010). Other than IPV, violence following alcohol consumption includes the physical and sexual abuse of children (Widom and Hiller-Sturmhöfel, 2001), and crime such as murders, stabbings and theft (Dingwall, 2013).

Interestingly, both the victim and aggressor's use of alcohol is associated with sexual violence. The likelihood of being a victim of crime in the US, especially of sexual crimes committed in public, increases discretely at the age of 21, when the victim is of legal drinking age (Chalfin et al., 2019). This finding suggests that aggressors seek out and exploit vulnerable populations for committing crimes. The finding also holds true among college students, where at least 50% of sexual victims had used alcohol, and in the majority of reported cases female students were too drunk to resist rape (Testa and Livingston, 2009). Unfortunately in such instances, bystanders too fail to stop violence if they are under the influence of alcohol (Leone et al., 2018). The findings relating victimhood and alcohol use

are backed by substance abuse literature among other populations globally (Abbey, 2002; Abbey et al., 2004).

The precise reason that alcohol is related to aggressive behavior is less understood. Theories of IPV have indicated that alcohol serves as a trigger that exacerbates stress or scarcity in the household (Heath et al., 2020b). Examples of stress and scarcity in the household can be arguments in decision making and resource control. Alcohol can also alter behaviours, such as self-control (Schilbach, 2019). Like other forms of substance abuse, alcohol abuse is linked to individuals with a high discount factor, who value immediate rewards much more than future repercussions (Chabris et al., 2008). It is yet to be established, however, if alcohol itself can cause discount factor changes. The attention-allocation model in psychology suggests that this may be a possibility. The consumption of alcohol causes individuals to ignore subtle cues that inhibit violence in favor of blatant, provocative cues that encourage violence (Giancola and Corman, 2007). Alcohol making individuals near-sighted implies that it alters discounting of the future, and, at least temporarily, makes their discount factor larger.

III. Research Design and Data

As described above, the primary objective of the intervention is to determine whether an alcohol mitigation program in rural western Kenya utilizing peer effects and spousal therapies as mechanisms has been effective in decreasing alcohol consumption. As a secondary outcome, however, we are interested in learning whether intimate partner violence also decreased as a result of the intervention. To identify these effects, we implemented a randomized control trial (RCT) in thirty rural villages in three counties of western Kenya (Bungoma, Busia, and Kakamega). This area is generally poor and primarily consist of smallholder farmers predominantly growing maize, beans, and other food crops along with limited amounts of cash crops including tobacco and sugarcane.

We conducted a short baseline survey from September to December, 2020, which included basic demographic questions, questions regarding alcohol use, at-

titudes towards gender norms, acceptability of IPV, and a list experiment[2] with all households in these villages that fit our survey criteria (cohabiting spouses 55 years old or younger).[3] This resulted in 1,558 individual surveys, of which 713 report consuming alcohol in the past 30 days (505 of these are men). Because the project was designed to be specific to alcohol users, the sample used for the project included all households that contained at least one alcohol user (1,050 individuals in 525 households).

Randomization proceeded in two stages: first, ten villages were randomly selected to be a pure control group, and the remaining twenty became treatment villages, in which the project activities were implemented. Secondly, a stratified randomization in each of the treatment villages placed 55% of the households into a treatment group, and 45% into a spillover control group.[4] Generally, the groups are well-balanced and attrition was low (6.5%) between baseline and endline surveys.[5]

A. Intervention

The intervention, implemented in early 2021, utilized two key mechanisms to achieve its primary goal of alcohol mitigation: peer effects and spousal therapies. Peer effects are used extensively in addiction treatment, for example, in twelve-step programs such as Alcoholics Anonymous, which have had demonstrated success over their long history (Kelly et al., 2020). These groups create informal networks of those suffering from similar addictions, or who have recently overcome them, enable those participating to learn from each others' experiences. Moreover, Battaglini et al. (2005) shows that peer effects can incentivize self control through pride/shame, as those participating in these groups are expected to share their successes/failures with others. Spousal therapies, on the other hand, work though rec-

[2]We include the results of this list experiment in Castilla and Murphy (2022).

[3]Many households were disqualified based on our "cohabiting spouses" requirement, as many men in this region work for extended periods of time in distant cities. However, due to the use of spousal therapies as a primary intervention mechanism, these households were not able to be included.

[4]We over-allocated households to the treatment group to ensure sufficient power given the two control groups.

[5]See Murphy (2022a) for balance tables and additional information about project location, randomization, balance, and attrition.

ognizing that addictions are oftentimes fueled through instability in the household, and spouses can both either enable or potentially check their spouse's alcohol consumption. This "family-systems approach" has also shown to be highly effective for treatment of alcoholism and preventing relapse (Kaufman and Pattison, 1981).

In partnership with a local organization, the Giselle Foundation, we coupled these two intervention strategies into an integrated, multi-week program within each village. An intervention team comprised of social workers and counselors was set up in each of the three Kenyan counties, and implemented the comprehensive treatment program in each village within that county consecutive, living in each village as the program was implemented. The program, described in detail in Murphy (2022a), consisted of three stages: contact and screening, group counseling and discussions, and household therapy sessions.

In the first stage, the intervention team worked with village guides to meet the households randomly placed into the treatment group. They then invited them to participated in group discussions modeled after those in twelve-step programs. These facilitated discussions, which took place over three (not necessarily consecutive) full days, included sharing of experiences among participants as well as guided discussions on a topic of the day that included, for example, how to manage peer pressures. The final and longest stage of the program involved home visits by therapists, who led the spouses through family-based therapy. This part of the program, which included at least eight visits by a therapist, was designed to instill accountability and trust between the spouses to enable one another to check each others' alcohol consumption.[6] The therapist also designed a personalized treatment plan and created goal-setting activities for each alcohol user within the household.

B. Endline Survey and Summary Statistics

A survey team composed of both female and male enumerators implemented an endline survey with all treatment, spillover control, and control households between

[6]While the therapist visited each household eight times, not each spouse chose to participate or be present during those visits. Overall, 50.5% of all treatment individuals participated in at least eight therapy sessions and 87.7% participated in at least one. Full statistics are included in Murphy (2022a).

