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ADVANCING THE AGENCY OF ADOLESCENT GIRLS

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ABSTRACT

Can life skills be taught in early adolescence? Using a clustered randomized control trial, this study analyzes the impact of a school-based life skills intervention in grades six and seven within a sample of 2,459 girls in Rajasthan, India. Our evidence suggests that the intervention is successful in developing stronger life skills including increased agency, more equitable gender norms, and stronger socio-emotional support. Girls also drop out of school at a lower rate: we observe an approximately 25 percent decline in dropout that persists from seventh grade through the transition to high school.

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A randomized controlled trials registry entry is available at <https://doi.org/10.1257/rct.1046-3.0>
All Project Related Documents are available at <https://sites.dartmouth.edu/edmonds/gep/>

1 Introduction

Throughout the developing world, women and girls face severe limitations on their ability to exercise agency in important choice domains, including the pursuit of education and economic self-sufficiency, the choice of when to marry and have children, and the choice of how to interact with the wider world. Limitations on agency have remained stubbornly persistent even as other dimensions of women’s and girls’ welfare have shown rapid improvement in recent decades. For example, in this study’s location of Rajasthan, India, net primary school enrollment rates for girls increased from 25 percent in 1983 to 85 percent in 2009.¹ However, baseline data collected for this evaluation documents that over 90 percent of adult women in our respondents’ households state that a wife should always obey her husband, and, at an average age of eleven, 17 percent of our subjects are married, suggestive of persistent and severe limitations on female agency within the household.

This study explores whether it is possible to increase girls’ agency and stimulate the development of more equitable gender norms in a setting of intense gender disadvantage and, through these attitudinal changes, increase girls’ schooling attainment. We utilize a randomized controlled trial to evaluate a life skills curriculum and mentoring program in a sample of 2,459 adolescent girls in 119 schools in the Ajmer district of Rajasthan, India. The intervention of interest is the Girls’ Education Program (GEP), a program encompassing twice-monthly life skills classes conducted in school as well as group mentoring sessions for girls.² The program is delivered by social mobilizers, women from the area who have completed secondary school and who are managed, trained and deployed by our partner non-governmental organization, Room to Read (RtR). The stated objective of GEP is to enhance girls’ life skills and increase secondary school completion; the intervention targets girls beginning in grade six, and was newly rolled out to 60 randomly selected treatment schools in 2016.

We examine the impact of GEP using an intent-to-treat empirical strategy. 96 percent of girls offered treatment attended at least one life skills class, and 85 percent remained

¹These represent the authors’ calculations of school attendance rate from the National Sample Survey for girls in Rajasthan age 6 to 12 inclusive. 2009 is the most recently available NSS thick round.

²The program’s definition of mentoring is not what we expect most readers to have in mind. Mentoring sessions are small group discussions around topics covered in the life skills classes, principally led by students.

engaged through grade seven. The majority of our analyses are based on surveys conducted with girls and their household members following grade seven, after two full years of program exposure; at that point, we have data on 2,435 girls relative to the original sample of 2,459 randomized into treatment, an attrition rate of less than one percent.

Our empirical analysis demonstrates that random assignment to GEP generates a significant enhancement in girls' reported life skills six months following their final life skills class in seventh grade. We document improvements in future planning, including reporting concrete goals for the future, and effectively articulating plans to achieve those goals. We see shifts in gender norms where girls express more desire for parity in the treatment of children regardless of gender, and an increase in empowerment in which girls report direct agency over important life decisions. There is also evidence of enhanced social-emotional support: treatment girls have more friends to rely on, identify more ways in which they rely on these friends, and spend 25 percent more time socializing. These experimental effects are corroborated by assessments by parents and enumerators, suggesting that the shifts in life skills were observable to adults interacting with girls exposed to GEP. Moreover, while it is possible that the observed shift in life skills responses could partially reflect treated girls learning the socially desirable answers (social desirability bias), we do not observe larger treatment effects on average in girls prone to give socially desirable answers.

These shifts in non-cognitive skills are associated with a substantial reduction in school dropout. In the endline survey conducted following seventh grade after two years of the program, we document a 30 percent reduction in dropout (equivalent to a decline of four percentage points) and a parallel increase in grade progression. We also utilize administrative records from schools that extend through the initiation of grade nine and find that the reduction in school dropout continues through the progression into high school, a frequent dropout point, and is usually around 25 percent in magnitude. While a large literature documents improvements in girls' education from a variety of material transfers such as uniforms (Duflo et al., 2015), bicycles (Muralidharan and Prakash, 2017), and cash (Dhaliwal et al., 2013; Fizbein et al., 2009; Baird et al., 2013), our findings are consistent with Ashraf et al. (2020) in highlighting that non-material interventions targeting underlying attitudinal barriers can in fact shift girls' enrollment in developing countries. This evidence contrasts

with research from the U.S. that generally does not find effects of adolescent life skills programs on dropout (Cunha et al., 2006; Levitt et al., 2016; Lavecchia et al., 2016).³

While assignment to treatment is associated with enhanced expression of life skills and a reduction in school dropout, there are many domains of the participating girls' lives that do not show any meaningful changes following exposure to GEP. The data do not reject the null hypothesis of no shifts in girls' attendance and time allocated to academic work, cognitive skills as measured by ASER tests administered at home, the probability of marriage, and engagement in labor inside or outside the home. Treatment and the resulting enhanced social support, sense of agency, and school progression do not seem to overcome all dimensions of disadvantage in these girls' young lives.

This paper contributes to several related bodies of research. First, it adds to the nascent literature on the feasibility of teaching life skills in poor country settings. Several studies focus on teaching one aspect of life skills using a focused strategy, such as negotiation (Ashraf et al., 2020) or gender attitudes (Dhar et al., 2018), or providing information on the value of education (Nguyen, 2008; Jensen, 2010), with success in communicating those targeted lessons. However, life skills are usually bundled when they are taught in school, as is common in guidance curriculums in higher income settings, and the context of delivery could be important in what students learn from the curriculum. Typically evaluations of multi-faceted life skills interventions are bundled with complementary interventions such as health and nutritional information or the provision of "safe spaces" (Buchmann et al., 2017; Bandiera et al., 2019, 2020). We document success in communicating a broad set of life skills in a school based program in a setting where it would be reasonable to be skeptical about teaching these lessons to girls given the broader socioeconomic context.

Second, it contributes to the growing literature on the importance of non-cognitive skills. In high income economies, there is a substantial body of evidence around the labor market value of the attributes the GEP attempts to develop (Heckman et al., 2006; Deming, 2017). There is some similar evidence from developing countries (e.g. Glewwe et al. (2017); Macours and Laajaj (2019)), but without a clear source of variation in non-cognitive skills. Our finding

³One related study, Carrell and Hoekstra (2014), does identify improvements in test scores and reduced behavioral problems among boys who receive access to school counselors in the US.

of a link between a life skills treatment and school enrollment is complementary to Ashraf et al. (2020), who offer an adapted two week Harvard Business School course in negotiation to eighth grade girls in Zambia and find sustained increases in enrollment. The GEP differs in its focus on a wide variety of life skills delivered in a classroom setting and in our context where the status of girls is such that it would be reasonable to question their ability to exercise life skills taught in the classroom.⁴ Our findings on the reduction in dropout with a school based life skills program contrast with Delavallade et al. (2017), evaluating an intervention also implemented in Rajasthan that targeted out of school girls with little effect.

Third, the paper contributes to the vast literature on intrahousehold decision-making in education. While that literature primarily focuses on spousal conflict over investments in education (Strauss and Thomas, 1995), increasing attention is being placed on the child’s agency in education. For example, Berry (2015) highlights the challenge parents face in getting children to take testing seriously, and Bursztyn and Coffman (2012) and Bursztyn et al. (2017) document that parents in Brazil face challenges in monitoring and incentivizing school attendance. The enrollment / dropout question is typically modeled as outside of the child’s sphere of control, but our results highlight that girls can influence choices around school enrollment. Our finding of a reduction in dropout without other measured changes in girls’ broader responsibilities in the household is consistent with the hypothesis that there is scope for gains in schooling without needing to fundamentally affect the economic organization of the household.

The paper proceeds as follows. Section 2 describes the setting and Section 3 describes the evaluation design and empirical strategy. Section 4 presents the empirical findings and Section 5 concludes.

⁴To highlight one metric, the World Economic Forum’s Gender Gap Index suggests that Zambia and Australia are at roughly the same level with respect to gender equity, with India much lower (Forum, 2020), and our study area of Rajasthan is among the most gender disadvantaged states in India, as measured by the prevalence of crimes against women (Mukherjee et al., 2001) and the skewness of the sex ratio (Oldenburg, 1992).

2 Background

2.1 Setting

This evaluation was conducted in Ajmer, Rajasthan in northwest India, a state that has been a focus of RtR programming in part because of persistent gender enrollment gaps. The programmatic rollout analyzed in this evaluation represented a substantial expansion; RtR was active in only four schools in Ajmer prior to this evaluation, entailing expansion to an additional sixty schools.

