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December 2018

Education

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Suggested citation: Jayachandran, S, Jain, T and Dhar, D, 2018. *Impacts of Breakthrough's school-based gender attitude change programme in Haryana, India,* 3ie Impact Evaluation Report 89. New Delhi: International Initiative for Impact Evaluation (3ie). Available at: https://doi.org/10.23846/PW2IE89

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Impacts of Breakthrough's school-based gender attitude change programme in Haryana, India

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3ie Impact Evaluation Report 89

December 2018

Acknowledgements

Summary

Despite two decades of rapid economic growth and social transformation, outcomes for women in India are considerably worse than those for men. This pattern is evident in educational outcomes, women's mobility outside home, labour force participation, and even the likelihood of being born. To address this issue, Breakthrough, a human rights organisation, developed an innovative gender attitude change programme targeting adolescent female and male students. Breakthrough implemented the two-and-a-half-year pilot programme (2014–2016) for cohorts from grades 7–10 in 150 government schools across four districts of Haryana, a state that is tackling numerous challenges related to deep-rooted gender discrimination. By changing gender attitudes among youth, the programme aimed to influence a wide range of behaviours related to girls' education, mobility, household work and decision-making, some in the short run and others in the longer run.

In order to assess the impact of this intervention, researchers conducted a randomised evaluation of the programme, with randomisation at school level, using a sample of 314 schools across Sonipat, Panipat, Rohtak and Jhajjar districts of Haryana, areas with some of the most skewed sex ratios in the country. The 150 schools in which Breakthrough ran the programme were chosen randomly from the 314 study schools. In all schools, we collected baseline and endline (as well as midline) tracking data to assess the programme's impacts on three primary outcomes: gender attitudes, girls' aspirations and gender-related behaviours. Each of these outcomes is constructed as an index that aggregates several survey questions. We also examined impacts on a set of secondary outcomes and examined heterogeneity in the treatment effects by participants' gender and their parents' attitudes.

The results suggest that Breakthrough's programme improved gender attitudes by 0.26 standard deviations, an effect size much larger than that associated with having a parent whose attitudes are 1 standard deviation more gender-equitable and equivalent to about 35 per cent of the male–female gap in adolescents' attitudes under the status quo. Programme participants also report more gender-equitable behaviour such as increased interaction with the opposite sex. The change in attitudes is similar for boys and girls, but certain behaviour change is larger among boys, suggestive of important barriers for girls to act in accordance with their own altered attitudes. We do not find an impact on girls' aspirations, and the programme's impact does not vary with parental attitudes for any of the three primary outcomes.

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Abbreviations and acronyms

DISE   District Information System for Education

IAT   Implicit Association Test

J-PAL   Jameel Poverty Action Lab

SDS   Social Desirability Score

1. Introduction

Despite two decades of rapid economic growth and social transformation, outcomes for women in India are considerably worse than those for men (Jha et al. 2006). This pattern is evident in educational outcomes: while boys and girls have almost equal enrolment at primary level and the start of secondary school, only 73 girls enrol in tertiary school for every 100 boys (World Bank 2010). Women tend to marry young and have children quickly, and face persistent barriers to mobility outside the home, labour force participation and career development (Duflo 2012). Another troubling manifestation of gender bias is sex-selective abortion, infanticide and neglect. In 2011, the child sex ratio (0–6 years) for the state of Haryana was an alarming 834 girls per 1,000 boys (0.834), reflecting widespread elimination of female foetuses and newborns, as well as discrimination in providing nutrition and healthcare.

A large literature in economics and other fields examines reasons for observed gender differences in developing countries. These reasons include demand-side explanations focusing on the value of girls and women to parents and employers in the economic or social marketplace (Rosenzweig and Schultz 1982; Qian 2008; Jensen 2012), as well as supply-side explanations such as differences in preferences, competitiveness and skills between women and men (Croson and Gneezy 2009; Gneezy et al. 2009). While the empirical literature has documented that these explanations are important, accounting for these factors does not fully explain gender differences in outcomes. In addition, empirical studies find that financial incentives to alleviate gender differences – for instance, in fertility behaviour – are largely ineffective.

Our study takes a new route. In contrast to models emphasising economic costs and benefits of females versus males, we investigate the role of social attitudes, representing opinions, points of view or evaluations, in shaping differential outcomes for women. Gender-equitable attitudes could shape women's outcomes, both in the short and long run, by decreasing the relative social costs of progressive behaviour. For example, an attitude that it is socially inappropriate for women to work outside the home will decrease a woman's workforce participation and earnings even when she is educated and potentially more productive than a man, and vice versa. The magnitude of social benefits versus costs might vary if discriminatory attitudes are reinforced or contrasted by the attitudes of parents, spouse or society as a whole. Insofar as these attitudes are deeply held and difficult to change through the provision of financial incentives, they may represent a significant challenge to erasing discrimination against women. At the same time, reforming basic attitudes through a targeted intervention early in life might produce long-term improvements in outcomes for women even when the intervention itself is withdrawn.

Within this context, we aimed to evaluate the effectiveness of an innovative school-based sensitisation programme aimed at promoting gender[1] equality. The programme was designed and implemented by Breakthrough, a human rights non-profit organisation with extensive experience using media, community engagement and training to change gender norms. The intervention engaged secondary school students and teachers to

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[1] For this report, we will talk about gender in binaries, i.e. male and female.

change students' gender attitudes. Breakthrough's messaging covered a wide array of gender-related topics, such as female education, women working outside the home and reproductive choices. Breakthrough's approach was both to make a human rights case for gender equity and to underscore pragmatic reasons to value women, such as their economic contributions.

There are several advantages of this approach compared with traditional economic incentives. First, adolescents are probably young enough to have malleable attitudes but old enough to think about these issues. Since attitudes are more stable post-adolescence, the effects of an attitude change programme could potentially sustain for a long time even after the end of the programme. In contrast, if financial incentives are the main motivation for gender-equitable behaviour, then the effects could potentially end once the incentives are withdrawn.

Second, the attitude change programme is potentially more cost-effective compared with pecuniary incentives, since in scale-up, activities to encourage gender-equitable attitudes could be a regular part of a standard school curriculum, taught by regular teachers. Finally, an attitude change programme might avoid problems of graft or gaming associated with financial incentives, especially conditional cash transfers.

To the best of our knowledge, this study is the first rigorous examination of whether gender attitudes can be changed with a school-based intervention targeting adolescents. This is particularly important, since the existing literature has focused on adults. Prominent among this is research by Bertrand et al. (2015) using US census data on the role of attitudes towards relative household earning by men and women, and the effect on the formation and dissolution of marriage. Jensen and Oster (2009) examined the role of messages spread through cable television, and showed that attitudes become more egalitarian, and behaviour, for example, more pro-woman as a result. In a similar vein, La Ferrara et al. (2012) showed that the entry of soap operas in Brazil was associated with lower fertility, in part due to role model effects from small family sizes on television. In the political sphere, Gangadharan et al. (2016) argued that men have adverse behavioural reactions when experiencing female leaders, although Beaman et al. (2009) showed that exposure changes attitudes towards women in leadership positions. Our school curriculum-based approach might be relatively low cost and have long-term effects well beyond the adolescent years.

In addition, our study contributes to the literature on gender bias in developing countries. This literature has focused on the role of enabling technologies for sex bias, such as the role of ultrasound machines (Bhalotra and Cochrane 2010), as well as economic and cultural incentives for having daughters; for instance, the role of patrilineal land inheritance in generating parental bias against daughters (Bhalotra et al. 2016; Jain 2014). In contrast, we study the attitudes that are the root cause of gender inequality.

Within the education literature, this paper is related to work that uses schools to deliver information on topics beyond the traditional school curriculum (Dupas 2011; Duflo et al. 2015), adding to the broader literature on the effects of changes to the content that students are taught in school (Abeberese et al. 2014; Duflo et al. 2011). We differ from most existing work in that the aim of changing the curriculum is to shape preferences and not just increase students' knowledge. Finally, our study is related to work that

provides information on the returns to education, in our case specifically girls' education (Jensen 2010; 2012).

We conducted a randomised evaluation of the gender attitude change programme, with randomisation at the school level, using a sample of 314 government schools across Sonipat, Panipat, Rohtak and Jhajjar districts of Haryana. These districts feature some of the most skewed sex ratios in the country. The researchers devised a detailed pre-analysis plan (Online Appendix B) in early November 2016, which pre-specified the hypotheses, regression specifications and primary and secondary outcomes of the analyses, and the researchers followed it while analysing the data. This report aims to address all questions presented in the pre-analysis plan submitted.