February and July 2021, with those in the treatment village receiving the endline survey an average of 45 days after treatment activities concluded in their village. We trained the enumerators both using live and pre-recorded video sessions, with an experienced logistics coordinator and former enumerator conducting the training on site in Bungoma, Kenya. As part of their instruction, enumerators received a detailed training module regarding procedures for eliciting information regarding intimate partner violence, as will be further described below.

The survey consisted of several modules, the first and second of which related to household-level demographics, agricultural production, and assets. After these initial modules, a male enumerator and female enumerator took the male and female spouses respectively into separate, private areas for individual surveys. These individual surveys asked questions related to more personal, potentially sensitive topics, including religious beliefs, alcohol consumption, relationships with village peers, attitudes towards gender norms, and questions aimed at direct elicitation of intimate partner violence. Questions related to this latter topic can be personally distressing even dangerous, if the spouse learns about reporting of abuse, and so enumerators were specifically trained on implementation of this module. Specifically, the enumerators were trained to ensure 1) informed consent, 2) that the respondent knew that they did not need to participate and could skip any/all questions, 3) confidentiality, 4) privacy of the respondent during the survey, and 5) they had information of an organization that could assist them in situations of domestic violence.

C. Summary Statistics on IPV, Attitudes and Balance Table

In Table 1 we present a summary of our IPV variables. We focus on three differences types of IPV: sexual, physical and emotional. Respondents 2 questions about their experiences with sexual violence, 5 on physical violence, and 8 on emotional violence. The response to each of these questions is expressed as an indicator variable in table 1.

Following (Heath et al., 2020a), we also construct summary measures of IPV. We are able to construct indices for both the extensive margin, which reflects the number of households where IPV was experienced, and the intensive margin, which

reflects the frequency of IPV experienced. The indices are constructed by first normalizing the indicators for each individual question response using the mean and standard deviation of the pure control group. The normalized indicators are then summed within their category (for example, sexual, physical or emotional IPV), and then re-normalized so that the final index has a standard deviation of 1. This process reduces the likelihood that variables with an unusually high variance would affect the overall sum disproportionately (Kling et al., 2007).

On average 22% of households in treatment villages experience any form of IPV. This is higher than households in the spillover control group (34%), and those in the pure control villages (34%). In fact, households in the treatment group have lower levels of IPV in almost all individual measures of IPV, and the indices on IPV and the frequency of IPV, relative to the pure control and spillover control. These villages have fewer households that experience any of the three types of IPV we examine, and also experience it less often in households where it does occur.

While we took several measures to protect respondents' confidentiality that we mention above, responses to IPV questions are prone to under-reporting due to their highly sensitive nature. To estimate the extent of potential under-reporting, in our followup survey we plan to conduct a List experiment on IPV which provides an additional layer of privacy, and subsequently, higher accuracy in responses, since researchers cannot observe responses to individual IPV questions (Castilla and Murphy, 2022).

To gauge respondents' change in beliefs we ask them about instances when they believe it is appropriate for a woman to be hit by her spouse (table 2). To prevent demand effects of the intervention, we did not include IPV questions in the baseline survey, but we included questions on attitudes towards wife-beating, which we use as controls in our regressions. The questions asked are whether it is appropriate to beat your wife in the following circumstances: (i) she goes out without asking her partner, (ii) she neglects her child, (iii) she argues (iv) she refuses sex, (v) she refused to do agricultural chores, and (vi) she burnt the food. In our analysis we focus on the first 4 which we believe are most likely to result in IPV in the house.

Surprisingly, in almost all the cases examined, wives are more likely to approve of violence than husbands are. For example, 43% of women in the treatment arm

approve of violence when they neglect a child, while only 14% of men do. This is interesting because it suggests that women may be more accepting of violence than men are, which could affect womens' ability to speak up against it. As expected, the raw averages in table 2 consistently suggest that women and men in treated households are less likely to approve of violence against wives than those in spillover control and in pure control households. The averages provide preliminary evidence of the effects of our treatment on IPV beliefs.

Table 3 present differences in baseline characteristics between the treated, spillover control and pure control groups. Columns 1-6 present averages and differences in averages across groups for women, and columns 7-12 for men. Women in our sample are in their early to mid-30s, while men are about 40. Individuals have completed about 7-9 years of education, which corresponds to less than middle school and middle school graduates. Most women report farming as their primary occupation, and about half of men do.

Treatment, spillover control and pure control groups are balanced in most characteristics with a few exceptions. Treated women are poorer than pure control women and work more hours than those in the spillover control. They also are more likely to approve of wife-beating in certain circumstances. Men in the treated group consume 0.5 more alcoholic drinks at baseline. They are less likely to approve of wife-beating in certain circumstances. This last difference is likely to understate the effect of treatment on beliefs around IPV. Additionally, we are able to control for variables such as the asset index and primary occupation to account for those differences in our estimations.

IV. Empirical Methods

We estimate the causal effect of the alcohol mitigation intervention on three different types of IPV: sexual, physical, and emotional. Our outcomes were measured using 15 questions on domestic violence, of which 8 asked about emotional violence, 5 about physical violence, and 2 about sexual violence[7]. We asked about the

[7]Questions on emotional violence included limiting access to money, harassment and stocking, insulting, locking her in a room, and manipulative behavior such as blaming her for his violent