Data from the baseline survey (described in more detail in Section 3.1) can be used to characterize the sample. In Table 1, we compare the characteristics of households in the study sample to state- and country-level averages. In our sample, households include on average seven members, of whom four are children and two are girls. 67% of the sampled households are members of a caste group denoted as OBC, or Other Backward Class; 25% are members of a scheduled caste or scheduled tribe, and the remainder are members of general caste households. Mean land ownership is around six bighas, or approximately one hectare. Study sample households are notably larger and are more likely to be from historically disadvantaged castes/tribes compared to the average Rajasthani household, and their mean land holdings are only 25% of the state-level mean.

This is also a context characterized by relatively low levels of female educational and professional attainment. Among the mothers of the sampled girls, only about 20% reported any post-primary education or engagement in wage employment. More than 90% agreed that a wife should always obey her husband. Among girls in the study sample, 17% were already married when first surveyed, and 84% of girls reported working for pay at that time. Thus, girls in this setting appear to face a number of obstacles to future educational enrollment and academic achievement.

Additional household characteristics, including patterns of income-generating activities, are presented in Appendix Table A1.⁵ Among sample households, 53% reported primary dependence on wage employment, 22% on self-employment in agriculture, 8% on self-employment outside of agriculture, and 16% on casual labor outside of agriculture. Total household con-

⁵Appendix tables are available on the project website: <https://sites.dartmouth.edu/eedmonds/gep/>.

sumption in the last month averaged around 26,000 rupees or \$400.

2.2 Intervention

2.2.1 GEP during evaluation period

The Girls' Education Program (GEP) delivered by Room to Read (RtR) is a seven year program that begins in grade six and continues through secondary school. It has two primary goals: encouraging girls to successfully complete secondary school and developing life skills. Since 2007, more than 95,000 girls in nine countries have been enrolled in GEP.

There are two differences between the intervention as analyzed in this evaluation and the broader program. First, the primary data collection for this evaluation was conducted following only two years of program implementation, when the target sampled girls had completed grade seven rather than grade twelve. We will refer to this period (2016–2018) as the evaluation period. Second, the evaluation focuses on a reduced intervention design including only deployment of social mobilizers (“SMs”) who deliver life skills classes and mentoring. The full program additionally includes material support and parent and community engagement, but these components were not implemented in Ajmer during the evaluation period.

GEP life skills training is delivered in twice-a-month sessions conducted by SMs during school hours, utilizing a curriculum developed by RtR. In each treatment school, 16 life skills classes were conducted in both grades six and seven. The curriculum is grade-based and emphasizes ten life skills: self-confidence, expressing and managing emotions, empathy, self-control, critical thinking, decision-making, perseverance, communication, relationship building, and creative problem solving. The intervention also focuses on applying these skills to simulations involving time management, education, physical protection and rights, health, and community involvement. It evolves as girls age and regularly revisits topics, adapting to stay age appropriate and relevant. Figures A1 and A2 contain histograms of the number of life skills classes attended by subjects in grade six and seven, respectively. While there was a growth in children who attended no classes between sixth and seventh grade, overall attendance patterns are similar across both grades with complete attendance the mode in both years.

While attending life skills classes, girls may miss some lessons in the primary classroom, though this varies by school. In some schools, the boys had recess while the girls attended life skills classes; in some schools, instruction continued. Any class time lost to life skills sessions would not be expected to significantly impact academic performance given the limited number of annual GEP classes, each of only an hour’s duration, and existing evidence on the low returns to instructional time in Indian schools (see, for instance, Banerjee et al., 2007).

In addition to life skills sessions, the intervention entails twice-a-month small group mentoring sessions proctored by the SM. In practice, these mentoring sessions served as student-led discussion sections for the life skills lessons taught by the SM. SMs were trained for these mentoring sessions to assist girls in identifying more personal difficulties in their lives related to the life skills lessons and to help them to develop more personalized strategies to cope with these difficulties.⁶

40 SMs were employed full-time as a part of this intervention during the two-year evaluation period, with a maximum of 33 employed at any one time.⁷ The typical SM is responsible for two schools (mean of 1.95). GEP aims to have 50 girls per SM. All the SMs (33 years old on average) had completed both secondary and post-secondary education, and all were from Ajmer district; within the district, 58% were from urban areas. Prior to the launch of the intervention, SMs received 14 days of training, and an additional eight days of training are provided at the start of each subsequent school year. Every eight SMs are supervised by a program assistant, and each SM was observed quarterly to assess the quality of her life skills session and to provide her with support to improve session delivery.

2.2.2 GEP post-evaluation period

In the original design, our partner only had funding for the GEP through grade seven, and thus the endline survey would correspond to the conclusion of the program. However, GEP has always been designed as a project continuing from sixth to twelfth grade, and our partner

⁶Earlier GEP descriptions presented these mentoring sessions differently. The description presented here is updated based on the authors’ experiences from talking with students and SMs in Ajmer about their actual experiences in the mentoring sessions. We also note that SMs were referred to as “female role models” in previous project documents, including our published analysis plan.

⁷Of the 40 SMs involved in this evaluation, seven left at some point over the two years and were replaced within three months. One was released for poor performance, and others left for personal reasons such as marriage or migration.

was successful in attaining programmatic funding to continue the GEP in treated schools beyond the period of study. They did not begin treating the control schools, and did not extend the program to other, non-study cohorts within treated schools.

However, in 2019 after the evaluation period, RtR added financial support to the GEP in Ajmer. A needs assessment was conducted in fall 2018, and 268 girls began receiving material support in 2019. Material support consisted of in-kind transfers of school supplies, valued at an estimated 500 rupees or approximately \$7.⁸ The addition of material support is not relevant for our primary outcome measures collected in the endline survey, as the survey was conducted prior to the rollout of the material support and the delivery of any associated information (students did not anticipate this future source of material support). However, this change is relevant for supplementary analysis conducted using administrative data, as we also analyze data available post-endline, for eighth and ninth grade.

2.3 Hypotheses

This evaluation examines the impact of GEP on two primary sets of outcomes, non-cognitive skills and school dropout. We also explore additional effects on ancillary outcomes: attendance and time allocation, academic achievement, child marriage and child labor. These hypotheses were pre-specified in an analysis plan that also included detailed definitions of all variables of interest.

1. Hypothesis 1: GEP has no effect on life skills.

The GEP directly aims to strengthen girls' life skills, and relevant outcome measures include survey-based measures posed to girls and parents, demonstrating tasks, and an enumerator assessment. Broadly, the questions focus on future planning, gender norms, aspirations, empowerment, self-esteem, freedom of movement, and socio-emotional support. We construct normalized indices for these domains. In general, previous literature has argued that interventions targeting non-cognitive skills can generate significant effects in adolescence given an overall high level of malleability of non-cognitive skills

⁸Preparation for assessing need for financial support began after the completion of the endline survey for all respondents other than a small number who had migrated (and was conducted by Room to Read, not the research team).

(Heckman et al., 2006), and evidence from India suggests an intervention focused on reshaping gender attitudes for adolescents had a significant effect in increasing support for gender equality (Dhar et al., 2018).

2. Hypothesis 2: GEP has no effect on school dropout and other academic outcomes.

Part of the purpose of teaching girls life skills is to encourage engagement with school, and the key outcome measure relevant to this hypothesis is school dropout. Previous literature suggests that interventions targeting non-cognitive skills, negotiating skills or educational expectations can generate shifts in school enrollment (as well as attendance and cognitive skills) (Ashraf et al., 2020; Nguyen, 2008; Jensen, 2010).⁹ It is also important to note that the relationship between a skills-building intervention and dropout is more plausible in this setting given that financial barriers to enrollment are less salient; both at baseline and endline, the modal household pays no school fees for their daughters' attendance.

3. Hypothesis 3: GEP has no ancillary effects on other academic outcomes, child marriage and child labor.

Life skills education may shift a range of secondary outcomes. The intervention itself may directly induce girls or their families to attend school more, or change their choices around child marriage or child labor; in addition, if there are shifts in non-cognitive skills or school progression, these effects may generate additional indirect effects in other dimensions. In general, the literature on effects of interventions of this form on child marriage and labor is limited. One recent paper found an intervention targeting equitable gender attitudes among adolescents shifted time allocation for boys, but not for girls (Dhar et al., 2018). Ashraf et al. (2020) finds that teaching negotiation skills to girls in Zambia led to enhanced human capital outcomes across a range of dimensions.

⁹By contrast, Holmlund and Silva (2014) find that an intervention targeting non-cognitive skills did not enhance cognitive skills.

3 Empirical Strategy

3.1 Evaluation Design

This evaluation is a clustered randomized trial with an allocation rate that was intended to be 1:1, conducted in 119 schools in Ajmer district in Rajasthan between 2015 and 2019. Given that GEP is delivered at the school level to all girls enrolled in the target grades of interest, a cluster randomization is appropriate.

