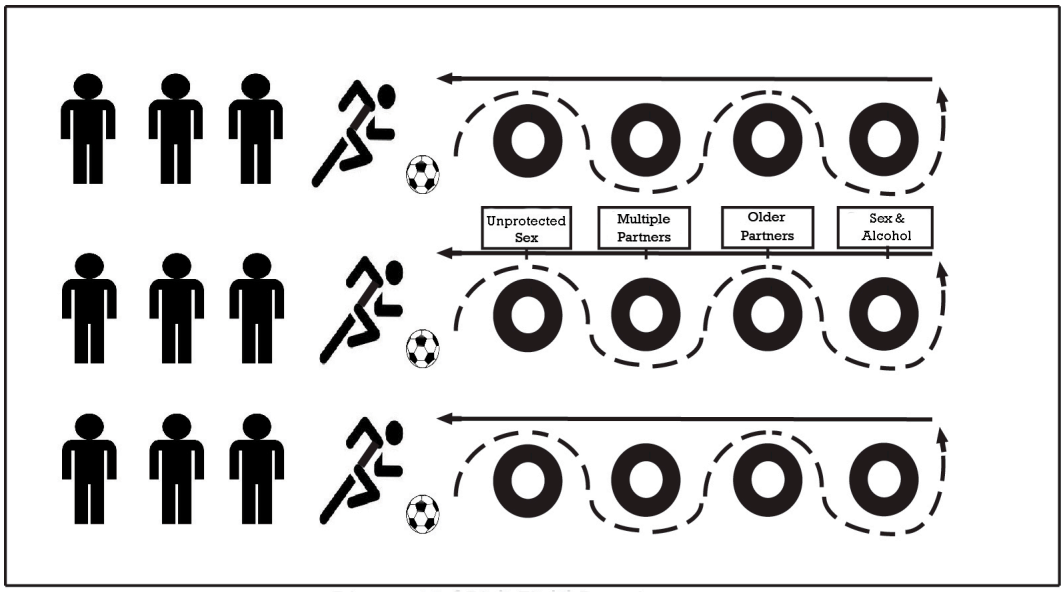
Appendices

A Figures and Tables

- Play the 1st round.



Risk Field Activity

Figure A1 Example of GRS Lesson Soccer Drill

Source. Grassroot Soccer Curriculum Manual

Players dribble through the Risk Field Cones

Coach's Tip: As they play, encourage players to cheer and support each other.

Discussion:

- What was the consequence of touching a cone in this round?
- What are some of the consequences to yourself if you get HIV?
  - ✓ Loss of job or schooling if you get sick.
  - ✓ Stigma and discrimination; people may be very mean or angry towards to you.
  - ✓ If treatment is available, you will have to take medicine for the rest of your life.
  - ✓ You can get sick and even die.

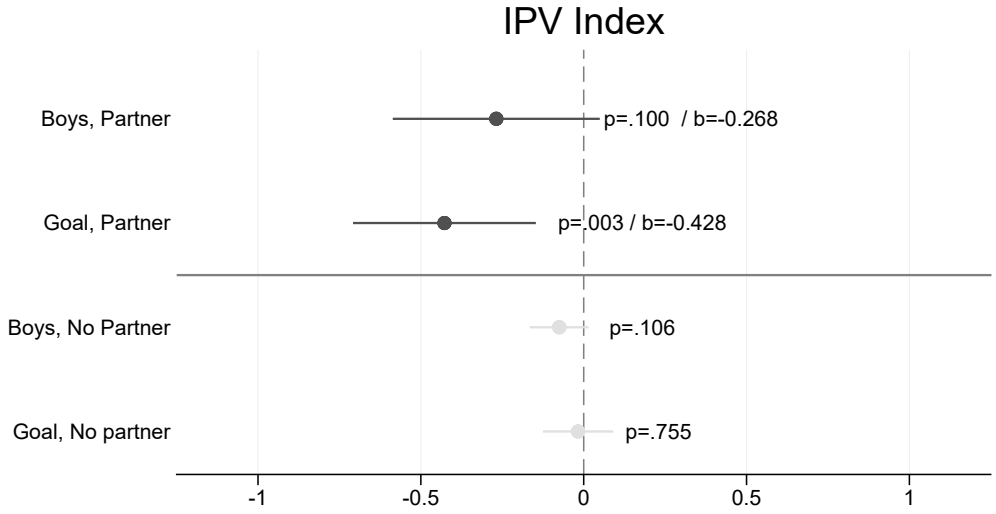


Figure A2 Impact of Treatments on IPV, Heterogeneity by Had Partner in Past Two Years at Baseline

Notes. This figure presents estimates of β_1 and β_2 from equation 1. The IPV index is centered on females in the ELA only communities who had a partner in the past two years at baseline and 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.
Source. Female baseline and endline data, balanced panel. The sample in the top half is restricted to females who had a partner in the past two years at baseline. The sample in the bottom half is restricted to females who did not have a partner in the past two years at baseline.

