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SEX, POWER, AND ADOLESCENCE:
INTIMATE PARTNER VIOLENCE AND SEXUAL BEHAVIORS

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ABSTRACT

Adolescents in Sub-Saharan Africa have some of the highest rates of intimate partner violence across the globe. This paper evaluates the impact of a randomized controlled trial that offers females a goal setting activity to improve their sexual and reproductive health outcomes and offers their male partners a soccer intervention, which educates and inspires young men to make better sexual and reproductive health choices. Both interventions reduce female reports of intimate partner violence. Impacts are larger among females who were already sexually active at baseline. We develop a model to understand the mechanisms at play. The soccer intervention improves male attitudes around violence and risky sexual behaviors. Females in the goal setting arm take more control of their sexual and reproductive health by exiting violent relationships. Both of these mechanisms drive reductions in IPV.

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A data appendix is available at http://www.nber.org/data-appendix/w31624
A randomized controlled trials registry entry is available at https://www.socialscienceregistry.org/trials/1305

1 Introduction

Intimate partner violence (IPV) is a global public health epidemic; nearly one in three women will experience some form of IPV in her lifetime (World Health Organization, 2021). Globally, 24% of 15-19 year olds have experienced physical or sexual IPV, and the prevalence is higher in Tanzania where 32% of ever-partnered 15-19 year olds report ever experiencing IPV and 25% report experiencing IPV in the last 12 months (World Health Organization, 2021). In addition to the direct negative effects of violence on women's outcomes (e.g., Campbell (2002)), social norms that perpetuate IPV and the resulting lack of bargaining power with sexual partners affect females' ability to make safe choices around sexual and reproductive health (SRH) (Barker et al., 2011). Importantly, IPV is also associated with risky sexual behavior, such as low rates of modern contraceptive use, multiple partnerships, and larger age gaps between partners (Melesse et al., 2020; Nkata, Teixeira and Barros, 2019; DHS, 2016).

We implement a randomized controlled trial (RCT) with female and male adolescents in Tanzania to shift these power dynamics around adolescent relationships with the goal of improving female SRH outcomes related to violence and risky sexual behaviors.[1] Our interventions build on an ongoing adolescent empowerment program (Empowerment and Livelihoods for Adolescents (ELA)) delivered to females through a network of 149 clubs in three regions of rural Tanzania. For females, we randomize invitations to participate in a goal setting activity aimed at motivating the adoption of safe behaviors to improve their SRH outcomes. In randomly selected communities, the boyfriends of ELA participants are invited to participate in an intervention using an innovative sport-based pedagogy that employs soccer-specific activities, metaphors, and language to educate and inspire them. The curriculum focuses on reshaping males' attitudes and behaviors around masculinity, gender-based violence, and sexual relationships. We collect baseline data on all female ELA participants and their boyfriends and resurvey them two years later.

Intent-to-treat (ITT) estimates show that female experience of IPV decreases by 0.190

[1] This research received ethical clearance in country through the Tanzania National Institute for Medical Research (NIMR) (protocol NIMR/HQ/R.8a/Vol. IX/2247) and from the University of California Los Angeles Institutional Review Board (protocol # 16-000125).

of a standard deviation as a result of the male soccer (*Boys*) intervention and by 0.248 of a standard deviation as a result of the female goal setting (*Goal*) intervention. Impacts are significantly larger for females who were already sexually active at baseline, highlighting greater efficacy of the interventions for those more vulnerable to IPV. We develop a game theoretic model of SRH and IPV to interpret the causal link between the interventions and IPV. In the model, males and females have preferences for risky sex, and violence emerges when their preferences conflict—namely, when males want it and females do not.[2] If she says no to risky sex, he may inflict violence to get her to acquiesce. But if he does that, she may exit the relationship.

The *Boys* treatment can reduce IPV either by decreasing his net payoff from violence and/or by decreasing his net payoff from risky sex. The *Goal* treatment induces the female to set improved SRH goals, increasing her disutility from risky sex. This means she will say no to risky sex more often. This can result in an increase or decrease in violence, depending on her relative costs of exit versus violence. In order for violence to decrease as a result of the *Goal* intervention, females must exit more often in response to violence. Otherwise, IPV will increase.

Our empirical results show that reductions in IPV from the *Boys* treatment are driven by an improvement in male attitudes around violence, as well as SRH, suggesting a role for both a decrease in the net benefit of violence and a decrease in the net benefit of risky sex. For the *Goal* treatment, we find increased partner churn, with females less likely to be with the same partner as at baseline, implying female exit as the mechanism for decreased IPV. Interestingly, boyfriends in the *Goal* arm appear to be of higher quality at endline.

This paper makes several important contributions. First, traditional programming has often ignored males in SRH education programs or service provision because they are not the primary beneficiaries of the services (Jewkes, Flood and Lang, 2015); however, because of gendered power dynamics, males may control decisions surrounding sexual

[2] Empirical evidence shows males use violence to obtain risky sex (see Raj et al. (2007); Teitelman et al. (2011); Alleyne et al. (2011); Kalichman et al. (1998)), and this is supported by evidence in our data that female experience of IPV and male perpetration of IPV are associated with lower reported condom use (see Table A1).

behavior that impact SRH outcomes (Varga, 2003). Due to the design of this study, we can causally estimate whether treating males improves female outcomes.

Second, recent evidence suggests that targeting adolescents with interventions focused on changing attitudes toward gender norms and risky behaviors can be effective (Edmonds, Feigenberg and Leight, 2021; Dhar, Jain and Jayachandran, 2022). Since adolescents are at an age where they are establishing a course for future relationships and have more malleable attitudes (Steinberg, 2015; Sheehan et al., 2017), interventions may have larger and longer-term effects. However, due to the focus of SRH programming on married couples (e.g., Dunkle et al. (2020)) and individual adults (e.g., Pronyk et al. (2006); Roy et al. (2019)), we still know relatively little about how to improve adolescent SRH outcomes in low-income settings (besides cash and school- or club-based programming).[3]

Third, the economics literature on the causal mechanisms behind IPV has focused exclusively on married couples, where exit costs are relatively high, and on the role of bargaining over household income and resources as a primary driver of IPV outcomes among women (e.g., Haushofer et al. (2019); Hidrobo, Peterman and Heise (2016); Angelucci (2008); Bobonis, González-Brenes and Castro (2013); Erten and Keskin (2018); Aizer and Dal Bó (2009); Aizer (2010)).[4] Our model expands beyond IPV as a bargaining response over monetary resources by focusing on partnership bargaining in another critical realm—sexual relations. In addition, given our focus on adolescent relationships, where couples are not married and non-cohabiting, exit costs might be lower.

Fourth, we contribute to the small causal literature on the impact of sports programming on adolescents (Beaman et al., 2021; Ditlmann and Samii, 2016) and to scant evidence on the role of goal setting in low-income settings. As far as we know, this is the first evaluation of the application of goal setting to SRH in any setting.[5] Lastly, this study

[3]Financial incentives and education-based interventions have been shown to reduce teen pregnancy, early marriage, HIV/AIDS and IPV (e.g., Baird, McIntosh and Özler (2011); Handa et al. (2015); Bandiera et al. (2020); Buchmann et al. (2021); Duflo, Dupas and Kremer (2015); Jewkes et al. (2008); Gibbs et al. (2020)).

[4]While these models allow for changes in the value of the female's outside option to play a role in mitigating violence (Haushofer et al., 2019; Angelucci, 2008; Bobonis, González-Brenes and Castro, 2013), they largely abstract away from the possibility of female exit from the relationship due to high normative and real costs of marital dissolution (e.g.,Erten and Keskin (2018)).

[5]Setting goals has been found to increase self-control and decrease present-biased behavior (Hsiaw, 2013), improve worker performance and productivity (Goerg, 2015), improve student performance on

provides low-cost, scalable solutions for decreasing IPV among adolescents. Most previous causal evidence on decreasing violence involves cash transfers or provision of income (Baranov et al., 2021; Kerr-Wilson et al., 2020), and our interventions are significantly lower cost.

2 Study Design

2.1 Setting

This study was implemented in three regions of Tanzania—Dodoma, Iringa, and Mbeya—in partnership with BRAC Maendeleo. These regions were selected due to BRAC's operation of a network of 149 adolescent female clubs (Empowerment and Livelihoods for Adolescents (*ELA*) clubs) across these regions. Mbeya is the largest of the three regions in terms of population at 2.7 million people as of the 2012 census, with Dodoma having a population of 2.2 million and Iringa just under 1 million people (National Bureau of Statistics et al., 2012). The average population size of study communities is about 3,000, and these are rural areas.

These regions were selected due to the presence of 149 adolescent female clubs (Empowerment and Livelihoods for Adolescents (ELA)) that BRAC began operating in Tanzania in 2009. This program started in Bangladesh and is also implemented in Uganda, Sierra Leone, South Sudan, and Liberia. ELA is an education-based intervention designed to empower adolescent females by providing a safe social space, life-skills training, and support in adolescent development. Female adolescents and youth are invited to participate in ELA. Participation is voluntary but members are expected to attend five days per week from 3-6PM. Each club averages 20 members and has a mentor who runs the programs. In an evaluation of ELA when it was initially rolled out in Tanzania, 25% of the eligible population participated in ELA clubs and research finds no significant selection into clubs (Buehren et al., 2017). While the evidence on ELA from Uganda and Sierra Leone is mostly positive in terms of decreasing unintended teen pregnancy and early entry into marriage or cohabitation (Bandiera et al., 2020, 2019), the Buehren et al. (2017)

tests, entrance exams, and homework (Clark et al., 2020), decrease energy consumption (Harding and Hsiaw, 2014), increase savings (Choi et al., 2006), etc.

evaluation of ELA during its 2009 roll out in Tanzania finds no positive impacts of ELA.

The current study builds on top of the ELA club structure to evaluate, via an RCT, complementary interventions. Figure 1 illustrates the overall design of the RCT. Treatment status was assigned at the ELA club level and at the individual level, depending on the treatment. At the ELA club level, the 149 clubs were randomly allocated to three groups of equal size, stratified by region: two treatment arms and one control arm. The control arm (49 clubs) maintained the status quo of ELA clubs. The two treatments arms are (i) *Supply* (50 clubs), which provided ELA club members access to free contraceptives (primarily injectables, implants, and IUDs), and (ii) *Boys* (50 clubs), which offers a soccer intervention for males in these communities. Due to budgetary constraints, we could only treat 25% of the sample with a goal setting intervention. We layer an additional intervention, randomized at the individual level across all study arms.

This paper focuses on the evaluation of the *Boys* and *Goal* treatments. The evaluation of the *Supply* arm, which produces null results due to no uptake of contraceptives is discussed in detail in Shah, Seager and Rubio (2022) (see Table B1, which presents utilization rates of the main contraceptives provided in the *Supply* arm at baseline and endline). Although it will not be discussed further in the current paper, we control for this study arm in all analyses.