Implementation of GEP was initiated in July 2016 at the beginning of the school year. At the time of design, RtR committed to running GEP in treated schools through the school year ending in the spring of 2018, with the goal of continuing GEP in these schools past that date if possible. Again, for the purposes of this analysis, we define the evaluation period as 2016 to 2018, corresponding to grades six and seven. As noted above, GEP did in fact continue post-2018 with the addition of material support, and accordingly we also report additional results analyzing administrative data from this post-evaluation period. Figure 1 summarizes the evaluation timeline.

This evaluation draws on a pre-analysis plan registered prior to the baseline survey (Edmonds et al., 2016). A detailed final evaluation report (Edmonds et al., 2019) fully populated the pre-analysis plan without deviations, and is publicly available on-line.¹⁰ This paper draws on this plan and also supplements it, noting where relevant that some analysis was not pre-specified.

3.1.1 Randomization

The selection of schools eligible for inclusion in this evaluation was undertaken between August and November 2015. A team of enumerators visited all schools in Ajmer that included girls enrolled in the relevant grades (six through eight) and collected information about school facilities, staffing, and enrollment. This information was also linked to administrative records about school facilities and enrollment provided by state educational authorities.

The evaluation team and RtR then jointly identified criteria that would determine whether or not a school was eligible for inclusion in the evaluation. These criteria included the re-

¹⁰The report can be found at <https://sites.dartmouth.edu/edmonds/gep/>.

quirements that the schools enrolled girls in grades six through eight, did not have any other non-governmental organizations providing life skills curricula to students, and had a classroom in acceptable condition in which a life skills class could take place. The evaluation team then identified the narrowest possible range of enrollments that would yield a sample of schools enrolling 2500 girls in total; the objective was to have a relatively homogeneous sample of schools in terms of size. This yielded the requirement that the school enrolled between 16 and 32 girls in grade five.

Using information collected in the school survey, the research team created a normalized school quality index, composed of measures of teacher experience, teachers' educational attainment, and classroom and school infrastructure quality. Schools above the median of the index were included in the "high quality" stratum, with the remaining in the "low quality" stratum. School assignment to treatment was conducted separately for the two strata. Randomization was conducted in Stata by the research team.¹¹

In order to identify the target sample of girls, a team of enumerators visited each school between December 2015 and January 2016 to obtain a roster of all girls enrolled in grade five. All female students who were currently enrolled in grade five in these schools as of January 2016 (2,543 female students in total) were eligible for inclusion in the evaluation.

3.1.2 Data Collection and Processing

The selection of schools and randomization process was conducted in fall 2015. Baseline data was collected between February and June 2016 prior to the launch of the intervention; a household survey was administered to the child's caregiver, and a direct interview of the girl potentially eligible for treatment was conducted. All data collection was conducted electronically in SurveyCTO. Details regarding data collection and consent processes are provided in Section A.1 in the Appendix.

¹¹Following the initiation of data collection, it was discovered that three of the schools selected to be in the sample in fact did not enroll girls past grade five; for the upper-level grades, these were single-sex schools including only boys. During the sample selection process, these schools were incorrectly designated as including higher-grade girls as well. These three schools (two treatment and one control school) were dropped, and an additional three schools were selected to replace them, constituting an additional third strata. The replacement process for these schools entailed identifying 12 schools that met the eligibility criteria if the enrollment window was slightly lowered to 15. Three schools were randomly chosen to join the sample among the 12, and of these, two were randomly assigned to the treatment group.

Following the baseline survey, the sample girls were revisited for tracking surveys in December 2016 and December 2017. The endline survey was conducted between July 2018 and December 2018. Baseline and endline surveys included both a household module and a child module for every girl in the sample, while only girls were surveyed for each of the two shorter tracking surveys. Consent was obtained separately for each subsequent survey.

3.1.3 Administrative Data Collection

In addition, administrative records from schools and RtR were also collected throughout the evaluation period and post-endline through July 2019. Administrative data from schools include enrollment and reported grades. It should be noted that in the majority of cases, our test score records are drawn from gradebooks where teachers hand copied student marks; accordingly, the potential for measurement error is non-trivial, a challenge we explore further in the results presented in Section 4.

Two points should be noted about the administrative data collection. First, given that its availability was not foreseen *ex ante*, this analysis was not pre-specified. Second, given the post-endline data collection, administrative data is available beyond the core evaluation period: grades are available through the conclusion of grade eight, and dropout information is available through early in grade nine.¹²

3.1.4 Evaluation Sample

At baseline, the survey team visited every one of the 2,543 girls on the enrollment lists provided by sampled schools; the survey was conducted before students or their families were informed about the life skills education program. Ultimately, any girl on the enrollment lists with either a completed household or child survey is considered to be enrolled into the evaluation. (In some cases, there are multiple sample girls in the same household.) Out of the 2,543 female students on the grade five enrollment lists, a total of 2,459 girls from 2,382 households were enrolled into the evaluation sample. Thus the evaluation includes 97% of

¹²In addition, administrative data from RtR report girls' participation in the intervention, including life skills sessions and mentoring. The research team also oversaw qualitative data collection at each phase of the evaluation, including in-depth interviews with girls in a subset of treatment schools as well as their caregivers.

the girls in the sampled school rosters.

However, not every girl who was part of the evaluation sample was interviewed at baseline; there were cases in which only the household survey was completed, as well as a smaller number of cases in which only the girl survey was conducted.¹³ There were 2,353 household surveys conducted at baseline, which provide parent-reported data for 2,427 girls, and 2,399 individual girl surveys conducted at baseline. A flow chart summarizing the sample of girls surveyed and their inclusion in different evaluation phases can be found in Figure A3. There were 84 children who were on the school enrollment lists but excluded from the evaluation because of failure to complete any component of the baseline survey.¹⁴

Summary statistics for the child outcomes mapped out in the evaluation design plan are provided in Appendix Tables A2 and A3. 3% of the sampled children had already dropped out of school at baseline. However, conditional on enrollment, 89% attended school in the past week, and girls attended 79% of the days the school was open. While the modal girl in our study is at an appropriate age for grade 5 (age 10-11), approximately a third of the sampled girls were older. 17% of the sampled girls were married at baseline. 87% of respondents engaged in child labor during the twelve months before the baseline survey, and 64% of respondents engaged in hazardous child labor. On average, children were not working full time.

Attrition The analysis sample includes all sampled girls represented in the endline survey, conducted between July 2018 and December 2018. At endline, 2,387 child surveys and 2,358 household surveys were conducted. There were 48 girls (in 47 households) for whom a

¹³In addition, 16 girls living in 14 separate households from one primary school were omitted from the baseline in error. A different set of students enrolled in an alternative, adjacent primary school that is outside the evaluation sample were surveyed in their place. Given that these girls were not intended for inclusion in the sample, their data was subsequently dropped, and the correct set of girls were surveyed from the first tracking survey forward. These girls are considered to be enrolled in the evaluation, though they were not surveyed at baseline.

¹⁴Of these 84 cases, 34 were from households that had permanently migrated prior to the date on which the survey team visited the community — a fact reported by neighbors or other community informants — or simply could not be located. 33 were excluded because they did not provide consent. The reasons for non-inclusion for the remaining girls varied but included illness or death of the child (4); parents who were uniformly unavailable during survey hours and thus could not be surveyed or provide consent for the child to be surveyed (3); and cases in which the child was away from home and parents declined to participate in her absence (10).

household survey was conducted without a child survey.¹⁵ There was also one girl surveyed whose household did not complete an endline survey. In addition, 24 girls in 23 different households attrited fully at endline with no data collection completed.¹⁶ Attrition patterns are summarized graphically in Figure A4. Within the sample of 2459 girls randomized, we have some endline information for 2435 girls, generating an attrition rate below 1 percent.

Attrition does not appear to be a source of bias in our intent to treat analysis. Among the 24 girls who fully attrited, 15 are from the control arm and 9 are from the treatment arm, corresponding to attrition rates of 0.7% and 1.2% in the treatment and control groups, respectively; the probability of full attrition is not significantly correlated with treatment, conditional on strata fixed effects ($\beta=-.004$, $p=.362$). The girls' survey is used in many of the life skills indexes, and 72 girls did not complete it. 45 are from the control arm and 27 are from the treatment arm, corresponding to attrition rates of 3.6% and 2.2%, respectively; this difference in attrition on the girls' survey is significant at the 10 percent level ($\beta=-.014$, $p=.087$). In the Appendix, we conduct a series of bounding exercises to evaluate the sensitivity of our findings to attrition. Attrition does not substantively affect the empirical results under reasonable assumptions regarding the distribution of missing values.

3.2 Statistical Model

To identify the impacts of assignment to treatment, we estimate the following pre-specified regression. Each outcome Y_{ist} for child i in school s measured at time t is regressed on a dummy for treatment assignment T_s and randomization strata fixed effects μ_s . The specification also includes a vector of age dummies γ_i , a vector of dummies λ_i capturing the most important type of employment in the household at baseline, the lagged (baseline) value of the relevant outcome $Y_{is,t-1}$, and additional controls for baseline variables where imbalance was detected between the treatment and control households, reported in Tables A1 through

¹⁵In 14 cases, consent was declined for the girl survey. 19 girls had migrated away from their households permanently; two had migrated temporarily and had not returned by the point at which the survey concluded. Four child surveys were not completed due to the death of the child, and nine child surveys were not completed due to child disability. In these nine cases, the child was similarly not surveyed at baseline, but a household survey was completed at both baseline and endline.

