

PROGRESS REPORT FOR  
NEGOTIATING A BETTER FUTURE: HOW  
INTERPERSONAL SKILLS FACILITATE  
INTER-GENERATIONAL INVESTMENT

NAVA ASHRAF\*    NATALIE BAU<sup>†</sup>    CORINNE LOW<sup>‡</sup>  
KATHLEEN MCGINN<sup>§</sup>

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\*London School of Economics, NBER, and BREAD. (email: [n.ashraf1@lse.ac.uk](mailto:n.ashraf1@lse.ac.uk))

<sup>†</sup>University of Toronto and CIFAR. (email: [natalie.bau@utoronto.ca](mailto:natalie.bau@utoronto.ca))

<sup>‡</sup>University of Pennsylvania. (email: [corlow@wharton.upenn.edu](mailto:corlow@wharton.upenn.edu))

<sup>§</sup>Harvard Business School. (email: [kmcginn@hbs.edu](mailto:kmcginn@hbs.edu))

## 1 Introduction

Throughout Sub-Saharan Africa, secondary school completion is low, and female educational attainment lags male educational attainment. Enrollment data for Zambia shows a dramatic decline in school enrollment at the transition from free primary school to fee-based secondary school in grade 8, and the decline for girls is three times as high as the decline for boys.<sup>1</sup> Secondary school fees are high (approximately 100 USD per year, almost 10% of per-capita GDP in 2015) and consequently, secondary school enrollment rates are low (47% for boys and 39% for girls).<sup>2</sup>

Many governments and NGOs try to address this issue by providing material support such as free uniforms and scholarships. We explore a potential alternative tool for increasing female human capital investment. A recent branch of economics, pioneered by James Heckman, has posited that differences in long-term outcomes (including wages and educational attainment) are in part driven by differences in non-cognitive skills, which are often formed in early childhood (Heckman and Rubinstein, 2001). Non-cognitive skills are typically both difficult to measure and change, particularly among older children, but neuroscience research in recent years has shown that interpersonal skills may be best learned by early adolescents (Choudhury et al., 2006). If this is the case, programs that affect interpersonal skills may offer policymakers an unusual opportunity to improve non-cognitive skills within the school system. Motivated by this literature, in this project, we test whether improving interpersonal skills can play a role in increasing female education.

To test whether children’s interpersonal skills affect parents’ human capital investments, we conducted an experiment in which we randomly provided eighth grade girls in Zambia with a two-week, after-school negotiation skills training. To disentangle the effects of the negotiation skills from the effects of participating in an all-girls training with a female, Zambian role model, we further randomized some girls to receive a placebo training (called “safe space”) where girls met to play games under the supervision of the mentor but did not receive negotiation skills training. We then collected data on the effect of negotiation in two ways. First, we conducted a lab-in-the-field investment game to better understand how negotiation affected parents’

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<sup>1</sup>Zambia DHS, 2007.

<sup>2</sup>These secondary school enrollment rates are not atypical among Sub-Saharan African countries. Secondary enrollment rates are as low as 17% in Niger, 25% in Mozambique, and 40% in Rwanda. Overall, the World Bank records Sub-Saharan Africa’s average enrollment rate as 43% (World Bank, 2016).

investment decisions. Second, we collected administrative data on girls' educational and life outcomes such as school fee payment, attendance, grades, and pregnancy status up to when the girls would be enrolled in tenth grade and evaluated the effect of negotiation on these individual outcomes and a single human capital index that aggregates the outcomes.

In the investment game, which simulated parents' educational investment decisions, a parent was given tokens that could be converted into cell phone airtime. Tokens sent to a daughter were doubled, daughters received a randomly chosen income shock of 2 or 4 tokens, and then a daughter decided how many tokens to return to her parent and how many to redeem for prizes. Notably, in most of the variations of this game that we administered, the returns to investment are known, and the only information known to a daughter but not her parent is how many tokens the daughter will return to her parent. Given the high return on investment, if parents and daughters can achieve the efficient outcome, parents should send daughters all of their tokens. Therefore, the only parameters likely to affect the investment decision are a parent's beliefs about how many tokens a daughter will return to her and a parent's altruism toward her daughter.

In the standard version of the game, where parents could not communicate with daughters prior to sending the tokens, girls who did and did not participate in the negotiation treatment received the same number of tokens, indicating that the negotiation treatment did not affect parents' general altruism toward their daughters. However, when parents and daughters could communicate before parents sent the tokens, parents sent daughters who participated in the negotiation treatment substantially more tokens and treated daughters ended the game with more tokens overall.

When we estimate the effects of negotiation on girls' longer-term outcomes – including whether parents paid off school fees, whether daughters took the ninth grade national exam (which is required to enroll in secondary school), average grades in required topics in school, daughters' enrollment and attendance rates over the post-treatment period, and whether a girl became pregnant in the post-treatment period – we find that negotiation moderately improved the average girl's outcomes. However, this average effect masks considerable heterogeneity.

When we estimate the effect of negotiation on the 70% of girls who attended the lab-in-the-field experiment, we discover that it had stronger and more precise effects on this sub-sample, with negotiation increasing the likelihood a girl took the national

exam – required to continue her education – by 3 percentage points (5%), increasing the school enrollment rate by 3.8 percentage points (5%), and and reducing pregnancy by 1.7 percentage points (68%). To put these effect sizes into perspective, Ashraf et al. (2016), who focus on a sub-sample of girls for whom the underlying demand for education is likely to be relatively high, show that a standard deviation increase in the stock of schools in a district caused by a large-scale school construction program in Zambia only increased female primary enrollment by 1.1 percentage points. We confirm that this sub-sample is not selected on negotiation status and in fact, when we use the methodology of Heckman (1979) to correct for any selection bias in the estimated effects, we find as large or larger effects of negotiation on the long-term outcomes. However, the sub-sample is selected in other respects: those who attended the lab-in-field experiment are more likely to live with both their biological mothers and fathers and have higher pre-treatment ability. Therefore, we find that negotiation had larger effects on somewhat more advantaged students.

This report is organized as follows. Section 2 describes the negotiation treatment in more detail. Section 3 describes the investment game and reports its results. Section 4 reports the effects of the negotiation treatment on educational outcomes. Section 5 concludes.