The report is structured in the following manner. It first talks about the intervention, theory of change and research hypotheses, then the context in which the study took place and its timeline. It then covers the evaluation design of the project, along with the methods used in the evaluation of the programme as well as implementation of the intervention. It further details the measures and tools used to capture the key outcomes of the evaluation. Lastly, it covers a discussion on the impact analysis and results of some of the key evaluation questions, followed by concluding remarks.

2. Intervention, theory of change and research hypotheses

The project emerged from discussions between Jameel Poverty Action Lab (J-PAL) South Asia, Breakthrough and the Department of Education, Government of Haryana, given government interest in testing programmes with adolescents in schools to help tackle challenges related to gender-based discrimination in the state. This pilot programme, accompanied simultaneously by a rigorous evaluation, aims to help make informed decisions for scaling it up across the state.

Breakthrough developed an innovative gender-equitable attitude change programme, targeting adolescent female and male students. The programme focused on adolescents since their attitudes and views are still malleable, yet they are on the cusp of making decisions related to career, marriage, reproductive health and fertility (Kågesten et al. 2016; John et al. 2017; Igras et al. 2014). Breakthrough implemented the two-and-a-half-year pilot programme (2014–2016) for cohorts from grades 7–10 in 150 government schools across four districts of Haryana. Through teacher training, interactive classroom sessions, youth clubs, school activities and a media and communications campaign, the programme aimed to create awareness of gender discrimination, change dominant gendered perceptions and promote gender-equitable attitudes. By changing gender attitudes among youth, the programme aimed to influence a wide range of behaviours related to girls' education, mobility, marriage, work and fertility.

Figure 1: Theory of change
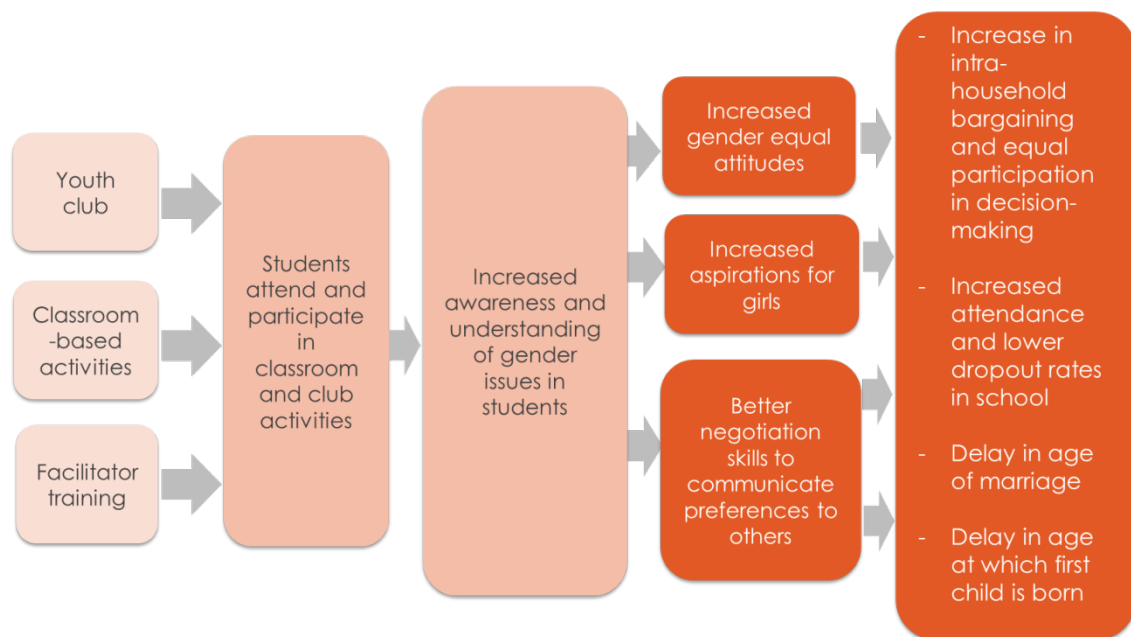
The main assumptions underlying this theory of change are:
- The programme inputs are delivered effectively by Breakthrough and result in increased awareness and understanding of gender equal behaviour and issues;
- Increased awareness and understanding of gender issues translates into attitudinal change and higher aspirations for girls, and participants improve communication skills to express their desires regarding gender-related decisions;
- Attitudinal change or higher aspirations or better communication skills among the youth lead to intermediate and sustained long-term behaviour changes, in spite of entrenched norms and power structures. (Note: This is an important assumption, which the evaluation aims to test both in the short and long run through a variety of evaluation methods). For example, girls might attend school more because they think it is more acceptable to be more educated than their husband (attitude change resulting in higher aspirations and changed behaviour) or because they can convince their parents to allow them to do it (better communication skills).
- Youth often have constraints on acting in ways they desire. For the attitude and aspirations to translate into behaviour, students must have enough autonomy over decisions or ability to persuade others to accept a certain behaviour. Thus, family and community attitudes and power serve as mediating factors in how attitude change translates into behaviour change.

Testing this approach of changing attitudes through a school-based programme as described above is important given that the stakes are high and recent government efforts, such as bans on sex selection or conditional cash transfers for having daughters, do not seem to work (Anukriti 2018). Thus, an attitude change intervention is promising because of the focus on adolescents rather than adults, long-term sustained exposure, and potentially effective content and delivery given the partner organisation's experience in gender attitude change in India.

Our main research question is whether a gender attitude change programme can impact attitudes, educational and occupational aspirations, and gender-related behaviours, and if so by how much. To understand the mechanisms through which the impact happens, we analyse which gender attitudes are affected the most, and how the effects vary by student gender, parents' gender attitudes and other characteristics.

3. Context

India is home to the world's largest population entering its reproductive years. This group's attitudes and choices about sex-selective abortion and, more generally, about the treatment of girls and women will determine whether India's skewed sex ratio and limited opportunities for women persist into the next generation. Youth are on the cusp of marrying and making fertility, health and education decisions for their own children. At the same time, their viewpoints are malleable: secondary school students are mature enough that they can discuss gender issues and are at a critical stage in the formation of moral character (Kohlberg 1976). Gender equity interventions aimed at this population have the potential to have a large impact on girls' educational attainment, as well as their reproductive health decisions in the near future. Schools can serve as a valuable venue for delivering interventions to improve gender attitudes among this age group because one can reach many individuals simultaneously and on a regular basis over several years.

The project emerged from the Government of Haryana's interest in testing school-based programmes with adolescents to help tackle challenges related to gender-based discrimination in the state. The study was conducted in four districts in Haryana: Sonipat, Panipat, Rohtak and Jhajjar. These districts feature some of the most skewed sex ratios in the country. The child sex ratio in Haryana was 0.834 girls per boy in the 2011 census, compared with 0.919 in India overall. The child sex ratio in Sonipat was 0.798, 0.837 in Panipat, 0.820 in Rohtak and 0.782 in Jhajjar.

Schools were selected for the study from a universe of 607 government-run secondary schools that offered grades 6–10 in the four districts. From these schools, the researchers focused on 347 schools with medium-to-high enrolment, based on 2011 data from the District Information System for Education (DISE), and with low dropout in enrolment between grades (as a proxy for attrition from the school). Finally, a sample was chosen, which consisted of 314 schools and 14,810 students at baseline survey,[2] with on average 47 students from each school being surveyed. The students were enrolled in the 6th and 7th grades during the baseline survey in 2013–2014 and were enrolled in 9th and 10th grades during the endline survey in 2016–2017.

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[2] One school in the treatment group was mistakenly not surveyed during baseline data collection. The school was then surveyed during endline.