¹⁶In 10 cases, the household had migrated and could not be reached for follow-up. Consent was declined in 12 cases. In one case, a partial survey was completed but the household declined to continue due to limited time, and in one case, no information was available about the household's whereabouts.

A3 and discussed in more detail below. These baseline variables are denoted $\xi_{is,t-1}$.¹⁷

$$Y_{ist} = \beta_1 T_s + \beta_2 Y_{is,t-1} + \beta_3 \xi_{is,t-1} + \mu_s + \gamma_i + \lambda_i + \epsilon_{ist} \quad (1)$$

We also estimate two simpler specifications, similarly pre-specified, to evaluate the robustness of these results: one specification including only the treatment dummy and strata fixed effects, and one specification including only the additional control variables γ_i , λ_i , and $Y_{is,t-1}$. These additional results are reported in the Appendix, but we focus on results from equation (1) in order to maximize precision (we never reject the null hypothesis of no change in treatment effects associated with the added controls).

In all specifications, standard errors are clustered at the school level, yielding 119 clusters. Given that there are a large volume of hypotheses tested regarding life skills, false discoveries (type 1 errors) are probable. Accordingly, for all life skill measures, we present false discovery rate adjusted q-values computed across all life skill outcomes using the same specification (Benjamini and Hochberg, 1995). For completeness, we also present false discovery rate adjusted q-values computed separately for dropout and other academic outcomes as well as for ancillary outcomes, although our original analysis plan only specified q-values for the life skills questions.

3.2.1 Balance

We pre-specified tests for balance from randomization across a wide variety of variables, and accordingly given 61 individual hypothesis tests, there is ample scope for type 1 errors. The results are reported in Tables A1 through A3. In the column labeled “Difference”, we report the coefficients from a simple regression in which the characteristics of interest are regressed

¹⁷For the family of outcomes corresponding to school dropout and other academic outcomes (Hypothesis 2), age at enrollment and maternal education are additionally included as control variables in equation (1); this methodology was pre-specified in the analysis plan. If the baseline control variable is missing because either the household or child survey was not conducted for a particular girl at baseline, the missing value is coded as zero. Additional dummy variables equal to one for observations with missing values are included for each baseline covariate. For non-cognitive outcome measures added at endline (the Rotter locus of control, the perceived stress index, the Rosenberg self-esteem index), we control for lagged values of overall life skills indices. For the ASER test scores added at endline, we control for baseline school dropout status, attendance, grade progression, time spent studying, hours spent on school and grades in grade five as reported in administrative data. These methodologies for addressing missing baseline values were all pre-specified in the evaluation design plan addendum.

on a treatment indicator and strata dummies, clustering standard errors at the school. False discovery rate adjusted q-values using the same specification are reported in the final column (Benjamini and Hochberg, 1995).

Under a true null of no difference between treatment and control, we expect six false rejections at 10 percent, and observe eight such rejections; similarly, we expect three rejections of the null at the five percent level, and observe exactly three. The smallest false discovery rate is 23 percent, and seven of the eight differences that are significant at the ten percent level have false discovery rates above 50 percent. For the 19 household characteristics reported, we also estimate a seemingly unrelated regression (SUR) specification that tests the joint null hypothesis that the treatment coefficient is equal to zero across all characteristics, and fail to reject the null ($p = .138$). That same SUR test applied to all of the child characteristics rejects the null of no joint difference ($p = .003$). This rejection is driven by the child work related variables; however, only the indicator for whether child works has a p-value below 0.05 and a false discovery rate below 25 percent (it is 23 percent). Given the high false discovery rates, we do not think baseline imbalance poses a significant risk of bias, but our preferred specification controls for all of the variables with individual differences significant at 10 percent. In practice, these controls add precision, and, as noted, we never reject the null hypothesis of no change in treatment effects with the added controls.

4 Findings

4.1 Life Skills

The GEP program aims to promote the agency of girls by teaching them life skills, and even in our setting with extreme gender disadvantage, we document substantial and statistically significant enhancements in life skills for girls assigned to treatment. We fielded 259 individual questions related to life skills measurement in the endline survey in addition to four demonstration tasks.¹⁸ In our analysis plan, we pre-specified how these questions would be combined into indices of life skills corresponding to our partner’s conceptualization of cat-

¹⁸The principal focus of the first year of this project was on piloting different ways to measure life skills for both our questionnaires and our partner’s internal global monitoring and evaluation efforts.

egories of life skills. The primary findings discussed here are based on estimating equation (1) and summary findings are presented in graphical form in Figure 2, with the corresponding complete coefficients presented in Tables 2 and 3.¹⁹ We also present some illustrative regression results for individual sub-component questions of indices when useful, and these results are reported in Tables A8 through A10 in the Appendix.

Girls assigned to treatment show improvements in future planning, as evident in Column (1) of Panel A in Table 2. The future planning index is constructed around a series of questions that ask girls about concrete goals they have for the future as well as their motivation for thinking about these goals and developing a plan to achieve them; treatment leads girls to express these goals and the steps to achieving them more completely. We also observe that treatment girls express more positive gender norms (Column (2)). The gender norms index consists of a series of opinions offered on statements that reflect different treatment of boys and girls. Relative to girls in the control group, treatment girls feel that boys and girls should be treated more similarly. Interestingly, while girls show improvements in future planning and articulated gender norms, they do not express greater aspirations about what type of life or career they will have in the future relative to the control sample (Column (3)).

Curiously, treatment girls report more negative marriage expectations with treatment (Column (4), Panel A of Table 2). The shift in the marital expectations index is driven primarily by a shift downward in the top of the distribution of desired and expected marriage ages. The GEP curriculum strongly emphasizes 18 as the appropriate minimum age of marriage, and treatment girls are then more likely to report 18 as the desired age of marriage relative to both younger and older desired ages.

Girls assigned to treatment articulate a stronger sense of empowerment (Column (5), Panel A of Table 2). The empowerment index consists of questions about who makes decisions in the girl's life over a variety of different domains, and girls assigned to treatment feel that they have more say in what happens in their lives. For example, girls exposed to treatment report a 17 percent increase in the probability they feel they are the sole decision-maker about whether to attend school, a 29 percent increase in the probability they feel they are

¹⁹Figure 2 presents primarily results from Table 2, in addition to three selected variables from Table 3. Additional specifications are presented for robustness in Tables A4 through A7 in the Appendix.

the sole decision-maker about whether to work, and a 32 percent increase in the probability they feel that they can talk to their parents about marriage.²⁰ However, despite this increase in empowerment, treatment girls do not express more self-esteem or report greater freedom of movement (Column (6), Panel A, and Column (1), Panel B of Table 2).

Treatment also increases girls' sense of socio-emotional support (Column (2), Panel B of Table 2). This index is composed of questions about friends and the support they offer, and we observe improvements in all the index components. Preferring to be alone (as reported by parents) declines by 14 percent, meeting friends outside of school increases by 7 percent, reporting a place to meet friends increases by 13 percent, and reporting a place to stay if needed increases by 4 percent.²¹ In addition, the amount of time reported devoted to socialization (in minutes) increases by 25 percent, reports of phone use double, and total time on the phone increases by more than 400 percent (for phone use, the mean is near zero in the control arm). Even our school travel time measures are consistent with increases in social engagement: conditional on attending school, treatment girls are not more likely to change schools or report a shift in their physical distance from school. However, it seems to take them 24 percent more time to travel to school post treatment.²²

We measure life satisfaction with Cantril's ladder and common measures of locus of control, perceived stress, and self-esteem. Here, we cannot reject the null of no change in these measures of life satisfaction (Columns (3) through (6), Panel B, Table 2). Confidence intervals are large relative to coefficients on all of these measures, and it is not obvious that a life skills intervention that builds awareness of challenges in adolescent life would be expected to improve life satisfaction.

We supplement the self-reported responses around life skills with several additional sources of data. We ask parents to assess the life skills of their daughters, and cannot reject the null hypothesis of no treatment effect for parental perceptions of girls' self-efficacy and freedom of movement, as well as parental attitudes around gender norms, schooling and

²⁰These results are reported in Appendix Table A8; the questions are all subcomponents of the empowerment index.

²¹These results are reported in Columns (1) through (4) of Appendix Table A9. The parental-reported variable around the preference to be alone is not part of the socio-emotional support index.