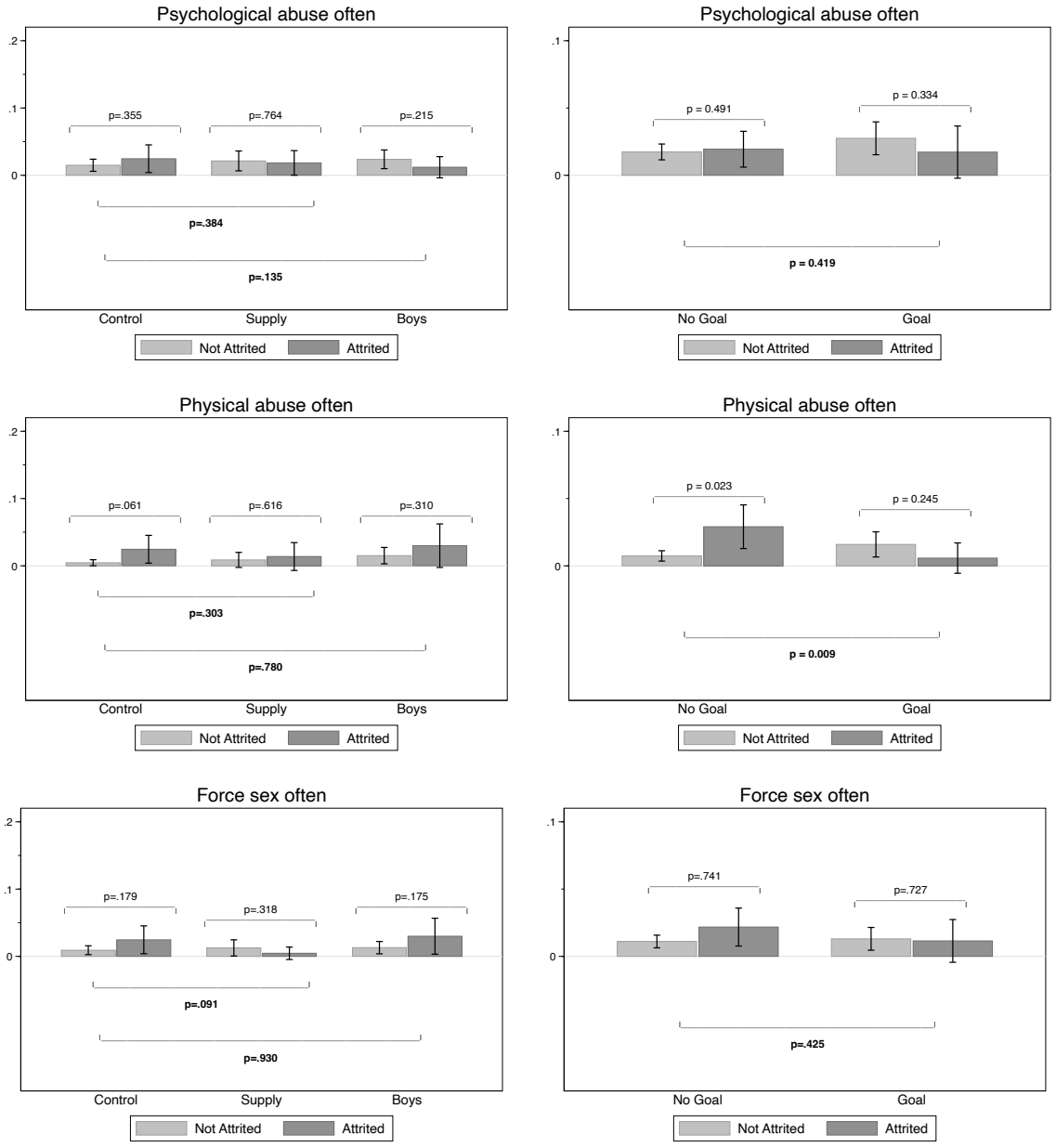


Figure A3 Baseline Outcomes by Attrition Status: IPV

Notes. This figure shows the mean of each outcome among females who attrited and those who did not by treatment status. The left-side column presents these means for each community-level treatment arm, specified on the x-axis. Above the mean bars are p-values for tests of equality between the means of attrited and non-attrited females. Below the mean bars are p-values for tests that attrition differed between treatment arms, first comparing the *Supply* arm to ELA only communities and then comparing the *Boys* arm to the ELA only communities. The right-side column presents the outcome means by attrition status for females assigned to the *Goal* treatment and those who were not, separately. Above the mean bars are p-values for tests of equality of means between attrited and non-attrited femaleswithin each arm. Below the mean bars is a p-value from a test that attrition differed between females who were assigned to *Goal* and those who were not.
Source. Female baseline data.

Table A1 Intimate Partner Violence and Risky Sex

	(1)	(2)	(3)	(4)	(5)	(6)
	Female Data			**Male Data**		
	Use condom with last partner	**Use condom always**	**Number of sex partners**	**Use condom with last partner**	**Use condom always**	**Number of sex partners**
IPV often	-0.097*	-0.040	-0.020	0.014	-0.108*	0.447**
	(0.059)	(0.048)	(0.081)	(0.077)	(0.057)	(0.193)
IPV in last year	0.019	-0.028	0.076	-0.091*	-0.147***	0.393**
	(0.040)	(0.031)	(0.070)	(0.051)	(0.035)	(0.156)
Psychological abuse often	-0.057	0.009	-0.164	-0.070	-0.184***	0.608**
	(0.071)	(0.056)	(0.109)	(0.090)	(0.049)	(0.254)
Physical abuse often	-0.221**	-0.044	-0.044	0.186	-0.041	0.201
	(0.090)	(0.066)	(0.117)	(0.181)	(0.180)	(0.184)
Force Sex often	-0.059	-0.012	0.160	0.101	0.119	0.073
	(0.090)	(0.080)	(0.129)	(0.123)	(0.130)	(0.130)
Psychological abuse in last year	0.001	-0.018	0.001	-0.108*	-0.178***	0.497**
	(0.043)	(0.038)	(0.094)	(0.057)	(0.035)	(0.213)
Physical abuse in last year	-0.008	-0.046	0.103	-0.124**	-0.105**	0.526**
	(0.047)	(0.039)	(0.102)	(0.058)	(0.043)	(0.241)
Force sex in last year	-0.040	-0.064	0.126	-0.065	-0.116***	0.379*
	(0.054)	(0.040)	(0.127)	(0.058)	(0.042)	(0.225)
Observations	800	800	800	678	678	678

Notes. Each cell of this table presents a coefficient from a separate regression of intimate partner violence (defined in the rows) on condom use (columns 1 and 4, with last partner and columns 2 and 5, always use) and the number of sexual partners in the last six months (columns 3 and 6). Standard errors are clustered at the club level in columns 1–3 and at the attached female level in columns 4–6 and are presented in parentheses below the coefficient estimates. ***p<.01, **p<.05, *p<.10.
Source. Columns 1–3: Female baseline data, restricted to females who were sexually active at baseline. Columns 4–6: Male baseline data, restricted to males who were sexually active at baseline.

Table A2 Predictors of Boys Participation in Boys Soccer Treatment

	(1)	(2)
	Contacted by GRS	**Enrolled in GRS**
Enrolled in school	0.076**	0.133***
	(0.037)	(0.051)
Household owns their house	0.037	-0.054
	(0.037)	(0.037)
Never talk to dad about SRH	-0.026	-0.000
	(0.049)	(0.050)
Age in years	0.027***	0.001
	(0.004)	(0.005)
House has electricity	-0.021	0.033
	(0.040)	(0.042)
Number of household members	0.001	0.040***
	(0.015)	(0.015)
Iringa	-0.246***	0.078
	(0.045)	(0.050)
Mbeya	-0.084*	0.131***
	(0.048)	(0.050)
Outcome mean	0.679	0.352
Observations	787	787

Notes. This table shows the results from two regressions, present in each column. In column 1, the outcome is an indicator that the GRS team contacted the male in our study sample; in column 2, the outcome is an indicator that the GRS team enrolled the male in our study sample. Covariates are shown in the rows. 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, restricted to males in the *Boys* treatment arm.

Table A3 Predictors of Achieving Goal

	(1)	(2)
	Number of Strategies Set	**Number of Strategies Achieved**
Major depressive disorder likely	-0.235*	-0.219*
	(0.121)	(0.127)
Self-efficacy	0.103***	0.102***
	(0.036)	(0.035)
Will take risk (top quintile)	0.055	-0.002
	(0.057)	(0.067)
Impatient now and patient later	-0.028	-0.018
	(0.076)	(0.082)
Age in years	-0.002	0.008
	(0.009)	(0.013)
Currently enrolled in school	-0.185	-0.168
	(0.114)	(0.135)
Completed school	-0.093	-0.054
	(0.106)	(0.125)
Household has electricity	-0.044	0.021
	(0.051)	(0.055)
Household has earthen floor	-0.232***	-0.121
	(0.065)	(0.088)
Outcome mean	1.772	1.640
Observations	789	644

Notes. The outcome in column 1 is the number of strategies the female set and committed to during the goal setting activity, ranging from 1 to 3 strategies; the outcome in column 2 is the number of strategies that the female reports she achieved at the endline survey, ranging from 0 to 3 strategies. The covariates are from the baseline survey (age, currently enrolled in school, completed school, household has electricity, household has earthen floor) or the goal setting activity, 1st visit (major depressive disorder likely, self-efficacy, will take risk). Major depressive disorder likely is a binary indicator measured using the Patient Health Questionnaire-2 (PHQ-2), where a score of 3 or higher is indicative of depression. Self-efficacy is measured using the General Self-Efficacy Scale developed by Schwarzer and Jerusalem (1995). This scale generates a total self-efficacy score that ranges from 10-40, which we standardized using the mean and standard deviation among females in ELA only communities. Will take risk is based on a question that asked females how willing they were to take risks on a scale from 1 to 10. We generate a binary indicator equal to one if the female gave an answer in the top quintile of responses. The excluded category for schooling is dropout or never enrolled. Standard errors, clustered at the club level, are presented in parentheses below coefficient estimates. ***p<.01, **p<.05, *p<.10.
Source. Column 1: Female goal setting participants, 1st visit. Column 2: Female goal setting participants, endline data.