## 2 Negotiation and Information Treatments

### 2.1 Experimental Design and Time Line

Between May and June 2013, we collected baseline data from 3,146 girls in 41 primary schools in a low-income section of Lusaka. The survey was conducted with the girls during after-school meetings in privacy from their peers. During this baseline survey, we randomly provided an information session to half the girls lasting approximately one hour on two main topics: education and health. In particular, the session addressed the following points: the benefits to girls from staying in school, job opportunities in Zambia, options for families to finance education such as scholarships, HIV transmission, and relative risk and prevention. The decision to provide information on health and returns to education was motivated by work by Jensen (2010), who shows that providing information on the returns to education increases educational attainment in the Dominican Republic and Dupas (2011), who shows that provid-

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ing teenage girls in Kenya with information on HIV risk affects sexual behavior and pregnancy.

Following this baseline survey, within each of 29 randomly chosen schools, girls were randomly allocated to one of three different treatments after stratifying on classroom and information status: negotiation, safe space, or a pure control group, which did not receive a treatment. The girls were told that a computer would randomly select the groups so that families and teachers would have no influence over the experimental assignment. While we initially intended to use the remaining 12 schools as a pure control group, we found that, despite the randomization, the characteristics of treated schools differed substantially from those of untreated schools. For example, treatment schools had statistically significantly more orphans and larger shares of the class receiving scholarship support. They also had significantly fewer classrooms, and were significantly less likely to offer interactive radio instruction.

Therefore, for this study, we compare the outcomes of girls *within* the 29 treated schools. Table 1 reports summary statistics for our sample, and table 2 reports the results of balance tests, controlling for school fixed effects. Table 2 suggests that most characteristics are balanced for the negotiation treatment relative to the safe space and pure control treatments, but there is some evidence that girls who received the negotiation treatment are lower ability. They are 5 percentage points less likely to read or speak Nyanja excellently ( $p < 0.05$  and  $p < 0.10$  respectively). However, given that we test balance across 15 outcomes, these may be significant by chance, and if negotiation girls *are* slightly lower ability, this is likely to negatively bias our results.

We summarize the negotiation, safe space, and pure control treatments briefly as follows, with more details on the negotiation treatment in the next sub-section:

1. *Negotiation Group* (801 girls): Girls received a free lunch on session days, a notebook, and pens. They participated in six after-school sessions over two weeks with female role models covering training on negotiation and interpersonal communication.
2. *Safe Space Group* (785 girls): Girls received a free lunch on session days, a notebook, and pens. They participated in six after-school sessions over two weeks, during which they could play games, study or do homework, or just talk with other girls. Trained female Zambian role models supervised these sessions.

3. *Pure Control Group* (780 girls): Girls assigned to this group did not participate in any after-school program.

We include the safe space group as a placebo test to ensure that any effects we identify on the negotiation group are not merely driven by interacting with educated, female mentors or by spending structured time with other girls. The intervention was implemented at 6-8 schools at a time on a rolling basis. Approximately one to two months after the intervention and again during the first term of grade 9, a one-day trouble-shooting session was held at each school with the negotiation and safe space groups in order to reinforce the knowledge gained (in the case of the negotiation group) and provide girls with additional support for effectively utilizing the skills gained in their lives. The same trained coaches from the initial program led these sessions.

Between September and October of 2013, all the girls in the sample were invited to attend a lab-in-the-field investment game with a parent or guardian, where they participated in a randomly chosen version of the investment game, which we describe in more detail in section 3. These games were designed to simulate the human capital investment problem by requiring parents to decide how much to invest in daughters – with a high return – and then requiring daughters to decide how much of that investment to return to parents. Thus, the game sheds light on the mechanisms through which negotiation could affect parents’ human capital investment decisions. When daughters and their parents arrived for the investment game, they also participated in a midline survey.

Additionally, from the start of the treatment to December 2014, we collected data on school fee payment, grades, national exam attendance, and national exam scores from the treatment schools, and until term 1 of 2016, we continued to collect data on whether girls became pregnant. Figure 1 documents the time line of the study.

## 2.2 Negotiation Treatment

The negotiation curriculum was designed to teach girls the interpersonal skills needed to negotiate health and educational decisions with power figures in their lives. The program took place in a classroom or, if not available, in the school hall, staff room or outdoors (in the same place as the safe space activities). The main objective was to teach girls that compromises and solutions were possible when negotiating

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partners were willing to consider reciprocal interests, instead of simply fighting over positions. This would allow girls to expand their choice set, creating room for new opportunities that would relax their resource constraints and allow them to pursue further education. The curriculum was structured according to four principles that can be followed as a process of negotiation:

1. *Me*: Identifying one's own interests and options in conflict situations.
2. *You*: Identifying the other person's interests, needs, and perspective.
3. *Together*: Identifying shared interests and small trades.
4. *Build*: Developing win-win situations.

Furthermore, girls were taught that they may not always progress through these steps in a linear fashion. Rather, the aim was to teach the girls to recognize the different steps and be able to go back and forth between them. The curriculum also discussed situations in which patience is required ("Take 5" to cool down), and others in which the only outcome to keep the girl safe and healthy was to walk away and not negotiate. Moreover, emphasis was put on the ability to be empathic with the other person and to detach from one's own strong emotions, such as anger and disappointment, which could compromise the possibility to develop shared solutions. Figure 2 summarizes the four steps of the negotiation curriculum.

The program was organized in six training sessions, comprised of activities like role-play, group discussion, story telling, and games. The rationale behind this structure was to teach the girls practical skills to talk and work together with other people in order to solve problems and generate efficiency gains from new allocations of time and resources. In the design of the curriculum, particular care was put in ensuring that the negotiation skills did not harm existing relationships.

To test whether girls in fact learned the negotiation curriculum, during the midline survey, girls were presented with a scenario and asked to imagine themselves in that situation. The scenario given was that the girl needed to study for a test and asked her sister to take care of their younger brother, but the sister refused, saying that she wanted to go visit a friend. After reading the description of the scenario, the girls were asked three open-ended questions about what they would do if they were in this situation. We blindly coded girls' answers to these questions on a scale of 1-7, with "7" indicating the best answer according to the negotiation curriculum.

Appendix table A1 regresses girls' scores on each of these questions and their average score across the questions on an indicator variable for whether girls received the negotiation treatment. As the table shows, girls who were taught negotiation score substantially better on all three questions. Given that the midline occurred several months after the negotiation classes, this provides important evidence that the classes had long-term effects on girls' knowledge of negotiation.

## 2.3 Information Treatment

The information treatment provided during the baseline survey addressed the following points: the benefits for girls from staying in school, job opportunities in Zambia, options for families to finance education, HIV transmission, relative risk and prevention. In the education section of the information session, the discussion leader started the discussion by asking girls to think about ways in which education can help them in their lives. After a brain storming session, the leader provided information on the link between maternal education and health of the child to the girl, the positive effect of education on a woman's own health, and how education could improve a girl's ability to care for her family.