²²Results for time use are also reported in Appendix Table A9. The analysis of time allocated to socialization was not pre-specified, and is not part of the socio-emotional support index.

marriage (Columns (2) through (7), Panel A of Table 3). We observe a decline in parents' assessment of girls' strengths, as reported in Column (1) of the same table; this primarily reflects a perception by parents that girls are less considerate and less willing to help.²³ This finding is similar to that reported by Ashraf et al. (2020), who document that mothers view their daughters more negatively following their engagement in a negotiating skills intervention. In addition, we developed four demonstration tasks for life skills, including a scavenger hunt that was designed to demonstrate life skills by having girls negotiate challenges in finding common items. We find no effects of treatment on any of the demonstration tasks (Columns (1) through (4), Panel B of Table 3). Though these demonstration tasks did well in pre-testing, in fielding substantial implementation challenges arose that complicate the interpretation of these failures to reject.²⁴

Improvements in life skills are also apparent to enumerators who are blind to the child's treatment status. We ask enumerators to directly assess girls based on their focus in the interview, attentiveness, responsiveness, and articulateness. Here, we find a statistically significant improvement in enumerator assessment of the girl's demonstration of these life skills in the interview, equal to approximately 0.1 standard deviation (Column (5), Panel B of Table 3).

Dhar et al. (2018) highlights that measures of life skills are vulnerable to parroting back the lessons taught in life skills classes as well as social desirability bias if the intervention builds awareness in subjects about the "right" answers. For example, future planning activities are a part of the GEP curriculum, and thus we cannot differentiate whether the enhanced future planning expression comes from in-program activities or broader impacts on how girls think about their futures. Similarly, questions about equitable gender norms are closely related to the content of many GEP classes, and thus these responses could reflect a parroting of class lessons (although these surveys are conducted in private at home, where if anything social pressure might run against an expression of the more progressive values

²³These results are reported in Columns (1) and (2) of Appendix Table A10.

²⁴Specifically, we observed that girls' efforts on the mirror drawing task varied based on the particular environment in which they were surveyed. The within-girl correlation between baseline and endline measures is only 0.06. For the scavenger hunt, variation in the time between the two required surveyor visits (one to introduce the scavenger hunt and one to assess scavenger hunt success), in addition to overall delays in the timing of surveyor re-visits, seems to have limited the signal value of the associated measures.

implied by class content).

On this parroting concern, our findings that parents and enumerators both report changes in treatment children are relevant. Also, it is important to bear in mind that the timing of our survey is such that most subjects are interviewed at endline approximately six months following the final life skills class.²⁵ In our view, the parroting that we might be capturing after six months reflects a degree of internalization of information that is a goal of the intervention, and is very different than asking girls questions shortly after a class ends. That said, we evaluate parroting / social desirability bias using two robustness checks.²⁶

First, to assess parroting, we classify 90 individual life skills questions posed in the endline survey based on whether they are explicitly addressed in the grade six or grade seven curriculum or addressed only indirectly. This distinction is based on whether we could identify an exact curricular match to the question; all of the life skills that we classify as not explicitly addressed may be indirectly addressed in the program. We then construct separate indices characterizing responses to explicitly versus indirectly addressed questions, and estimate the treatment effects for these indices. We find a treatment effect of 0.056 SD for the explicitly addressed questions index (standard error of 0.018) and an effect of 0.016 SD for the indirectly addressed questions index (standard error of 0.019). However, we know that the marital expectations questions show an effect in the opposite direction of that hypothesized, and many marital expectations questions are in the indirect questions index. If we exclude the five questions related to marriage age that are included in the marital expectations index, the treatment effect for the indirectly addressed questions index rises to 0.040 SD (standard error of 0.020), and we cannot reject the hypothesis that the treatment effects for indirect and direct questions are equal in magnitude.²⁷

Second, to assess social desirability bias, we use the baseline data to gauge the extent to which a child is inclined to provide socially desirable answers. Specifically, in Appendix Tables A11 and A12, we employ a social desirability index that is constructed based on three

²⁵Our surveys are largely collected in July and August; classes ended in February before seventh grade exams and eighth grade life skills classes did not resume until October.

²⁶This analysis was not pre-specified.

²⁷Complete regression results for every non-cognitive question posed in the survey, categorized as directly or indirectly addressed, are available in Table 13 of the final evaluation report (Edmonds et al., 2019). The report can be found on-line at <https://sites.dartmouth.edu/edmonds/gep/>.

component responses from the baseline child survey: (1) an indicator for whether the girl reports that she wants to become a “Teacher/School head/Educator” when she grows up, (2) an indicator for whether she reports that she is currently living “the best possible life,” and (3) an indicator for whether the surveyor recorded that the girl paid close attention “the whole time” when receiving instructions during the survey. We view these three survey measures as the baseline questions that best capture girls’ proclivity to offer responses or to engage in behaviors that would be perceived as socially desirable (and most analogous to how Dhar et al. (2018) execute a similar test). We analyze heterogeneous treatment effects based on whether a child is above the median value of this social desirability index. Above-median index values are highly predictive of more positive expression of life skills in both control and treatment groups. We do not reject the null that treatment effects are the same regardless of whether the child is above or below the median social desirability index.

In sum, six months after the conclusion of the second year of life skills classes, we see enhancements in future planning, attitudes towards gender norms, empowerment, and socio-emotional support. Enumerators similarly document these improvements in girls, and parents, whose attitudes do not seem to change measurably with daughter’s engagement in treatment, report treatment girls acting more in their own self interest. We do not see evidence consistent with these findings being driven by parroting or an attempt by treated girls to give more socially desirable answers. In the next section, we see that treatment is also associated with a reduction in school dropout.

4.2 Education

The program evaluated here is called the Girls Education Program, because its primary purpose is to advance the education of girls. Following two years of treatment, the endline survey conducted at the end of seventh grade documents that GEP is generating a decline in dropout and an increase in grade progression, as captured graphically in Figure 3. Again, Figure 3 is based on estimating equation (1), and the corresponding regression results are provided in Table 4.²⁸ Treatment girls are four percentage points less likely to have dropped out at endline (after 7th grade), corresponding to a 31 percent reduction relative to the

²⁸Additional specifications are reported in Appendix Tables A13 through A16 in the Appendix.

control group dropout rate of 13.2 percent. We similarly observe a four percentage point increase in progression to grade seven, suggesting that treatment girls remain with their same cohort as they progress through school (Columns (1) and (2) of Table 4).

The impact of treatment on dropout seems persistent. A year after endline, we compiled school administrative records on dropout and test scores as of the start of grade nine; this analysis was not pre-specified, as we did not anticipate access to this data, but it allows us to identify the effect of the treatment on dropout in grades six through eight and at the transition into high school in grade nine, a frequent point of dropout for girls. The results suggest that the treatment effect on dropout increases from endline through grade eight and grade nine, and remains statistically significant (Columns (3) through (6), Table 4).²⁹ Because the grade nine records were collected at the start of the school year in late July 2019, they differ from other records based on attendance throughout the school year; data is available only about how many days the child attended school in the last seven days, and how many days the school was open in that period. Hence, defining dropout based on this measure will have substantive measurement error if there is any irregularity in attendance, and the evidence suggests irregularity is non-trivial. Accordingly, the findings for grade nine are estimated using a modified version of specification (1) that also controls directly for the number of days the school was reported open. Without controlling for this form of measurement error from days open, we find a noisy zero effect of treatment on dropout in grade nine (not presented).

In addition, we pool the dropout measures into an index in order to address multiple hypothesis testing concerns; including grade six where there is no treatment effect, we observe a statistically significant decline in dropout overall in the administrative records (t-statistic of 2.6, Column (7) of Table 4). While in percentage terms, the largest effect is observed in grade seven, the magnitude of the treatment effects is relatively consistent (around 25 percent). If we conduct a bounding exercise in the administrative records where we assume

²⁹In the administrative records, we observe a slightly smaller impact of treatment on dropout in grade seven compared to the household survey. This discrepancy might reflect that a girl is in the administrative records for grade seven if she attended school at all during the grade seven school year, while the endline survey response reflects whether she views herself as a dropout after the conclusion of grade seven. In addition, in interpreting these results, it is important to note that grades eight and nine correspond to the post-evaluation period during which some limited material support was rolled out.

all girls with missing records have dropped out or all girls with missing records have attended, we observe no substantive change in estimates of treatment effects (reported in Table A17 in the Appendix) as selection into the administrative records is not correlated with treatment.

Despite these substantial effects on dropout in treatment schools, however, we do not observe any significant shift in other academic outcomes. There is no increase in attendance conditional on enrollment in grade seven (self-reported in the endline survey) as reported in Columns (1) and (2), Panel A of Table 5. However, reported attendance is extremely high: the mean reported past-week attendance rate for control girls was 92%, suggesting limited power to detect any effects.³⁰ We also do not observe any significant shift in girls' reported time spent studying, as reported in Columns (3) and (4) of the same panel.

In addition, we do not observe any meaningful improvements in girls' measured cognitive skills. We administered ASER tests in the endline survey (at the conclusion of grade seven) and cannot reject the null of no treatment effect, as reported in Columns (1) through (3), Panel B of Table 5.³¹ We similarly observe no positive effect on administratively reported test scores in grades six, seven or eight for enrolled girls, based on records compiled from evaluation schools (Columns (4) through (6) of the same panel).³² Further exploration of the effects on school test scores, including analysis of any potential bias induced by selection into test attendance, is reported in Appendix Tables A18 and A19.³³

The growth in social engagement documented in the previous section provides an interest-

³⁰These attendance results are based on the endline survey. We also examine effects on attendance using administrative data reported by the schools, and similarly observe a null effect; these results are not reported, given that we conjecture measurement error is substantial.