Table A4 Implementation of goal-setting strategies

	(1)	(2)	(3)
	No Sex	**No Sex Partners**	**Use Condom last partner**
Goal to abstain	0.075*	0.072*	-0.036
	(0.045)	(0.042)	(0.038)
Goal to use condom	-0.115***	-0.063**	0.089***
	(0.034)	(0.030)	(0.030)
Other goal	-0.021	-0.009	-0.007
	(0.030)	(0.027)	(0.025)
Outcome mean among non-goal-setting	0.746	0.784	0.144
Observations	2452	2496	2591

Notes. The sample for these regressions is restricted to endline female data. Each column in this table is an estimation for a separate regression given by the following specification: $Y_{ic} = \alpha + \beta_1 \times \text{Abstain}_{ic} + \beta_2 \times \text{Condom}_{ic} + \beta_2 \times \text{Other}_{ic} + \alpha_c + \epsilon_{ic}$, where Abstain (Goal to abstain) is a binary indicator for setting a strategy to abstain from sex during the goal-setting activity, Condom (Goal to use condom) is a binary indicator for setting a strategy to use a condom during sex during the goal-setting activity, and Other (Other goal) is a binary indicator for setting any other strategy (see Figure 3), and α_c is branch fixed effects. No sex is an indicator equal to one if the female reports that she has sex zero times per month on average. No sex partners is an indicator that the female reports zero sexual partners in the six months before survey. Use condom with last partner is an indicator that the female used a condom with her last partner. Standard errors, clustered at the club level, are presented in parentheses. 0.01 ***, 0.05 **, 0.10 *.

Table A5 External Validity: Comparison of Our Sample to a Random Sample

	(1)	(2)	(3)	(4)	(5)
	Female Baseline Mean	**Buehren et al. (2017) Baseline Mean**	**Buehren et al. (2017) Baseline Control Mean**	**(1)-(2) p-value**	**(1)-(3) p-value**
Age in year	16.355	16.676	16.621	.023	.097
Married	0.044	0.022	0.024	.024	.052
Household owns their house	0.605	0.606	0.626	.951	.560
Has child	0.089	0.068	0.073	.115	.283
Ever had sex	0.241	0.228	0.242	.557	.948
Uses condom	0.182	0.188	0.189	.739	.765
Highest grade attended	8.273	8.342	8.239	.648	.835
Dropout from school	0.236	0.212	0.217	.243	.438
Never enrolled in school	0.012	0.015	0.019	.518	.234
Observations	1,621	4,954	1,708		

Notes. Column 1 shows baseline means among females in Dodoma and Iringa in the current study sample, collected in 2016. Columns 2 and 3 show baseline means (before ELA clubs were established) among females in the Buehren et al. (2017) study, collected in 2009. The Buehren et al. (2017) sample comprises a random sample of adolescent females from the same communities as the current study in Dodoma and Iringa. Buehren et al. (2017) treatment communities are where ELA clubs were eventually established. Column 2 shows means using the entire baseline sample from Buehren et al. (2017). Column 3 shows means using baseline data restricted to the Buehren et al. (2017) control communities. Column 4 presents the p-values from a test of equality between the means in columns 1 and 2. Column 5 presents the p-values from a test of equality between the means in columns 1 and 3. The latter comparison is made to alleviate concern that communities where clubs are established are different from surrounding communities.

Source. Column 1: Female baseline data, restricted to females in Dodoma and Iringa. Columns 2–3: Buehren et al. (2017) female baseline data. In columns 1–3, the sample is restricted to females aged 13-22 in order for their to be a common age range across samples.

Table A6 External Validity: IPV Reports, Females and Males Aged 15-24

	(1)	(2)
	Female Baseline Mean	**DHS 2016 Mean**
Panel A. Partnered and unpartnered females		
IPV often	0.040	0.049
IPV in last year	0.115	0.154
Psychological abuse often	0.027	0.037
Physical abuse often	0.013	0.012
Force sex often	0.015	0.016
Psychological abuse in last year	0.088	0.135
Physical abuse in last year	0.069	0.049
Force sex in last year	0.051	0.053
Jealous or angry if talk to other men	0.313	0.281
Insists on knowing where you are	0.277	0.271
Sample size	2,140	3,275
Panel B. Partnered females		
IPV often	0.097	0.104
IPV in last year	0.282	0.322
Psychological abuse often	0.066	0.077
Physical abuse often	0.031	0.026
Force sex often	0.038	0.034
Psychological abuse in last year	0.216	0.283
Physical abuse in last year	0.168	0.103
Force sex in last year	0.124	0.111
Jealous or angry if talk to other men	0.764	0.600
Insists on knowing where you are	0.677	0.568
Sample size	876	1,820

Notes. This table presents average reports of IPV by females ages 15-25 at baseline in column 1, by females ages 15-24 as reported in the 2015 Tanzania DHS data in column 2. IPV items from the DHS were selected to match the specific items used in the study surveys. Psychological violence is measured as being threatened with harm and being insulted or made to feel bad. Physical violence is measured as being pushed, shaken, or throwing something. Force sex is measured as being forced to engage in sexual intercourse. Each item is reported as occurring often, sometimes, or not in the last 12 months. For each violence type, we generate indicators for the violence being reported as occurring often or at all in the last 12 months (in last year). IPV often is an indicator equal to one if the female report experiencing any of the IPV items (psychological, physical, and sexual) occurring often. IPV in last year is an indicator equal to one if the female reports experiencing any of the IPV items (psychological, physical, and sexual) occurring in the last 12 months.
Source. Column (1) Female baseline data for females ages 15-24, balanced panel. (2) Tanzania DHS 2016 female data for females ages 15-24.