Following the section on the benefits of education on health, the participants engaged in another activity where they were asked to look through job advertisements in a newspaper and identify required education for the positions, as well as earnings. This was done to make opportunities that require a secondary school degree salient to the girls. This section concluded with information on organizations that offer scholarships and other forms of assistance for secondary school education.

The second part of the treatment focused on prevention of HIV. Participants were first provided basic information on what HIV is, its prevalence in Zambia, ways to get tested for it, and how to cope with HIV. Then, the discussion leader asked girls to identify ways in which HIV could be transmitted from a list of behaviors and activities on a flip chart. This exercise was followed by explanations of abstinence and condom use. The session concluded with the discussion leader providing information on risky behaviors for contracting HIV such as sexual contact with older men, who have a higher positive HIV rate, and having multiple partners.



### 3 Lab in the field: Investment game

Two months after the negotiation training took place, girls were asked to bring a parent or guardian to participate in a lab-in-the field experiment to better understand how negotiation might affect parental investment decisions. 70% of the girls attended this experiment with a parent or guardian, but there was no significant selective attrition by negotiation or safe space status (see rows 1 and 2 of appendix table A2 for the associations between appearing in the sample and the negotiation and safe space treatments).

After arriving for the experiment, girls were assigned to one of several variations of the investment experiment. Regardless of what version the daughter and her parent was assigned to, at the start of the experiment, the parent received ten tokens that could be redeemed for cell phone air time. In the simplest version of the game, the dictator game, the parent then decided how many tokens to send to her daughter, the tokens sent to the daughter were doubled, and the daughter received a randomly determined “income shock” of 2 or 4 tokens. Importantly, these tokens were sent to the daughter along with the tokens sent by the parent, and the daughter wasn’t aware of the size of her income shock. This aspect of the experiment was intended to avoid painful cases where daughters discovered that parents had sent them zero tokens. The daughter could then redeem her tokens for prizes at a “Chuck E. Cheese” store. Figure 3 shows the prizes. This simple dictator game was intended to determine if the negotiation treatment affected the parent’s altruism toward her daughter, and a total of 333 girls took part in the dictator game.

The remaining girls were assigned to a more complicated investment experiment. In the investment experiment, after a parent sent the girl the tokens, the girl still received an income shock, but the girl could now decide how many tokens to return to her parent. Since the returns to investment are high in the basic version of the investment game (100%), if a girl and her parent are able to achieve the efficient outcome, the parent should send all her tokens to the daughter. In fact, on average, the parent sent only about 5 tokens in the investment game, indicating that in the context of the experiment, girls and parents were far from achieving the efficient outcome.

We further varied the investment game as follows: (1) a random subset of girls were allowed to communicate with their parents before the parent decided how many

tokens to send, and (2) for a random subset of girls, the tokens sent to the girl were only doubled if the girl successfully completed a word search. This second variation was intended to allow the returns on a parent’s “investment” in the daughter to vary based on the daughter’s ability. These variations were cross-randomized so that a total of 1,054 girls participated in the normal investment game (without either variation), 332 participated in the word search version without communication, 318 participated in the communication version without the word search, and 329 participated in a game that featured both the word search and communication.

## 3.1 Results from the investment game

*Tokens Sent to Daughter.* Table 3 reports the effect of negotiation on the number of tokens parents sent to their daughters. Since randomization took place within schools, all regressions control for school fixed effects. Additionally, to maximize precision, we control for ethnicity fixed effects and a rich set of controls for socioeconomic status consisting of controls for both parents alive, lives with biological father, lives with biological mother, lives with father and mother, parents were paying school fees in the pre-treatment period, reading Nyanja excellently, speaking Nyanja excellently, reading English excellently, speaking English excellently, reading Nyanja well, speaking Nyanja well, reading English well, and speaking English well.

Column (1) reports the results from the dictator game alone. We find that neither negotiation nor safe space had a statistically significant effect on the number of tokens that the parent sent to her daughter. Column (2) estimates the effects of negotiation, safe space, and the communication treatment for the full sample. Again, negotiation and safe space have no significant effects on the number of tokens sent. In contrast, being assigned to the communication treatment increases the number of tokens sent by 0.313 ( $p < 0.01$ ). Columns (1) and (2) appear to confirm that negotiation did not generally increase the parent’s altruism toward her daughter. In column (3), we allow the effect of communication to interact with negotiation and safe space. Column (3) shows that the entire positive effect of communication on the number of tokens parents sent comes from the girls who had received the negotiation treatment. The interaction is positive and significant with parents sending 0.502 more tokens ( $p < 0.01$ ) to girls in the negotiation treatment who could communicate at the start of the investment game. In contrast, there is no strong positive interaction

between safe space and communication. Columns (4) and (5) report the interactions between participating in the word game and negotiation and safe space and the triple-interactions between participating in the word game, communication and negotiation and safe space respectively. In both cases, we see little evidence that the word game interacted with the treatments to affect investment decisions. While the coefficient on communication  $\times$  negotiation is no longer significant, the coefficient is still large and positive, suggesting that the loss of significance is due to declining precision with the inclusion of the word game interactions. Therefore, the key result from table 3 is that – when daughters can communicate – girls who have been taught negotiation are sent more tokens.

*Daughter's Welfare.* In table 4, we also investigate whether negotiation made daughters better off. The regressions in table 4 duplicate the specifications in columns (2)-(5) of table 3, but the outcome variable is now the final number of tokens the daughter received in the investment game.<sup>3</sup> Table 4 reports the results of these regressions. The results in table 4 echo the results in table 3. Column (1) suggests that daughters in the communication treatment end the game with significantly more tokens, but column (2) shows that this effect is driven by the girls who received the negotiation treatment. Girls who have been taught to negotiate and can communicate with their parents end the game with 0.954 ( $p < 0.05$ ) more tokens. In contrast, girls who received the safe space treatment and are allowed to communicate with their parents do not receive significantly more tokens. As in table 3, the inclusion of the word game interactions in column (4) causes the interaction between negotiation and communication to lose significance. However, the point estimate for the coefficient is even larger than in columns (2) and (3), suggesting that the loss of significance is due to the decline in precision from including these additional interactions.