³¹In Table 5, controls for baseline outcome values cannot be included for cognitive test measures since cognitive tests were not conducted at baseline; specification (1) instead includes controls for baseline school dropout status, attendance, grade progression, time spent studying, hours spent on school, and grades as reported in grade five.

³²Analysis of school administrative records was not pre-specified, but we follow the same analytical strategy as in the pre-specified analysis. There is heterogeneity within schools across years and across schools in how year-end exams are scored, and thus for comparability purposes, we have computed an average GPA across the three tests based on the letter grades associated with the numerical test scores. One obvious concern might be that negative selection in students who do not drop out is masking the gain in test scores for higher-achieving students. While dropouts are indeed negatively selected, we similarly do not see positive effects on test scores among students who were higher-achieving at baseline.

³³A negative and significant effect of treatment on grade six grades is in fact observed in Column (4), Panel B in Table 5. This effect is unlikely to reflect differential selection in school continuity as treatment is only associated with an eight tenths of one percent reduction in dropout in this grade; alternatively, this may be an artifact of the volume of hypothesis tests. The false discovery rate associated with this test is 36 percent.

ing explanation for why we might see a reduction in dropout without a rise in attendance or academic performance. In our qualitative fieldwork, one particularly insightful head teacher remarked that the GEP program was effective in inducing girls to stay in school to be with their friends without any improvements in their performance, and our results are consistent with her experience. An increase in social support may make it easier to miss school, as friends can assist to make up any missed material, counterbalancing any increased desire to attend. For academic performance, additional social engagement may offset whatever gains might otherwise result from increased future planning and growth in motivation. We also observe that treatment leads to a decline in private tutoring; this is presumably replaced by group-based social activities, as we do not observe any change in time spent studying.

Enhanced social support may also help girls to overcome salient socioemotional challenges: for example, in our qualitative work, we heard frequently that teasing is a significant challenge that increases dropout. While girls learn in one life skills class to ignore teasing, a collective response to teasing may be more effective than an individual response, suggesting that strengthened friendship networks may serve to amplify direct effects of treatment in addition to independently influencing dropout propensity.

An alternate interpretation of the observed effects on dropout is that the intervention develops girls' agency, and they use this agency to negotiate with their parents to remain in school. There is ample evidence in our findings to suggest that treatment improves girls' ability to advocate for themselves. However, it is not clear that girls' preference for more education significantly diverges from parental preferences. In the control sample at endline, two-thirds of parents report that they expect their daughters will complete at least senior secondary school, and 71 percent expect their daughters will complete at least five more years of schooling (beyond grade seven). Moreover, 54 percent of parents think that being well-educated is an important characteristic for a potential daughter-in-law, and 74 percent believe that girls need to pursue higher education. As such, it is not obvious that parents are less enthusiastic about their daughters' schooling than the girls themselves; while girls do seem to be more empowered, and this may be an important broader channel for intervention effects, they may not be required to deploy this sense of empowerment vis-a-vis their parents

in order to remain in school.³⁴

Treatment could also reduce dropout if it changed parents' or girls' perception of the returns to education. We have already documented above that we did not observe a meaningful change in parental attitudes, and for girls themselves, we do not see any evidence of greater aspirations, including a shift in the desire to work for wages, a desire to work in an occupation that requires secondary schooling, or how much education girls hope to complete (as reported in Columns (3) through (5), Table A10). For this last outcome, 93 percent of girls in the control arm report wanting to complete secondary schooling, and the confidence interval on the treatment effect ranges between -2.5 and 2.6 percentage points.

4.3 Ancillary Analysis

In our pre-analysis plan, we specified an analysis of intervention effects on child marriage, child labor and child time allocation. In general, as shown in Appendix Table A20, the effects of treatment on ancillary outcomes are insignificant and inconsistent in sign. In Appendices A.2 and A.3, we further explore the robustness of the primary results to alternative assumptions about attrition, and find that the primary effects remain generally consistent in magnitude and significance. In Appendix A.4, we examine heterogeneous effects with respect to a number of pre-specified baseline covariates, and find no evidence of meaningful heterogeneity.

5 Conclusion

In this paper, we analyze evidence around an intervention aimed at improving the life skills of adolescent girls. The target population for the intervention was girls attending fifth grade in government schools in Ajmer, Rajasthan, India, and the intervention provided girls with twice-monthly life skills classes during sixth and seventh grade, taught in school by trained social mobilizers delivering a curriculum developed by our partner organization. The modal treatment girl attended all the life skill classes offered.

³⁴These patterns are also consistent with Bursztyn and Coffman (2012), who find that parents value their children's attendance at school, and accordingly value conditionality in cash transfers as a strategy to manipulate child school attendance.

Treatment is associated with improvements in life skills around future planning, empowerment and socio-emotional support. Girls expressed improved gender norms and felt improvements in socio-emotional support, evident in a range of dimensions including a 25 percent increase in time spent socializing with friends. We also observed a 30 percent reduction in school dropout by grade seven with a corresponding improvement in school progression. Subsequent to endline, we were able to revisit study schools, and found that the reduction in dropout persisted at around 25 percent through the transition to high school.

While random assignment to life skills classes led to a reduction in dropout and improved expressions in life skills, there are a host of adolescent life outcomes that do not seem to have been impacted by treatment: test scores, child labor, and marriage being among the most important. The finding of a lack of improvement in test scores is consistent with many other studies in the life skills space (e.g. Holmlund and Silva, 2014; Delavallade et al., 2017). In our context of reduced dropout, this naturally raises the question of whether continued school enrollment is valuable in itself. It is possible to have financial returns to education that are not proxied by test scores. Moreover, even if school performance does not change differentially with treatment, eighth graders still know more than seventh graders, and treatment improves school progression. Continued enrollment may also facilitate delayed fertility, and this may be especially relevant in our setting with pervasive child marriage. The literature on returns to female education further highlights the value of remaining in school for the life skills, experiences, and social relationships that education can help foster. Given that we observe a direct treatment effect on socio-emotional support, treatment can be valuable even if it does not promote test-measured learning.

Room to Read's Girls Education Program usually includes outreach and financial support that was not delivered in the study area. While we are able to evaluate the impact of the life skills component of the program in isolation, our study is nonetheless related to recent research evaluating multifaceted interventions that combine life skills training with other social services such as Save the Children's Safe Spaces (Buchmann et al., 2017) and BRAC's Empowerment and Livelihood for Adolescents (ELA) program (Bandiera et al., 2019, 2020). While both Safe Spaces and ELA target older girls than our study, they both document improvements in schooling. Our finding that life skills training (separate from the

other components of ELA or Safe Spaces) increases education while building social relationships highlights the potential importance of that specific component of these multifaceted programs. Relatedly, our finding that life skills alone is not sufficient to influence some of the important life decisions that ELA impacts also highlights the additional value of other components of the multifaceted approach, despite the non-experimental evidence in Bandiera et al. (2020) that emphasizes the contribution of life skills training in particular.

Our study delivery method also highlights the tradeoffs inherent in targeting decisions related to life skills programs. Both ELA and Safe Spaces use time and space outside of schools. This allows them to reach more marginalized girls not associated with a school absent the program. However, they face much lower take-up than our school based intervention. While 85 percent of our subjects are still engaged after two years, Safe Spaces only induced 56 percent of girls to attend one class, and ELA take-up in Uganda was below 25 percent. In our context, not only is it easy to reach girls within school, but the girls already have within-school social relationships that can be leveraged. To the extent that the reinforcement and deepening of those social relationships are important in our dropout results, such dynamics might not be present in an intervention targeting out of school girls. Better understanding how social relationships can be leveraged to improve schooling seems a promising area for future research.