Table A7 Impact of Treatments on Intimate Partner Violence (IPV), No Controls

	(1)	(2)	(3)	(4)	(5)
	Boys Treatment	**Goal Treatment**	**Boys = Goal p-value**	**Endline Control Mean**	**Observations**
IPV index					
treatment x post	-0.181**	-0.264***	0.457	0.000	5,182
	(0.082)	(0.097)			
Psychological abuse often					
treatment x post	-0.011	-0.014	0.813	0.026	5,182
	(0.012)	(0.013)			
Psychological abuse in last year					
treatment x post	-0.025	-0.030	0.867	0.086	5,182
	(0.024)	(0.030)			
Physical abuse often					
treatment x post	-0.017**	-0.021*	0.697	0.019	5,182
	(0.008)	(0.011)			
Physical abuse in last year					
treatment x post	-0.034*	-0.024	0.694	0.062	5,182
	(0.020)	(0.026)			
Force sex often					
treatment x post	-0.027**	-0.036***	0.515	0.023	5,182
	(0.011)	(0.013)			
Force sex in last year					
treatment x post	-0.026	-0.063***	0.144	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 single 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 club fixed effects. IPV index is generated by taking the unweighted mean across the six 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 A8 Impact of Treatment on Intimate Partner Violence (IPV), Separating Goal into High and Low Strategies

	(1)	(2)	(3)	(4)	(5)	(6)
	Boys Treatment	**2-3 strategy Treatment**	**1 strategy Treatment**	**2-3 strategy = 1 strategy p-value**	**Endline Control Mean**	**Observations**
IPV index						
treatment x post	-0.190**	-0.323***	-0.131	0.065	0.000	5,182
	(0.082)	(0.111)	(0.102)			

Notes. This table presents estimates of a modified specification of equation 1 that splits the goal treatment indicator into two mutually exclusive categories for females assigned to the *Goal* arm: set 2 or 3 strategies or set 0 or 1 strategy. For each outcome, the coefficients from a single regression are presented in a single row, with estimates of β_1 in column 1 and the coefficients on the two *Goal* arm indicators in columns 2 and 3. Column 4 presents the p-value for a test of whether column 1 is equal to column 2. Column 5 presents the control mean at endline, and column 6 shows the number of observations in the model. Standard errors, clustered at the club level, are presented in parentheses below coefficient estimates in columns 1–2. ***p<.01, **p<.05, *p<.10.
Source. Female baseline and endline data, balanced panel.

Table A9 Impact of Treatments on Intimate Partner Violence (IPV), Goal Interactions

	(1)	(2)	(3)	(4)	
	Boys Treatment	**Goal Treatment**	**Boys = Goal treatment 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)			
treatment x post x Goal	0.110				
	(0.173)				
Psychological abuse often					
treatment x post	-0.011	-0.012	0.941	0.026	5,182
	(0.012)	(0.013)			
treatment x post x Goal	-0.024				
	(0.020)				
Psychological abuse in last year					
treatment x post	-0.029	-0.024	0.840	0.086	5,182
	(0.024)	(0.030)			
treatment x post x Goal	-0.020				
	(0.042)				
Physical abuse often					
treatment x post	-0.018**	-0.020*	0.827	0.019	5,182
	(0.008)	(0.011)			
treatment x post x Goal	0.003				
	(0.018)				
Physical abuse in last year					
treatment x post	-0.037*	-0.019	0.496	0.062	5,182
	(0.019)	(0.026)			
treatment x post x Goal	0.007				
	(0.034)				
Force sex often					
treatment x post	-0.028**	-0.035***	0.588	0.023	5,182
	(0.011)	(0.013)			
treatment x post x Goal	0.035**				
	(0.014)				
Force sex in last year					
treatment x post	-0.028*	-0.059**	0.206	0.045	5,182
	(0.017)	(0.024)			
treatment x post x Goal	0.057**				
	(0.028)				

Notes. This table presents estimates of β_1, β_2, and γ_1 from equation 1. For each outcome, the coefficients from a single regression are presented in two sub-rows, with estimates of β_1 in column 1 and β_2 in column 2, labeled treatment x post, and the estimate of γ_1 in the second of the two rows, labeled treatment x post x Goal. 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 club fixed effects. IPV index is generated by taking the unweighted mean across the six 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 A10 Impact of Treatments on Males, Restricted to Sexually Active at Baseline (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	0.413***	0.100	0.046	0.000	1,100
	(0.112)	(0.153)			
Women should not tolerate violence from husband/partner					
treatment x post	0.204***	0.057	0.050	0.741†	1,100
	(0.050)	(0.074)			
Men should not beat women under any circumstance					
treatment x post	0.069	0.008	0.415	0.786	1,100
	(0.062)	(0.077)			
B. Male SRH Attitudes					
Risk perception index					
treatment x post	0.239**	0.044	0.160	0.000	1,100
	(0.096)	(0.136)			
Female friend somewhat or very likely to have STI					
treatment x post	0.106	0.071	0.683	0.619	1,100
	(0.065)	(0.083)			
Over 15% of males have an STI					
treatment x post	0.056	-0.040	0.323	0.286	1,100
	(0.071)	(0.091)			
Girls have a right to ask to use a condom					
treatment x post	0.106*	-0.002	0.185	0.881	1,100
	(0.057)	(0.083)			

Notes. This table presents estimates of β_1 and β_2 from equation 10. See notes from Table 3 for detail on table structure, outcome definitions, and control variables. Standard errors, clustered at the attached female level, are presented in parentheses below coefficient estimates in columns 1–2. ***p<.01, **p<.05, *p<.10.

†Baseline mean in the *Boys* treatment arm. At baseline, 74.1% of sexually active males in the *Boys* treatment arm agreed with this statement compared to 87.5% in the males' control group. At endline, these means had changed to 92.5% and 86.0%, respectively, generating the treatment effect in the *Boys* arm.

Source. Male baseline and endline data, balanced panel, but restricted to males who had ever had sex at baseline.

Table A11 Impact of Boys Treatment Among Enrolled

	(1)	(2)	(3)
	Boys Enrolled	**Endline Control Mean**	**Observations**
A. Female Data			
IPV index			
treatment x post	-0.300**	0.000	3,662
	(0.150)		
Sexual activity index			
treatment x post	-0.297***	0.000	3,662
	(0.060)		
B. Male Data			
Violence attitudes index			
treatment x post	0.442***	0.000	1,542
	(0.104)		
Risk perception index			
treatment x post	0.370***	0.000	1,542
	(0.087)		
Sexual activity index			
treatment x post	-0.097	0.000	1,542
	(0.073)		

Notes. The table presents estimates of β_1 in column 1 from estimating equation 1 in Panel A and equation 10 in Panel B after restricting the sample in the *Boys* treatment arm to females with males in their network who enrolled in GRS in Panel A and to males who enrolled in GRS in Panel B. Column 2 presents the control mean at endline, and column 3 shows the number of observations. See Tables 2 and 3 for outcome definitions and control variables. Standard errors are clustered at the club level in panel A and at the attached female level in panel B, and are presented in parentheses below coefficients estimates in column 1. ***p<.01, **p<.05, *p<.10.
Source. Panel A: Female baseline and endline data, balanced panel. Panel B: Male baseline and endline data, balanced panel. The sample in the *Boys* treatment arm is restricted to females with males in their network who enrolled in *Boys* treatment in Panel A and to males who enrolled in *Boys* treatment in Panel B.

Table A12 Impact of Treatments on Partnership Churn, By Baseline IPV

	(1)	(2)	(3)	(4)	(5)
	Boys Treatment	**Goal Treatment**	**Boys = Goal p-value**	**Endline Control Mean**	**Observations**
A. Experienced IPV at baseline					
With same partner as baseline					
treatment x post	-0.068	-0.305***	.003	0.395	204
	(0.019)	(0.021)			
B. Had not experienced IPV at baseline					
With same partner as baseline					
treatment x post	-0.021	-0.014	.788	0.097	2387
	(0.098)	(0.088)			
p-value	0.627	0.031			

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 single 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 club fixed effects. 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, restricted to females who experienced any IPV (psychological, physical, or sexual) at baseline. Panel B: Female baseline and endline data, balanced panel, restricted to females who did not experience any IPV at baseline.