2.2 Data Collection

Figure 1 presents the baseline sample distribution across study arms. We conducted a baseline census of members of all 149 ELA clubs in Dodoma, Iringa, and Mbeya from August to October 2016. Club leaders provided a complete list of active members. Females enrolled in school were considered active if they attended ELA meetings at least twice a week. Out of school females were considered active if they attended ELA meetings three times per week. The census identified a population of 3,419 active members aged 11-22 across the 149 clubs, and all active members were selected for survey. The female baseline survey occurred from September to December 2016, 2–5 months before any interventions were implemented and resulted in a final sample of 3,178 females. Surveys were completed with 92.9% of the total number of females listed during the census. The discrepancy reflects changes in participation in ELA clubs rather than refusals to participate in survey.

We also collected data on the male partners of our female sample. During the baseline survey, females were asked to list males to whom they were attracted and males with whom they were currently or historically having sex. Overall, 56.8% of females named at least one male across both categories (37.4% named males they found attractive, and 27.2% named male sexual partners). Females named one male on average and approximately 900 males were identified in each treatment arm. This list of males served as the sampling frame for the male survey sample.

Males were sampled so that half would be in the *Boys* arm and the other half would be distributed equally across the other two arms, where no intervention for males was implemented. Thus, all of the males listed as attractive and/or sexual partners in *Boys* communities were selected for survey, and, in all other communities, a sub-sample of the listed males were randomly selected for survey. The males' baseline survey took place from December 2016 to February 2017. In total 1,466 males were surveyed at baseline, with 787 males in the *Boys* intervention and 679 males across all other communities.

Prior to endline data collection, another census of ELA members was conducted during May 2018. Endline data collection took place between June and August 2018 for both males and females, six to eight months after the end of all interventions. Of the 3,178 females in our baseline sample, 2,591 were successfully tracked to the endline survey, an overall tracking rate of 81.5%. This tracking rate is similar across survey treatments (81% in the control arm, 85% in *Boys*, and 80% of females invited to *Goal*) and is in line with tracking rates of studies in similar contexts (Bandiera et al., 2020). We do not find evidence of differential attrition according to treatment status or our outcomes of interest. We discuss attrition in more detail in section 7.

Baseline and endline adolescent surveys collected information on the adolescent's household and about the adolescent's sexual behavior, SRH knowledge and attitudes, education and time use, health, and socio-emotional skills. STI and HIV testing was also conducted, but prevalence was unexpectedly low at baseline, around 1% for both, so this data is not used in analysis as we are underpowered.

2.3 Interventions and Takeup

Soccer Intervention. The *Boys* arm intervention was implemented by Grassroot Soccer (GRS), an organization focused on empowering adolescent males through the power of soccer, educating them on sexual and reproductive health topics, preventing HIV, and increasing uptake of health-promoting services among youth (ages 10-19).[6] The activity-based curriculum uses soccer language and analogies to start conversations around healthy and responsible behaviors and uses soccer drills and games to reinforce key messages.

The soccer intervention primarily targeted males within ELA club members' social and sexual networks; however, the ELA and GRS interventions were independent of one another. All 787 males sampled for survey in the *Boys* arm were invited to participate. This resulted in about 300 males enrolling (35% of the male survey sample).[7] Because we had funding for 1,000 males to participate, Grassroot Soccer enrolled around 700 additional males from communities assigned to the *Boys* arm. We followed the standard GRS protocol for recruitment via schools and the community. Ultimately, 1,090 males completed the soccer curriculum in *Boys* communities.

Grassroot Soccer began implementing sessions during the second half of February 2017, continuing through December 2017. In each region, five coaches each ran three rounds of programming, resulting in a total of 15 teams of approximately 25 males per region. The curriculum included 11 one-hour soccer practices on topics related to risk behaviors, HIV/AIDS prevention, and intimate partner violence and respecting females. The sessions integrate key messages into soccer drills. Appendix Figure A1 illustrates an example soccer drill where males dribble the soccer ball around cones that represent risky behaviors they are being encouraged to avoid (e.g., unprotected sex, multiple partnerships). In between exercises, coaches facilitate discussion around lessons learned during the activity and how it relates to the session topic. Coaches are available after practice

[6]While this is the ideal age for the intervention, Grassroot Soccer treated a few males older than 19 for this study, as some of the boyfriends named by females in *Boys* treatment communities were older than 19.

[7]Males who enrolled in Grassroot Soccer look similar to males who did not enroll in terms of household wealth, communication with parents, and age, but are 13.3 percentage points more likely to be enrolled in school, which is consistent with GRS's target population, and had larger households. There is also evidence that GRS was more easily able to contact older males, which may be indicative of phone access and ownership. See Table A2 for more detail.

for an additional 15-30 minutes in case males want one-on-one meetings to discuss more private issues.

Ten of the practices are on SRH issues and one is on malaria. Of the ten classes on SRH issues, several touch on issues directly related to IPV. For example, in the *Communicate* lesson (lesson two), males are expected to name at least one local service for victims of rape and violence. One key message of this lesson is "In life, we should all stand up for girls and women to protect them from abuse" (Grassroot Soccer, 2013). Similarly in lesson three, *Risky Partners*, the key message is about having sex with individuals your own age and not pressuring younger females to have sex. In lesson ten, *Red Card*, males are given scenarios worthy of a red card, such as bus drivers requiring sex from female passengers, older partners pressuring younger females to have sex, and gender-based violence. See Appendix Table C1 for more details on the curriculum for all sessions.

Goal Setting. For the goal setting activity, facilitators asked selected females if they were willing to set a goal to remain healthy and stay STI/HIV free for the following year.[8] If they agreed, facilitators went through the S.M.A.R.T. process of setting Specific, Measurable, Achievable, Relevant, and Timely goals (Doran, 1981), which is often used in cognitive-behavioral therapy (CBT). Females were asked to identify and commit to up to three specific strategies to achieve the goal. This initial activity took about 90 minutes and was done one-on-one with a trained facilitator in August 2017. We invited 865 females, who were randomly selected from the baseline sample across all 149 clubs, to participate in this goal setting activity. Of the 865 females invited to participate, 789 participated (91%).[9] Of the 789 participants, 113 females (14.3%) set three strategies, 383 females (48.5%) set two strategies, and 293 females (37.1%) set only one strategy. Figure 3 highlights that the most commonly identified strategy was to use a condom, followed by abstinence and being faithful. Females also wrote about why this goal was important for their future and what obstacles they might face in following through with their specific

[8] Oettingwen and Gollwitzer (2010) argue that framing goals in terms of positive outcomes (rather than preventing negative outcomes) is more effective.

[9] Of the 76 females who did not participate, only two refused. The rest were either unavailable at the time of the intervention or had moved away from the study area.

strategies.

Four months later, in December 2017, facilitators checked in with the females to see if they were implementing the strategies they set and asked them about behavioral constraints they might be facing in meeting these goals. These meetings were also one-on-one and lasted about 60 minutes.

In Table A3 we investigate which characteristics are correlated with setting and achieving more strategies using data from the baseline survey. Females whose responses indicate depression set and achieved fewer strategies.[10] Consistent with the psychological concept of self-efficacy, females with higher general self-efficacy scores set and achieved more strategies.[11] Females from relatively poorer households (e.g., with earthen floors) set and achieved fewer strategies. We can also use endline data to test whether females change their behaviors in line with their strategies. While suggestive, Table A4 shows that females who set the primary goal to use a condom were more likely to report using a condom with their last partner and females who set the primary goal to abstain from sex were more likely to have no sexual partners in the last six months. These associations provide evidence that the goal setting participants changed their behaviors in response to their strategies.

Figure 2 shows the timing of the interventions relative to data collection.

3 Outcomes and Sample characteristics

3.1 Outcomes

The primary outcomes in this paper are related to intimate partner violence and sexual activity.[12]

[10]Depression is measured using the Patient Health Questionnaire-2 (PHQ-2), where a score of three or higher is indicative of depression. The PHQ-2 includes the first two items of the PHQ-9 (Kroenke, Spitzer and Williams, 2003).

[11]Self-Efficacy is measured using the General Self-Efficacy Scale developed by Schwarzer and Jerusalem (1995). A total self-efficacy score that ranges from 10-40 was calculated. We then standardized this score using the mean and standard deviation of the score among females in control communities.

[12]We present definitions for all registered primary outcomes in Appendix Table D1.

Intimate partner violence. For females, intimate partner violence (IPV) is based on responses to three questions that capture her experience of violence with her most recent partner within the last two years. These are standard questions on IPV from the Tanzania Demographic and Health Surveys (DHS, 2016). Violence categories include physical (pushing, shaking, or throwing something at her), psychological (threatening to hurt or harm her or someone she cares about), and sexual (being physically forced to have sexual intercourse). Interviews were conducted in private and confidentiality was ensured. In cases where females reported violence, they were provided resources to seek support.

We generate an overall index across six indicators measuring violence, following Kling, Liebman and Katz (2007). We generate six indicators for psychological, physical, and sexual violence happening often (rather than sometimes, not in the last 12 months, or never) and in the last year (rather than not in the last 12 months or never). If the female did not a have partner in the last two years, her response is coded as zero for all indicators. To create the index, we standardize each indicator at baseline and endline separately around the mean and standard deviation of females in control communities who were not assigned to the *Goal* treatment and take the unweighted average across items.

Sexual Activity. For sexual activity, we focus on behaviors that may be mechanisms through which the interventions operate, such as gender attitudes around violence and SRH, risk perceptions around STIs, and changes in sexual partnerships (both quantity and quality). These outcomes are measured at both baseline and endline.

For each group of outcomes, we create an overall index, following the same procedure as for IPV.

3.2 Sample Characteristics and Baseline Balance

Table 1 presents summary statistics of the primary outcomes and demographic characteristics at baseline. Columns 1 and 3 shows means for the control group (females in ELA only communities and females not assigned to the Goal treatment). Columns 2 and 4 report the difference between the treatment arm and the control mean and test for differences between the *Boys* arm and the control (column 2) and the *Goal* arm and the control (column 4).

Looking to columns 2 and 4, the RCT appears to be balanced across observed outcomes and demographics at baseline. Females are 16.5 years of age on average (panel C), between 3.5% and 5.4% of females have experienced IPV in the past year, depending on the item (panel A),[13] and 25% of the sample is sexually active. In our main analysis, we focus on the balanced panel of 2,591 females who were surveyed at both baseline and endline. Table B2 presents baseline balance for this sub-sample. In addition, we show balance for the IPV outcomes for the sub-sample of females who were sexually active at baseline in Table B3.

We are interested in whether ELA participants are representative of adolescent females. To test for this, we compare our sample of ELA members to the random sample of females from the same communities in the baseline sample of Buehren et al. (2017) before ELA was introduced (see Table A5). We find no evidence of systematic differences. While ELA participants in Tanzania are less likely to have a child than non-participants, there is no evidence that they differ by education enrollment status, relationship status, engagement in income generating activities, or across several measures of household wealth (Buehren et al., 2017). Likewise, in Uganda, Bandiera et al. (2020) find little evidence of selection on observables into ELA participation.