## 4 Effect of Negotiation on Human Capital

### 4.1 Collection of administrative data

In order to assess the long-term impact on the girls' educational and other human capital outcomes, we collected administrative data from junior secondary schools, the

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<sup>3</sup>The final number of tokens a daughter received is given by *daughter final tokens* =  $2 \times$  *tokens guardian sent* + *income shock* – *tokens daughter returned*. Since *tokens daughter returned* is missing for the girls in the dictator game, we exclude these girls from the analysis.

National Exam board, and senior secondary schools. Administrative data collection started in mid-2013 when participants were in grade 8, two weeks before the start of the intervention, and continued (in the case of pregnancy) through 2016. From 2013 to 2014, girls were enrolled in junior secondary school (grades 8 and 9), and data collection could be administered at treatment schools as follows:

*Attendance Data:* Daily attendance records were not collected on a regular basis prior to the intervention, so our data collectors selected and trained pupils (“class monitors”) to fill out attendance register forms that we provided. Recording started approximately two weeks before the baseline survey, on the same day the invitation letters for parents to participate in the experiment were delivered to the girls in school.

*Fee Payment Data and Grade Data:* Data on payments and grades were collected from school administrators for each term and each subject, starting in term 2 of grade 8. As before, the data collection covered grades 8 and 9.

*Enrollment and Pregnancy Data:* Data on whether students were still enrolled in school and whether they had become pregnant were collected from school administrators at the end of year. Beginning in 2014 (term 1 of grade 9), we cross-checked this data with data collected by the class monitors.

To collect the data, the collectors visited the schools twice in every academic term, at the beginning and at the end. At the end of each term, they collected attendance registers from the term and left the registers for the following term in advance, so that they could be given to pupils in the first week of school. They also dropped off data forms for exam results, fee payment, and student status tracking, which they then collected at the start-of-term visit. In each school, a teacher was appointed as the “contact teacher,” as a point of reference for our collectors and a mediator between the school administration, the collectors, and the class monitors.

At the end of grade 9, girls could take the national exam and decide whether to enroll in secondary school. In addition to the data we collected from the junior secondary schools, we also collected the girls’ examination numbers and results for the grade 9 national exam, which is a high-stakes, standardized assessments held in October-November 2014. The results of the national exam determine whether pupils can enroll in grade 10 and at which school. In order to facilitate the process of matching exam scores to participants, we collected the examination number for all pupils prior to the exam in term 3 of 2014.

Following grade 9, we tracked whether participants in intervention schools enrolled

in grade 10 and 11 by contacting the junior secondary schools in our study sample, as well as visiting upper secondary schools in the Lusaka area. Depending on the score from the grade 9 National Exam, pupils are assigned to enroll in particular senior secondary schools. We first gathered information from their junior secondary schools to determine whether our participants had enrolled in grade 10, and if so, at which senior secondary school. In order to confirm that our participants actually enrolled at a particular school, we visited the senior secondary schools they were assigned to throughout Lusaka and verified if they were indeed enrolled. We also tracked information on the pupils' pregnancy status. When pupils were found, they provided us with information on their peers' senior secondary enrollment statuses, as well as their own. We used this information to visit other senior secondary schools that were not listed by the junior schools within Lusaka and searched for any participants from our intervention. If we found girls at these schools, we collected enrollment and pregnancy statuses. In 2016 we went back to the same senior secondary schools for additional robustness checks on data collected in 2015, as well as to collect information on girls' statuses in grade 11. However, since our enrollment data following grade 9 is quite noisy, we focus on enrollment outcomes in grades 8 and 9 in our regressions.

## 4.2 Long-Term Impact on Human Capital: Average Effect

In this section, we estimate the effect of the negotiation and safe space treatments on the educational and related outcomes of daughters. Our regressions take the form

$$y_i = \beta_0 + \beta_1 \textit{negotiation}_i + \beta_2 \textit{safe\_space}_i + \beta_3 \textit{information}_i + \mathbf{\Gamma} \mathbf{X}_i + \epsilon_i, \quad (1)$$

where, as before, *negotiation*<sub>*i*</sub> and *safe\_space*<sub>*i*</sub> are indicator variables for receiving the negotiation and safe space treatments, and  $\mathbf{X}_i$  is the same set of controls as in tables 3-4. Our main outcome variables are: (1) an indicator variable for whether parents paid all junior secondary school fees at the end of 8th grade, (2) an indicator variable for whether a daughter took the national exam in ninth grade, which she was required to take and pass to continue her education, (3) average standardized grades across required subjects (English, math, science, geography, history, and civics) in term 3 of 8th grade and terms 1 and 2 of 9th grade, (4) average enrollment rate over term 3 of grade 8 and terms 1 and 2 of grade 9, (5) average percent of days attended in terms 2 and 3 of grade 8 and terms 1 and 2 of grade 9, and (6) whether

girl became pregnant prior to term 1 of 2016. Additionally, to increase power we form two indices that combine these measures, a human capital index, which only includes measures 1-5 and a full index, which includes measure 6 as well. For these indices, we standardize each of the measures and then take the average to create a new outcome variable (flipping the sign of pregnancy so that all the effects are in the same direction).<sup>4</sup>

Table 5 reports the results of these regressions. For all the outcomes in columns (1)-(6), the effect of negotiation is in the expected direction – it increases the likelihood school fees are paid, the likelihood of taking the national exam, average grades, enrollment rates, and attendance, and it reduces pregnancy – but the effects are statistically insignificant. In the remaining columns, we report the effects using the human capital and full index, which increase our statistical power. We now find that negotiation increases the human capital index by 0.047 ( $p < 0.05$ ) standard deviations and increases the full index by 0.042 standard deviations ( $p < 0.10$ ). In contrast, neither safe space nor the informational treatment have a significant effect on these measures.<sup>5</sup>

### 4.3 Effect on the Daughters Who Attended the Investment Game

Recalling that only 70% of girls attended the investment game, we now estimate the effect of negotiation, safe space, and information for this sub-sample. Table 6 re-estimates equation 1 for the girls who attended the investment game. While safe space and information still do not have significant effects on the girls' outcomes, negotiation now has strong effects on both the human capital and full index and several of the original outcomes. For this sub-sample, negotiation increases the likelihood of taking the national exam by 3 percentage points ( $p < 0.05$ ), increases the average attendance rate by 1 percentage point ( $p < 0.1$ ), increases the average enrollment rate by 3.8 percentage points ( $p < 0.05$ ), and reduces the likelihood of becoming pregnant over the study period by 1.7 percentage points ( $p < 0.10$ ). When the measures are combined into indices, negotiation increases the human capital index by 0.06 standard

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<sup>4</sup>The results using these indices are very similar to those attained using average effect sizes as in, for example, Clingingsmith et al. (2009).