TABLE 1
SUMMARY STATISTICS INCIDENCE OF IPV

	Treatment		Spillover Control		Pure Control	
Variable	Mean	SD	Mean	SD	Mean	SD
Index IPV (last 2 months)	-0.059	(0.830)	0.040	(1.053)	0.031	(1.126)
Index Frequency of IPV (last 2 months)	-0.076	(0.777)	-0.006	(0.971)	0.096	(1.235)
Index Sexual Violence (last 2 months)	-0.061	(0.911)	-0.056	(0.890)	0.129	(1.183)
Index Frequency of Sexual Violence (last 2 months)	-0.037	(0.955)	-0.074	(0.880)	0.118	(1.150)
Has your husband made you perform sex acts against your will?	0.071	(0.258)	0.078	(0.269)	0.123	(0.330)
Has your husband forced or tried to force you to have sex?	0.082	(0.275)	0.078	(0.269)	0.136	(0.344)
Index Physical Violence (last 2 months)	-0.038	(0.876)	-0.029	(0.971)	0.075	(1.157)
Index Frequency of Physical Violence (last 2 months)	-0.071	(0.704)	-0.049	(0.912)	0.133	(1.325)
Has your husband choked you?	0.005	(0.074)	0.006	(0.081)	0.013	(0.114)
Has your husband hit you with a fist or object?	0.049	(0.217)	0.058	(0.235)	0.071	(0.258)
Has your husband threatened to harm or kill you or a loved one?	0.098	(0.299)	0.071	(0.258)	0.123	(0.330)
Has your husband used or threatened to use a weapon to hur you?	0.027	(0.163)	0.071	(0.258)	0.052	(0.223)
Has your husband shook, pushed, threw, or grabbed you?	0.098	(0.299)	0.058	(0.235)	0.097	(0.297)
Index Emotional Violence (last 2 months)	-0.048	(0.790)	0.110	(1.137)	-0.053	(1.072)
Index Frequency of Emotional Violence (last 2 months)	-0.066	(0.774)	0.056	(1.051)	0.022	(1.173)
Has your husband locked up in a room?	0.005	(0.074)	0.026	(0.160)	0.026	(0.160)
Has your husband tried to turn your family or friends against you?	0.038	(0.192)	0.058	(0.235)	0.045	(0.209)
Has your husband followed you when you left home?	0.038	(0.192)	0.026	(0.160)	0.026	(0.160)
Has your husband blamed you for his violence behavior?	0.120	(0.326)	0.156	(0.364)	0.071	(0.258)
Has your husband kept you from seeing your family or friends?	0.044	(0.205)	0.110	(0.314)	0.078	(0.269)
Has your husband told you that you were stupid or crazy?	0.333	(0.473)	0.266	(0.443)	0.331	(0.472)
Has your husband harrassed you by phone?	0.202	(0.403)	0.266	(0.443)	0.156	(0.364)
Has your husband kept you from having your own money?	0.022	(0.147)	0.039	(0.194)	0.039	(0.194)
Observations	183		154		154	

TABLE 2
SUMMARY STATISTICS ATTITUDES TOWARDS WIFE-BEATING

	Women			Men		
Variable	Treat	PC	SC	Treat	PC	SC
Husband has right to beat wife: going out	0.306	0.364	0.403	0.137	0.182	0.221
	(0.462)	(0.483)	(0.492)	(0.344)	(0.387)	(0.416)
Husband has right to beat wife: neglecting children	0.432	0.409	0.526	0.137	0.091	0.266
	(0.497)	(0.493)	(0.501)	(0.344)	(0.288)	(0.443)
Husband has right to beat wife: arguing	0.311	0.364	0.292	0.197	0.117	0.097
	(0.464)	(0.483)	(0.456)	(1.642)	(0.322)	(0.297)
Husband has right to beat wife: refusing chores	0.137	0.130	0.143	0.082	0.078	0.195
	(0.344)	(0.337)	(0.351)	(0.275)	(0.269)	(0.397)
Husband has right to beat wife: sexual encounter	0.301	0.364	0.260	0.087	0.084	0.182
	(0.460)	(0.483)	(0.440)	(0.283)	(0.279)	(0.387)
Husband has right to beat wife: burning food	0.186	0.227	0.149	0.251	0.201	0.318
	(0.390)	(0.420)	(0.358)	(0.435)	(0.402)	(0.467)
Observations	183	154	154	183	154	154

incidence and frequency of each type of violence in the last 2 and 6 months.

As previously described, of the 20 villages in our sample, 10 were in a pure control, and the households in the remaining 10 villages were assigned to the treatment (T) group or the spillover control (SC) group. Among households assigned to treatment, 76% (278 of 366) attended the group counseling, 88% (321 of 366) attended spousal therapies, and 75% (275 of 366) attended both. Finally, 3 individuals from the SC group attended a day of group counseling before the counselors found they were not meant to be in attendance.

There were also differences in the frequency of participation in the 3 group counseling and 3 therapy sessions. As evidenced in Table 4, 45% of couples attended 8 sessions. While the therapy was intended for husbands and wives jointly, there are instances where only one spouse attended. Of the 366 individuals in the treatment group, 10.9% of women and 15.7% of men did not attend any counseling sessions. To account for imperfect non-compliance we estimate the intention-to-treat (ITT) and local average treatment effects (LATE) of the treatment.

behavior and trying to turn her family against her. Physical violence questions comprised pushing, shaking, throwing, grabbing, threatening to use a weapon against her or a loved one, hitting her with a fist or object, and trying to choke her. Finally, sexual violence questions included forcing sex and making her perform sexual acts against her will.