4 Empirical Framework

We estimate intent-to-treat (ITT) impacts using difference-in-differences (DD), accounting for the cross-cutting randomization of the goal setting activity following Muralidharan, Romero and Wüthrich (2021). The specification is as follows:

$$\begin{aligned} Y_{ict} = \alpha + \beta_1 \text{Boys}_c \times \text{Post}_t + \beta_2 \text{Goal}_i \times \text{Post}_t + \gamma_1 \text{Boys}_c \times \text{Post}_t \times \text{Goal}_i \\ + \theta_1 \text{Goal}_i + \theta_2 \text{Post}_t + \theta_3 \text{Goal}_i \times \text{Boys}_c + X_{ict}^{'} \xi + \alpha_c + \epsilon_{ict} \end{aligned} \tag{1}$$

[13]Rates of IPV measured in our data are consistent with estimates for equivalent populations from the Tanzania DHS (2016). See Table A6.

where Y_{ict} is the outcome of interest for individual i in club c at time t, Boys_c and Goal_i are binary indicators for being assigned to the *Boys* and *Goal* treatments, respectively, and Post_t is a dummy variable that takes on the value one for the period after treatment is implemented. X_{ict} is a vector of controls including $\text{Supply}_c \times \text{Post}_t$, $\text{Supply}_c \times \text{Goal}_i$ and $\text{Supply}_c \times \text{Post}_t \times \text{Goal}_i$ to control for assignment to the *Supply* treatment as well as a set of individual characteristics. α_c is a vector of club fixed effects that control for club-level treatment assignment and to account for the stratification of the *Goal* treatment assignment. The standard errors ϵ_{ict} are clustered at the club level to account for the clustered study design.[14] The parameters of interest, β_1 and β_2, capture the ITT effects of the *Boys* treatment and *Goal* treatment, and γ_1 estimates the interaction between the two treatments.

The individual characteristics included in X_{ict} are age in years, highest grade attended, and binary indicators that the female never communicates with her mother about SRH topics and whether the female's household (i.e., parents) owns the house in which she lives, unless otherwise noted. We include these controls because they are strongly correlated with sexual activity and relationship status (Bruhn and McKenzie, 2009); however, the results are qualitatively similar if we do not include them (see Table A7). We estimate DD specifications rather than ANCOVA because our primary outcomes, IPV and sexual activity, are relatively highly autocorrelated, which make them well-suited for DD analysis (McKenzie, 2012). Also, since we estimate sub-analyses by baseline sexual activity and partnership status, we estimate DD regressions in case of possible baseline imbalance across treatment arms within sub-sample.

5 Results

We present estimation results from equation 1 for IPV outcomes in Table 2. Columns 1 and 2 present the estimates for β_1 and β_2, and column 3 tests for equality of the treatment

[14]While the *Goal* treatment is randomized at the individual level, we cluster standard errors at the club level to account for sampling design and interactions between goal-setting participants and other club members. Clustering the standard errors at the club level is conservative for inference from the *Goal* treatment.

effects. Column 4 presents the outcome mean among the control group (females in ELA only communities who were not assigned to the *Goal* treatment) at endline and 5 presents the observations.

Table 2 shows that the *Boys* treatment reduces the IPV index 0.190 standard deviations (p=.022) compared to the control. Looking at the individual components of the indices, the *Boys* treatment reduces the various IPV outcomes between 1.1 and 3.7 percentage points. Table 2 also shows that the *Goal* treatment decreases the IPV index 0.248 standard deviations (p=.011) compared to the control. The individual components of the indices have magnitudes between 1.2 and 5.9 percentage points. Table A8 shows that females who are more engaged in the goal setting activity and set two to three strategies reap larger benefits than those who set only one or no strategies. Figures 4 and 5 present the ITT effects of the *Boys* treatment (β_1) and the *Goal* treatment (β_2) on the IPV index.

We cannot reject that the treatments effects are the same across arms (see column 3). Appendix Table A9 presents the coefficient estimate for γ and shows there are no additional reductions in IPV for females who were invited to goal setting in *Boys* treatment communities. This might be because each treatment alone reduces IPV prevalence to nearly zero.

The previously discussed impacts are based on the entire sample of females, starting at age 10, when almost no one is experiencing IPV. These outcomes become more salient as females age and become sexually active. At baseline, 25.7% of the sample reported ever having had sex. Figure 6 presents estimates of β_1 and β_2 from equation 1 for females who were and who were not sexually active at baseline separately. For this estimation, we re-center the IPV index at baseline and endline separately around females who were sexually active at baseline in control communities who were not assigned to the goal setting activity. Reductions in IPV are now twice as large in the *Boys* arm (0.382 standard deviation reduction, p=.043) and 65% larger in the *Goal* arm (0.411 standard deviation reduction, p=.011) among females who were sexually active at baseline.[15] In the next section, we investigate potential mechanisms driving these reductions in IPV through a

[15] We also look at heterogeneity by having a partner in the past two years at baseline and the results are consistent (shown in Figure A2).

conceptual framework that gives us empirical predictions on IPV and ancillary behaviors.

6 Conceptual Framework

Men may use violence against women when they disagree over sexual relations (Raj et al. (2007); Teitelman et al. (2011); Alleyne et al. (2011), Kalichman et al. (1998)).[16] The following model uses a simple game theoretic framework to explore the mechanisms driving violence during negotiations over sexual relations. We then explicitly discuss how the *Boys* and *Goal* interventions can change these interactions.

6.1 Model Setup

In the following one-shot, sequential game, nature first generates a male-female pair. Each player may derive positive or negative utility from engaging in risky sex, i.e. a trade-off between the pleasure of risky sex (e.g., unprotected sex) and its perceived expected cost (e.g., STI infection). Here we are interested in conflicting preferences between risky sex and sex, but the implications are no different if we were to consider sex or no sex. When male and female preferences are aligned (i.e., either they both prefer risky sex or they both dislike it), there is no conflict and no chance of violence. We focus on the scenario where males gain positive utility from risky sex and females gain negative utility from risky sex. Formally, the payoff of the pair is $(s_m, -s_f)$, where $s_i > 0$, so that s_m denotes the male's net benefit from risky sex and s_f denotes the female's net cost from risky sex. We normalize the pair's payoff from being in a couple without risky sex to $(0, 0)$; thus, s_m and s_f are the additional benefits or costs associated with engaging in risky sex.

The game (depicted in Figure 7) is as follows.[17] First, the male decides whether or not to propose risky sex to the female. If he does not, the game ends with both players receiving a normalized payoff of zero. If he proposes, the female chooses yes or no. If she says yes, the game ends with the male receiving payoff $s_m > 0$ and the female receiving

[16] Table A1 also shows correlations between violence and risk behaviors in both the male and female data at baseline.

[17] Figure 7 denotes the complete information version of the game to give the reader a flavor of the game. However, we assume that payoffs are private information—while players know their own payoffs, they do not know each other's payoffs.

payoff $-s_f < 0$. If she says no, the male decides whether or not to respond with violence. If he chooses violence, the female can either (i) stay in the relationship, bearing the full cost of violence, resulting in payoffs $(v_m, -v_f)$, where v_m is a net benefit for the male and v_f is a net cost for the female;[18] or (ii) exit the relationship, incurring a cost of dissolving the relationship, resulting in payoffs $(-d_m, -d_f)$, where d_i is a cost for both males and females.[19] We assume throughout that $v_f > s_f$ for all s_f.

If $d_f < v_f$, then she exits the relationship when threatened with violence. We define these females as *exit-types* (E). If $d_f > v_f$, the cost of exit is prohibitively high and she will stay. We define these females as *stay-types* (S). We let the cost of violence v_f be common across types and the cost of leaving d_f^k be type-specific, where $k = E, S$, such that $d_f^E < v_f < d_f^S$. The fraction of exit-type females is given by α, with the remaining $1 - \alpha$ being stay-types. For both exit-type and stay-type females, s_f is distributed according to the cumulative distribution function $F(\cdot)$, which is continuous and strictly increasing everywhere.

The distribution of s_f and the values of α, d_f^E, d_f^S, and v_f are all common knowledge, but only females know their type. Likewise the distributions of s_m and v_m and the value of d_m are all common knowledge; however, the female does not know with certainty whether saying no will trigger a violent response from the male. We denote the probability of triggering violence by p.

If the female is exit-type, she will say no if

$$s_f > pd_f^E. \tag{2}$$

If she is stay-type, she will say no if

$$s_f > pv_f. \tag{3}$$

These conditions establish thresholds for female's cost from risky sex, above which a k-

[18] v_m can be positive or negative depending on the male's relative taste for and opportunity cost of violence.

[19] The female may still experience (some) violence at the point of leaving, but such violence is not chronic.

type female says no. Intuitively, a higher probability of a violent response, p, makes it increasingly difficult for both types to say no.

From conditions (2) and (3), we obtain two best response functions that map the probability that an exit- and stay-type female says no as a function of p:

$$\rho^E(p) = 1 - F(pd_f^E), \tag{4}$$

and

$$\rho^S(p) = 1 - F(pv_f). \tag{5}$$

Conditional on the female saying no, the male, knowing α, ρ^E and ρ^S, uses Bayes' rule to calculate the probability that the female will exit if he responds with violence:

$$q(p) = \frac{\alpha\rho^E(p)}{\alpha\rho^E(p) + (1-\alpha)\rho^S(p)}. \tag{6}$$

Based on (6), the male chooses to respond with violence if

$$(1-q)v_m - qd_m > 0, \tag{7}$$

Rearranging, this condition can be written as

$$v_m > \frac{q}{1-q}d_m, \tag{8}$$

which establishes a threshold for the payoff from violence, v_m, above which the male responds with violence. Intuitively, the higher the probability q, the less attractive it is for him to respond with violence. Also, we show without loss of generality, all males with $s_m > 0$ will propose (see Appendix E.1 for the proof). It follows that the probability a male reacts violently to a no is given by

$$p(q) = 1 - M\left(\frac{q}{1-q}d_m\right), \tag{9}$$

where $M(\cdot)$ is the cumulative distribution function of v_m, which we assume to be continuous and strictly increasing everywhere. This gives the male's best-response function to q.

6.2 Equilibrium

An equilibrium is given by $\{q^*, p^*\}$ such that (i) ρ^E satisfies (4), ρ^S satisfies (5), and q^* satisfies (6), all evaluated at p^*; and (ii) p^* satisfies (9) evaluated at q^*. The function $p(q)$ is decreasing in q (i.e., males are less likely to respond with violence as females become more likely to exit). However, $q(p)$ can be increasing or decreasing in p. To ensure an increase in p results in an increase in $q(p)$, we impose a straightforward assumption: stay-type females, who would suffer cost v_f, are more responsive to changes in p than exit-type females, who can leave.