<sup>5</sup>While information has effectively increased educational attainment in other contexts (for example, see Jensen (2010)), our informational treatment may not have been intensive enough to change girls' behavior.

deviations ( $p < 0.05$ ) and the full index by 0.06 standard deviations ( $p < 0.05$ ).

There are two possible explanations for why the effect sizes in table 6 are larger and more precise than those in table 5. First, there could be differential attrition by negotiation status, leading to biased estimates in table 6. Second, negotiation could have heterogeneous effects, and it has larger effects for the selected sample that attended the investment game. Given that there is no evidence of differential attrition by negotiation status (see appendix table A2), we find the first explanation unlikely. Moreover, while negotiation does not have a significant effect on attending the investment game, the association between negotiation and attendance is positive. Since the remaining rows of appendix table A2 suggest that the investment game sample is positively selected (girls who attend are more likely to live with their biological parents and have higher pre-treatment ability), any omitted variable bias should be negative.

Nonetheless, to rule out the possibility of omitted variable bias, we follow the procedure of Heckman (1979) to correct the estimates in table 6 for selection bias. To instrument for attending the investment game, we take advantage of the fact that different girls were assigned to attend the investment game on different days, and whether it rained on the day a girl was assigned to attend the midline is a significant predictor of attendance. Appendix table A3 reports the selection-corrected estimates. Column (1) of appendix table A3 verifies that an indicator variable for whether it rained is a significant predictor of attendance: rain reduced the likelihood of attendance by almost 9 percentage points ( $p < 0.05$ ). The remaining columns report the estimates of the effects of negotiation, safe space, and information on daughters' outcomes. The selection-corrected effects of negotiation are even larger and more significant than before, with negotiation increasing the human capital index by 0.08 standard deviations ( $p < 0.01$ ) and the full index by 0.07 standard deviations ( $p < 0.01$ ), consistent with the idea that any omitted variable bias is negative.

These results suggest that the differences between the effect sizes for the full sample and the investment game-only sample are driven by heterogeneous effects rather than omitted variable bias. Given the positive selection of the investment game-only sample, this may suggest that negotiation has larger effects on girls who are already somewhat more advantaged. This finding may not be so surprising, given that secondary school enrollment rates are low for Zambian women. Negotiation skills may simply not be enough to overcome the constraints on very disadvantaged girls'

educational attainment.

## 5 Conclusion

In this paper, we study the effect of negotiation and interpersonal skills on female education in Zambia, a context where – as in much of sub-Saharan Africa – female secondary school enrollment is low. To study the effects of negotiation, we provide a randomly chosen group of Zambian 8th graders with negotiation skills training. Then, to understand how negotiation can affect girls’ outcomes, we invite the girls to participate in a lab-in-the-field investment game with a parent that simulates the educational investment decision. The results of our investment game provide evidence that negotiation affects parents’ investment decisions when girls can communicate with parents. That is, the negotiation treatment did not simply raise parents’ altruism toward daughters; using the negotiation skills themselves during the investment decision is important to changing girls’ outcomes. Additionally, we collect and analyze data on girls’ longer-term educational outcomes, consisting of whether parents pay school fees, attendance rates, school enrollment, grades, and whether girls took the national exam. We find that negotiation skills increase educational investment, particularly for girls who are slightly more advantaged in terms of socioeconomic status and ability.

More broadly, we contribute to the growing literature on how non-cognitive skills improve long-term outcomes and shed light on how to design female education programs to affect girls’ agency. We provide – to our knowledge – the first estimates of the educational returns, to a specific type of non-cognitive, interpersonal skills, not only in laboratory settings but also in real-life outcomes. By focusing on interpersonal skills, which are best taught in adolescence (Choudhury et al., 2006), instead of other non-cognitive skills, which are typically best influenced when children are very young, we discover an opportunity to influence non-cognitive skills in the school system. In fact, after the intervention was shown to improve negotiation skills, the Ministry of Education in the Zambian government incorporated sections of our negotiation training methods into the current life-skills and sexual health curriculum rolled out throughout the country. In order to achieve wider dissemination of our negotiation tools, we have also made our curriculum freely available for download.<sup>6</sup> We

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<sup>6</sup><https://cb.hbsp.harvard.edu/cbmp/pages/content/girlsarise>



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hope that this curriculum and our findings can provide practitioners with a new tool to increase female education beyond providing information and alleviating resource constraints.