4. Timeline

Figure 2: Timeline of project activities
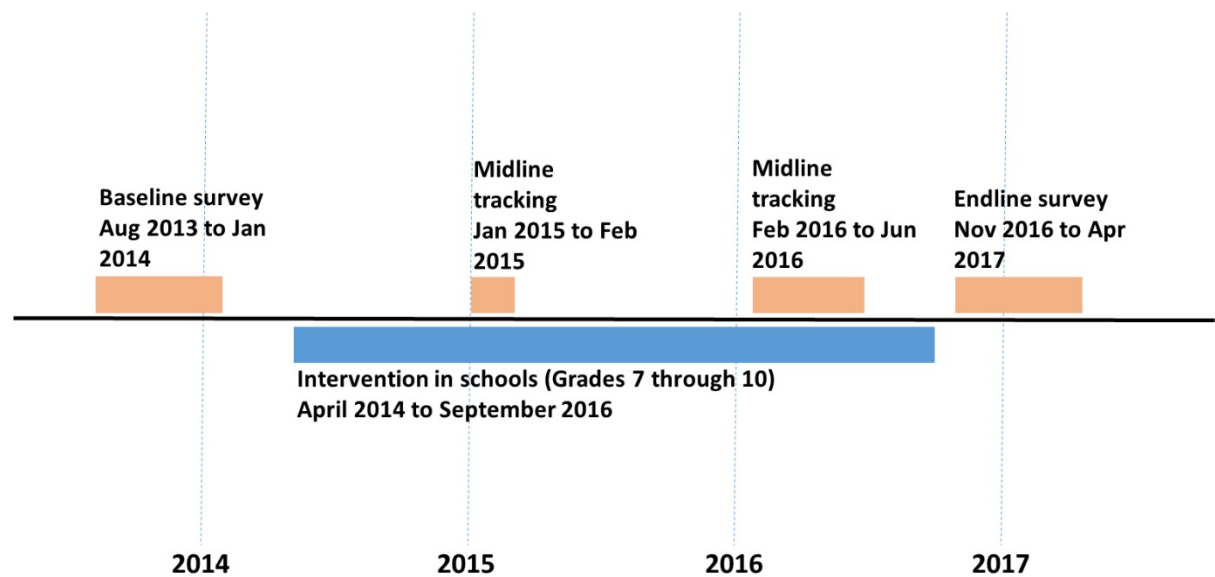
5. Evaluation: Design, methods and implementation

We conducted a randomised evaluation of the gender attitude change programme, with randomisation at the school level, using a sample of 314 government schools across Sonipat, Panipat, Rohtak and Jhajjar districts in Haryana. These districts feature some of the most skewed sex ratios in the country.[3]

5.1 Power calculations

The sample size was determined both to measure the immediate impact of the programme on change in gender attitudes, aspirations and behaviour, as well as on long-term outcomes such as school attendance, occupational choice, marriage and fertility. In particular, we expected that participants would be less likely to engage in sex-selective abortion when they started families. Therefore, the sample size was determined

so that subsequent surveys could measure the impact on the sex ratio among the participants' children. Drawing on the finding of Beaman et al. (2009) that a female village head has a 0.1 standard deviation effect on gender attitudes, we assumed that this programme would also have a 0.1 standard deviation effect on both gender attitudes and the sex ratio. This implied a change in the child sex ratio from 0.834 to 0.868 girls per boy, or a drop in the abortion of female foetuses from roughly 17 per cent to 13.2 per cent. To measure effects with 5% statistical significance with 80% power, using 44 children per school at baseline and allowing for a 10% attrition rate, the study required 296 schools. We added a small cushion by surveying more schools and 47 students per school on average, in case some of our assumptions were too optimistic, yielding a

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[3] The child sex ratio in Haryana was 0.834 girls per boy in the 2011 census, compared with 0.919 in India overall. The child sex ratio in Sonipat was 0.798, 0.837 in Panipat, 0.820 in Rohtak and 0.782 in Jhajjar.

sample size of 314 schools and 14,810 students, which offered sufficient power to measure the impact both on gender attitudes immediately after the intervention and on the sex ratio in the long term.

## 5.2 Sample selection

5.2.1 Quantitative component

Schools were selected for the study from a universe of 607 government-run secondary schools that offered grades 6–10 in the four districts. From these schools, the researchers focused on 347 schools with medium-to-high enrolment, based on DISE (2011) data, and with low dropout in enrolment between grades (as a proxy for attrition from the school). In villages with multiple schools, only one school per village was randomly selected.[4] After initial visits, we excluded 33 schools because of chronically low actual attendance, despite high official enrolment, leaving 314 schools that formed the sample used in this study. Of these, 59 schools enrol only girls and 40 schools enrol only boys, with the remaining 215 schools enrolling both boys and girls. Each school has an average of 84 students per grade.[5] Our focus on government schools implies that girls and students from poorer families disproportionately participate in the experiment as well as the survey sample. In Haryana, boys are more likely than girls to attend private schools. At the same time, wealthier families send their children to private schools, so if these families are more likely to send their sons to private schools, the boys in government schools will be from relatively poorer families than the girls. When making comparisons between boys and girls, we correct for this differential selection into our sample by household wealth for boys versus girls (on average, higher household wealth is associated with more progressive gender attitudes in our sample). Setting a threshold enrolment for selection into the school sample implies that we miss small schools located in smaller villages. Table 1 provides the sample size at each stage of the project for the quantitative component.

Table 1: Sample size for activities of the quantitative component

Activity (project stage)	Sample size		
	Students	Parents	School staff
Baseline	14,810	5,483	313
Midline tracking 1	14,588	–	–
Midline tracking 2	13,892	–	–
Endline	13,989	–	314
Observing behaviour in classroom activities	12,972	–	197

[4] If these schools were adjacent to each other or shared a building, we considered them a single school.
[5] The sampling procedure implies that the schools included in the study deviate from the universe of schools in a number of ways. First, our survey does not cover the 731 private unaided schools, which are found disproportionately in urban areas; thus, urban and wealthier students are under-represented. Second, among government schools, we excluded schools where grades 6 and 7 had a combined average enrolment of less than 45 students; the government schools in our sample have higher enrolment and are in larger villages than the universe of government schools.

Post-endline tracking	14,151	–	–

5.2.2 Implementation

The implementation started in April 2014 and concluded in November 2016. All students attending grade 7 and grade 8 in the year 2014, grade 8 and grade 9 in year 2015 and grade 9 and grade 10 in year 2016 were considered a part of the programme. Table 2 provides the number of participants covered by Breakthrough during the implementation stage of the project.

Table 2: Participants covered during programme implementation

Activity (project stage)	Sample size		
	Students	Parents	School staff
Implementation of the school programme	18,000	–	450

5.2.3 Qualitative component

Catalyst Management Services was our qualitative research partner both during baseline and endline. A total of 15 schools from 4 study districts were selected randomly during baseline for formative research. Similarly, a total of 12 schools were selected for qualitative surveys from 4 study districts. Out of these 12 schools, 7 were from the treatment group and 5 were from the control group. Catalyst Management Services observed that they reached saturation in variation in responses during baseline and decided that conducting activities in 12 randomly selected schools would provide them with clear and detailed insights. Table 3 summarises the qualitative sample during baseline and endline.

Table 3: Sample size for qualitative component

Activity (project stage)	Sample size		
	Students	School staff	Observation checklist
Qualitative study at baseline	359	15	15
Qualitative study at endline	379	11	–

5.2.4 Observing behaviour in classroom activities

We conducted activities to objectively measure gender attitudes and behaviour in our sample schools. Since we were measuring the level of comfort that the students shared with the opposite sex and the belief in girls' competence as held by both the boys and the girls, we could choose schools that were co-educational (co-ed). Therefore, in the school year after we completed the endline, we decided to conduct these activities in 207 co-ed schools across 4 districts with all students enrolled in grades 10 and 11 (our study cohort was in grades 10 and 11 in academic year 2017–2018). However, we were only able to conduct the activities in 197 schools, as we were not able to secure permission from school principals in the remaining 10 schools. Some 12,972 students participated in the activities. Note that these were classroom-level activities, with classroom-level outcomes, and the participants were not restricted to our enrolled study participants.

5.3 Randomisation strategy

For a randomised evaluation, we compared the schools that received the programme with those that did not. It is important that the two groups should be balanced on observable characteristics. This makes them comparable and helps in attributing the effect of intervention to the programme itself. For this study, the unit of randomisation is a school, and the sample includes 150 treatment and 164 control schools (control to treatment ratio of 1.09). Figure 3 shows the location of the schools assigned to the treatment and control groups in the study districts. Table 4 shows baseline characteristics for the schools assigned to treatment and control status. While we used a wider set of characteristics for balance, the first panel of Table 4 confirms that the two samples are balanced on co-ed status and location, as well as on the number of male and female students by grade, and the number of teachers.

Figure 3: Study areas
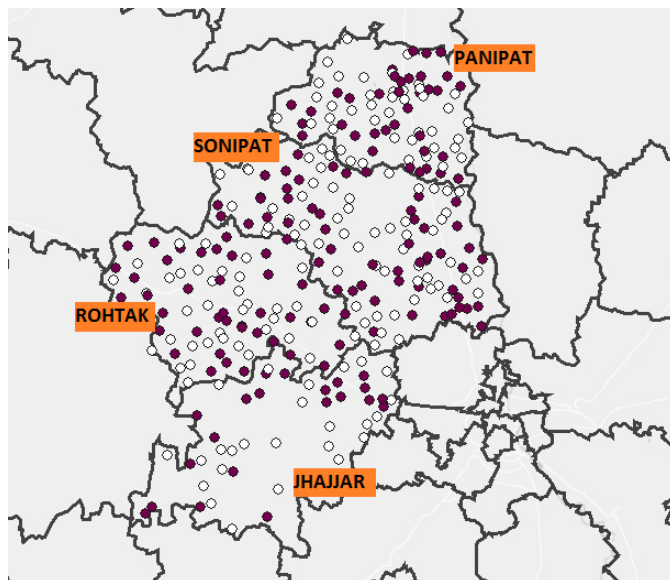
Table 4: School characteristics at baseline

Variable	Treatment	Control	Standardised diff.
Number of schools	149	164	
Urban	0.107	0.073	0.119
	[0.311]	[0.261]	
School is co-ed	0.698	0.677	0.045
	[0.461]	[0.469]	
Number of males in 6th and 7th grades	53.924	52.995	0.021
	[48.391]	[40.152]	
Number of females in 6th and 7th grades	66.709	63.078	0.061
	[60.389]	[58.318]	
Total number of teachers	17.768	17.173	0.066

Note: Table reports variable means and standard deviations.