Proposition 1 *There exists a unique equilibrium* $\{q^*, p^*\}$*.*

A proof for Proposition 1 is provided in Appendix Section E.2. Figure 8 illustrates the equilibrium. The top two panels show the best response functions for stay- and exit-type females, respectively. The upward sloping curve in the bottom panel is the best response function $q(p)$. The downward sloping curve in the bottom panel is the best-response function $p(q)$. The curves $q(p)$ and $p(q)$ intersect once, showing there is a unique equilibrium.

The y-intercept for $q(p)$ is α because, as p goes to zero, all females will say no and q will converge to the share of exit-type females in the population. Similarly, the x-intercept for $p(q)$, β, is the share of males for whom $v_m > 0$. This is because all males with $v_m > 0$ will respond with violence as q goes to zero.

6.3 Testable Predictions: *Boys* Arm

The Soccer curriculum in the *Boys* arm aims to reshape boys' attitudes towards IPV and teaches males the importance of avoiding risky behaviors to stop the spread of HIV/STIs. This has two implications from the model: the curriculum can decrease the net benefit of risky sex, s_m, and/or it can decrease the net benefit of violence, v_m.

If the former effect is strong enough to shift some males' s_m to be negative (i.e., he no longer wants risky sex), then this trivially decreases violence by decreasing the probability of a mismatch in preferences for risky sex (where $s_m > 0$ and $s_f < 0$), and, thus, of a potentially violent relationship.

A decrease in v_m unambiguously reduces p, the equilibrium probability the male responds with violence when the female says no (see Figure 9).

Proposition 2 *The Boys treatment unambiguously reduces violence.*

A proof of Proposition 2 is given in Appendix Section E.3. This decrease in violence results from a decrease in s_m and/or v_m.

6.4 Testable Predictions: *Goal* Arm

The *Goal* intervention strengthens females' commitment to adopt safe sexual behaviors to remain healthy. This translates to an increase in the net cost of risky sex, s_f, across the distribution of females, shifting $F(s_f)$ to the right and increasing $\rho^k(p)$ for all values of p. As a result, females will say no more often. In equilibrium, this can increase or decrease violence depending on whether the change in $\rho^k(p)$ is relatively larger for stay-types vs. exit-types. The intuition is that, if stay-type females say no relatively more often, males are more likely to inflict violence as they learn the change is coming from stay-types. Breakups become less likely and violence increases (see Figure 10(a)). If, on the other hand, exit-type females say no relatively more often, males become less likely to inflict violence as females leave more often. Breakups become more likely and violence decreases (see Figure 10(b)).

Proposition 3 *The impact of the Goal intervention on violence is ambiguous.*

The necessary condition for the *Goal* intervention to decrease violence is a decrease in p^* and increase in q^*, such that breakups increase. A proof of Proposition 3 is given in Appendix Section E.4.

6.5 Empirical Evidence for Model Predictions

***Boys* Treatment.** In the model, the male's willingness to inflict violence is driven by both his preferences over risky sex (s_m) and the net payoff of violence (v_m). The *Boys* intervention could affect either of these channels. To empirically assess the explanatory power of these channels, we use the male survey data and estimate ITT impacts using DD on males' outcomes using the following specification:

$$Y_{ict} = \alpha + \beta_1 \text{Boys}_c \times \text{Post}_t + \beta_2 \text{Goal}_i \times \text{Post}_t + \gamma_1 \text{Boys}_c \times \text{Post}_t \times \text{Goal}_i \\ + \theta_0 \text{Boys}_c + \theta_1 \text{Goal}_i + \theta_2 \text{Post}_t + \theta_3 \text{Goal}_i \times \text{Boys}_c + X'_{ict}\xi + \alpha_c + \epsilon_{ict}, \tag{10}$$

where Y_{ict} is the outcome of interest for male i connected to a female in club c at time t, Boys_c is an indicator that the boy resides in a community assigned to the *Boys* intervention, Goal_i is an indicator that the female who is connected to the male was invited to the *Goal* treatment, and Post_t is an indicator for the post-treatment period. X'_{ict} is a vector of controls that includes individual characteristics equivalent to the controls for the females' models, except we control for whether the male speaks to his father about sexual reproductive health topics rather than his mother. Location fixed effects in α_c are at the region level to account for the level of stratification of treatment assignment to the *Boys* arm, and standard errors are clustered at the level of the female to whom the male is attached. For the males' estimates, the coefficient estimate of β_2 estimates the indirect treatment effect of his girlfriend being invited to the *Goal* intervention.

We present estimation results from equation 10 in Table 3. Columns 1 and 2 present the estimates for β_1 and β_2, and column 3 tests for equality of the treatment effects. Column 4 presents the outcome mean among the control group (males whose connected female is in an ELA only community who were not assigned to the *Goal* treatment) at endline and 5 presents the observations. Panel A captures v_m through males' attitudes toward violence and Panels B and C capture aspects of s_m through males/ risk perceptions of STIs and sexual activity.

Panel A of Table 3 focuses on violence attitudes, namely disagreement that "A woman should tolerate violence from her husband/partner," and agreement that "A man should not beat a woman under any circumstance." We code attitude responses so that higher values indicate improved attitudes. We see that the *Boys* treatment improves attitudes related to violence by 0.290 standard deviations (p=.016).[20] There is no comparable impact of the *Goal* intervention on males' attitudes (Panel A, columns 2 and 3), which makes sense given it was males' girlfriends who were treated in this arm. The magnitude of the *Boys* impact is similar to RCT results from Dhar, Jain and Jayachandran (2022), who engaged adolescents in classroom discussions about gender equality. Table A11 shows that improvements in attitudes were larger among males who enrolled in Grassroot Soccer, with an improvement in the Violence attitudes index of 0.442 standard deviations (p=.002) among this group. This evidence is consistent with a decrease in the male's net payoff of violence (v_m) as a result of the *Boys* arm.

Panels B and C present evidence consistent with a decrease in males' net payoff of risky sex (s_m) as well. In Panel B, the *Boys* intervention increases males' perceptions around the likelihood of their friends having STIs. Previous research has found that increasing expectations of the likelihood of HIV infection reduces risky behavior and vice versa (e.g., Delavande and Kohler (2016)). Males in the *Boys* arm are 14 percentage points more likely to believe that a randomly selected female friend is very or somewhat likely to have an STI and 12.3 percentage points more likely to believe that at least 15 out of 100 randomly selected males his age in the community have an STI. In turn, males are 12.2 percentage points more likely to agree that girls have the right to demand condom use compared to males in control communities (p=.059). The Risk perception index shows an increase of 0.293 standard deviations for males in the *Boys* treatment arm (p <.000). In Table A11, we show that the treatment effect is larger among males who enrolled in Grassroot Soccer, with an increase of 0.370 standard deviations (p <.000) among this group. Again, as expected, there is no comparable impact of the *Goal* intervention on these outcomes (Panel B, columns 2 and 3).

A reduction in s_m implies fewer males proposing risky sex in the first place. While we

[20]Table A10 shows that these shifts in attitudes are concentrated among males who were already sexually active at baseline, precisely the group of males who would be perpetrating IPV and consistent with female reports of greater reductions of IPV among females who were already sexually active at baseline.

do not have a direct measure of this, we try to capture it indirectly via sexual activity. Panel C of Table 3 presents impacts of the *Boys* arm on sexual activity as reported by males. Overall, males report a reduction in sexual activity of 0.098 standard deviation, driven by a reduction in currently having a partner by 6 percentage points and in the number of sexual partners by 0.116 fewer sexual partners on average (a 14% reduction). We corroborate these reports with female data in Panel A of Table 4. We find that females in *Boys* communities experience a 0.125 standard deviation (p=.032) reduction in sexual activity, primarily driven by a reduction in currently having a partner. In Table A11, we show that the reduction in the sexual activity index is larger among females for whom a male in their sexual network enrolled in Grassroot Soccer, showing a 0.297 standard deviation (p <.000) reduction in the sexual activity index among this group.

Figure 4 presents a summary of treatment effects across outcomes for the *Boys* treatment (β_1 from equation 10), highlighting improved violence attitudes and SRH risk perceptions for males and reductions in sexual activity. While we cannot identify the relative importance of v_m vs. s_m in reducing IPV, we note that both factors seem to be at play.

***Goal* Treatment.** Empirically we have observed an overall reduction in IPV among females assigned to the *Goal* arm. The model shows this can only be a result of an increase in the conditional probability of exit (q^*) and a decrease in the conditional probability of violence (p^*). An increase in q^* implies that females are more likely to exit relationships in response to violence.

We investigate relationship stability in Table 4. In Panel B, we estimate the treatment effects on the likelihood of being with the same partner as at baseline. As the outcome is a change from baseline to endline, we estimate a cross-sectional treatment-control model, controlling for the same baseline characteristics as in equation 1. The results in Panel B of Table 4, column 2, show evidence of increased relationship dissolution. Females invited to participate in the *Goal* treatment are 3.9 percentage points less likely to be with the same partner as at baseline than females in the control group (p=.070). However we cannot reject that this effect is the same as the *Boys* treatment, although the *Boys* treatment coefficient is not statistically significant. In Table A12, we restrict the sample to females who reported experiencing any IPV at baseline. Females in the *Goal* treatment are 30.5 percentage points less likely to be with the same partner as at baseline than females in the control group (p =.001) and this is significantly more likely in the *Goal* arm compared to the *Boys* arm (p =.003), although sample sizes are small.

In addition, in Panel A of Table 4, females in the *Goal* treatment report having more total sexual partners ever, but are equally likely to be in a current partnership as the control group (both statistically different than the *Boys* treatment, see column 3), suggesting more partnership turnover in this arm. All of these results are consistent with an increase in q driven by the *Goal* treatment. Figure 5 presents a summary of treatment effects across outcomes for the *Goal* treatment arm (β_2), highlighting increased exits.

The model is built around the notion that females will exit violent relationships conditional on her opportunity cost of leaving being sufficiently low (i.e., that she is a exit-type, $d_f^E < v_f$). Table A13 compares endline characteristics of females who exited relationships to those who stayed, conditional on naming a sexual partner at baseline. Panel A shows that females who exited relationships are nearly twice as likely to be currently enrolled in school and are 13 percentage points less likely to be currently married or cohabiting, both of which are consistent with having better outside options. Panel B broadly suggests that females who exited are less likely to be experiencing IPV at endline, consistent with exit-type females leaving violent relationships.

Even though our model does not speak to matching or dynamics over time, we now use our rich data to explore two potential consequences of increased break-ups with violent partners: quality of subsequent partners and displacement of violence to other females in the community. In Panel C of Table 4, we restrict the sample to females who report having partners at baseline and/or endline and utilize data from female reports of her boyfriends' characteristics. For each female, we average the characteristics of her boyfriends for age and school enrollment and create an index, as these characteristics are correlated with risky sex and partnerships (Agüero and Bharadwaj, 2014; Schaefer et al., 2017; Beauclair, Dushoff and Delva, 2018). We find that goal setting significantly increases average boyfriend quality by 0.265 standard deviations (p=.023). Next, we compare IPV outcomes of females invited to the *Goal* treatment to control group females. If violent partners are being displaced, we would expect a reported increase in IPV among control females that offsets the decrease in IPV among those in the *Goal* treatment. Table A14 shows that while IPV significantly decreases for females in the *Goal* arm, there is no offsetting increase among control females.