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## Figures

Figure 1: Experimental Time Line

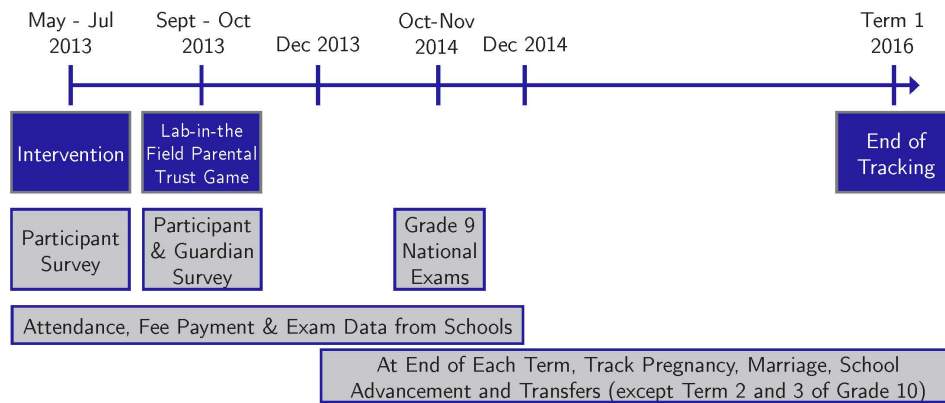


Figure 2: Negotiation Curriculum

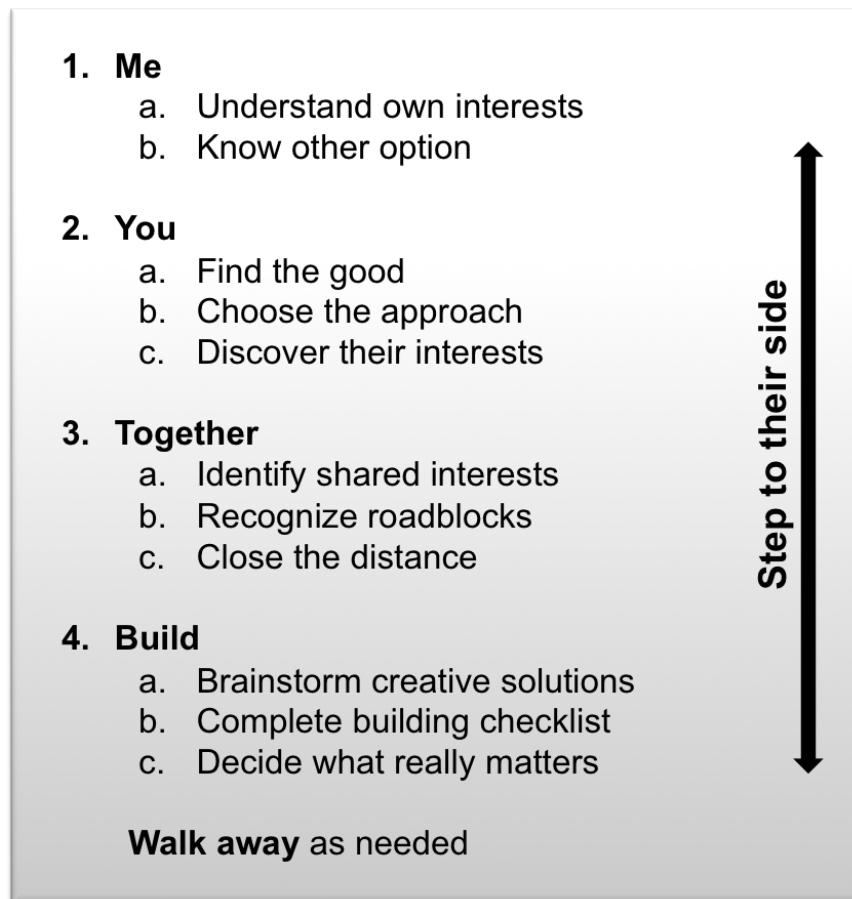


Figure 3: Prizes from the Chuck E. Cheese's Store



## Tables

Table 1: Summary Statistics

	(1)	(2)
	Mean	SD
Both Parents Alive	0.737	0.440
Live With Bio Dad	0.548	0.498
Live With Bio Mom	0.701	0.458
Live With Mom and Dad	0.499	0.500
Parents Pay Fees	0.763	0.425
Read Nyanja Excellently	0.399	0.490
Speak Nyanja Excellently	0.480	0.500
Read English Excellently	0.697	0.459
Speak English Excellently	0.412	0.492
Bride Price	0.249	0.432
Age	14.419	1.461
Read Nyanja Well	0.637	0.481
Speak Nyanja Well	0.885	0.320
Read English Well	0.899	0.301
Speak English Well	0.789	0.408

This table reports summary statistics collected during the baseline survey for the girls from the 29 treatment schools who participated in the experiment.

Table 2: Balance of Characteristics by Negotiation Treatment

	(1) Mean	(2) Coefficient	(3) SE	(4) N
Both Parents Alive	0.732	-0.018	0.017	2,254
Live With Biological Dad	0.544	-0.014	0.022	2,254
Live With Biological Mom	0.689	0.008	0.019	2,254
Live With Both Parents	0.493	-0.018	0.020	2,254
Parents Pay School Fees	0.754	0.023	0.015	2,249
Read Nyanja Excellently	0.396	-0.048**	0.017	2,254
Speak Nyanja Excellently	0.482	-0.047*	0.027	2,254
Read English Excellently	0.692	-0.021	0.018	2,254
Speak English Excellently	0.409	-0.025	0.018	2,254
Bride Price	0.278	-0.012	0.021	2,127
Age	14.447	0.046	0.053	2,254
Read Nyanja Well	0.631	-0.016	0.021	2,254
Speak Nyanja Well	0.885	-0.003	0.017	2,254
Read English Well	0.896	-0.005	0.012	2,254
Speak English Well	0.785	-0.022	0.018	2,254

This table reports tests of the within-school randomization of the negotiation treatment. Each row is a regression of a child/household characteristic on a indicator for whether the girl was included in the negotiation treatment, controlling for school fixed effects. Standard errors are heteroskedasticity robust.

Table 3: Effect of Negotiation Treatment on Parents' Behavior in the Investment Game

	(1)	(2)	(3)	(4)	(5)
	Tokens Sent	Tokens Sent	Tokens Sent	Tokens Sent	Tokens Sent
Negotiation	0.390 (0.275)	0.003 (0.116)	-0.197 (0.146)	-0.142 (0.169)	-0.093 (0.182)
Safe Space	0.271 (0.252)	-0.058 (0.116)	-0.122 (0.145)	0.020 (0.165)	0.026 (0.176)
Communication		0.313*** (0.097)	0.079 (0.177)	0.055 (0.183)	0.214 (0.259)
Communication × Negotiation			0.502** (0.240)	0.538** (0.246)	0.377 (0.340)
Communication × Safe Space			0.163 (0.239)	0.243 (0.246)	0.216 (0.338)
Word Game				0.107 (0.174)	0.264 (0.224)
Word × Negotiation				-0.165 (0.238)	-0.323 (0.303)
Word × Safe Space				-0.441* (0.242)	-0.461 (0.309)
Communication × Word					-0.368 (0.364)
Communication × Word × Negotiation					0.369 (0.484)
Communication × Word × Safe Space					0.041 (0.499)
Sample	DG Only	All	All	All	All
Ethnicity FE	Y	Y	Y	Y	Y
SES Controls	Y	Y	Y	Y	Y
School FE	Y	Y	Y	Y	Y
Number of observations	297	1,521	1,521	1,521	1,521
Adjusted R <sup>2</sup>	0.085	0.035	0.037	0.038	0.038

This table reports the effects of the negotiation treatment on parents' behavior in a lab-in-the-field investment game. In the dictator game (column 1), parents decided how many tokens to send to their daughters and the tokens were doubled (plus a random component), but daughters did not return tokens to their parents. In other versions of the game, parents decided how many tokens to send to daughters, and coins sent to daughters were doubled (plus a random component). Daughters then decided how many tokens to return to guardians. In the communication treatment, daughters were allowed to communicate with guardians before guardians sent the tokens. In the word game treatment, the tokens were only doubled if the girl had found at least half the words in a word game. Column 1 only includes girls who participated in the dictator game. The remaining columns include the full sample but control for whether the parent-daughter pair was assigned to the dictator game treatment. Socioeconomic controls consist of controls for both parents alive, lives with biological dad, lives with biological mom, lives with mom and dad, parents were paying school fees in the pre-treatment period, reading Nyanga excellently, speaking Nyanga excellently, reading English excellently, speaking English excellently, reading Nyanga well, speaking Nyanga well, reading English well, and speaking English well. Standard errors are heteroskedasticity robust.