5.4 Data collection

5.4.1 Piloting

Each survey instrument was piloted in non-sample schools from all the four study districts. We targeted students in grades 6 and 7 in 2013 and grades 9 and 10 in 2016 to conduct extensive piloting, which ensured that each question was understood by the respondent and that the responses were relevant to the study objectives. We recorded the time taken to complete each section of the survey during the piloting to make sure that we did not run into measurement errors due to respondent fatigue.

5.4.2 Baseline survey

Student survey: To select students within schools for the sample, we randomly chose from those students whose parents gave consent for their child to participate in the study and who personally agreed to participate, stratifying by gender and grade in the ratio of 3:2:2:2 (female 6th:male 6th:female 7th:male 7th). We surveyed more girls than boys because female enrolment is higher than male enrolment in government schools, as discussed in section 5.2.1. We sampled more grade 6 girls than grade 7 girls because we expect lower attrition among them during our follow-up survey waves. An additional criterion was that the student attended school on the survey day. Students with chronically low school attendance or whose parents did not consent to the survey are under-represented in the data. Surveyors interviewed students for approximately 35 minutes on school premises. Each survey included questions on demographic and family background of students, school attendance and participation, as well as participation in household chores and activities, gender attitudes and gender behaviour. Table 5 summarises key demographic variables for students in the sample at baseline. The baseline instrument is included in Online Appendix A. Descriptive statistics are included in Online Appendix C.

Table 5: Student characteristics at baseline

Variable	Treatment	Control	Standardised diff.
Number of students	7,052	7,758	
Student's age	11.833	11.854	-0.017
	[1.258]	[1.246]	
Female	0.565	0.543	0.044
	[0.496]	[0.498]	
Hindu	0.945	0.953	-0.037
	[0.227]	[0.211]	
Enrolled in grade 6	0.526	0.521	0.010
	[0.499]	[0.500]	
Scheduled caste	0.268	0.285	-0.040
	[0.422]	[0.433]	
Mother's age	35.183	35.247	-0.015
	[4.084]	[4.272]	
Father's age	40.251	40.294	-0.009
	[4.568]	[4.678]	
Mother is illiterate	0.369	0.374	-0.011
	[0.460]	[0.461]	
Mother works full time	0.291	0.292	-0.002

Variable	Treatment	Control	Standardised diff.
	[0.445]	[0.446]	
Dwelling has flush toilet	0.155	0.131	0.069
	[0.362]	[0.337]	
Gender Attitudes Index	0.031	0.000	0.031
	[1.012]	[1.000]	
Aspirations Index	0.015	-0.000	0.015
	[1.016]	[1.000]	
Behaviour Index	-0.012	-0.000	-0.012
	[0.991]	[1.000]	

Note: Table reports variable means and standard deviations.

Parent survey: Parent attitudes and behaviour are the most proximate part of the social environment in which students form their attitudes. To understand parent attitudes, one parent of a random 40 per cent subsample of the surveyed students participated in a survey at the student's home. We selected at random whether to interview the father or the mother. If after multiple visits and follow-up phone calls, we could not interview the selected parent, we randomly chose a replacement household. The completion rate of the household survey was higher for mothers (89.6%) than for fathers (70.2%) because fathers were more often away for work during the daytime hours when the survey was conducted. We surveyed a total of 2,379 fathers and 3,104 mothers. Both fathers and mothers answered questions on gender attitudes, their control of their child's behaviour, aspirations for their child (in education, occupation, marriage and fertility) and their own behaviour within the household (for instance, which spouse takes decisions on what to cook, how much to spend and whether to have a child or not). The baseline instrument is included in Online Appendix A. Descriptive statistics are included in Online Appendix C.

School survey: School surveys were conducted with the head teachers or principals of sample schools to gather administrative data for the schools. We collected information including respondent details, type of school (rural, urban), number of teachers, number of students, existence and frequency of extra-curricular activities and observational questions on availability of various facilities in schools. Table 4 summarises key variables from the school survey at baseline. The baseline instrument is included in Online Appendix A. Descriptive statistics are included in Online Appendix C.

Implicit Association Test survey: In order to mitigate social desirability bias when the students self-report their gender attitudes and behaviours, the researchers introduced specially designed psychological tests and questions designed to measure gender perceptions through the Implicit Association Test (IAT). The test was administered to approximately 50 per cent of the total student sample, and students were asked to associate images of boys and girls with good and bad characteristics. Screenshots of the baseline instrument are included in Online Appendix A.

5.4.3 Midline tracking 1
To ensure minimal sample attrition, we conducted the first midline survey from January 2015 to February 2015 to verify respondents' location and contact information. We were able to track 98.5 per cent of our respondents through this survey. The midline 1 instrument is included in Online Appendix A. Descriptive statistics are included in Online Appendix C.

5.4.4 Midline tracking 2

In a similar way to the first midline survey, we conducted the second midline survey from February 2016 to June 2016, yielding a 93.8 per cent tracking rate. Similar information was collected in this wave as well. The midline 2 instrument is included in Online Appendix A. Descriptive statistics are included in Online Appendix C.

5.4.5 Endline survey

Student survey: The endline data collection commenced in November 2016, a month after the intervention ended and concluded in April 2017. We were able to collect endline data on 94.16 per cent of the baseline respondents. The endline survey was conducted primarily in the same school where the baseline was conducted (75.6% of endline respondents). A number of students had either moved to a different school, either in the same village or a different village, or dropped out of school entirely. These students were surveyed at home (24.3% of endline respondents). If the student had moved to another village that was far from the survey districts and was difficult to track down in person, we conducted a truncated phone survey (0.11% of endline respondents). The endline instrument is included in Online Appendix A. Descriptive statistics are included in Online Appendix C.

School survey: In a similar way to the baseline surveys, school surveys were conducted with the head teachers or principals of sample schools to gather administrative data of the schools. The endline instrument is included in Online Appendix A. Descriptive statistics are included in Online Appendix C.

IAT survey Again, in a similar way to baseline, IATs were administered to approximately 50 per cent of the total sample. However, this time we had two IATs. Half of the total IAT sample was asked to associate images of boys and girls with good and bad characteristics and the other half associated images of men and women with stereotypical jobs. Screenshots of the endline instrument are included in Online Appendix A.

5.4.6 Observing behaviour in classroom activities

We conducted these activities in 197 co-ed schools from our sample of 314 sample schools to improve upon our endline outcome measures, as previously the gender attitude outcomes relied on self-reporting. By conducting these activities, we wanted to objectively measure gender attitudes and behaviours in our sample schools.

They were conducted in all sections of grades 10 and 11, thereby totalling 491 classrooms. The activities took approximately 1 hour and 30 minutes for a team (consisting of 3 surveyors) to complete. The activities (in order of playing) were chosen primarily to test for two effects:
- Level of comfort shared or how much students enjoyed interacting with the opposite sex; and
- Belief in girls' competence as held by both boys and the girls.

All activities are described in detail in section 7.

5.4.7 Post-endline tracking

In a similar way to midline surveys 1 and 2, we conducted another tracking exercise from January 2018 to May 2018. The tracking exercise yielded a 96.24 per cent tracking rate.

We intend to continue the tracking exercise until we have exhausted all possibilities to track our sample students.

In addition to updating the contact information (such as addresses and phone numbers) of our sample students, we also collected information about their marital status and contact information about their spouses (if any).

The post-endline tracking instrument is included in Online Appendix A. Descriptive statistics are included in Online Appendix C.

6. Programme or policy: Design, methods and implementation

Breakthrough's programme involved working with education officials at state, district and block levels, school principals and school teachers. Breakthrough oriented and gathered inputs from various education officials and school principals, and conducted multiple district-wise trainings of school teachers to sensitise them, and build their involvement and engagement with the programme. In consultation with school principals and teachers, they created an annual activity plan for each school to help embed the programme into the ongoing school curriculum and activities. In each school, Breakthrough created a youth club named Taaron ki Toli (Cluster of Stars) where all intervention students were invited to enrol and sign pledges to declare their commitment to participate in club activities. In turn, students received an activity workbook and branded materials such as caps and badges with the club's insignia.