TABLE 3
BALANCE OF TREATMENT

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
				Women						Men		
Variable	PC	SC	Treat	Treat vs PC	SC vs PC	Treat vs SC	PC	SC	Treat	Treat vs PC	SC vs PC	Treat vs SC
Age	34.823	33.925	34.100	-0.723	-0.898	0.175	40.994	40.019	39.750	-1.244	-0.975	-0.269
	(8.522)	(8.365)	(8.583)	(0.901)	(0.937)	(0.899)	(8.899)	(8.603)	(8.781)	(0.931)	(0.971)	(0.921)
Household size	4.760	4.766	4.858	0.098	0.006	0.092	4.760	4.766	4.858	0.098	0.006	0.092
	(1.954)	(1.999)	(1.828)	(0.206)	(0.225)	(0.209)	(1.954)	(1.999)	(1.828)	(0.206)	(0.225)	(0.209)
Multiple spouses	0.110	0.058	0.077	-0.034	-0.052	0.018	0.110	0.058	0.077	-0.034	-0.052	0.018
	(0.314)	(0.235)	(0.267)	(0.032)	(0.032)	(0.028)	(0.314)	(0.235)	(0.267)	(0.032)	(0.032)	(0.028)
How many years married	15.935	14.690	15.904	-0.031	-1.245	1.214	17.201	16.461	17.661	0.460	-0.740	1.200
	(8.996)	(9.331)	(9.468)	(1.012)	(1.044)	(1.029)	(9.140)	(9.195)	(9.879)	(1.044)	(1.045)	(1.047)
Years of education	8.500	7.987	8.153	-0.347	-0.513	0.166	8.883	8.519	9.093	0.210	-0.364	0.573*
	(3.038)	(2.865)	(2.741)	(0.315)	(0.337)	(0.306)	(3.537)	(3.148)	(2.795)	(0.345)	(0.382)	(0.324)
Nights away in last week	0.226	0.099	0.190	-0.036	-0.126	0.091	0.463	0.366	0.285	-0.178	-0.097	-0.081
	(1.029)	(0.634)	(0.853)	(0.099)	(0.095)	(0.081)	(1.407)	(1.430)	(1.127)	(0.133)	(0.157)	(0.135)
Primary occupation farmer	0.792	0.721	0.743	-0.049	-0.071	0.022	0.526	0.448	0.519	-0.007	-0.078	0.071
	(0.407)	(0.450)	(0.438)	(0.046)	(0.049)	(0.049)	(0.501)	(0.499)	(0.501)	(0.055)	(0.057)	(0.055)
Spouses consuming alcohol in HH	1.335	1.385	1.355	0.020	0.050	-0.030	1.335	1.385	1.355	0.020	0.050	-0.030
	(0.474)	(0.488)	(0.480)	(0.050)	(0.053)	(0.051)	(0.474)	(0.488)	(0.480)	(0.050)	(0.053)	(0.051)
Alcoholic drinks past week (at baseline)	0.561	0.585	0.445	-0.116	0.024	-0.140	2.329	2.025	2.480	0.151	-0.304	0.455**
	(1.204)	(1.267)	(1.021)	(0.117)	(0.137)	(0.120)	(1.941)	(1.761)	(1.971)	(0.206)	(0.206)	(0.199)
Asset index	0.102	-0.023	-0.066	-0.168*	-0.125	-0.044	0.102	-0.023	-0.066	-0.168*	-0.125	-0.044
	(0.989)	(0.935)	(0.870)	(0.101)	(0.110)	(0.098)	(0.989)	(0.935)	(0.870)	(0.101)	(0.110)	(0.098)
Total hours worked past week (baseline)	71.860	68.124	73.675	1.815	-3.736	5.551**	67.369	71.180	69.120	1.751	3.811	-2.060
	(27.330)	(23.753)	(24.891)	(2.741)	(2.843)	(2.583)	(31.320)	(31.384)	(32.546)	(3.371)	(3.478)	(3.392)
Husband has right to beat wife for going out without tell him.	0.293	0.304	0.305	0.012	0.012	0.001	0.207	0.155	0.155	-0.052	-0.052	-0.000
	(0.456)	(0.462)	(0.462)	(0.048)	(0.051)	(0.049)	(0.407)	(0.363)	(0.363)	(0.040)	(0.043)	(0.038)
Husband has right to beat wife for neglecting the children.	0.506	0.503	0.385	-0.121**	-0.003	-0.118**	0.366	0.348	0.350	-0.016	-0.018	0.002
	(0.501)	(0.502)	(0.488)	(0.052)	(0.056)	(0.052)	(0.483)	(0.478)	(0.478)	(0.051)	(0.053)	(0.051)
Husband has right to beat wife for arguing with him.	0.293	0.292	0.255	-0.038	-0.001	-0.037	0.177	0.211	0.260	0.083*	0.034	0.049
	(0.456)	(0.456)	(0.437)	(0.047)	(0.051)	(0.047)	(0.383)	(0.409)	(0.440)	(0.044)	(0.044)	(0.045)
Husband has right to beat wife for refusing a sexual encounter.	0.213	0.242	0.185	-0.028	0.029	-0.057	0.073	0.056	0.110	0.037	-0.017	0.054*
	(0.411)	(0.430)	(0.389)	(0.042)	(0.047)	(0.043)	(0.261)	(0.230)	(0.314)	(0.031)	(0.027)	(0.030)
Husband has right to beat wife for burning the food.	0.451	0.404	0.300	-0.151***	-0.047	-0.104**	0.189	0.143	0.240	0.051	-0.046	0.097**
	(0.499)	(0.492)	(0.459)	(0.050)	(0.055)	(0.050)	(0.393)	(0.351)	(0.428)	(0.043)	(0.041)	(0.042)
Observations	164	161	200	364	325	361	164	161	200	364	325	361

Notes: *p < 0.10, **p < 0.05, ***p < 0.01.

We use the following model to estimates the ITT effects of the intervention:

$$Y_{iv} = \beta_0 + \beta_1 Treat_i + \beta_2 SC_i + \delta X_i + \theta_v + \varepsilon_{iv} \quad (1)$$

where Y_{iv} is the IPV index for woman i in village v, $Treat_i$ is equal to 1 if i is assigned to the treatment group, SC_i is 1 is in the spillover control (same village as those in the treatment group but not assigned to treatment) group, and X_i is a matrix of control variables at baseline that includes: an index of attitudes towards wife beating, age, number of alcoholic drinks in the last week, assets index, household size, years of schooling, whether the household is polygamous, number of nights the husband spent away from home in the last week, and an indicator variable for whether farming is the main occupation. These controls account for baseline differences in characteristics and beliefs on wife-beating. The main coefficient of interests are β_1, the effect of random assignment to treatment, and β_2, the effect of random assignment to the spillover control. The variable θ_v represents village and enumerator fixed effects.

To estimate the effect of attending the counseling and therapy sessions, we estimate Equation 2 using the random treatment assignment as an instrumental variable for attending counseling or therapy. The LATE estimates therefore present the effect of treatment on compliers using assignment to treatment as an instrument. For LATE to be valid, our identification strategy must satisfy the conditions of monotonicity and and independence (Angrist and Krueger, 2001). The pure control group where no households received treatment supports the independence assumption, while the monotonicity assumption is supported by the fact that we do not have households for which treatment assignment was not at least weakly likely to induce participation (no households were "defiers").

We use the following model to estimate the LATE effects of the intervention:

$$Y_{iv} = \alpha + \rho_1 \hat{D}_i + \rho_2 SC_i + \phi X_i + \theta_v + \varepsilon_{iv} \quad (2)$$

where $\hat{D}_{iv}$ is instrumented by the assignment to treatment. The LATE effect of

participating in treatment is given by ρ_1. All controls from equation 1 are included in equation 2.