Table 4: Effect of Negotiation Treatment on Daughters' Outcomes in the Investment Game

	(1)	(2)	(3)	(4)
	Daughter Total	Daughter Total	Daughter Total	Daughter Total
Negotiation	-0.068 (0.234)	-0.537* (0.306)	-0.576 (0.373)	-0.606 (0.412)
Safe Space	-0.406* (0.240)	-0.524* (0.308)	-0.362 (0.379)	-0.520 (0.410)
Communication	0.792*** (0.196)	0.364 (0.343)	0.366 (0.347)	0.511 (0.509)
Communication × Negotiation		0.954** (0.478)	0.952** (0.481)	1.027 (0.688)
Communication × Safe Space		0.239 (0.484)	0.236 (0.487)	0.552 (0.700)
Word Game			-0.075 (0.333)	0.066 (0.436)
Word × Negotiation			0.084 (0.464)	0.150 (0.606)
Word × Safe Space			-0.330 (0.480)	0.001 (0.616)
Communication × Word Game				-0.285 (0.680)
Communication × Word Game × Negotiation				-0.143 (0.929)
Communication × Word Game × Safe Space				-0.681 (0.971)
Ethnicity FE	Y	Y	Y	Y
SES Controls	Y	Y	Y	Y
School FE	Y	Y	Y	Y
Number of observations	1,219	1,219	1,219	1,219
Adjusted R <sup>2</sup>	0.035	0.037	0.036	0.036

This table reports the effects of the negotiation treatment on daughters' outcomes in a lab-in-the-field investment game. In the investment game, parents decided how many tokens to send to daughters, and coins sent to daughters were doubled (plus a random component). Daughters then decided how many tokens to return to guardians. In the communication treatment, daughters were allowed to communicate with guardians before guardians sent the tokens. In the word game treatment, the tokens were only doubled if the girl had found at least half the words in a word game. Socioeconomic controls consist of controls for both parents alive, lives with biological dad, lives with biological mom, lives with mom and dad, parents were paying school fees in the pre-treatment period, reading Nyanga excellently, speaking Nyanga excellently, reading English excellently, speaking English excellently, reading Nyanga well, speaking Nyanga well, reading English well, and speaking English well. Standard errors are heteroskedasticity robust.

Table 5: Effect of Negotiation on Outcomes in Administrative Data

	(1) Paid All Fees	(2) Took National Exam	(3) Average Score	(4) Attendance Rate	(5) Enrollment Rate	(6) Ever Pregnant	(7) Human Capital Index	(8) Full Index
Negotiation	0.013 (0.024)	0.013 (0.011)	0.062 (0.040)	0.008 (0.007)	0.022 (0.014)	-0.008 (0.009)	0.047** (0.023)	0.042* (0.022)
Safe Space	0.007 (0.024)	0.009 (0.011)	0.017 (0.042)	0.006 (0.007)	0.025* (0.014)	-0.009 (0.009)	0.035 (0.023)	0.033 (0.023)
Information	-0.025 (0.019)	-0.005 (0.009)	0.012 (0.033)	0.001 (0.006)	-0.009 (0.012)	-0.001 (0.007)	-0.012 (0.019)	-0.013 (0.018)
School FE	Y	Y	Y	Y	Y	Y	Y	Y
Ethnicity FE	Y	Y	Y	Y	Y	Y	Y	Y
SES Controls	Y	Y	Y	Y	Y	Y	Y	Y
Number of observations	2,050	1,996	1,945	2,093	2,122	2,122	1,894	1,894
Adjusted R <sup>2</sup>	0.124	0.028	0.191	0.384	0.094	0.028	0.177	0.163

This table reports estimates of the effect of the negotiation, safe space, and information experimental treatments on outcomes collected in the administrative data. In column (1), the outcome is an indicator variable equal to 1 if parents paid 9th grade school fees and 0 otherwise. In column (2), the outcome is an indicator variable equal to 1 if the student took the national exam at the end of grade 9. In column (3), the outcome is the student's average grade on required school subjects. In column (4), the outcome is the students' average post-treatment attendance rate in grades 8 and 9. In column (5), the outcome is the student's average enrollment rate in term 3 of grade 8 and terms 1 and 2 of grade 9. In column (6), the outcome is an indicator variable equal to 1 if the student is ever observed to be pregnant in the post-treatment period. In column (7), the outcome is a human capital index constructed by standardizing each of the outcomes in columns 1-5 and taking their average and in column (8), the outcome is the full index, which includes pregnancy as well. Socioeconomic controls consist of controls for both parents alive, lives with biological dad, lives with biological mom, lives with mom and dad, parents were paying school fees in the pre-treatment period, reading Nyanga excellently, speaking Nyanga excellently, reading English excellently, speaking English excellently, reading Nyanga well, speaking Nyanga well, reading English well, and speaking English well. The standard errors are heteroskedasticity robust.

Table 6: Effect of Negotiation on Girls' Outcomes in the Investment Game Sample

	(1) Paid All Fees	(2) Took National Exam	(3) Average Score	(4) Attendance Rate	(5) Enrollment Rate	(6) Ever Pregnant	(7) Human Capital Index	(8) Full Index
Negotiation	0.020 (0.028)	0.031*** (0.012)	0.057 (0.045)	0.012* (0.007)	0.038** (0.016)	-0.017* (0.010)	0.060** (0.026)	0.057** (0.025)
Safe Space	0.024 (0.028)	0.013 (0.013)	0.016 (0.047)	0.003 (0.008)	0.031* (0.016)	-0.012 (0.011)	0.042 (0.026)	0.040 (0.027)
Information	-0.048** (0.023)	-0.017* (0.009)	0.014 (0.037)	-0.001 (0.006)	-0.029** (0.013)	0.013 (0.008)	-0.025 (0.021)	-0.025 (0.020)
Ethnicity FE	Y	Y	Y	Y	Y	Y	Y	Y
School FE	Y	Y	Y	Y	Y	Y	Y	Y
SES Controls	Y	Y	Y	Y	Y	Y	Y	Y
Number of observations	1,494	1,458	1,431	1,499	1,521	1,521	1,394	1,394
Adjusted R <sup>2</sup>	0.110	0.054	0.202	0.418	0.100	0.035	0.189	0.174