Trained Breakthrough facilitators visited the school once every two or three weeks and conducted 45-minute-long sessions based on the curriculum developed by Breakthrough, using the workbook and other applied tools and exercises. The curriculum, spread over 28 interactive classroom sessions, included topics such as gender identity, values, aspirations, goals, roles and stereotypes, recognition and tolerance of discrimination; and interpersonal skills such as public speaking, communication and social interaction between the sexes, negotiation, presentation, assertiveness, leadership, self-efficacy and trust-building. Through these topics, and interactive activities such as writing letters and stories, recording observations, street theatre, activities, sports, video vans, short school campaigns and dialogue with families, students were helped to explore gender identity and stereotypes, better understand gender inequities and their consequences and their rights and entitlements, and encouraged to communicate and act on what they had learnt.

Breakthrough also conducted two community mobilisation activities by running video vans across all intervention schools in 2015 and 2016. These activities helped the intervention students in showcasing the work that they did as a part of the youth club (creating posters that talk about a gender-equal society and performing street plays on the prevalent discrimination against women in society). The students were also able to participate in various activities that helped them think about gender stereotypes around division of work and career opportunities. However, this was a very small component and the researchers were not evaluating its effects on the children.

7. Measuring gender attitudes, behaviours and aspirations

The study aims to assess the impact of the intervention primarily on gender attitudes and behaviours and aspirations. Our survey instruments included questionnaires, IATs and observing behaviour in classroom activities.

7.1 Questionnaire

The questionnaire had multiple questions on each of these three concepts (gender attitudes, behaviours and aspirations). In order to consolidate the effect of the intervention on these outcomes, the researchers created an index for each of these outcomes.

Each index was created by demeaning all variables per outcome, and then converting them to effect sizes by dividing each variable by its control group's standard deviation. This normalises variables so that they are on a comparable scale. The index is then created by assigning weights to the normalised variables, the weights being the inverse of the covariance matrix of the transformed variables. This detailed step-by-step procedure to create the indexes has been outlined in Anderson (2008). We further normalise the index to have mean 0 and standard deviation 1 in the control group.

The pre-analysis plan (Online Appendix B) lists all the questions that formed each of the following indexes and sub-indexes. We have also included a document (in Appendix D) that lists the ways in which we deviated from the pre-analysis plan in our analysis and the output of data-driven procedures we specified in the pre-analysis plan.

7.1.1 Attitudes
Attitudes are assessments of normative statements by the student. We followed a threefold approach to measure gender attitudes. This consisted of: (1) direct questions on gender roles; (2) questions based on vignettes; and (3) questions on social and domestic norms. The questions from all three approaches are aggregated into a Gender Attitudes Index. Children indicated their level of agreement/disagreement with a particular statement on a scale of 1 to 5. The index is further divided into four mutually exclusive sub-indices, namely: gender equality in education (edu), gender equality in employment (emp), willingness of females to obey others unquestioningly (sub), sex composition preferences (fert).

The reason behind creating sub-index categories was to illustrate which attitudes had changed, which is useful for both operational and policy purposes. While constructing the index, it is true that any one question could arguably represent different ideas; however, the set of questions within the sub-index was chosen to collectively represent that theme.

7.1.2 Behaviour
The researchers hypothesised that the intervention would increase gender-equitable behaviour among students in the treatment schools. That would mean the students were more comfortable with and interacted more with the opposite sex, girls had more autonomy and engaged in fewer traditional activities, boys engaged in less gender-discriminatory actions and both genders encouraged girls/women in their lives to have progressive actions/aspirations. The index is further divided into sub-indices, namely:

interaction with the opposite sex, participation in household chores, decision-making and mobility.

7.1.3 Aspirations

Aspirations are statements about intended future behaviours. The researchers hypothesised that the Breakthrough programme would have a positive impact on the aspirations and intended behaviours of girls regarding further education, non-traditional occupations, etc. In order to measure aspirations, the instrument had direct questions on aspirations, especially for girls, their plans for further education and interest in non-traditional occupations.

7.2 Implicit Association Tests

Direct questions and vignette-based questions in the questionnaire are supplemented by IATs developed and customised to measure attitudes towards male versus female children.

IATs were administered to approximately 50 per cent of the total sample. At baseline, the sample was asked to associate images of boys and girls with good and bad characteristics. However, in endline we had two IATs. Half of the total IAT sample was asked to associate images of boys and girls with good and bad characteristics and the other half associated images of men and women with stereotypical jobs. The endline instrument is included in Online Appendix A.

7.3 Observing behaviour in classroom activities

7.3.1 Quiz competition

Description: The students were told about an inter-school quiz competition based on general knowledge being held by J-PAL South Asia in Rohtak, Jhajjar, Panipat and Sonipat for their respective grades, wherein the winning classrooms in grades 10 and 11 in each district would get school bags as a prize for every student in that classroom.

To participate in the above, the students were asked to vote for three representatives who would take the quiz on their behalf, whom they felt would most likely do well in such a quiz.

The representatives from all classrooms of a school were made to take the quiz at their respective schools during school hours after all three activities were completed. The quiz consisted of 25 multiple choice questions (each with only one correct answer) and the representatives were given 30 minutes to answer them.

Motivation: This activity was conducted to be able to test the belief in the competence of girls as held by both boys and girls themselves and to see how gender segregated the outcome – that is, the answers of the class representatives – would turn out to be.

Data recorded
- Number of girls and boys chosen as the class representatives in a classroom.

7.3.2 Class discussion

Description and motivation: We introduced a class discussion in the classrooms on the topic, 'What changes do you want to see in your society/village/India?' with the motive to

assess the level of comfort girls share while interacting with boys and vice versa. Additionally, we also wanted to test whether girls are confident enough to participate in classroom-level discussions in front of their peers. The discussion, on average, would last for about 15–20 minutes.

Data recorded
- Number of comments given by girls and boys during the discussion; and
- Number of girls and boys who participated in the class discussion.

7.3.3 Poster making
Description: The students were asked to make groups of five to be able to participate in the poster-making activity. Each group had to make a poster using slogans, pictures and/or poems they thought best represented the given topic, Swachh Bharat Abhiyan (India Cleanliness Drive).

They were given up to 45 minutes to complete this activity. Each group was given chart paper and a pack of crayons (students were to use their own pencils, erasers, rulers, etc).

The students were also made aware of the fact that this was not a competition and only a fun activity organised by us.

Motivation: The motivation behind this activity was to be able to see voluntary formation of teams and how gender segregated these are, and thereby understand how comfortable the students are in interacting with the opposite sex.

Data recorded
- Number of teams formed; and
- Gender composition of each of these teams.

A description of the activities is included in Online Appendix A.

8. Impact analysis and results of the key evaluation questions

8.1 Empirical analysis

8.1.1 Specification
The intervention is hypothesised to make participants' attitudes less gender discriminatory against females, to raise aspirations and increase gender-equitable behaviour. Our primary outcomes are indices as mentioned in section 7.1.

We used a dataset with one observation per student and estimated the following basic specification using ordinary least squares regression:

$$Y_{ij} = \beta_0 + \beta_1 Treat_j + \beta_2 Y_{ij}^0 + \beta_3 X_{ij} + \varepsilon_{ij} \qquad (1)$$

In the above specification, Y_{ij} is the outcome variable measured at endline for student i in school j. $Treat_j$ is the binary treatment indicator, which is 1 if the school received the intervention and 0 otherwise. β_1 represents the average treatment effect of the intervention on the outcome variables. The outcomes are constructed so that a higher value represents more gender progressiveness. Hence, the hypothesis is $\beta_1 > 0$.

We controlled for Y_{ij}^0, the baseline analogue of the outcome. The vector X_{ij} consists of other control variables, which in equation 1 are grade-gender fixed effects and district-gender fixed effects. We allowed the error term, ε_{ij}, to be correlated at the school level; that is, we clustered standard errors at the school level.

In addition to equation 1, we also estimated an enhanced specification which controls for additional baseline student, parent and school characteristics chosen using LASSO following Belloni et al. (2014).[6]

8.1.2 Programme impact on primary outcomes
Table 6 reports the treatment effects on gender attitudes, aspirations and behaviour without controlling for the baseline analogue of the outcome. We find that the intervention had a positive and significant ($p < 0.01$) impact on the primary outcomes, with similar effect sizes to our main results using our pre-specified regression specification.