Treatment Interaction. Encouraging women to say "no" more often can have a backlash effect for stay-type females, as demonstrated in Figure 10(a). In that world, additionally implementing the *Boys* intervention could mitigate this backlash. Table A9 presents the same results as Table 2 but includes the coefficient estimate for γ_1 from equation 1. While imprecisely estimated, the coefficients on the interaction between the two interventions are positive for the IPV index, indicating that, in this case, the interventions may substitute each other in terms of reducing IPV. As mentioned previously, this could be because each treatment alone reduces IPV prevalence to nearly zero.

7 Attrition

Tables 5 and 6 present analysis of sample attrition using baseline data for the females and males, respectively, to test whether attrition varies by treatment status and/or baseline characteristics. The outcome in all panels is an indicator equal to 1 if the female (male) attrited by endline. We find no evidence of differential attrition by treatment status overall or by baseline characteristics.

We show baseline outcome means by attrition status in appendix figure A3, which shows no evidence of differential attrition. There is some evidence that females in the *Goal* treatment who experienced physical abuse at baseline are less likely to attrit. If anything, this would imply positive bias in our estimate of the impact of goal setting on physical abuse, indicating our treatment effects are a lower bound.

8 Cost-effectiveness

We now present evidence on the cost-effectiveness of our interventions. Given the lack of experimental studies that provide evidence on reducing IPV among adolescents in

LMICs that include cost data, we benchmark our IPV impacts and costs against two studies that estimate the impact of cash transfer programs on IPV among married women in Kenya (Haushofer et al., 2019) and Ecuador (Hidrobo, Peterman and Heise, 2016). We acknowledge that cash transfer programs are designed to shift many other outcomes unrelated to violence and these comparisons should be considered with this in mind.

Table A15 summarizes our cost effectiveness comparison. The per-female cost of the *Boys* treatment is \$41 and the per-female cost of the *Goal* treatment is \$38. To ease comparison across treatments and studies, we normalize the cost of each treatment to a 0.25 standard deviation reduction in IPV—\$54 for the *Boys* treatment and \$38 for the *Goal* treatment per 0.25 standard deviation decrease.

Haushofer et al. (2019) find that \$496 cash transfers to adult women in Kenya reduced physical violence by 0.26 standard deviation and sexual violence by 0.22 standard deviation. Transfers of equal value to their husbands reduced physical violence by 0.18 standard deviations. These imply a cost of \$477 to \$539 per 0.25 standard deviation reduction in IPV from cash given to women, and a \$689 per 0.25 standard deviation reduction in IPV from cash given to their husbands. Similarly, Hidrobo, Peterman and Heise (2016) find that monthly transfers (cash or in-kind) of \$40 to adult women in Peru over a six-month period, for a total of \$240 per woman, reduces physical or sexual violence by 6 percentage points. This translates to a cost of \$400 per 0.25 standard deviation reduction in IPV. This basic costing analysis suggests that our interventions are highly cost-effective in reducing IPV relative to cash and in-kind transfers.

9 Discussion and Conclusion

This paper presents causal evidence from a multi-level cluster and individual RCT and finds that offering males a soccer-based health intervention reduces female experience of IPV by 0.190 standard deviations on average. Similarly, offering females a goal setting activity reduces experience of IPV by 0.248 standard deviations. Reductions in IPV in both treatment arms are larger for females who were already sexually active at baseline.

Sexual relations can be shaped by power relations between females and males. We evaluate interventions that each shift one side of the relationship. We develop a model to illuminate mechanisms behind the power relations that drive SRH and IPV outcomes. In our model, male decision-making around IPV is driven by his net payoffs from risky sex and violence and expectations around whether his partner will exit in response to proposals of risky sex and violence. Females decide whether to engage in risky sex based on their net payoffs from risky sex and the costs they face from violence relative to exiting the relationship, along with their expectations about the likelihood their partner will perpetrate IPV.

This model speaks directly to our interventions, which separately target adolescent males and females to shift the dynamics that allow for IPV at this critical juncture in male and female development. The reduction in IPV in the *Boys* arm is driven by an improvement in male attitudes toward IPV and risky sex. Mapping back to our model, this implies a reduction in the likelihood the male responds with violence when the female says no and a reduction in the likelihood the male proposes risky sex in the first place. On the other side, the *Goal* arm helps females set concrete strategies on how to improve their sexual and reproductive health, increasing the cost of risky sex. The model suggests this will lead to females saying no more often, which could decrease or increase violence depending on whether females can leave these relationships once threatened with violence. Our data suggests that more females are able to exit relationships when faced with violence, resulting in an overall reduction in violence.

While programming focusing on adolescents is increasing, there is still little evidence on what works to reduce IPV for this age group. These results provide evidence of two effective, inexpensive, and scalable interventions to reduce IPV experienced by adolescent females. Changing gender relations at this early stage of adulthood could potentially shift the life trajectory of young men and women, which is a fruitful avenue for future research.

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Figures and Tables

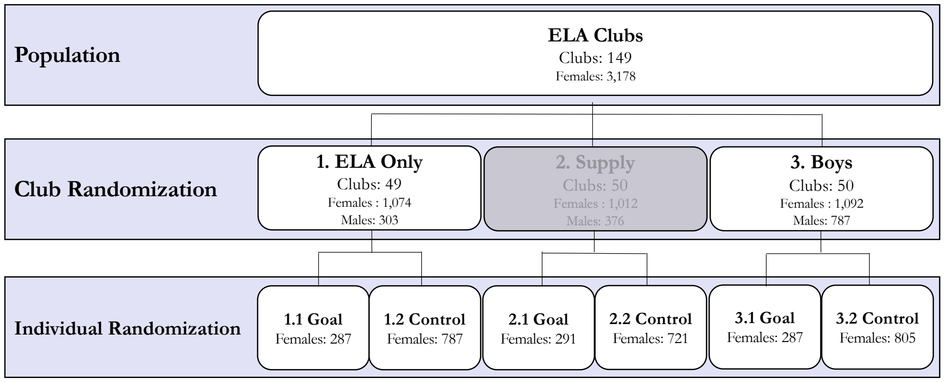


Figure 1 Study Design

Notes. This figure presents the overall study design. The study population, presented in the top box, is female participants in 149 ELA clubs at baseline in 2016. The middle box shows community-level randomization and the number of males and females surveyed at baseline in each community-level treatment arm. The bottom box shows the cross-cutting, individual-level *Goal* treatment.

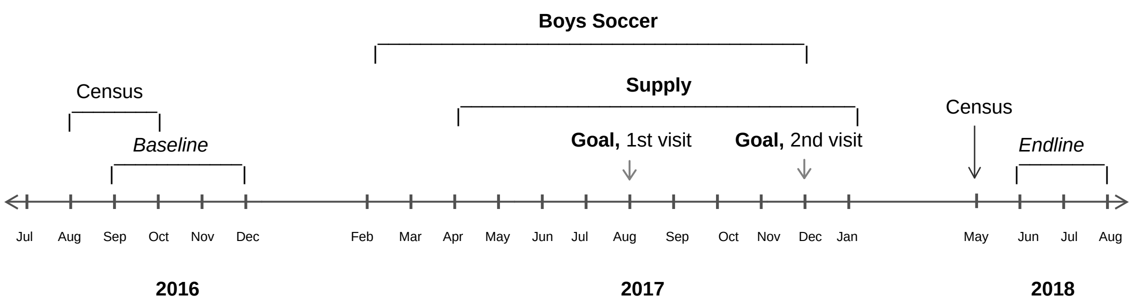


Figure 2 Study Timeline

Notes. This figure presents the study timeline.

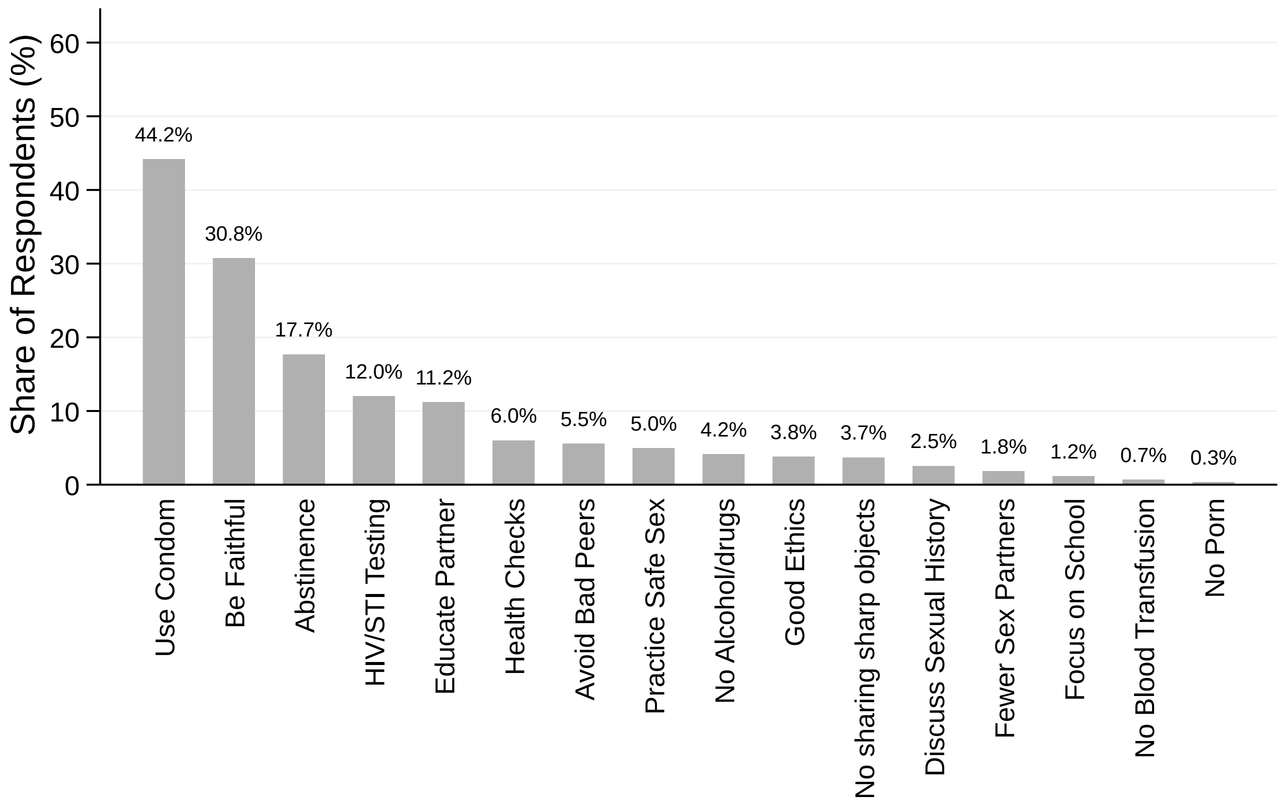


Figure 3 Strategies from Goal Setting Activity

Notes. This figure summarizes strategies identified during the goal setting activity. Each female was asked to identify 1–3 strategies. These strategies were categorized into 16 over-arching categories. The percent of females who set a strategy that fits in each category is presented above the bar. As females could set up to 3 strategies, the percentages above the bars do not sum to 100%.
Source. Female goal setting participants, first visit.