This table reports estimates of the effect of the negotiation, safe space, and information experimental treatments on outcomes collected in the administrative data. The sample is restricted to girls who appeared in the midline survey. In column (1), the outcome is an indicator variable equal to 1 if parents paid 9th grade school fees and 0 otherwise. In column (2), the outcome is an indicator variable equal to 1 if the student took the national exam at the end of grade 9. In column (3), the outcome is the student's average grade on required school subjects. In column (4), the outcome is the students' average post-treatment attendance rate in grades 8 and 9. In column (5), the outcome is the students' average post-treatment attendance rate in grades 8 and 9. In column (6), the outcome is the student's average enrollment rate in term 3 of grade 8 and terms 1 and 2 of grade 9. In column (7), the outcome is a human capital index constructed by standardizing each of the outcomes in columns 1-5 and taking their average and in column (8), the outcome is the full index, which includes pregnancy as well. Socioeconomic controls consist of controls for both parents alive, lives with biological dad, lives with biological mom, lives with mom and dad, parents were paying school fees in the pre-treatment period, reading Nyanga excellently, speaking Nyanga excellently, reading English excellently, speaking English excellently, reading Nyanga well, reading English well, and speaking English well. The standard errors are heteroskedasticity robust.

## 6 Appendix Tables

Table A1: Effect of Negotiation Treatment on Knowledge of Negotiation

	(1)	(2)	(3)	(4)
	Question 1	Question 2	Question 3	Combined Questions
Negotiation	0.739*** (0.095)	0.777*** (0.114)	0.768*** (0.133)	0.786*** (0.080)
Safe Space	-0.066 (0.086)	-0.170 (0.115)	-0.115 (0.134)	-0.095 (0.079)
Ethnicity FE	Y	Y	Y	Y
SES Controls	Y	Y	Y	Y
School FE	Y	Y	Y	Y
Number of observations	1,523	1,569	1,569	1,515
Adjusted R <sup>2</sup>	0.083	0.071	0.062	0.129

This table reports the effect of the negotiation treatment on girls' understanding of negotiation skills in the midline survey. Girls were asked how they would apply negotiation skills in a scenario that the curriculum had not directly discussed. The scenario asked a girl to negotiate with her sister over who would watch their brother when she has to study for a test. The vignette was designed to test how girls would apply their negotiation skills rather than whether they had learned the terminology from the course. Performance on each of three open-ended questions was blindly graded between 1 and 7, with 7 indicating the highest score. Socioeconomic controls consist of controls for both parents alive, lives with biological dad, lives with biological mom, lives with mom and dad, parents were paying school fees in the pre-treatment period, reading Nyanga excellently, speaking Nyanga excellently, reading English excellently, speaking English excellently, reading Nyanga well, speaking Nyanga well, reading English well, and speaking English well. The standard errors are heteroskedasticity robust.

Table A2: Association Between Girls' Characteristics and Attending the Investment Game

	<u>Likelihood in Investment Game</u>	
	Coeff.	SE
Negotiation	0.024	0.020
Safe Space	0.015	0.020
Both Parents Alive	0.049**	0.022
Live With Bio Dad	0.051***	0.019
Live With Bio Mom	0.110***	0.022
Live With Mom and Dad	0.082***	0.019
Parents Pay Fees	0.044*	0.023
Read Nyanja Excellently	0.053***	0.019
Speak Nyanja Excellently	0.029	0.019
Read English Excellently	0.042**	0.021
Speak English Excellently	0.035*	0.020
Age	-0.024***	0.007
Read Nyanja Well	0.058***	0.020
Speak Nyanja Well	0.017	0.031
Read English Well	0.068**	0.033
Speak English Well	0.037	0.024
Bride Price	0.022	0.022

This table reports the association between different daughter characteristics and an indicator variable for whether the daughter attended the investment game. Each row of the table is a regression of the indicator variable for appearing for the game on a different characteristic, controlling for school fixed effects. The standard errors are heteroskedasticity robust.

Table A3: Selection-Corrected Estimates of the Effect of Negotiation in the Midline-Only Sample

	(1) In Midline	(2) Paid All Fees	(3) Took National Exam	(4) Average Score	(5) Enrollment Rate	(6) Ever Pregnant	(7) Human Capital Index	(8) Full Index
Rained	-0.086*** (0.029)							
Negotiation	0.016 (0.026)	0.051* (0.031)	0.030** (0.013)	0.072 (0.050)	0.029* (0.017)	-0.014 (0.011)	0.079*** (0.028)	0.074*** (0.027)
Safe Space	0.059** (0.025)	0.030 (0.031)	0.009 (0.014)	0.007 (0.051)	0.038** (0.017)	-0.006 (0.012)	0.042 (0.028)	0.038 (0.029)
School FE	Y	Y	Y	Y	Y	Y	Y	Y
Ethnicity FE	Y	Y	Y	Y	Y	Y	Y	Y
SES Controls	Y	Y	Y	Y	Y	Y	Y	Y
Number of observations	1,560	1,534	1,514	1,491	1,560	1,560	1,458	1,458
Adjusted R <sup>2</sup>	0.029							

This table reports estimates of the effect of the negotiation and safe space experimental treatments on outcomes collected in the administrative data. The sample is restricted to girls who appeared in the midline survey, and estimates have been corrected for selection using the methodology of Heckman (1979). An indicator variable for whether it rained on the day girls were assigned to come to the midline survey is used to predict whether girls showed up for the survey. Column (1) estimates the effect of the instrument on whether a girl appears in the midline. The remaining columns report the selection-corrected estimates of the negotiation and safe space effects. In column (2), the outcome is an indicator variable equal to 1 if parents paid 9th grade school fees and 0 otherwise. In column (3), the outcome is an indicator variable equal to 1 if the student took the national exam at the end of grade 9. In column (4), the outcome is the student's average grade on required school subjects. In column (5), the outcome is the students' average post-treatment attendance rate in grades 8 and 9. In column (6), the outcome is the student's average enrollment rate in term 3 of grade 8 and terms 1 and 2 of grade 9. In column (7), the outcome is an indicator variable equal to 1 if the student is ever observed to be pregnant in the post-treatment period. In column (8), the outcome is a human capital index constructed by standardizing each of the outcomes in columns 1-5 and taking their average and in column (9), the outcome is the full index, which includes pregnancy as well. Socioeconomic controls consist of controls for both parents alive, lives with biological dad, lives with biological mom, lives with mom and dad, parents were paying school fees in the pre-treatment period, reading Nyanga excellently, speaking Nyanga excellently, reading English excellently, speaking English excellently, reading Nyanga well, speaking Nyanga well, reading English well, and speaking English well. The standard errors are heteroskedasticity robust.