Table 6: Effect of gender attitude change intervention with no controls

	(1) Gender Attitudes Index	(2) Aspirations Index	(3) Girls' Behaviour Index	(4) Boys' Behaviour Index	(5) Behaviour Index
Treated	0.267***	0.060***	0.203***	0.473***	0.360***
	[0.016]	[0.016]	[0.022]	[0.025]	[0.015]
Outcome variable baseline control	No	No	No	No	No
Basic controls	No	No	No	No	No
Extended controls	No	No	No	No	No
Observations	13,989	13,989	7,788	6,201	13,989
R-squared	0.04	0.08	0.03	0.07	0.21

Note: Standard errors in brackets. Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All columns do not include for any control variables. Standard errors are not clustered.

Table 7 reports the treatment effects on gender attitudes, aspirations and behaviour using estimating equation 1. In column 1, we find that students in treatment schools have a 0.25 standard deviations higher Gender Attitudes Index than those in control schools. This result is statistically significant at 1 per cent. Therefore, we conclude that the intervention made gender attitudes more progressive.

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[6] The pre-analysis plan (Online Appendix B) lists the extended control variables and the larger set of variables from which the LASSO procedure chose them.

Table 7: Effect of gender attitude change intervention

	(1) Gender Attitudes Index	(2) Aspirations Index	(3) Girls' Behaviour Index	(4) Boys' Behaviour Index	(5) Behaviour Index
Treated	0.250*** [0.019]	0.051*** [0.019]	0.199*** [0.031]	0.461*** [0.031]	0.323*** [0.022]
Outcome variable baseline control	Yes	Yes	Yes	Yes	Yes
Basic controls	Yes	Yes	Yes	Yes	Yes
Extended controls	No	No	No	No	No
Observations	13,989	13,989	7,788	6,201	13,989
Clusters	314	314	275	254	314
R-squared	0.17	0.13	0.07	0.10	0.35

Note: Standard errors in brackets. Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All columns control for the baseline analogue of the outcome variable, grade-gender, and district-gender fixed effects. All regressions also include a variable indicating if any component of the index was missing and imputed with the gender-district-treatment average. Standard errors are clustered by school.

The coefficient is stable (0.237) when the LASSO-selected extended controls are included in our basic specification as shown in Table 8.[7]

Table 8: Average effects of the intervention with extended controls

	(1) Gender Attitudes Index	(2) Aspirations Index	(3) Girls' Behaviour Index	(4) Boys' Behaviour Index	(5) Behaviour Index
Treated	0.237*** [0.019]	0.046** [0.019]	0.189*** [0.031]	0.478*** [0.029]	0.317*** [0.021]
Outcome variable baseline control	Yes	Yes	Yes	Yes	Yes
Basic controls	Yes	Yes	Yes	Yes	Yes
Extended controls	Yes	Yes	Yes	Yes	Yes
Observations	13,989	13,989	7,788	6,201	13,989
Clusters	314	314	275	254	314
R-squared	0.19	0.16	0.11	0.12	0.36

Note: Standard errors in brackets. Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All columns control for the baseline analogue of the outcome variable, grade-gender and district-gender fixed effects and a set of extended controls. These extended controls were chosen by LASSO. All regressions also include a variable indicating if any component of the index was missing and imputed with the gender-district-treatment average. Standard errors are clustered by school.

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[7] Because the results are similar with or without the extended controls, subsequent tables only present results without the extended control variables.

We also accounted for potential endogenous attrition from the sample by estimating Lee bounds on the treatment effects (Lee 2009). Table 9 shows that the attrition-adjusted lower bound on the point estimate is 0.233.

Table 9: Lee bounds on treatment effects

	(1) Gender Attitudes Index	(2) Aspirations Index	(3) Girls' Behaviour Index	(4) Boys' Behaviour Index	(5) Behaviour Index
Treated	0.250***	0.051***	0.199***	0.461***	0.323***
	[0.019]	[0.019]	[0.031]	[0.031]	[0.022]
Treated (lower bound)	0.233***	0.031*	0.115***	0.326***	0.312***
	[0.019]	[0.019]	[0.030]	[0.030]	[0.021]
Treated (upper bound)	0.261***	0.059***	0.314***	0.594***	0.331***
	[0.019]	[0.019]	[0.030]	[0.029]	[0.021]
Outcome variable baseline control	Yes	Yes	Yes	Yes	Yes
Basic controls	Yes	Yes	Yes	Yes	Yes
Extended controls	No	No	No	No	No
Observations	13,989	13,989	7,788	6,201	13,989
Observations (Lee bounds)	13,946	13,946	7,620	5,974	13,946
Clusters	314	314	275	254	314

Note: Standard errors in brackets. Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All columns control for the baseline analogue of the outcome variable, grade-gender, and district-gender fixed effects. All regressions also include a variable indicating if any component of the index was missing and imputed with the gender-district treatment average. Standard errors are clustered by school.

One key concern threatening the validity of our results is that participating in the programme might have made salient to the children what the socially desirable responses to our survey questions were, leading them to give gender-progressive responses without changing their actual views. To test for this concern, we constructed a Social Desirability Score (SDS) using responses to a modified Crowne-Marlowe module (conducted at baseline) that measures whether the respondent has a tendency to offer socially desirable answers.

We then tested for heterogeneous treatment effects based on this measure (Appendix A). Table 10 shows that there are no differential treatment effects on gender attitudes by the SDS. Meanwhile, the main effect of having a low (i.e. below-median) SDS is quite large and negative, suggesting that there is some upward shading of responses overall and that SDS is capturing this tendency. Importantly, there is no more of this shading-up in the treatment group than in the control group. The estimated treatment effects thus appear to reflect real changes in attitudes.

Table 10: Robustness check for social desirability bias

	(1) Gender Attitudes Index	(2) Aspirations Index	(3) Girls' Behaviour Index	(4) Boys' Behaviour Index	(5) Behaviour Index
Treated	0.223***	0.064**	0.189***	0.488***	0.328***
	(0.025)	(0.027)	(0.043)	(0.041)	(0.028)
Treated*Low Social Desirability Score	0.045	-0.020	0.017	-0.040	-0.008
	(0.031)	(0.032)	(0.046)	(0.047)	(0.028)
Low Social Desirability Score	-0.108***	-0.100***	-0.127***	-0.001	-0.055***
	(0.021)	(0.021)	(0.033)	(0.032)	(0.019)
Outcome variable baseline control	Yes	Yes	Yes	Yes	Yes
Basic controls	Yes	Yes	Yes	Yes	Yes
Extended controls	No	No	No	No	No
Observations	13,989	13,989	7,788	6,201	13,989
Clusters	314	314	275	254	314
R-squared	0.17	0.14	0.07	0.10	0.35

Note: Standard errors in brackets. Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All columns control for the baseline analogue of the outcome variable, grade-gender and district-gender fixed effects. All regressions also include a variable indicating if any component of the index was missing and imputed with the gender-district-treatment average. Standard errors are clustered by school.

Additionally, to benchmark what these effect sizes imply, Table 11 shows the correlation in the control group between baseline factors that could impact endline attitudes, such as being female, age and parent gender attitudes. The table shows that being a girl is associated with a Gender Attitudes Index that is higher by 0.663 standard deviations, whereas a 1 standard deviation increase in a parent's gender attitudes increases child gender attitudes by 0.029 standard deviations. Thus, the treatment effect is much larger than the effect of having a parent whose attitudes are 1 standard deviation more progressive and about 40 per cent as large as the girl-boy gap in attitudes.

Table 11: Benchmarking the effect sizes

	(1) Gender Attitudes Index	(2) Aspirations Index	(3) Girls' Behaviour Index	(4) Boys' Behaviour Index	(5) Behaviour Index
Female	0.663***	0.245***			1.024***
	[0.026]	[0.024]			[0.028]
Age	-0.065***	-0.088***	-0.115***	0.028*	-0.020**
	[0.010]	[0.012]	[0.015]	[0.015]	[0.009]
Asset index	0.038***	0.052***	0.066***	-0.047**	0.023**
	[0.011]	[0.012]	[0.015]	[0.018]	[0.009]
Baseline Parent Gender Attitudes Index	0.029**	0.020*	0.039**	0.036**	0.034***
	[0.011]	[0.011]	[0.018]	[0.015]	[0.009]
Outcome variable baseline control	No	No	No	No	No
Basic controls	Yes	Yes	Yes	Yes	Yes
Extended controls	No	No	No	No	No
Observations	7,327	7,327	3,980	3,347	7,327
Clusters	164	164	141	134	164
R-squared	0.14	0.11	0.06	0.06	0.34

Note: Standard errors in brackets. Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Sample consists of endline respondents in the control group. All columns control for the baseline analogue of the outcome variable, and district fixed effects. (We do not include grade-gender and district-gender fixed effects because we are interested in the coefficient on female.) Standard errors are clustered by school.