Table A13 Endline Characteristics of Females, By Status of Baseline Partnership

	(1)	(2)	(3)
	Not with Baseline Partner	With Baseline Partner	p-value
A. Demographics			
Age in years	20.5	21.4	<.001
Highest grade attended	10.2	9.96	.220
Currently enrolled in school	0.223	0.124	.001
Married or cohabiting	0.267	0.396	.001
Household owns their house	0.572	0.520	.189
Number of household members	2.73	2.76	.753
B. Intimate Partner Violence			
IPV often	0.044	0.072	.147
IPV in last year	0.181	0.264	.014
Psychological abuse often	0.028	0.048	.201
Physical abuse often	0.019	0.032	.300
Force sex often	0.016	0.028	.333
Psychological abuse in last year	0.144	0.204	.051
Physical abuse in last year	0.095	0.160	.017
Force sex in last year	0.067	0.068	.978
Observations	430	250	

Notes. This table presents endline means of demographics (Panel A) and outcomes (Panel B) for females who are no longer with the same partner as at baseline in column 1 and who are with the same partner as at baseline in column 2. Column 3 presents the p-value on a test of differences between the means in columns 1 and 2. Robust standard errors are used in the calculation of p-values.
Source. Female endline data, balanced panel, restricted to females who name sexual partners at baseline.

Table A14 Secular Trends in IPV in ELA Only Communities

	(1)	(2)
	IPV index	
	Non-Goal	**Goal**
Post	-0.052	-0.323***
	(0.05)	(0.095)
Observations	1,285	458

Notes. Each column in this table presents coefficient estimates of θ_1 from a separate estimation of the following specification: $Y_{ic} = \alpha + \theta_1 Post_t + \psi age_i + \epsilon_{ic}$. In column 1, the sample is restricted to non-goal setting participants in ELA only communities. In column 2, the sample is restricted to goal setting participants in ELA only communities. Standard errors, clustered at the club level, are presented in parentheses below coefficient estimates. ***p<.01, **p<.05, *p<.10.
Source. Female baseline and endline data, balanced panel, restricted to females in ELA only communities.

Table A15 Cost-Effectiveness Comparison

	(1)	(2)	(3)	(4)
	Cost per person	**Treatment effect**	**Type of violence**	**Cost per 0.25 SD effect**
Boys	\$41	-0.190 SD	psychological, physical, sexual	\$54
Goal	\$38	-0.248 SD	psychological, physical, sexual	\$38
Haushofer et al. (2019)				
Transfer to wives	\$496	-0.26 SD	physical	\$477
		-0.22 SD	sexual	\$539
Transfer to husbands	\$496	-0.18 SD	physical	\$689
Hidrobo, Peterman and Heise (2016)				
Transfers to adult women	\$240	-0.06 pp	physical/sexual	\$400

Notes. Standard deviation is denoted SD and percentage point is denoted pp. Column 1 shows the per person cost of each treatment and column 2 reports the treatment effect as reported in the original paper. For Hidrobo, Peterman and Heise (2016) the 6 percentage point reduction was converted to a 0.25 standard deviation change by the authors.

B Balance Tables

Table B1 Impacts of *Supply* Treatment on Contraceptive Uptake

		(1)	(2)	(3)
		ELA Only		
Outcome	**Time**	**Control Mean**	**Supply**	**DD**
Panel A. Whole Sample				
Injectable	Baseline	0.021	0.026	
	Endline	0.024	0.021	-0.008
				(0.008)
Implant	Baseline	0.007	0.011	
	Endline	0.008	0.022	0.010
				(0.007)
IUD	Baseline	0.007	0.003	
	Endline	0.002	0.003	0.005
				(0.004)
Observations	Baseline	1,074	1,012	
	Endline	1,766	1,746	5,598
Panel B. Balanced Panel Sample				
Injectable	Baseline	0.020	0.026	
	Endline	0.028	0.020	-0.014
				(0.010)
Implant	Baseline	0.008	0.010	
	Endline	0.011	0.023	0.009
				(0.009)
IUD	Baseline	0.007	0.004	
	Endline	0.000	0.005	0.008
				(0.006)
Observations	Baseline	871	795	
	Endline	871	795	3,332

Notes. Column 1 shows control means for females in ELA only communities and column 2 shows means for females assigned to the *Supply* treatment. Column 3 shows the simple difference-in-differences estimate between the *Supply* treatment and the ELA Only communities over time. Outcomes are indicators that the female used an injectable, implant, or intrauterine device (IUD) as contraception with her last partner. These are the primary methods that were promoted by the implementation partners in the *Supply* treatment. Standard errors, clustered at the club level, are presented in parentheses below coefficient estimates in column 3. ***p<.01, **p<.05, *p<.10.
Source. Female baseline data.

Table B2 Treatment-Control Balance at Baseline, Balanced Panel

	(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	0.015	0.009	0.017	0.008
		(0.008)		(0.006)
Psychological abuse in last year	0.053	0.014	0.057	0.013
		(0.016)		(0.012)
Physical abuse often	0.005	0.011*	0.007	0.006
		(0.007)		(0.005)
Physical abuse in last year	0.040	0.010	0.044	0.008
		(0.015)		(0.011)
Forced sex often	0.009	0.004	0.011	0.001
		(0.006)		(0.005)
Forced sex in last year	0.032	0.001	0.033	0.004
		(0.011)		(0.009)
B. Sexual Activity				
Had sex	0.247	-0.006	0.252	0.020
		(0.038)		(0.021)
Has partner	0.204	0.013	0.218	0.006
		(0.036)		(0.020)
Had a partner in the past 2 years	0.258	0.009	0.266	0.019
		(0.040)		(0.021)
Total sexual partners ever	0.295	0.029	0.316	0.020
		(0.056)		(0.029)
Hours with boyfriend in the past day	0.030	0.019	0.044	0.002
		(0.014)		(0.013)
Panel C. Demographics				
Never talks to mother about SRH	0.844	-0.011	0.824	0.008
		(0.023)		(0.018)
Age in years	16.44	-0.715**	16.09	0.116
		(0.358)		(0.135)
Highest grade attended	7.99	-0.194	8.02	-0.118
		(0.301)		(0.119)
Married or cohabiting	0.075	-0.009	0.076	0.004
		(0.022)		(0.012)
Household owns their house	0.665	0.015	0.651	-0.016
		(0.040)		(0.021)
Number of household members	3.24	0.009	3.25	-0.055
		(0.135)		(0.055)
Observations	871	2,591	2,591	

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 column 4 test for difference between means in the community- or individual-level treatment arms and the corresponding control group means, controlling for randomization strata. Standard errors, clustered at the club level, are presented in parentheses below coefficient estimates in columns 2 and 4. ***p<.01, **p<.05, *p<.10

Source. Female baseline data, balanced panel.

Table B3 Treatment-Control Balance at Baseline: Intimate Partner Violence, Balanced Panel, Sexually Active at Baseline

	(1)	(2)	(3)	(4)
Outcome	**ELA Only Control Mean**	**Boys-ELA**	**No Goal Control Mean**	**Goal - No Goal**
Psychological abuse often	0.060	0.032	0.059	0.039
		(0.033)		(0.029)
Psychological abuse in last year	0.169	0.095*	0.196	0.040
		(0.052)		(0.046)
Physical abuse often	0.010	0.054**	0.026	0.023
		(0.026)		(0.020)
Physical abuse in last year	0.109	0.089*	0.148	0.012
		(0.049)		(0.041)
Force sex often	0.020	0.032	0.037	-0.005
		(0.020)		(0.018)
Force sex in last year	0.085	0.037	0.102	0.000
		(0.041)		(0.029)
Observations	201	637	459	637

Notes. Column 1 shows means for females in ELA only communities and column 3 shows control for females not assigned to the *Goal* treatment. Columns 2 and column 4 test for difference between means in the community- or individual-level treatment arms and the corresponding control group means, controlling for randomization strata. Standard errors, clustered at the club level, are presented in parentheses below coefficient estimates in columns 2 and 4. ***p<.01, **p<.05, *p<.10

Source. Female baseline data, balanced panel, but restricted to females who had ever had sex at baseline.