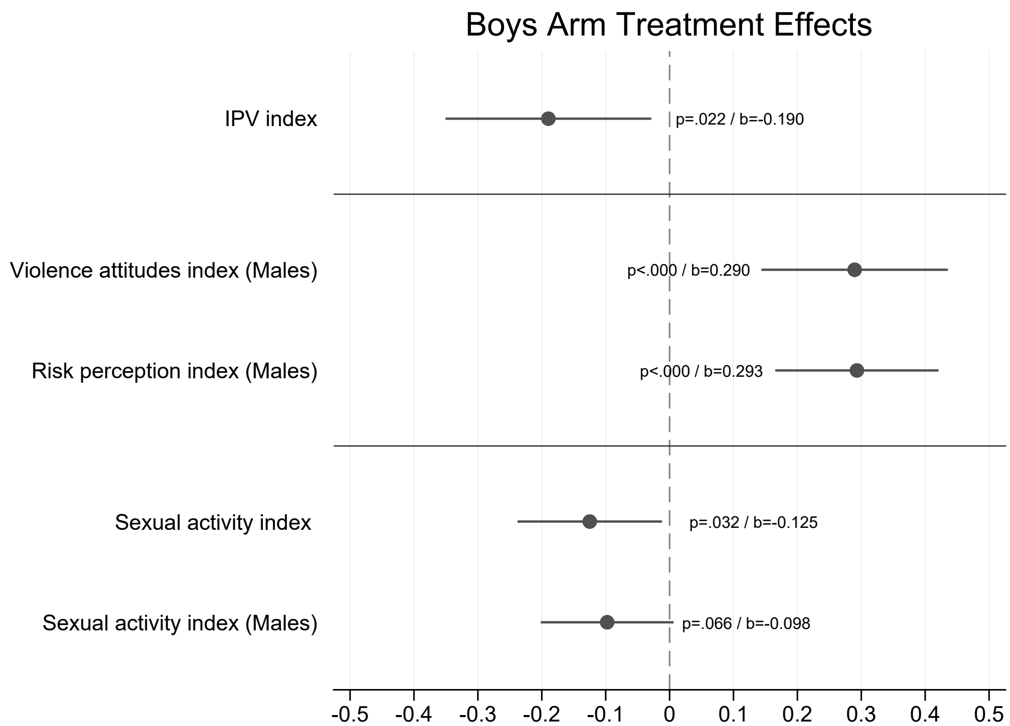


Figure 4 ITT Effects of *Boys* Treatment

Notes. This figure presents estimates of β_1 from equation 1 for separate regressions with the outcome specified on the y-axis. Outcomes have been standardized so that the x-axis is in standard deviation units. Outcomes are centered around females (males) in ELA only communities who were not assigned (whose connected female was not assigned) to the *Goal* treatment. Bolded markers are statistically significant at $p < 0.1$. p-values and coefficient estimates are displayed beside each marker.
Source. Female and male baseline and endline data, balanced panel.

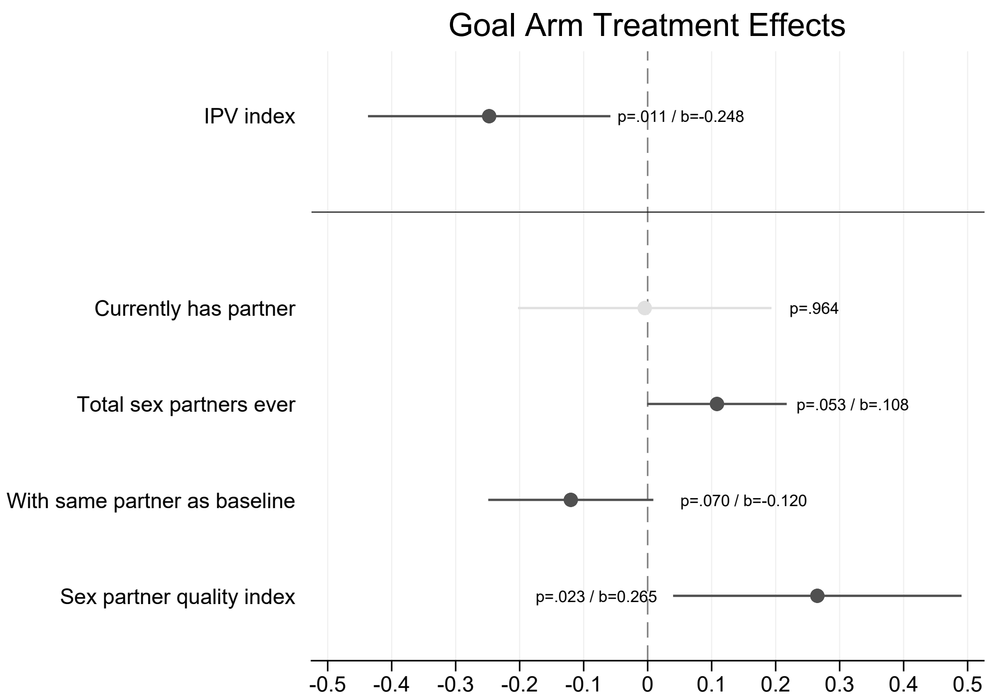


Figure 5 ITT Effects of *Goal* Treatment

Notes. This figure presents estimates of β_2 from equation 1 for separate regressions with the outcomes specified on the y-axis. Outcomes have been standardized so that the x-axis is in standard deviation units. Outcomes are centered around females (males) in ELA only communities who were not assigned (whose connected female was not assigned) to the *Goal* treatment. Bolded markers are statistically significant at $p < 0.1$. p-values and coefficient estimates are displayed beside each marker.
Source. Female and male baseline and endline data, balanced panel.

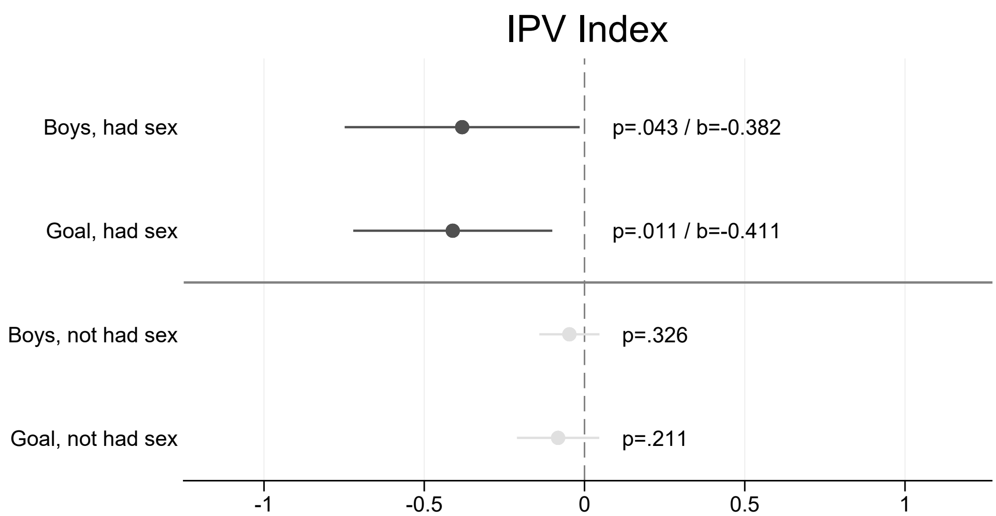


Figure 6 Impact of Treatments on IPV, Heterogeneity Sexually Active at Baseline

Notes. This figure presents estimates of β_1 and β_2 from equation 1 splitting the data by sexual activity status at baseline. The IPV index is centered on females in ELA only communities who were sexually active at baseline and who were not assigned to the *Goal* treatment. Bolded markers are statistically significant at $p < 0.1$. p-values and coefficient estimates are displayed beside each marker. The p-value on a test of differences between the *Boys* had sex and not had sex coefficients is 0.066. For the test of differences between the *Goal* had sex and not had sex coefficients, the p-value is 0.131.
Source. Female baseline and endline data, balanced panel. The sample in the top half is restricted to females who are sexually active at baseline. The sample in the bottom half is restricted to females who are not sexually active at baseline.

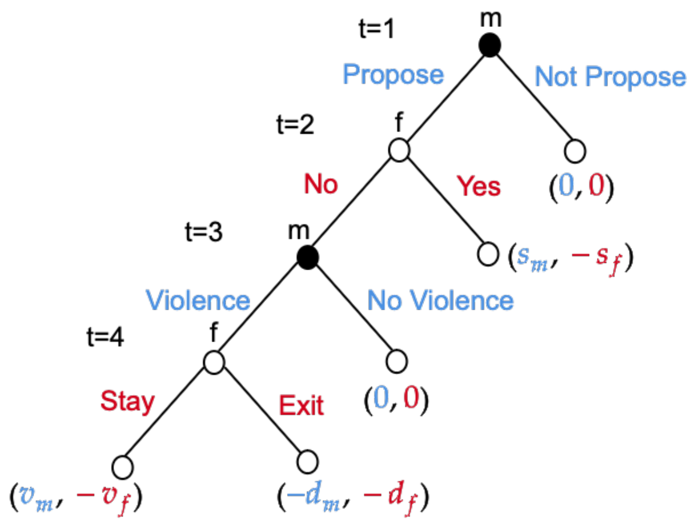


Figure 7 Game Tree

Notes. This figure presents the complete information version of the game to give the reader a flavor of the game. This is a one-shot, sequential game, indicated by $t = 1, 2, 3, 4$, where players know their own payoffs but do not know each other's payoffs. Blue text denotes male strategies and payoffs and red text denotes female strategies and payoffs, and m indicates a male decision node and f indicates a female decision node.