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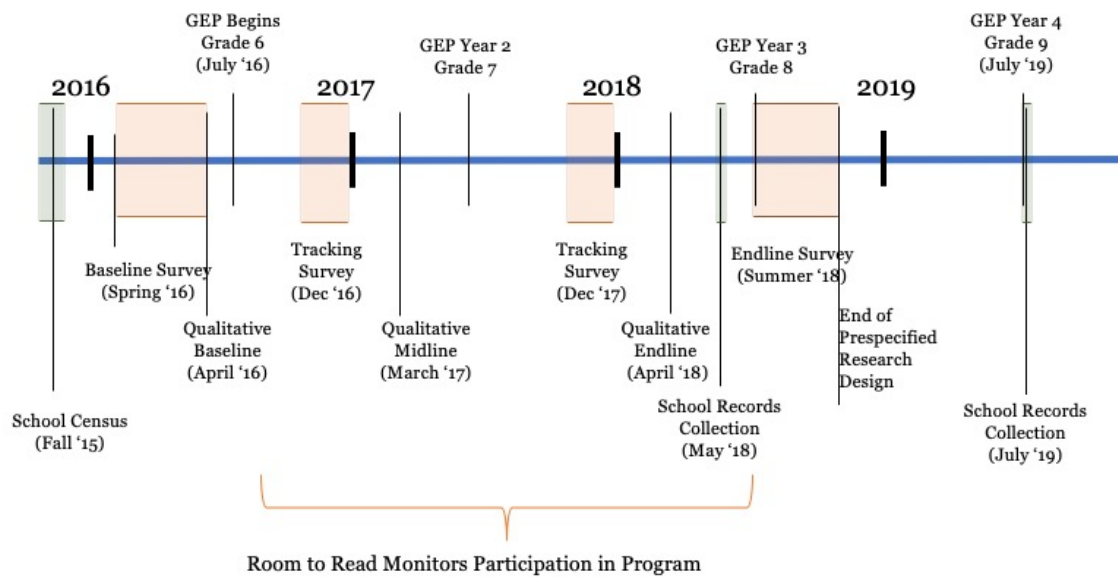


Figure 1: Intervention and Data Collection Timeline

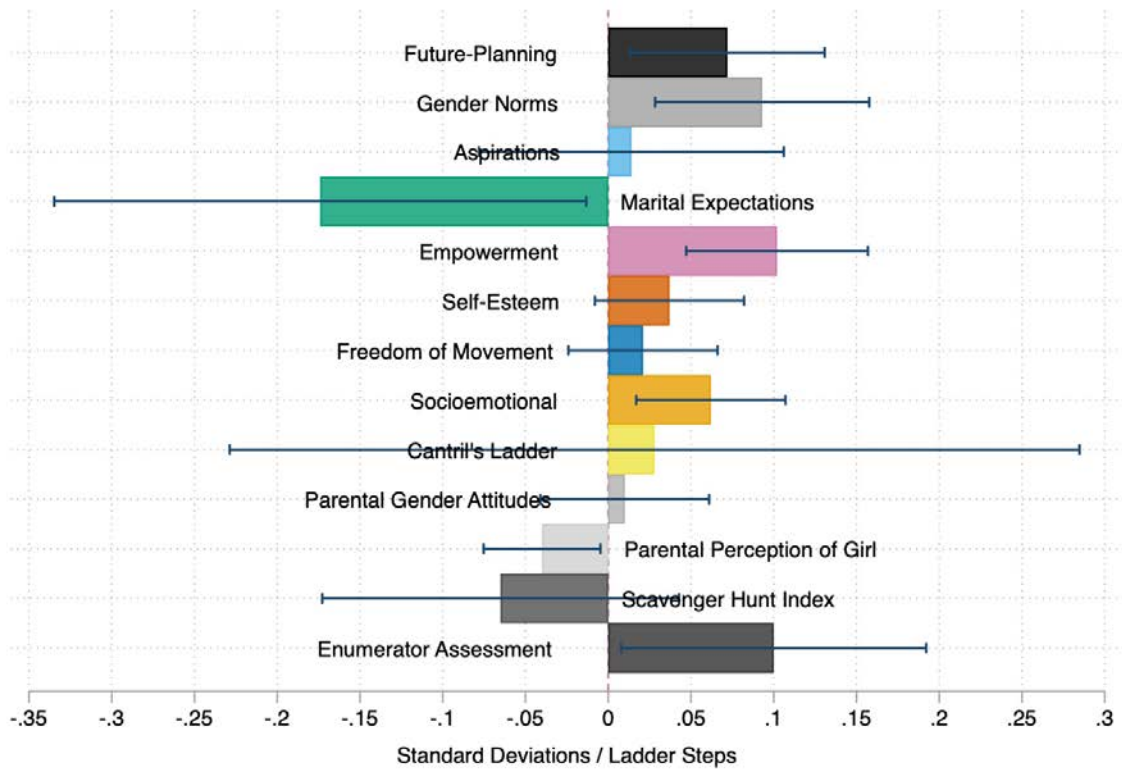


Figure 2: Treatment Effects on Non-Cognitive Skills

Notes: This figure reports the estimated treatment effects on indexes for noncognitive skills or Cantril's ladder, controlling for stratum, baseline value, age effects, type of employment in the household, and imbalanced variables. Baseline and endline data are from the respective surveys. 95 percent confidence intervals are pictured. Standard errors are clustered by school.

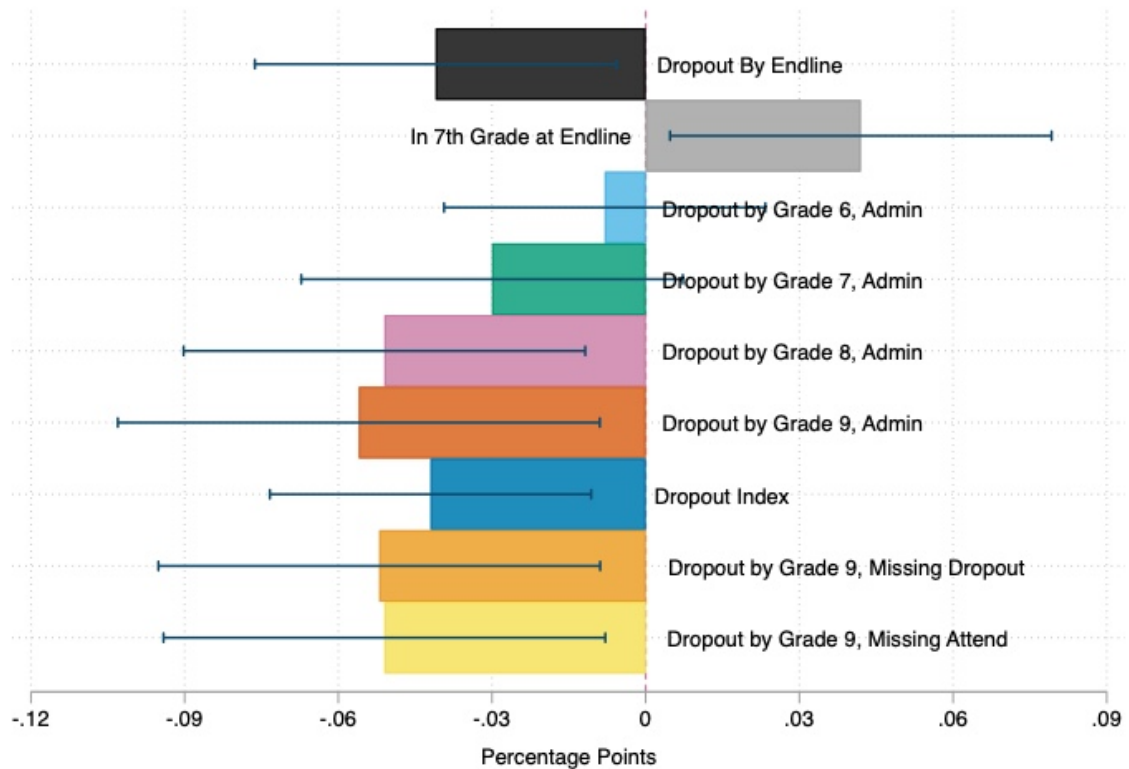


Figure 3: Treatment Effects on Dropout by Grade

Notes: This figure reports the estimated treatment effects on dropout (and progression to grade 7), controlling for stratum, baseline value, age effects, type of employment in the household, and imbalanced variables. Baseline and endline data are from the respective surveys. The top 2 rows are from the endline survey and were pre-specified. All other specifications are estimated using school administrative records. Grade nine data was collected at the start of the school year and is only based on whether the child attended school in the seven days before surveying; thus all grade nine results also include controls for the number of days the school was open in the seven days prior to survey. Dropout index is constructed by combining all other dropout variables. The last two rows replace all missings as dropping out and all missings as attending respectively. 95 percent confidence intervals are pictured. Standard errors are clustered by school.

Table 1: Summary Statistics for Sampled Households

	(1)	(2)	(3)
	Sample Mean	Rajasthan Mean	India Mean
Number of household members	6.838	5.091	4.692
Number of boys in household (under 18)	1.379	1.005	0.834
Number of girls in household (under 18)	2.438	0.898	0.775
Enrollment: girls 10-11	97.5	92.8	95.5
Enrollment: boys 10-11	97.7	95.9	95.6
Enrollment: girls 12-14	92.0	84.0	90.2
Enrollment: boys 12-14	92.4	92.8	91.4
Marriage rate: girls 13-14	0.1095	0.0166	0.0162
Muslim	0.214	0.080	0.125
Other Backward Class	0.674	0.459	0.442
Scheduled Caste/Scheduled Tribe	0.250	0.337	0.312
Land owned (bighas)	6.283	23.924	10.664

Notes: Column (1) presents mean values averaged over all households in the study sample. Households with multiple study subjects occur as multiple observations. 16 study subjects completed a baseline child survey but no baseline household survey and thus are not represented in these summary statistics. Columns (2) and (3) present household-level mean values for respondents to the 2015-2016 Indian Demographic and Health Survey. Enrollment measures take on values from 0 to 100. Marriage rate takes on values from 0 to 1, and Muslim, Other Backward Class, and Scheduled Caste/Scheduled Tribe are all indicator variables.