C Grassroot Soccer Curriculum

The GRS curriculum comprised 11 one hour practices, including graduation. Ten of the 11 sessions were on SRH and one was on malaria. Each practice starts with a short "warm-up" where players recap the key messages of the previous practice and start discussing some of the themes of the current practice. The main part of the practice is a sport-based activity aimed at teaching and sparking discussions about healthy behaviors. Key messages are included throughout the activity. The practice ends with a quick "cool down" to recap the goals and key messages of the practice. In selected practices, the coaches also share personal stories about their real-life experiences related to the practice theme. Coaches are available post-practice for an additional 15-30 minutes in case males want one-on-one meetings to discuss more private issues.

Table C1 presents the goals and key messages of each practice.

Table C1 Grassroot Soccer Curriculum

(1)	(2)	(3)	(4)
Session	**Title**	**Goals**	**Sample key messages**
1	Join the Team!	Instill a core set of life skills and knowledge to help the boys stay healthy	"Build your team with strong supporters that help you abstain from sex or to practice safe sexual behaviors like using condoms."
2	Communicate	Develop good communication skills, in particular with girls	"Boys and girls can listen to each other and respect each other, even if it can be difficult." "When communicating with someone of the opposite sex, remember to: find a safe place to talk; show respect to the person you are communicating with; make strong eye contact; and stay positive." "In life, we should all stand up for girls and women to protect them from abuse."
3	Risky Partners	Emphasizes the skewed power dynamics and risks involved when a girl is in a sexual relationship with an older boy; Reinforces that abstinence is safest way to avoid HIV	"If you chose to have sex, it is much less dangerous to have sex with someone your own age than to have sex with someone older." "If you have less power in a relationship, it is harder to make healthy decisions, like using condoms or being mutually faithful."
4	Stop the Spread	Importance of HIV testing and safe sexual practices	"HIV spreads quickly when people have unprotected sex with multiple sexual partners."
5	Build your Team	Building supportive social networks	"We all need to build our team with strong supporters to stay strong in life."
6	One or None	Emphasizes importance of abstinence or having a single sexual partner to protect them from contracting HIV	"If you do choose to have sex, you can protect yourself by using condoms and having 1 mutually faithful partner that is HIV-negative."
7	Know the Game	Understanding how HIV attacks the body, living with HIV, and antiretroviral drugs	"The immune system protects the body from germs and diseases." "A healthy lifestyle can help an HIV-positive person live a longer, healthier life."
8	Protect yourself	Learn how to identify and use contraceptives, how condoms and circumcision protect from HIV	"You can say NO to unprotected sex!" "There are several ways to prevent pregnancy. Choose the one that's right for you and your partner"
9	Kick out Malaria	Discusses malaria, the use of bednets, and malaria treatment	"Malaria can kill. You can protect yourself from malaria by sleeping under a CCD every night."
10	Red Card	Uses the concept of "Red Card" in soccer to identify high risk situations to avoid, such as intimate partner violence, unprotected sex, old partners, multiple partners, and alcohol abuse	"Use the knowledge and skills you learned from the program to start conversations with friends and family members about difficult issues, like unprotected sex, older partners, multiple sexual partners, mixing sex and alcohol, and gender-based violence."
11	Make your Move!	Celebration of the boys' graduation based on the most important lessons	"Negative pressures from friends, family and the community can be difficult to avoid. But you can make your own smart choices in life!"

D Registered Outcomes

Empirical analysis is pre-registered through the AEA RCT registry (RCT ID: AEARCTR-0001305). In this appendix we present power calculations and estimation from our main specification on all registered outcomes.

For our study sample, we were limited to the total number of ELA clubs in Dodoma, Iringa, and Mbeya regions: 150 clubs with an average of 20 members. For our three arm study, this implies 50 clusters per treatment arm. We assume a 5% significance level, 80% power, an ICC of 0.1, and a coefficient of variation of 0.33. In general, for standardized outcomes, with mean zero and standard deviation one, we are powered to detect a 0.22 standard deviation change. Specifically looking to our IPV outcomes, we are powered to detect a 3 percentage point reduction in any IPV often (from a baseline rate of 3%) and a 5 percentage point reduction in any IPV in the last 12 months (from a baseline rate of 8%).

We pre-registered the following outcomes:

1. SRH behavior and biomarkers: sexual activity; pregnancies; knowledge and use of contraception methods; HIV and STI knowledge, status, and testing; and family planning goals and strategies;

2. Other health behaviors: intimate partner violence; smoking, drinking, socializing, physical activity, and self-reported physical and mental health;

3. Behavioral economic model parameters: time discounting, risk tolerance, locus of control.

We generate nine indexes across these outcomes. Each index is comprised of several indicators, which are standardized to the mean and standard deviation among females in the control group at baseline and endline separately. The final index is the unweighted mean of the standardized sub-measures. Detail on the index subcomponents is presented in Table D1.

We estimate the following specification for all primary outcome measures:

$$\begin{aligned} Y_{ict} = \alpha + \beta_1 \text{Boys}_c \times \text{Post}_t + \beta_2 \text{Goal}_i \times \text{Post}_t + \gamma_1 \text{Boys}_c \times \text{Post}_t \times \text{Goal}_i \\ + \theta_1 \text{Goal}_i + \theta_2 \text{Post}_t + \theta_3 \text{Goal}_i \times \text{Boys}_c + X_{ict}^{'} \xi + \alpha_c + \epsilon_{ict} \end{aligned} \tag{11}$$

where Y_{ict} is the outcome of interest for individual i in club c at time t, Supply_c, Boys_c and Goal_i are binary indicators for being assigned to the *Supply*, *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 and 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 study design. The parameters of interest, β_1 and β_2, capture the ITT effects of the *Boys* treatment and *Goal* treatment, and γ_1 estimate the interaction between the *Boys* treatment and the *Goal* treatment.

Table D2 presents estimates of β_1, β_2, and γ_1 for all outcomes.