V. Results

Alcohol consumption has long been associated with intimate partner violence. However, we know little about what aspects of IPV are significantly caused by alcohol consumption, and how the dynamics of alcohol consumption by men only, versus men and women affect the type of violence that is observed. Consuming alcohol affects self control, may increase irritability, and decreases inhibitions. These different responses may affect violence in the household differently. A decrease in self control may cause a husband to demand sex from his wife against her will, but not have any effect on physical or emotional violence. Sexual violence implies immediate gratification, while other forms of violence may not. An increase in irritability can make it more likely for a husband to lose his temper and respond with violence or with actions that can cause wives' emotional distress. Decreasing inhibitions can make it easier for an individual to make statements they would not have otherwise. And of course, different forms of violence are not necessarily independent of one another, a husband may beat his wife when she refuses sex, which may result in sexual violence. We, therefore, examine the effect of the alcohol mitigation intervention on different types of violence separately.

In Western Kenya, while men consume alcohol more frequently and, according to our data, in substantially greater quantities, women also drink. This affords us a unique opportunity to examine how men and women respond to information about the consequences of consuming alcohol, and justifies treating the household as a whole and not a single individual.

In a related paper, results show that the intervention had a large and significant effect both on decreasing alcohol consumption and increasing labor outcomes. Murphy (2022a) finds that the random assignment to the treatment decreases alcohol consumption by 3.9 to 4.4 US standard drinks in the past week compared to individuals in the pure control. Moreover, the results in that study show treatment assignment increases hours worked on one's farm by 5.4 hours in the past week,

TABLE 4
TRAINING AND COUNSELING SESSIONS

Therapy attendance	Gender								
	Female			Male			Total		
	No.	Col %	Cum %	No.	Col %	Cum %	No.	Col %	Cum %
0	20	10.9	10.9	25	13.7	13.7	45	12.3	12.3
1	6	3.3	14.2	1	0.5	14.2	7	1.9	14.2
2	9	4.9	19.1	8	4.4	18.6	17	4.6	18.9
3	10	5.5	24.6	12	6.6	25.1	22	6.0	24.9
4	7	3.8	28.4	5	2.7	27.9	12	3.3	28.1
5	11	6.0	34.4	9	4.9	32.8	20	5.5	33.6
6	6	3.3	37.7	13	7.1	39.9	19	5.2	38.8
7	26	14.2	51.9	13	7.1	47.0	39	10.7	49.5
8	83	45.4	97.3	83	45.4	92.3	166	45.4	94.8
9	1	0.5	97.8	5	2.7	95.1	6	1.6	96.4
10	3	1.6	99.5	4	2.2	97.3	7	1.9	98.4
11	0	0.0	99.5	5	2.7	100.0	5	1.4	99.7
12	1	0.5	100.0	0	0.0	100.0	1	0.3	100.0
Total	183	100.0		183	100.0		366	100.0	

increases labor earnings by 20% relative to the pure control group mean, and increases the likelihood of engaging in wage labor in the past month by 9 percentage points. Similar to this study, the effects of the program also spread to those in the spillover control group. We therefore hypothesize that a causal pathway flows from reductions in alcohol consumption to the below findings that suggest significant decreases in sexual IPV among treated and spillover control households.

A. Effects on Sexual Violence

In Table 5 we present the ITT and LATE effects of treatment on sexual IPV. Our survey measures these by asking is respondents were made to perform sex acts, or to have sex, against their will. The endline survey took place between 25 and 124 days (median of 45 days) after the intervention concluded in a particular village. We therefore examine the effects of the intervention on sexual violence in the previous 2 and 6 months separately. The effect of treatment is measured on the extensive margin using an overall index of sexual violence after Heath et al. (2020), and on the intensive margin using an index on the frequency of violence. All estimations use robust standard errors which are clustered at the household level.

The alcohol mitigation intervention had a significant and robust effect in decreasing sexual violence against women. In columns 1 and 2 our ITT estimates imply a 0.30 standard deviations decrease in the incidence and frequency of sexual violence relative to the mean of the pure control group. Columns 3 and 4 show the LATE effects on those who attended their assigned therapy sessions or spousal counseling. The number of households where sexual IPV occurs decreased by 0.38 standard deviations and the frequency by 0.34 standard deviations relative to the pure control mean. The larger effects are consistent with the fact that these households actually received in treatment. Together the coefficients suggest that the treatment reduced not only the number of households where there is sexual violence, but the number of instances of sexual violence in those households against female partners as well.

As expected, the program has an effect on the spillover group relative to the pure control group as well. We observe an effect of similar magnitude on the in-

cidence and frequency of violence among women in the spillover control as well. In columns 1 and 2 the ITT estimates imply a reduction in the number of households where sexual IPV occurs by 0.32 standard deviations and in the frequency of violence by 0.36 standard deviations relative to the control group mean. In this case, the effects for households close to those that were assigned treatment (ITT effects) and those that actually received treatment (LATE effects) are very similar. The spillover control group women are from households which were not assigned to any treatment but which were in the same village as treatment households. The spillover effect could be explained by the presence of the Giselle Foundation team of counselors in the treated villages (Murphy, 2022a), or through transmission of information over social networks of treated households (Murphy, 2022b). Both mechanisms suggest that the proximity of households and counselors who have information is instrumental in reducing sexual violence.

Our effects are robust to using indicators of sexual violence in the last 2 and 6 months for incidence and frequency, confirming that the reduction in IPV is caused by the intervention. In columns 5 and 6, treatment reduced the incidence of sexual violence in the last 6 months by 0.34 standard deviations, and the frequency by 0.30 standard deviations, relative to the pure control mean. Again, the effect of treatment on treated is slightly larger (columns 7 and 8). Columns 5-8 add to the evidence that the treatment caused the reduction in sexual violence that we observe. An alternative cause would have decreased sexual violence in the last 6 months when treatment programs were still in place in some treatment villages, but we would not expect this to also be the case in the past 2 months, when treatment programs had been completed in all treatment villages. Finally, we instrument for attendance to the training and sessions and find that our results are also robust and of a similar magnitude to our main results.