Table 2: Non-cognitive Skills: Child Survey Measures

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
	Future planning index	Gender norms index	Educ. / emp. aspirations index	Marital expectations index	Empowerment index	Self- esteem index
Treatment	.072** (.030)	.093*** (.033)	.016 (.039)	-.174** (.082)	.102*** (.028)	.037 (.023)
Obs.	2380	2380	2380	2380	2380	2380
R^2	.034	.036	.206	.308	.032	.059
Q-statistic	0.103	0.065	0.820	0.122	0.008	0.357
Mean Control Group	-0.016	0.000	0.000	-0.606	-0.002	-0.001
Panel B						
	Freedom of movement index	Socio- emotional index	Cantril's ladder	Locus of control index	Perceived stress index	Rosenberg self-esteem index
Treatment	.021 (.023)	.062*** (.023)	.028 (.131)	-.026 (.046)	-.025 (.046)	.021 (.030)
Obs.	2380	2380	2380	2380	2380	2380
R^2	.018	.034	.02	.028	.013	.042
Q-statistic	0.707	0.065	0.867	0.795	0.795	0.755
Mean Control Group	0.000	0.000	4.513	0.000	0.000	0.000

Notes: Table contains results from regressing the outcome variable indicated by the column header on an indicator for treatment (reported), stratification fixed effects, age fixed effects, baseline value of the outcome, a vector of dummies for the most important type of employment in the household at baseline, and controls for variables that appear imbalanced in the balance tables. For Columns (4) through (6) of Panel B reporting measures added at endline, we control for lagged values of overall life skills indices.

For all included indices, we calculate the normalized difference between treatment and control for each component question, and average over all components, ensuring that the interpretation is consistent (i.e. higher values of empowerment index components all correspond to higher levels of empowerment). Marital expectations index is not mean 0 because married girls are assigned the minimum value calculated for non-married girls. Detailed definitions of all referenced indices can be found in the analysis plan.

Standard errors, clustered by school, in parenthesis. * significant at 10 percent level; ** significant at 5 percent level; *** significant at 1 percent level. Q-statistics are False Discovery Rate corrected q-values based on Benjamini and Hochberg (1995). These are computed by pooling all specifications included in Tables 2 through 3.

Table 3: Non-cognitive Skills: Parental Reports, Demonstration Tasks, and Enumerator Assessment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Parental Reports							
Parental perception of girls' strengths	Parental perception of girls' self-efficacy	Parental perception of freedom of movement	Parent daughter communication	Parental gender attitudes	Parental schooling attitudes	Parental marriage attitudes	
Treatment	-.040** (.018)	.010 (.029)	.031 (.028)	-.009 (.029)	.010 (.026)	.043 (.037)	.022 (.031)
Obs.	2434	2430	2434	2434	2434	2434	2434
R ²	.021	.03	.017	.027	.045	.127	.037
Q-statistic	0.122	0.820	0.604	0.820	0.820	0.592	0.755
Mean Control Group	0.000	-0.002	0.000	0.000	0.000	0.001	-0.004
Panel B: Demonstration Tasks and Enumerator Assessment							
Delay discounting	Completed mirror drawings	Mirror drawings (seconds)	Scavenger hunt index	Enumerator assessment index			
Treatment	.003 (.032)	.072 (.082)	2.720 (4.559)	-.065 (.055)	.100** (.047)		
Obs.	2380	2387	2317	2380	2380		
R ²	.021	.027	.022	.064	.052		
Q-statistic	0.914	0.707	0.795	0.592	0.122		
Mean Control Group	0.331	3.269	119.5	0.000	0.000		

Notes: Table contains results from regressing the outcome variable indicated by the column header on an indicator for treatment (reported), stratification fixed effects, age fixed effects, baseline value of the outcome, a vector of dummies for the most important type of employment in the household at baseline, and controls for variables that appear imbalanced in the balance tables.

For all included indices, we calculate the normalized difference between treatment and control for each component question, and average over all components, ensuring that the interpretation is consistent (i.e. higher values of empowerment index components all correspond to higher levels of empowerment). Detailed definitions of all referenced indices can be found in the analysis plan. Four observations are missing for parental perception of girl's self-efficacy, as the parent answered "Don't know" to all questions. Seven observations are missing from the analysis for both the future discounting and scavenger hunt measures, corresponding to the seven cases in which the respondent responded only to the first section of the child survey. 70 observations are missing for time spent on mirror drawing measure, corresponding to the 70 respondents who did not attempt any drawings. Delay discounting is an indicator for whether the respondent would prefer 60 Rs. in one week over 30 Rs. now. Completed mirror drawings takes on values from zero to four and Mirror drawings (seconds) measures the total number of seconds spent on mirror drawings, conditional on having attempted at least one drawing.

Standard errors, clustered by school, in parenthesis. * significant at 10 percent level; ** significant at 5 percent level; *** significant at 1 percent level. Q-statistics are False Discovery Rate corrected q-values based on Benjamini and Hochberg (1995). These are computed by pooling all specifications included in Tables 2 through 3.

Table 4: School Dropout

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Survey data		Administrative data				
	Whether child has dropped out	Whether child progressed to 7th grade	Dropout Grade 6	Dropout Grade 7	Dropout Grade 8	Dropout Grade 9	Dropout Index
Treatment	-.041** (.018)	.042** (.019)	-.008 (.016)	-.030 (.019)	-.051*** (.020)	-.056** (.024)	-.042*** (.016)
Obs.	2433	2387	2374	2319	2455	2228	2458
R ²	.152	.144	.111	.122	.114	.438	.223
Q-statistic	0.041	0.041	0.600	0.138	0.041	0.041	
Mean Control Group	0.132	0.865	0.075	0.142	0.192	0.290	0.169

Notes: Table contains results from regressing the outcome variable indicated by the column header on an indicator for treatment (reported), stratification fixed effects, age fixed effects, baseline value of the outcome, a vector of dummies for the most important type of employment in the household at baseline, and controls for variables that appear imbalanced in the balance tables.

Column (1) uses child and household endline survey data. Column (2) uses child endline survey only (all children enrolled in grade five at baseline). Columns (3) through (6) rely on administrative data. In Columns (3) through (5), dropout is measured based on whether a child attended school at the conclusion of the referenced school year. In Column (6), dropout is measured based on whether a child attended school during the past week (conditional on the school being open). The Column (7) dropout index is constructed as the average of the outcome variables included in Columns (1), (3), (4), (5), and (6). Columns (6) through (7) include a set of fixed effects for the number of days that the school was open in the week before administrative data collection in grade nine.

Standard errors, clustered by school, in parenthesis. * significant at 10 percent level; ** significant at 5 percent level; *** significant at 1 percent level. Q-statistics are False Discovery Rate corrected q-values based on Benjamini and Hochberg (1995).

Table 5: Attendance, Time Allocation, and Test Scores

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Attendance (Past Week) and Time Allocation (Typical Day in Past Week)						
	Attendance Rate	Any Attendance	Hours studying at home	Hours spent at school		
Treatment	.002 (.009)	.003 (.006)	-.043 (.075)	.164 (.188)		
Obs.	2089	2089	2386	2386		
R^2	.027	.019	.052	0.1		
Q-statistic	0.841	0.841	0.841	0.841		
Mean Control Group	0.918	0.982	1.541	7.166		
Panel B: Test Scores						
	ASER Mathematics	ASER Hindi	ASER English	GPA Grade 6	GPA Grade 7	GPA Grade 8
Treatment	-.014 (.070)	.022 (.089)	-.068 (.084)	-.150** (.074)	-.145 (.096)	-.026 (.087)
Obs.	2380	2380	2380	2178	1976	1912
R^2	.078	.085	.096	.334	.216	.207
Q-statistic	0.841	0.841	0.841	0.451	0.665	0.841
Mean Control Group	2.353	3.025	2.369	2.259	2.404	2.890

Notes: Table contains results from regressing the outcome variable indicated by the column header on an indicator for treatment (reported), stratification fixed effects, age fixed effects, baseline value of the outcome, a vector of dummies for the most important type of employment in the household at baseline, and controls for variables that appear imbalanced in the balance tables.

Columns (1) and (2) of Panel A use child endline survey data and are conditional on school being open and child not having dropped out of school. Attendance rate in Column (1) is the fraction of school days attended in the week prior to being surveyed and the Attendance dummy in Column (2) is an indicator for having attended any days in the past week. 298 observations are missing for these measures because of temporary school closures. Time use outcomes in Columns (3) and (4) of Panel A are defined based on time use patterns recorded for “a typical day in the past week.” In Panel B, baseline cognitive test values were not collected, and accordingly Columns (1) through (3) instead include controls for baseline school dropout status, attendance, grade progression, time spent studying, hours spent on school, and grades as reported in grade five.

Standard errors, clustered by school, in parenthesis. * significant at 10 percent level; ** significant at 5 percent level; *** significant at 1 percent level. Q-statistics are False Discovery Rate corrected q-values based on Benjamini and Hochberg (1995).