Table D1 Registered Outcomes

(1)	(2)
Measure	**Constructon**
Sexual activity index	Comprised of three indicators: (1) a binary indicator that the female has ever had sex; (2) a binary indicator that the female currently has a partner; and (3) an indicator measuring the total number of sexual partners the female reported.
Family planning index	Comprised of four indicators: (1) a binary indicator that the female has never been pregnant; (2) a binary indicator that the female uses injectable contraceptive; (3) a binary indicator that the female uses implant contraceptives; and (4) a binary indicator that the female uses an IUD contraceptive.
IPV often index	Comprised of three indicators: (1) a binary indicator that the female reports experiencing psychological violence often; (2) a binary indicator that the female reports experiencing physical violence often; and (3) a binary indicator that the female reports experiencing forced sex often.
IPV in last year index	Comprised of three indicators: (1) a binary indicator that the female reports experiencing psychological violence in the last year; (2) a binary indicator that the female reports experiencing physical violence in the last year; and (3) a binary indicator that the female reports experiencing forcecd sex in the last year.
Knowledge Index	Comprised of seven indicators: (1) a binary indicator that the female has learned about domestic violence in school; (2) a binary indicator that the female has learned about sexual reproductive health (SRH) in school; (3) a binary indicator that the female has learned about domestic violence or SRH outside of school; (4) a HIV knowledge index comprised of four HIV knowledge indicators (older partners increase risk of HIV, pregnant woman with HIV can give the virus to her unborn baby, condoms reduce risk of HIV, males have higher risk of HIV); (5) an index of contraceptives that the female has heard of (condom, IUD, injectable, pills, implant, female condom, vaginal ring); (6) an index of contraceptives that the female knows how to use (condom, IUD, injectable, pills, implant, female condom, vaginal ring); and (7) an indicator that the female knows of a place to get contraceptive advice.
HIV/STI positive index	Comprised of two indicators: (1) an indicator that the female tested positive for HIV and (2) an indicator that the female tested positive for an STI.
Other health behaviors index	Comprised of three indicators: (1) an indicator that the female does not smoke; (2) an indicator that the female does not drink; and (3) an indicator of the reported hours spent on physical activity on a typical day.
Behavioral index	Comprised of four indicators: (1) a locus of control index comprised of seven statements from Locke and Latham (1990); (2) an indicator that the female is confident she can complete any task she starts; (3) a discount factor to measure patience; (4) an binary indicator that the female is risk averse.
Mental health index	Sum of three items from the PHQ-9 (depressed, low energy, low concentration) standardized to the mean and standard deviation among females in the control group at baseline and endline separately (Kroenke, Spitzer and Williams, 2001). Higher values indicate worse mental health.

Table D2 Impact of Treatments on Registered Outcomes

	(1)	(2)	(3)	(4)
	Boys Treatment	**Goal Treatment**	**Endline Control Mean**	**Observations**
Sexual activity Index				
treatment x post	-0.125**	0.065	0.000	5182
	(0.058)	(0.064)		
treatment x post x Goal	-0.027			
	(0.081)			
Family planning index				
treatment x post	-0.011	-0.042	0.000	5,182
	(0.037)	(0.046)		
treatment x post x Goal	0.047			
	(0.069)			
IPV index				
treatment x post	-0.190**	-0.248**	0.000	5,182
	(0.082)	(0.097)		
treatment x post x Goal	0.110			
	(0.173)			
Knowledge index				
treatment x post	0.107	0.053	0.000	5,182
	(0.086)	(0.054)		
treatment x post x Goal	-0.077			
	(0.072)			
HIV/STI positive index				
treatment x post	-0.023	0.031	0.000	4,122
	(0.079)	(0.101)		
treatment x post x Goal	0.039			
	(0.121)			
Other health behaviors index				
treatment x post	0.216**	0.090	0.000	5,182
	(0.093)	(0.071)		
treatment x post x Goal	-0.036			
	(0.110)			
Behavioral index				
treatment x post	0.038	0.045	0.000	5,182
	(0.075)	(0.059)		
treatment x post x Goal	0.029			
	(0.081)			
Mental health index				
treatment x post	0.007	0.051	0.000	5,182
	(0.142)	(0.079)		
treatment x post x Goal	0.027			
	(0.134)			

Notes. This table presents estimates of β_1 and β_2 and γ_1 from equation 11. For each outcome, the coefficients from a single regression are presented in two sub-rows, with estimates of β_1 in column 1 and β_2 in column 2, labeled treatment x post, and the estimates of γ_1 in column 1 in the second of the two rows, labeled treatment x post x Goal. Column 3 presents the control mean at endline, and column 4 shows the number of observations in the model. All specifications include club fixed effects. See Table D1 for outcome definitions. 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.

E Model Appendix

E.1 Proof: All males with $s_m > 0$ propose

Lemma 4 *It is WLOG to assume that in all equilibria, all males with $s_m > 0$ always propose risky sex.*

Proof. Given that males use violence with probability p upon being rejected, their belief of the female leaving upon receiving violence is

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

Suppose $q = 1$ (i.e., all females choose to exit upon receiving violence), then no male will choose violence because it will result in the dissolution of the relationship ($-d_m < 0$), i.e. $p = 0$ (following equation 9). But $q(0) = \frac{\alpha\rho^E(0)}{\alpha\rho^E(0)+(1-\alpha)\rho^S(0)} = \alpha < 1$, i.e. since there is no threat of violence, stay-type females will reject risky sex, which results in a decreased exit rate upon receiving violence. Therefore, $q = 1$ cannot appear in the equilibrium.

Now suppose $q < 1$. Then, following equation 9, we know $p > 0$, i.e., since there are females who stay upon receiving violence, there will always be males who use violence upon receiving no. With $p > 0$, both ρ^E and ρ^S are less than 1, which means there are always females who say yes to risky sex, so it is strictly better for males with $s_m > 0$ to propose risky sex. To summarize:

Male's payoff from playing "Not propose": 0

Male's payoff from playing "Propose":

$$Pr(Yes)s_m + (1 - Pr(Yes)) \max\{0, qv_m + (1-q)(-d_m)\} > 0$$

E.2 Proof of Proposition 1.

Proof. There exists a unique equilibrium $(p*, q*)$.

This proof has three parts.

(i) We show that $q(p)$ is increasing in p under simplifying assumption 1 below. We define the following elasticity as

$$\varepsilon_p^k = \frac{d\rho^k}{dp}\frac{p}{\rho^k},$$

which measures the relative change in probability the female says no for a change in the conditional probability of violence.

Assumption 1. The elasticity of *stay-types* is greater than the elasticity of *exit-types*.

$$\frac{|\varepsilon_p^S|}{|\varepsilon_p^E|} > 1 \tag{12}$$

Differentiate (6) with respect to p to get

$$\begin{aligned}\frac{\partial q}{\partial p} &\propto -\alpha f^E d_f^E[\alpha(1-F^E)+(1-\alpha)(1-F^S)] - [-\alpha f^E d_f^E - (1-\alpha)f^S v_f]\alpha(1-F^E) \\ &= \alpha(1-\alpha)\left[v_f f^S(1-F^E) - d_f^E f^E(1-F^S)\right]\end{aligned}$$

Under Assumption 1, we have

$$\frac{|\varepsilon_p^S|}{|\varepsilon_p^E|} = \frac{f(pv_f)pv_f}{1-F(pv_f)} \Big/ \frac{f(pd_f^E)pd_f^E}{1-F(pd_f^E)} > 1.$$

Therefore, $\frac{\partial q}{\partial p}$ is positive, so q increases in p.

(ii) Observe that $p(q)$ is decreasing in q. This is an immediate consequence of (9).

(iii) Given (i) and (ii), $p(q)$ and $q(p)$ intersect once, at the equilibrium (p^*, q^*).

E.3 Proof of Proposition 2

Proof. The *Boys* treatment unambiguously reduces violence.

The *Boys* intervention can decrease s_m and/or decrease v_m. If the *Boys* intervention reduces s_m, this reduces violence by reducing the share of males who propose risky sex without affecting the equilibrium (p^*, q^*).