B. Effects on Physical Violence

The alcohol mitigation intervention did not reduce physical violence at the extensive margin, but had significant effect at the intensive margin. We show in Table 6 that the ITT effect of treatment on the index of incidence of physical violence is negative

TABLE 5
EFFECT OF ALCOHOL INTERVENTION ON SEXUAL VIOLENCE

	IPV Last 2 months				IPV Last 6 months			
	(1) Index	(2) Freq	(3) Index	(4) Freq	(5) Index	(6) Freq	(7) Index	(8) Freq
Assigned to treatment	-0.24**	-0.22**			-0.25**	-0.22**		
	(0.11)	(0.11)			(0.11)	(0.11)		
Participation in group counseling OR therapy			-0.28**	-0.25**			-0.29**	-0.25**
			(0.13)	(0.12)			(0.12)	(0.13)
Spillover control	-0.24**	-0.26**	-0.23**	-0.26**	-0.14	-0.24**	-0.13	-0.23**
	(0.12)	(0.11)	(0.11)	(0.11)	(0.12)	(0.11)	(0.12)	(0.11)
Estimation	ITT	ITT	LATE	LATE	ITT	ITT	LATE	LATE
County/Enumerator FEs & additional regressors‡								
Kleibergen-Paap rk Wald F-stat								
Observations	491	491	491	491	491	491	491	491

Notes: Dependent variables are indices computed using (Heath et al., 2020a). Index measures incidence and Freq indicates number of violent incidents. Standard errors clustered at the household level. *p < 0.10, **p < 0.05, ***p < 0.01.

but statistically insignificant (column 1), indicating that there was no statistically significant reduction in the number of households where physical violence occurs. However, the frequency of physical violence decreases by 0.31 standard deviations relative to the pure control mean in column 2. The LATE results for those who participate in counseling or therapy are larger, and consistent in sign with the ITT results. For those who participated in treatment, there was no significant change in the number of households which experience physical IPV, but the number of incidences decrease by 0.35 standard deviations relative to the pure control mean.

The results are stronger when using indicators of violence in the last 2 months relative to the last 6 months, which suggests that the the reduction in IPV was stronger when treatment programs were completed in all villages. Similar to the case for sexual IPV, we find that households in treatment villages who were not assigned to treatment also experienced a reduction in the frequency of physical IPV. For these spillover control households, IPV and LATE effects are extremely similar because these households did not benefit from treatment assignment and receiving treatment; rather, they benefit from their proximity to both types of households.

Overall, our results show that the intervention decreased the frequency of violence among households that already engaged in such behavior, but had no significant impact on the number of households that engage in physical IPV.

C. Effects on Emotional Violence

The estimates of the effect of the intervention on emotional violence are presented in Table 7. We do not find a significant effect of the intervention on emotional violence. The estimated coefficients are small, and positive in the case of the incidence of emotional IPV and negative for the frequency of IPV. Coefficients do not change in sign or significance for IPV experienced in the last 2 months and that experienced in the last 6 months.

As mentioned in our review of the literature, alcohol consumption is linked to aggressive behavior (Abbey et al, 2014; Testa, 2002). One reason that treatment did not have a substantial impact on emotional IPV may be that the nature of emotional IPV is be more subtle, less aggressive (though damaging in its own way), and

TABLE 6
EFFECT OF ALCOHOL INTERVENTION ON PHYSICAL VIOLENCE

	IPV Last 2 months				IPV Last 6 months			
	(1) Index	(2) Freq	(3) Index	(4) Freq	(5) Index	(6) Freq	(7) Index	(8) Freq
Assigned to treatment	-0.13	-0.22*			-0.10	-0.15*		
	(0.11)	(0.11)			(0.11)	(0.09)		
Participation in group counseling OR therapy			-0.15	-0.25**			-0.11	-0.17*
			(0.12)	(0.13)			(0.12)	(0.10)
Spillover control	-0.15	-0.22*	-0.15	-0.22*	-0.15	-0.09	-0.15	-0.09
	(0.12)	(0.12)	(0.11)	(0.12)	(0.11)	(0.12)	(0.11)	(0.12)
Estimation	ITT	ITT	LATE	LATE	ITT	ITT	LATE	LATE
County/Enumerator FEs & additional regressors‡								
Kleibergen-Paap rk Wald F-stat								
Observations	491	491	491	491	491	491	491	491

Notes: Dependent variables are indices computed using (Heath et al., 2020a). Index measures incidence and Freq indicates number of violent incidents. Standard errors clustered at the household level. *p < 0.10, **p < 0.05, ***p < 0.01.

therefore less likely to be exacerbated by the consumption of alcohol.

D. Attitudes

In the previous sections we showed how our treatment to reduce alcohol consumption had the effect of lowering sexual IPV. One potential mechanism for the decrease in sexual and physical violence is a change in attitudes towards violence as a result of the spousal counseling sessions. The sessions had the objective to provide tools for spouses to support each other in their effort to reduce their consumption of alcohol. The counselors, however, conducted spousal therapy sessions and these covered aspects of the subjects relationship that was likely quite heterogeneous across households.

We collected data on six different situations in which husbands could be justified in beating their wives. The questions asked if the "Husband has the right to beat his wife" for: (i) going out without telling him; (ii) neglecting the children; (iii) arguing with him; (iv) refusing a sexual encounter with him; (v) refusing to do agricultural chores; and (vi) burning the food. Husbands and wives responded to these questions privately and at the same time, both at baseline and during the endline survey. We focus on the first four of these indicators as they are the most likely to directly translate into IPV in a household setting.

We report on the effect of the intervention on women and men separately in Table 8 and Table 9. In Table 8, we show that women decreased their approval of their husbands' right to beat them for going out without telling them by 11 percentage points (column 1) and for neglecting the children by 10 percentage points (column 2). There were no changes in attitudes for arguing or for refusing sex. The results are robust to using treatment assignment as an instrument for participation in training and counseling sessions (columns 1-4), and examining those who participated in group counseling or therapy (columns 5-8).