In column 2 of Table 7, we find that the intervention increases aspirations, but the effect is small (0.051). Moreover, this result is not robust to restricting the sample to respondents with below-median SDS (Table 11). (In addition, as we report below, it is driven by boys, whose aspirations are not hypothesised to be improved by the programme.) Thus, we interpret the data as showing no clear evidence that the intervention raised aspirations. The third primary outcome reported in Table 7 is behaviour.[8] We show the results separately for girls and boys, including all available questions; and then also pooled, restricting the index to the common questions (and where we code an increase in boys doing chores as equivalent to a decrease in girls doing chores). The gender-specific Behaviour Indices increase by 0.199 standard deviations for girls and 0.461 standard deviations for boys. Column 5 pools both genders and finds an average effect of 0.323 standard deviations.

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[8] Our survey included more behaviour questions relevant for girls than boys (e.g. mobility outside the home), and in some cases the hypothesised behaviour change is in opposite directions for boys and girls (e.g. doing more chores for boys and fewer for girls).

The behaviour estimates are robust among respondents exhibiting low social desirability bias (Table 11). Therefore, our analysis suggests that the intervention led to a sizeable reduction in gender-biased and gender-stereotyped behaviour.

Figure 4 illustrates the effect of the intervention on our three primary outcomes.

Figure 4: Effect of gender attitude change intervention
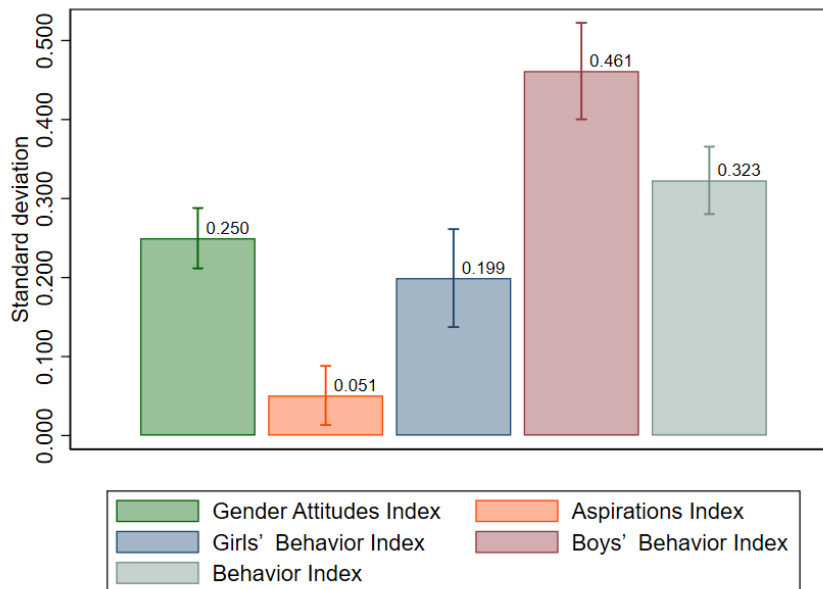
8.1.3 Disaggregated results and heterogeneity analysis

We disaggregated the main effects shown above and examined sub-indices to understand which specific attitudes and behaviours the intervention affected. We broke down the Gender Attitude Index into four sub-indices of attitudes: towards opportunity for education, employment outside the home, women's role in society and fertility behaviour.

Table 12 reports that the effects on attitudes towards education, employment and women's roles are large and statistically significant, with the strongest effect on employment attitudes (0.319), followed by gender roles attitudes (0.223) and education attitudes (0.190). The effect on gender-equitable fertility attitudes is smaller (0.036), which is probably due to the Breakthrough sessions having very limited discussion on this outcome, but could also be due to such attitudes being difficult to change.

Table 12: Effect of gender attitude change intervention on attitude sub-indices

	(1) Education attitudes	(2) Employment attitudes	(3) Attitudes towards female gender roles	(4) Fertility attitudes
Treated	0.190***	0.319***	0.223***	0.036**
	[0.020]	[0.021]	[0.021]	[0.018]
Outcome variable baseline control	Yes	Yes	Yes	No
Basic controls	Yes	Yes	Yes	Yes
Extended controls	No	No	No	No
Observations	13,989	13,989	13,989	13,989
Clusters	314	314	314	314
R-squared	0.15	0.21	0.09	0.01

Note: Standard errors in brackets. Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All columns control for the baseline analogue of the outcome variable, grade-gender and district-gender fixed effects. All regressions also include a variable indicating if any component of the index was missing and imputed with the gender-district-treatment average. Standard errors are clustered by school.

Figure 5 illustrates the effect of the intervention on our gender attitude sub-indices.

Figure 5: Effect of gender attitude change intervention on gender attitude sub-indices
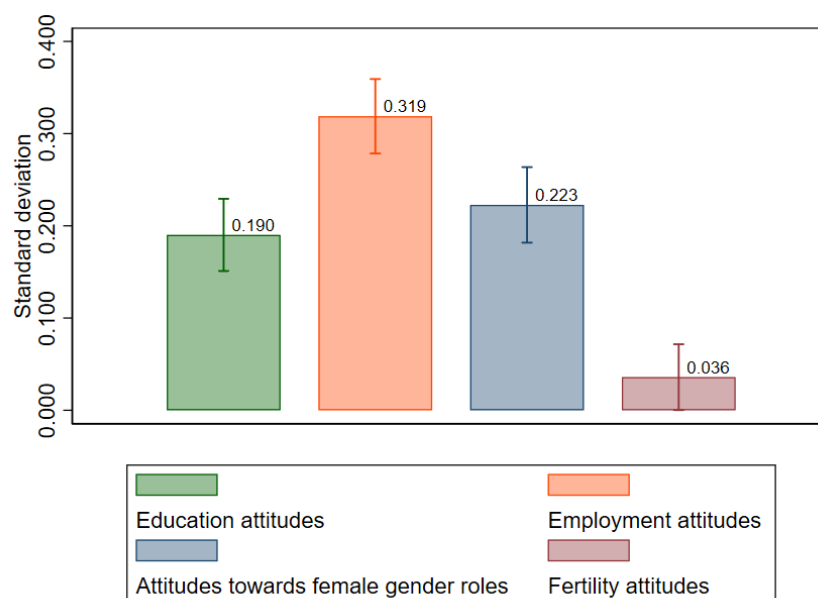
Similarly, the Behaviour Index is broken down into: interaction with the opposite sex; participation in household chores; supporting female relatives' ambitions; girls' decision-making; and girls' mobility. The intervention generated more interaction with the opposite sex for both boys and girls, with a larger impact for girls. It also led to greater mobility (i.e. walking to school alone) for girls, but had no impact on girls' decision-making power (Table 13).

Table 13: Effect of gender attitude change intervention on behaviour sub-indices

|	(1) Interaction with the opposite sex	(2) Participation in household chores	(3) Supporting female relatives' ambitions	(4) Girls' mobility	(5) Girls' decision-making
Treated	0.277***	0.078**	0.484***	0.092***	0.016
	[0.041]	[0.035]	[0.029]	[0.026]	[0.029]
Treated*Female	0.145***	-0.070	-0.453***		
	[0.045]	[0.044]	[0.033]		
Outcome variable baseline control	Yes	Yes	No	Yes	Yes
Basic controls	Yes	Yes	Yes	Yes	Yes
Extended controls	No	No	No	No	No
Observations	13,989	13,989	13,989	7,788	7,788
Clusters	314	314	314	275	275
R-squared	0.09	0.07	0.27	0.01	0.01

Note: Standard errors in brackets. Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All columns control for the baseline analogue of the outcome variable, grade-gender and district-gender fixed effects. All regressions also include a variable indicating if any component of the index was missing and imputed with the gender-district-treatment average. Standard errors are clustered by school.

Two specific behaviours drive the larger effect for boys on the aggregated Behaviour Index reported above. First, boys help out more with household chores, but girls do not help out less. This pattern is consistent with boys being able to unilaterally decide to help out more, but girls needing their family's consent to do fewer chores and not receiving it. Second, there was a large increase for boys in encouraging female family members to pursue higher education and careers, but no such effect for girls. While the chores variable is special in being asymmetrically defined, the findings for encouraging women to pursue education and career goals point to a more general phenomenon that men face fewer constraints on their behaviour than women do. For this reason, the programme's similar impact on attitudes for males and females might translate into larger changes in the long-term behaviour for males.

Figure 6 illustrates the effect of the intervention on our behaviour sub-indices.