If the *Boys* intervention reduces v_m, this unambiguously reduces p. This has an ambiguous impact on violence. To see this, observe that the probability of violence is P(violence) = (1-α)P(violence|stay-type) + αP(violence|exit-type), where P(violence|k-type) = P($s_m > 0$) $\times$ $\rho^k(p^*) \times p^*$. The ambiguity is a result of the increase in $\rho^k(p)$ that occurs with a decrease in p. We introduce an intuitive assumption to eliminate this ambiguity.

Assumption 2. The response elasticity of stay-type females is less than 1.

$$|\varepsilon_p^S| < 1$$

This assumption bounds the response sensitivity of stay-type females, such that the relative increase in probability females say no does not outweigh the decrease in p.

To see how this assumption ensured a decrease in stay-type violence, recall from equation 5 that

$$\rho^S(p) \times p = (1 - F(pv_f)) \times p.$$

Then for stay-type violence to decrease, we need

$$\frac{\partial(\rho^S(p) \times p)}{\partial p} = 1 - F(pv_f) - f(pv_f)pv_f > 0$$

which is naturally true under Assumption 2. As p decreases, more stay-type females will say no since there is less threat of violence. Assumption 2 ensures that this increase in probability of saying no will not outweigh the decrease in the conditional probability of violence.

Further, Assumptions 1 and 2 together imply that $|\varepsilon_p^E| < 1$, which also guarantees that exit-type violence will decrease when p decreases. Together, this implies a overall decrease in violence.

E.4 Ambiguity of the *Goal* intervention on violence

In the model, the *Goal* intervention translates into an increase in the net cost of risky sex, s_f, across the distribution of females. Previously, s_f was distributed according to the cumulative distribution function $F(s_f)$. After the intervention, the distribution becomes $F(s_f - \Delta)$, where Δ is equal to the shift of the distribution of s_f.

There are two sources of ambiguity in the impact of the *Goal* intervention on violence. First, the impact of the *Goal* intervention on violence depends on the relative response sensitivity of exit-type and stay-type females. If stay-types' s_f is more affected by the intervention, the conditional exit curve $q(p)$ will shift down and result in a lower q^* and a higher p^*; if exit-types' s_f is more affected by the intervention, the conditional exit curve $q(p)$ will shift up and result in a higher q^* and a lower p^*. In the first case, violence increases. In the second case, the impact on violence remains ambiguous despite the decrease in p^*. The result is formally stated in Proposition 3'.

Proposition 3'

Under Assumptions 1 and 2,

1. if $1 < \frac{v_f}{d_f^E} < |\varepsilon_p^S/\varepsilon_p^E|$: the *Goal* intervention will shift $q(p)$ downwards, resulting in a lower q^* and higher p^*, and violence increases;

2. if $1 < |\varepsilon_p^S/\varepsilon_p^E| < \frac{v_f}{d_f^E}$: the *Goal* intervention will shift $q(p)$ upwards, resulting in a higher q^* and lower p^*, and the impact on violence remains ambiguous.

To understand why an increase in q^* and a decrease in p^* is not sufficient to ensure a reduction in violence, notice that the *Goal* intervention increases the female's net cost of risky sex, s_f, and, therefore, increases the probability of females rejecting risky sex at all levels of p. Therefore, although p^* decreases to p', $\rho^k(p)$ increases to $\rho^{k'}(p)$ for all levels of p. Therefore, the overall change remains ambiguous. Assumption 2 ensures that

$\rho^k(p^{'}) \times p^{'} < \rho^k(p^*) \times p^*$. However, it does not ensure that $\rho^{k'}(p^{'}) \times p^{'} < \rho^k(p^*) \times p^*$. This requires a stronger assumption than assumptions 1 and 2. The proof is as follows:

Proof. After the intervention, the probability of a female exiting upon violence becomes

$$q'(p) = \frac{\alpha(1 - F(pd_f^E - \Delta))}{\alpha(1 - F(pd_f^E - \Delta)) + (1 - \alpha)(1 - F(pv_f - \Delta))}$$

The intervention will shift $q(p)$ upwards if $\partial q'/\partial \Delta > 0$:

$$\alpha f^E[\alpha(1 - F^E) + (1 - \alpha)(1 - F^S)] - [\alpha f^E + (1 - \alpha)f^S]\alpha(1 - F^E) > 0$$

Or equivalently,

$$\frac{f^S}{1 - F^S} < \frac{f^E}{1 - F^E}$$
$$\frac{|\varepsilon_p^S|}{|\varepsilon_p^E|} < \frac{v_f}{d_f^E}$$

Throughout the paper, we always assume that $\frac{|\varepsilon_p^S|}{|\varepsilon_p^E|} > 1$ and we have $v_f/d_f^E > 1$. Therefore, we have the two cases mentioned above:

1. if $1 < \frac{v_f}{d_f^E} < |\varepsilon_p^S/\varepsilon_p^E|$: the intervention will shift $q(p)$ downwards, resulting in a lower q^* and higher p^*;

2. if $1 < |\varepsilon_p^S/\varepsilon_p^E| < \frac{v_f}{d_f^E}$: the intervention will shift $q(p)$ upwards, resulting in a higher q^* and lower p^*.

To reduce the probability of violence against stay-type females, $Pr(s_m > 0)(1-\alpha)\rho^S p$, we need that $(1 - F(p'v_f - \Delta))p'$ decreases in Δ, i.e.:

$$\frac{\partial(\rho^S p)}{\partial \Delta} = \frac{\partial p}{\partial \Delta} - F^S \frac{\partial p}{\partial \Delta} + p f^S \left(-v_f \frac{\partial p}{\partial \Delta} + 1\right) < 0$$

Equivalently,

$$\left(1 - F^S - pv_f f^S\right) \frac{\partial p}{\partial \Delta} + pf^S < 0$$
$$\left[\frac{\partial p}{\partial \Delta} - \frac{1}{v_f}\right] |\varepsilon_p^S| > \frac{\partial p}{\partial \Delta}$$

Under case 1, we have $\frac{\partial p}{\partial \Delta} > 0$, so for violence to decrease, we need

$$\left(1 - \frac{1}{v_f \frac{\partial p}{\partial \Delta}}\right) |\varepsilon_p^S| > 1$$

which always fails under Assumption 2. Therefore, under Assumption 2, violence against stay-types always increases in case 1: although females will say no more often as p increases, their behavioral response is inelastic; therefore, the increase in p is the dominant effect.

Under case 2, we have $\frac{\partial p}{\partial \Delta} < 0$, so for violence to decrease, we need

$$\left(1 - \frac{1}{v_f \frac{\partial p}{\partial \Delta}}\right) |\varepsilon_p^S| < 1,$$

which is not guaranteed by Assumption 2. The interpretation is as follows: there are two competing forces determining the overall change in violence. On the one hand, the intervention shifts $q(p)$ upwards, resulting in a lower violent response rate p^*, which reduces the probability of violence; on the other hand, the intervention also increases the share of females who will say no, shifting $\rho^k(p)$ upward to $\rho^{k'}(p)$, which increases the probability of violence. Assumption 2 only guarantees that the change in probability the female says no caused by a change in p will not outweigh the change in p. Therefore, to ensure that the decrease in p outweighs both the shift in and the movement along $\rho^k(p)$, a stronger condition on female's response elasticity is required.