The decrease in husbands' attitudes is stronger and more statistically significant. Interestingly, we find an 11 percentage point decrease in men's approval for beating a wife when she refuses sex in both the ITT results (column 4) and LATE results (column 8). The magnitude of the change is about a third of the size of the control

TABLE 7
EFFECT OF ALCOHOL INTERVENTION ON EMOTIONAL VIOLENCE

	IPV Last 2 months				IPV Last 6 months			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Index	Freq	Index	Freq	Index	Freq	Index	Freq
Assigned to treatment	0.01	-0.08			0.01	-0.13		
	(0.10)	(0.10)			(0.10)	(0.11)		
Participation in group counseling OR therapy			0.02	-0.09			0.01	-0.14
			(0.11)	(0.12)			(0.12)	(0.13)
Spillover control	0.18	0.05	0.18	0.05	0.09	-0.02	0.09	-0.02
	(0.11)	(0.12)	(0.11)	(0.12)	(0.12)	(0.12)	(0.11)	(0.12)
Estimation	ITT	ITT	LATE	LATE	ITT	ITT	LATE	LATE
County/Enumerator FEs & additional regressors‡								
Kleibergen-Paap rk Wald F-stat								
Observations	491	491	491	491	491	491	491	491

Notes: Dependent variables are indices computed using (Heath et al., 2020a)). Index measures incidence and Freq indicates number of violent incidents. Standard errors clustered at the household level. *p < 0.10, **p < 0.05, ***p < 0.01.

group mean, which is a substantial effect, especially in the short time span being examined. The change in attitudes could be the basis of how treatment lowered sexual IPV in our main results. With this interpretation, our treatment not only caused a change in attitudes, but also resulted in a tangible change in actions in the household.

Similar to the case for women, we also find a lower male approval for wife-beating when a wife goes out without asking them or when she neglects the children. The effects are consistent across columns in the ITT coefficients (columns 1-4) and LATE coefficients (columns 5-8). These could potentially explain some of the decrease in physical IPV that w observe in our main results, though in this case the translation from attitudes to actionable change is less robust.

While changing women's attitudes towards violence is of great policy importance, it may be secondary in importance to changing men's attitudes. Husband-to-wife IPV is more common, and occurs in situations where women approve or disapprove of wife beatings alike, because men tend to be physically stronger. Changing men's attitudes in patriarchal societies is one of the most difficult challenges of IPV reduction efforts. Our results imply that men reducing their approval for beating their wives for going out or neglecting children likely at least partially explains the decrease in the frequency of physical violence. Similarly, the mechanism for lowered incidence and frequency of sexual violence is at least partially due to a change in attitudes towards wife-beating when women refuse sex.

E. Why are there effects of the treatment on the Spillover Control

As shown in the results above, many of the effects of the intervention on attitudes towards and incidence of IPV are significant among both the treatment and spillover control groups. While we do not have causal evidence to identify a particular reason for this, suggestive evidence points to word-of-mouth effects from two sources: treated individuals and the intervention team. The latter is likely to occurred as social workers and counselors rented homes and lived in the villages during the implementation of the project, and these outsiders were likely persons if interest to the community at large. Also, because of the strong networks that exist among the

TABLE 8
EFFECT OF ALCOHOL INTERVENTION ON ATTITUDES TOWARDS VIOLENCE - WOMEN

	(1) Going Out	(2) Neglect Child	(3) Argue	(4) Refuse Sex	(5) Going Out	(6) Neglect Child
Assigned to treatment	-0.11**	-0.10*	0.01	-0.01	0.02	0.03
	(0.05)	(0.05)	(0.05)	(0.04)	(0.05)	(0.04)
Spillover control	-0.05	-0.15***	0.04	-0.03	0.07	0.07
	(0.05)	(0.05)	(0.05)	(0.04)	(0.05)	(0.04)
County/Enumerator FEs & additional regressors‡						
Kleibergen-Paap rk Wald F-stat						
Observations	491	491	491	491	491	491

	(1) Going Out	(2) Neglect Child	(3) Argue	(4) Refuse Sex	(5) Going Out	(6) Neglect Child
Assigned to treatment						
Participation in group counseling OR therapy	-0.12**	-0.11*	0.02	-0.01	0.02	0.04
	(0.06)	(0.06)	(0.05)	(0.04)	(0.05)	(0.04)
Spillover control	-0.05	-0.15***	0.04	-0.03	0.07	0.07
	(0.05)	(0.05)	(0.05)	(0.04)	(0.05)	(0.04)
County/Enumerator FEs & additional regressors‡						
Kleibergen-Paap rk Wald F-stat						
Observations	491	491	491	491	491	491

Notes: Dependent variables are dummy variables equal to 1 if the respondent answered yes to the question whether "Husband has the right to beat his wife for ...". Standard errors clustered at the household level. *p < 0.10, **p < 0.05, ***p < 0.01.

TABLE 9
EFFECT OF ALCOHOL INTERVENTION ON ATTITUDES TOWARDS VIOLENCE - MEN

	(1) Going Out	(2) Neglect Child	(3) Argue	(4) Refuse Sex	(5) Going Out	(6) Neglect Child
Assigned to treatment	-0.10**	-0.13***	0.09	-0.11***	-0.10***	-0.06
	(0.04)	(0.04)	(0.12)	(0.04)	(0.04)	(0.04)
Spillover control	-0.03	-0.18***	-0.02	-0.11***	-0.09**	-0.11***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
County/Enumerator FEs & additional regressors‡						
Kleibergen-Paap rk Wald F-stat						
Observations	491	491	491	491	491	491

	(1) Going Out	(2) Neglect Child	(3) Argue	(4) Refuse Sex	(5) Going Out	(6) Neglect Child
Assigned to treatment						
Participation in group counseling OR therapy	-0.11***	-0.14***	0.10	-0.12***	-0.11***	-0.07
	(0.04)	(0.04)	(0.13)	(0.04)	(0.04)	(0.05)
Spillover control	-0.03	-0.18***	-0.02	-0.11***	-0.09**	-0.11***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
County/Enumerator FEs & additional regressors‡						
Kleibergen-Paap rk Wald F-stat						
Observations	491	491	491	491	491	491

Notes: Dependent variables are dummy variables equal to 1 if the respondent answered yes to the question whether "Husband has the right to beat his wife for ...". Standard errors clustered at the household level. *p < 0.10, **p < 0.05, ***p < 0.01.

community in these villages, peer effects also likely passed over treatment group boundaries and influenced outcomes in the spillover group as well as the treatment group.