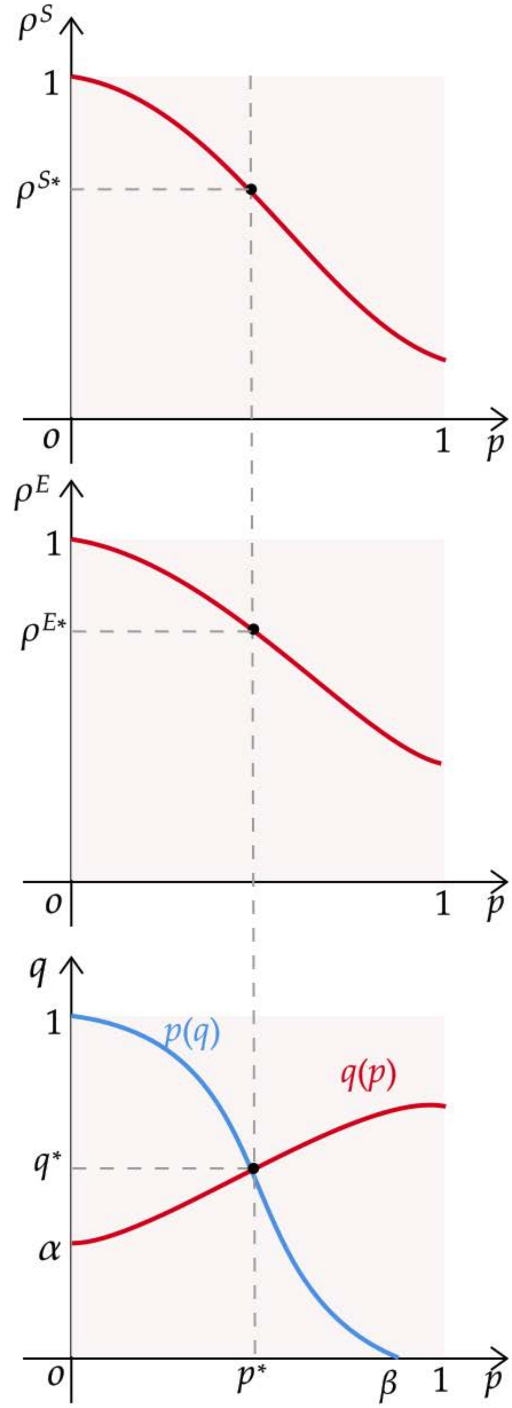


Figure 8 Equilibrium

Notes. This figure presents the model equilibrium as described in Proposition 1. The top panel presents the best response function for stay-type females, the middle panel presents the best response function for exit-type females, and the bottom panel shows the unique equilibrium point given by the crossing point of the $q(p)$ curve and the best response function for males, the $p(q)$ curve.

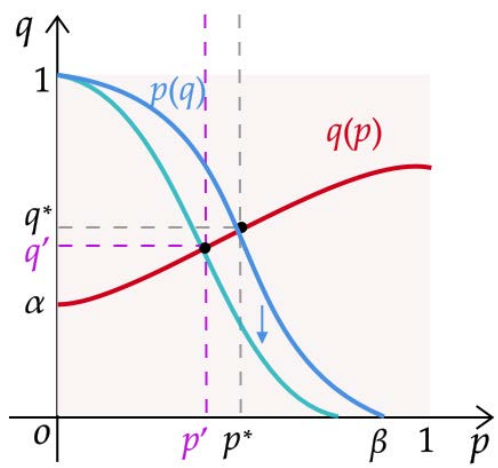
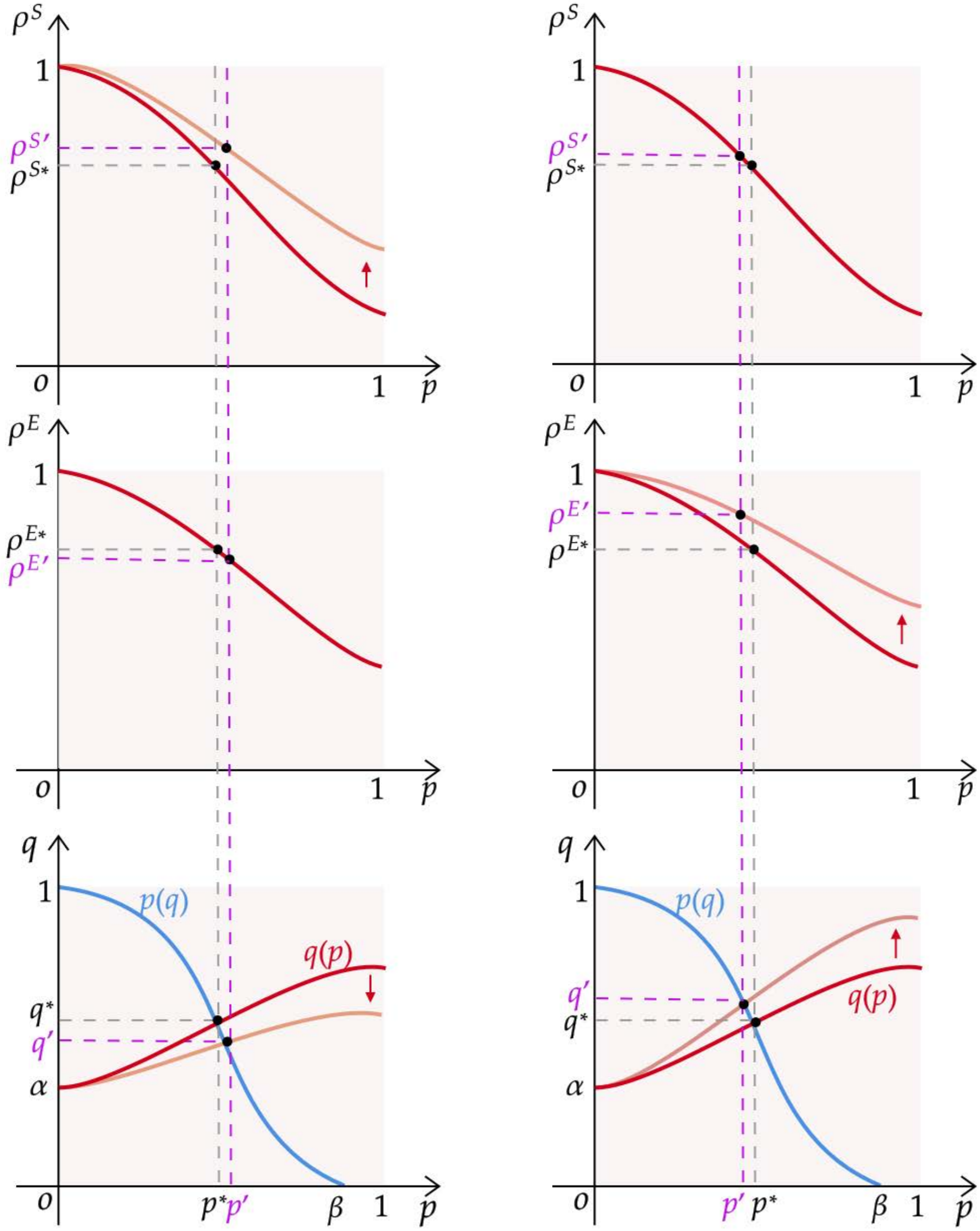


Figure 9 A Change in Males' Payoff from Violence

Notes. This figure demonstrates the dynamic impacts of a decrease in the net benefit of violence for males, v_m, on the model equilibrium. The males' best response function, $p(q)$ will shift inward, resulting in a lower equilibrium p' and q'.



(a) Stay-type females

(b) Exit-type females

Figure 10 A Shift in Females' Payoff from Risky Sex

Notes. This figure demonstrates the dynamic impacts of an increase in the cost of risky sex for females, s_f on the model equilibrium. Panel (a) demonstrates the impacts if only stay-types' s_f increases and Panel (b) demonstrates the impacts if only exit-types' s_f increases. In Panel (a), stay-type females become more likely to say no for every value of p, shown in the top panel. This causes $q(p)$ shift downward, shown in the bottom panel, resulting in a lower equilibrium q' and a higher equilibrium p'. In Panel (b), exit-type females become more likely to say no for every value of p, shown in the middle panel. This causes $q(p)$ shift upward, shown in the bottom panel, resulting in a higher equilibrium q' and a lower equilibrium p'.

Table 1 Treatment-Control Balance at Baseline

	(1)	(2)	(3)	(4)
Outcome	**ELA Only Control Mean**	**Boys-ELA**	**No Goal Control Mean**	**Goal - No Goal**
A. Intimate Partner Violence				
Psychological abuse often	0.017	0.006	0.018	0.006
		(0.008)		(0.006)
Psychological abuse in last year	0.054	0.017	0.062	0.006
		(0.017)		(0.010)
Physical abuse often	0.008	0.010	0.011	0.000
		(0.007)		(0.004)
Physical abuse in last year	0.045	0.011	0.053	-0.007
		(0.016)		(0.009)
Forced sex often	0.012	0.004	0.013	-0.001
		(0.006)		(0.004)
Forced sex in last year	0.035	0.006	0.040	-0.007
		(0.013)		(0.008)
B. Sexual Activity				
Ever had sex	0.250	-0.001	0.261	0.006
		(0.035)		(0.018)
Currently has a partner	0.212	0.011	0.230	-0.006
		(0.034)		(0.017)
Had a partner in the past 2 years	0.266	0.010	0.279	0.003
		(0.037)		(0.019)
Total sex partners ever	0.312	0.018	0.334	0.001
		(0.054)		(0.026)
Hours with boyfriend in the past day	0.030	0.014	0.041	-0.002
		(0.013)		(0.011)
C. Demographic Characteristics				
Never talks to mother about SRH	0.839	-0.004	0.830	-0.001
		(0.022)		(0.016)
Age in years	16.45	-0.625*	16.18	0.045
		(0.336)		(0.115)
Highest grade attended	8.01	-0.182	8.04	-0.059
		(0.283)		(0.107)
Married or cohabiting	0.074	-0.010	0.078	0.000
		(0.019)		(0.010)
Household owns their house	0.674	-0.002	0.653	-0.014
		(0.039)		(0.018)
Number of household members	3.28	-0.023	3.27	-0.043
		(0.130)		(0.048)
Observations	1,074	3,178	2,313	3,178
χ^2 p-value		.535		.867

Notes. Column 1 shows means for females in ELA only communities and column 3 shows means for females not assigned to the *Goal* treatment. Columns 2 and 4 test for differences between the means in the community- or individual-level treatment arms and the corresponding control group means, controlling for the randomization strata. Standard errors, clustered at the club level, are presented in parentheses below coefficient estimates in columns 2 and 4. The χ^2 p-value in the last row is the p-value from a test of the joint significance of all outcomes in Panel A and B. ***p<.01, **p<.05, *p<.10.
Source. Female baseline data.