We can identify two findings to support these potential mechanisms for the effects found among the spillover control. First, in Murphy (2022a), the author uses GPS coordinates to calculate the distance between homestead locations and location of the group therapy sessions, and uses this distance as a proxy to exposure to information about the program. Controlling for distance from the homestead to the center of the village and baseline alcohol consumption, the regressions show a positive and significant correlation between the distance between a spillover control household and group therapy location and alcohol consumed in the past week. This means that individuals in the spillover control group nearer the intervention site drank less alcohol than those farther away, providing suggestive evidence of word-of-mouth effects.

Other suggestive evidence comes from Murphy (2022b), who analyzes effects on village peer networks of the program intervention. Results in that paper show that nearby male-male peers are twelve percentage points more likely to communicate daily with each other and ten percentage points more likely to work with each other when one is in the treatment group and the other the spillover control group compared to two male peers who are both in the spillover control (no effects are found among female peers). While we cannot know for sure whether alcohol or IPV are being discussed in these interactions, these results at least suggest that greater quantities of information are being shared between treatment and control individuals in the same village and suggest a possible pathway for the effects found in the spillover control group.

F. Why are there stronger effects on Sexual IPV than on Physical and Emotional IPV?

We collected the content of group counseling and therapy session discussions. A closer examination of these conversations reveals why alcohol consumption and IPV are so closely intertwined, and, subsequently, why an alcohol treatment pro-

gram would also reduce IPV.

Many respondents describe how IPV is triggered by or associated with alcohol abuse in the household. For example, one respondent mentioned that his family had *"suffered from domestic violence, incurred injuries and loss of valuable properties to alcohol"*. In a session with a different household, the respondent *"admitted he was an addict, which has also caused domestic violence in his marriage"*. This respondent's wife mentioned that she did not know how to handle her alcoholic husband, which led to misunderstanding and domestic violence in their family. Subsequently, individuals were also asked to consider the consequences of IPV. In one therapy session a respondent (who admitted to beating his wife when drunk) was asked to *"discuss the effects of gender violence on children and on their spouses"*. It is clear then that conversations around IPV were inevitable when discussing alcohol abuse, and that reducing alcohol abuse would reduce the IPV that alcohol accompanies in households.

Our findings suggest that the greatest impact of the alcohol treatment program was on sexual IPV. Along with a reduction in the number of households that experienced sexual IPV, and the frequency of experiencing sexual IPV, we also find a change in men's belief around sexual IPV. As mentioned above, men assigned to treatment were 11-12 percentage points less likely to condone the refusal of sex as a reason for beating one's wife.

While we find similar reductions on beliefs around physical violence, we do not find actual reductions in physical violence to be as strong as those for sexual violence. One aspect of sexual violence that may be different from other types of IPV is the aspect of obtaining an immediate reward in exchange for a more subtle and distant cost. Research in psychology suggests that alcohol abuse can make individuals near-sighted. This effect has been explained using the attention-allocation model, which suggests that alcohol limits individuals' attention span. In these conditions, individuals undervalue subtle cues that inhibit violence, and overvalue cues of less subtle and more immediate cues that exacerbate violence (Giancola and Gorman, 2013). Sexual IPV may be different from physical IPV in that there is no comparable immediate reward in physical IPV.

In the economics literature, higher discount factors have been linked to be-

haviours such as alcohol and substance abuse (Chabris et al., 2008). Individuals who discount the future by more are also those who are more likely to abuse alcohol. However, in this case it is unclear if having a high discount factor led to alcohol abuse, or if alcohol abuse can affect discount factors. This is a question that we are exploring in the next round of our survey, planned for the summer of 2022. To do so, we have included a game between spouses to measure discounting behavior, as well as questions about recall from the counseling and therapy sessions. We have also included a more questions about sexual IPV to understand the different types of sexual IPV in depth.

VI. Conclusion

The abuse of alcohol has strongly been associated with intimate partner violence. In our paper we causally identify the effect of an alcohol treatment program on IPV. Our treatment program is set in rural Western Kenya. Many developing countries have experienced a rise in alcoholism in recent decades, and in African countries in particular the level of IPV is also higher than the global average.

Our paper shows that the alcohol treatment program has substantial effects on reducing IPV. In particular, there were fewer households assigned to treatment that experienced IPV relative to the pure control. Those that did experience it experienced a lower frequency of IPV. These results were robust to analyzing changes in sexual IPV in the past 6 months, when the average household would have completed treatment, and in the past 2 months, when all households would have completed treatment.

We also assigned households to a spillover control group. These households were in the same village as treated households and so would potentially benefit from the positive externalities of the proximity of treated households. Households assigned to the spillover control group also experienced substantially less sexual IPV, on the extensive and on the intensive margins. We interpret these results as a consequence of being geographically close to treated households. As a result, these households were exposed to those who were treated, as well as enumerators who led counseling and therapy sessions.

The alcohol treatment program had effects on other forms of IPV in varying degrees. The frequency of physical IPV decreased for households assigned to treatment and to the spillover control, but the number of households experiencing physical IPV did not change. Meanwhile, we did not observe a change in emotional IPV on the extensive or the intensive margins.

One of the reasons that IPV and alcohol abuse are closely linked is that alcohol can be a trigger for IPV. Indeed, in the records of conversations in counseling and in couples therapy, we find numerous examples of couples mentioning domestic violence together with alcohol abuse. The counseling and therapy they received is likely to have affected both.

It is interesting to understand why the effects were different for sexual IPV compared to other forms of IPV. We find that treatment also changed beliefs, and especially men's beliefs, around wife-beating. Relative to pure control households, men in treated households were less likely to approve of wife-beating if a wife refuses sex. However, while they were also less likely to approve of wife-beating for other reasons, such as for going out without telling her husband, we observe reductions in physical violence that are less strong than those for sexual violence. One reason for this could be that alcohol consumption makes individuals more nearsighted, so that a strong immediate reward takes precedence over a subtle, delayed cue that inhibits violence. Relative to other forms of IPV, the immediate reward after sexual IPV may be more salient and provocative than that after physical IPV.

Overall, our study suggests that reducing IPV is a substantial consequence of alcohol abuse interventions. The benefit of these interventions, therefore, may be two-fold. On the one hand, treatment for alcohol abuse increases productivity, on the other, it also has the potential to reduce IPV, which is directly linked to the health of women, men and children in the house.

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APPENDICES

For Online Publication

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Authors

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Appendix Figures

Appendix Tables