Table 2 Impact of Treatments on Intimate Partner Violence (IPV)

	(1)	(2)	(3)	(4)	(5)
	Boys Treatment	**Goal Treatment**	**Boys = Goal p-value**	**Endline Control Mean**	**Observations**
IPV index					
treatment x post	-0.190**	-0.248***	0.608	0.000	5,182
	(0.082)	(0.097)			
Psychological abuse often					
treatment x post	-0.011	-0.012	0.941	0.026	5,182
	(0.012)	(0.013)			
Psychological abuse in last year					
treatment x post	-0.029	-0.024	0.840	0.086	5,182
	(0.024)	(0.030)			
Physical abuse often					
treatment x post	-0.018**	-0.020*	0.827	0.019	5,182
	(0.008)	(0.011)			
Physical abuse in last year					
treatment x post	-0.037*	-0.019	0.496	0.062	5,182
	(0.019)	(0.026)			
Force sex often					
treatment x post	-0.028**	-0.035***	0.588	0.023	5,182
	(0.011)	(0.013)			
Force sex in last year					
treatment x post	-0.028*	-0.059**	0.206	0.045	5,182
	(0.017)	(0.024)			

Notes. This table presents estimates of β_1 and β_2 from equation 1. For each outcome, the coefficients from a single regression are presented in a row, with estimates of β_1 in column 1 and β_2 in column 2. Column 3 presents the p-value for a test of whether β_1 is equal to β_2. Column 4 presents the control mean at endline and column 5 shows the number of observations in the model. All specifications include controls for highest grade attended, whether the female's household owns the house she lives in, whether the female talks to her mom about sexual reproductive health topics, age of the female, and ELA club fixed effects. IPV index is generated by taking the unweighted mean across the six IPV indicators after they have been standardized to the mean and standard deviation among females in the control group at baseline and endline separately. Standard errors, clustered at the club level, are presented in parentheses below the coefficient estimates in columns 1–2. ***p<.01, **p<.05, *p<.10.
Source. Female baseline and endline data, balanced panel.

Table 3 Impact of Treatments on Male IPV and SRH Attitudes (Male Data)

	(1)	(2)	(3)	(4)	(5)
	Boys Treatment	**Goal Treatment**	**Boys = Goal p-value**	**Endline Control Mean**	**Observations**
A. Male Violence Attitudes					
Violence attitudes index					
treatment x post	0.290***	0.066	0.024	0.000	2,314
	(0.074)	(0.099)			
Women should not tolerate violence from husband/partner					
treatment x post	0.174***	0.014	0.001	0.727†	2,314
	(0.035)	(0.048)			
Men should not beat women under any circumstances					
treatment x post	0.039	0.025	0.812	0.831	2,314
	(0.043)	(0.058)			
B. Male Risk Perception					
Risk perception index					
treatment x post	0.293***	-0.022	0.001	0.000	2,314
	(0.065)	(0.098)			
Male believes female friend is somewhat or very likely to have STI					
treatment x post	0.140***	0.053	0.184	0.581	2,314
	(0.048)	(0.066)			
Male believes that over 15% of males in his community have STIs					
treatment x post	0.123***	-0.019	0.035	0.308	2,314
	(0.046)	(0.066)			
Girls have right to ask to use condom					
treatment x post	0.122***	-0.066	0.001	0.797	2,314
	(0.043)	(0.059)			
C. Male Sexual Activity					
Sexual activity index					
treatment x post	-0.098*	-0.006	0.195	-0.062	2,314
	(0.053)	(0.072)			
Ever had sex					
treatment x post	-0.028	-0.006	0.587	0.423	2,314
	(0.030)	(0.041)			
Currently has a partner					
treatment x post	-0.060*	-0.006	0.299	0.345	2,314
	(0.036)	(0.053)			
Total sex partners ever					
treatment x post	-0.116**	0.003	0.045	0.398	2,314
	(0.047)	(0.060)			

Notes. This table presents estimates of β_1 and β_2 from equation 10. For each outcome, the coefficients from a single regression are presented in a row, with estimates of β_1 in column 1 and β_2 in column 2. Column 3 presents the p-value for a test of whether β_1 is equal to β_2. Column 4 presents the control mean at endline and column 5 shows the number of observations in the model. All specifications include controls for age of the male, highest grade attended, a binary indicator that the male never talks to his father about sexual reproductive health topics, a binary indicator that the male's household owns the house he lives in, and region fixed effects. The indexes in Panels A, B, and C are the unweighted mean of the indicators that follow after they have been standardized to the mean and standard deviation among males in the control group at baseline and endline separately. Standard errors, clustered at the attached female level, are presented in parentheses below the coefficient estimates in columns 1–2. ***p<.01, **p<.05, *p<.10.

†Baseline mean in the *Boys* treatment arm. At baseline, 72.7% of males in the *Boys* treatment arm agreed with this statement compared to 85.0% in the males' control group. At endline, these means had changed to 93.2% and 88.6%, respectively, generating the treatment effect in the *Boys* arm.

Source. Male baseline and endline data, balanced panel.

Table 4 Impact of Treatment on Partner Churn and Quality of Sex Partners

	(1)	(2)	(3)	(4)	(5)
	Boys Treatment	**Goal Treatment**	**Boys = Goal p-value**	**Endline Control Mean**	**Observations**
A. Sexual Activity					
Sexual activity index					
treatment x post	-0.125**	0.065	0.004	0.000	5182
	(0.058)	(0.064)			
Ever had sex					
treatment x post	-0.047	0.046	0.010	0.372	5,182
	(0.031)	(0.031)			
Currently has a partner					
treatment x post	-0.110***	0.000	0.007	0.337	5,182
	(0.036)	(0.044)			
Total sex partners ever					
treatment x post	-0.025	0.088**	0.015	0.491	5,182
	(0.037)	(0.038)			
B. Partner Churn					
With same partner as baseline					
treatment x post	-0.020	-0.039*	0.468	0.117	2,591
	(0.021)	(0.021)			
C. Partner Quality					
Quality index					
treatment x post	-0.052	0.265**	0.170	0.000	1,711
	(0.106)	(0.114)			
His age					
treatment x post	0.114	-0.488	0.353	24.998	1,711
	(0.537)	(0.410)			
Dropout/never enroll					
treatment x post	-0.007	-0.047**	0.141	0.041	1,711
	(0.023)	(0.023)			

Notes. Panels A and C present estimates of β_1 and β_2 from equation 1. In Panel B, the reported coefficients are β_1 and β_2 from an adapted version of equation 1 that uses only one round of data, where the outcome is the change in partnership status from baseline to endline. In Panel C, His Age is the average age in years of all sexual partners listed and Dropout/Never Enrolled is the share of sexual partners listed whose enrollment status is dropped out or never enrolled in school.The Quality index is generated by taking the unweighted mean of the indicators after they have each been recoded so that positive coefficients indicate improved outcomes and standardized to the mean and standard deviation among females control group at baseline and endline separately. Standard errors, clustered at the club level, are presented in parentheses below the coefficient estimates in columns 1–2. ***p<.01, **p<.05, *p<.10
Source. Panel A: Female baseline and endline data, balanced panel. Panel B: Female data, outcome from endline, controls from baseline, balanced panel. Panel C: Female baseline and endline data, balanced panel. Sample is restricted to females in the balanced panel who list at least one sexual partner at baseline or endline.

Table 5 Attrition: Female Sample

	(1)	(2)	(3)	(4)
	×Boys×Goal	**×Boys**	**×Goal**	**Levels**
Panel A. Differential Attrition by Treatment Status, fully-interacted				
Boys			-0.031	-0.012
			(0.038)	(0.032)
Goal				0.005
				(0.025)
Panel B. Differential Attrition by Treatment Status and Key Measures				
Never talks to mother about SRH	0.033	-0.014	-0.056	0.001
	(0.094)	(0.050)	(0.078)	(0.041)
Age in years	-0.010	0.008	-0.001	-0.000
	(0.012)	(0.010)	(0.008)	(0.007)
Highest grade attended	0.019	-0.016	-0.003	0.006
	(0.014)	(0.010)	(0.010)	(0.008)
Married or cohabiting	-0.076	-0.011	-0.082	0.021
	(0.101)	(0.085)	(0.065)	(0.065)
Household owns their house	0.091	-0.058	-0.076	0.027
	(0.080)	(0.041)	(0.054)	(0.029)
House has electricity	0.057	-0.027	0.011	0.020
	(0.066)	(0.045)	(0.040)	(0.030)
Number of household members	-0.044	-0.004	0.009	-0.008
	(0.028)	(0.016)	(0.019)	(0.011)
Boys			0.004	0.077
			(0.196)	(0.154)
Goal				0.108
				(0.112)
Observations		3,178		

Notes. Each panel presents coefficients from a single regression where the outcome, Y_{ic}, is an indicator equal to 1 if the female was not resurveyed at endline (i.e., attrited). In each panel, the rows list demographic variables included in the model, and the columns indicate interaction terms. Column 1 presents coefficient estimates on interactions between the row variables and a treatment indicator of being assigned to both the *Boys* and *Goal* treatment, column 2 presents coefficient estimates on interactions of the row variables with being assigned to the *Boys* treatment, column 3 presents coefficient estimates on interactions of the row variables with being assigned to the *Goal* treatment, and column 4 presents coefficient estimates on the row variables. Standard errors, clustered at the club level, are presented in parentheses below the coefficient estimates. ***p<.01, **p<.05, *p<.10.
Source. Female baseline data.

Table 6 Attrition: Male Sample (Male Data)

	(1)	(2)	(3)	(4)
	×Boys×Goal	**×Boys**	**×Goal**	**Levels**
Panel A. Differential Attrition by Treatment Status, fully-interacted				
Boys			-0.001	-0.006
			(0.033)	(0.022)
Goal				-0.009
				(0.027)
Panel B. Differential Attrition by Treatment Status and Key Measures				
Never talk to dad about SRH	-0.075	0.028	0.099	-0.070
	(0.075)	(0.063)	(0.065)	(0.057)
Age	0.011	0.006	-0.009	-0.005
	(0.009)	(0.005)	(0.008)	(0.005)
Highest grade attended	0.011	-0.018*	-0.002	0.011
	(0.012)	(0.009)	(0.010)	(0.008)
Married or cohabiting	-0.062	-0.096	0.142	0.048
	(0.160)	(0.060)	(0.146)	(0.046)
Household owns their house	0.030	-0.066	-0.028	0.038
	(0.082)	(0.050)	(0.067)	(0.044)
House has electricity	-0.154**	0.040	0.087	-0.035
	(0.078)	(0.043)	(0.056)	(0.036)
Number of household members	0.032	0.006	-0.010	-0.000
	(0.027)	(0.016)	(0.022)	(0.013)
Boys			-0.227	0.025
			(0.190)	(0.112)
Goal				0.063
				(0.158)
Observations		1,466		

Notes. Each panel presents coefficients from a single regression where the outcome, Y_{ic}, is an indicator equal to 1 if the male was not resurveyed at endline. In each panel, the rows list demographic variables included in the model, and the columns indicate interaction terms. Column 1 presents coefficient estimates on interactions between the row variables and a treatment indicator of being assigned to both the *Boys* and *Goal* treatment, column 2 presents coefficient estimates on interactions of the row variables with being assigned to the *Boys* treatment, column 3 presents coefficient estimates on interactions of the row variables with being assigned to the *Goal* treatment, and column 4 presents coefficient estimates on the row variables. Standard errors, clustered at the attached female level, are presented in parentheses below the coefficient estimates. ***p<.01, **p<.05, *p<.10.
Source. Male baseline data.