Figure 6: Effect of gender attitude change intervention on gender behaviour sub-indices
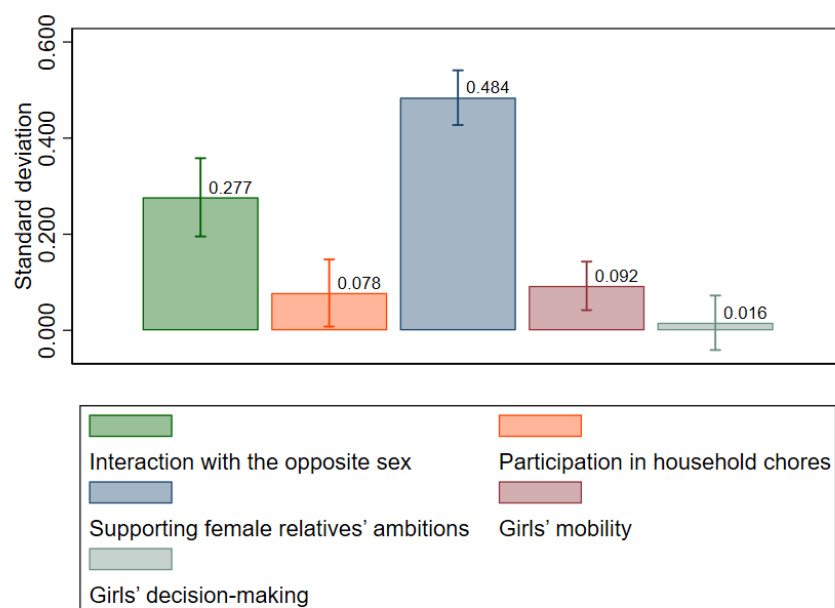
Further, we examined how the impact of the programme differs across individuals; in our case, whether it had different effects on girls versus boys. Consequently, we do not find a statistically significant differential effect of the programme on girls' attitudes, on average (column 1, Table 14). In column 2 of Table 14, although the negative interaction effect for girls (-0.043) is not statistically significant, we cannot reject the null of no effect on girls' aspiration.

Table 14: Heterogeneity of primary effects by gender and baseline parent attitudes

	(1) Gender Attitudes Index	(2) Aspirations Index	(3) Behaviour Index	(4) Gender Attitudes Index	(5) Aspirations Index	(6) Behaviour Index
Treated	0.281*** [0.028]	0.075*** [0.028]	0.462*** [0.029]	0.272*** [0.039]	0.044 [0.037]	0.337*** [0.037]
Treated* Female	-0.056 [0.037]	-0.043 [0.037]	-0.250*** [0.036]			
Treated* Above median baseline parent attitudes				-0.028 [0.041]	0.008 [0.039]	-0.018 [0.034]
Outcome variable	Yes	Yes	Yes	Yes	Yes	Yes

	(1) Gender Attitudes Index	(2) Aspirations Index	(3) Behaviour Index	(4) Gender Attitudes Index	(5) Aspirations Index	(6) Behaviour Index
baseline control						
Treat+Treat*Female =0	0.00	0.20	0.00			
Treat+Treat*Above median parent attitudes= 0				0.00	0.01	0.00
Basic controls	Yes	Yes	Yes	Yes	Yes	Yes
Extended controls	No	No	No	No	No	No
Observations	13,989	13,989	13,989	13,989	13,989	13,989
Clusters	314	314	314	314	314	314
R-squared	0.17	0.13	0.36	0.17	0.13	0.35

Note: Standard errors in brackets. Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All columns control for the baseline analogue of the outcome variable, grade-gender and district-gender fixed effects. All regressions also include a variable indicating if any component of the index was missing and imputed with the gender-district-treatment average. Standard errors are clustered by school.

Using the Behaviour Index based on outcomes relevant for boys and girls, we find that the programme had a significantly smaller impact on girls' behaviour (interaction coefficient of -0.250, $p < 0.01$), although the net effect for girls was also positive and significant. One interpretation of this finding is that boys and girls can adopt gender-equal attitudes with relatively equal ease, but girls face more constraints on translating their attitudes into behaviour.

Moreover, we also tested whether the programme had different effects on participants belonging to more progressive or regressive families at baseline, thereby answering the broader question of whether the intervention is a substitute for or a complement to parents' views in shaping children's attitudes. Columns 4, 5 and 6 of Table 14 indicate that we do not find any evidence that pro-girl parent attitudes facilitate or hinder the success of the intervention in this context.

8.1.4 Programme impacts on secondary outcomes
The study also examined the impacts on perceptions of social norms as a secondary outcome, as changes in beliefs about social norms could be as or more important a channel for behaviour change as changes in personal attitudes (Tankard and Paluck

2016).[9] Conversely, we also assessed how much participants view social norms as preventing them from acting on their progressive attitudes. To do so, we examined parallel questions about: (1) personally holding a positive gender attitude; (2) believing society has a positive gender norm in that domain; and (3) personally holding a positive attitude and believing society will not oppose them if they act on it.

Table 15 reports the results, first, for a norm about women's employment. Column 1 shows that the intervention made personal attitudes about female employment more progressive by 13 percentage points, and column 2 shows that it increased the perception that others in the community hold that gender-progressive view by 5 percentage points. Meanwhile, the effect on holding the progressive attitude and believing society will be supportive (column 3) is smaller (7 percentage points) than the effect on simply holding that attitude (column 1). Some students whose own attitude changed believe that they will be hindered in acting on their views by restrictive cultural norms. Columns 4 to 6 show a similar pattern for norms about women pursuing a college education.

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[9] We also examined two other pre-specified secondary outcomes: girls' self-esteem and awareness of gender discrimination, and perception of social norms. First, positive messages delivered as part of the programme might affect participants' self-esteem, offering a pathway for the intervention to affect behaviour. Table 16 shows that the intervention increased the Self-Esteem Index, but surprisingly, as much for boys as girls. Second, the programme led to a modest (0.069 standard deviation) increase in awareness of gender-based discrimination.

Table 15: Effect of intervention on perception of social norms

	(1) Child agrees that women should be allowed to work	(2) Child agrees that community thinks women should be allowed to work	(3) Child agrees that women should be allowed to work and thinks community will not	(4) Child agrees that women should be allowed to study in college even if it is far	(5) Child agrees that community thinks women should be allowed to study in college even if it is far	(6) Child agrees that women should be allowed to study in college and thinks community will not
Treated	0.129***	0.052***	0.072***	0.084***	0.056***	0.067***
	(0.011)	(0.013)	(0.012)	(0.008)	(0.014)	(0.013)
Outcome variable baseline control	No	No	No	No	No	No
Basic controls	Yes	Yes	Yes	Yes	Yes	Yes
Extended controls	No	No	No	No	No	No
Observations	6,862	6,464	6,409	7,075	6,753	6,718
Clusters	314	314	314	314	314	314
R-squared	0.16	0.03	0.07	0.07	0.01	0.02

Note: Standard errors in brackets. Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 16: Effect of intervention on self-esteem and awareness of gender discrimination

	(1) Girls' Self-esteem Index	(2) Boys' Self-esteem Index	(3) Gender-based Discrimination Index
Treated	0.100***	0.139***	0.069***
	[0.023]	[0.025]	[0.019]
Outcome variable baseline control	Yes	Yes	No
Basic controls	Yes	Yes	Yes
Extended controls	No	No	No
Observations	7,788	6,201	13,989
Clusters	275	254	314
R-squared	0.01	0.01	0.31

Note: Standard errors in brackets. Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

8.1.5 *Programme impacts on observed classroom-level behaviour*

Lastly, as self-report measures are subject to concerns about social desirability and self-presentational concerns (Gawronski and Houwer 2014), after analysis of our initial results was completed and presented to some audiences, we decided to collect additional measures to objectively measure gender-related behaviours in our sample schools. Hence, we developed and conducted three activities in our sample schools, specifically the subset that are co-ed, as the activities we brainstormed were appropriate for co-ed schools. The three activities aimed to measure girls' participation in classroom discussions, students' belief in girls' knowledge/ability (based on whom they vote for to represent the class in a quiz competition), and interaction with opposite-gender peers.

Table 17 reports the impact of the intervention on observed classroom-level behaviour.

Table 17: Impact on observed classroom-level behaviour

	(1) % of girls among quiz representatives	(2) % of comments given by girls	(3) % of girls among class discussion participants	(4) % of groups that are mixed gender
Treated	-0.027	0.004	0.012	0.018
	(0.032)	(0.023)	(0.021)	(0.014)
Control group mean	0.60	0.56	0.56	0.06
Control group standard deviation	0.30	0.19	0.18	0.13
Basic controls	Yes	Yes	Yes	Yes
Extended controls	No	No	No	No
Observations	336	335	335	336
Clusters	197	197	197	197
R-squared	0.04	0.03	0.04	0.08

Note: Standard errors in brackets. Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Interestingly, for both participation in class discussion and voting for girls to participate in the quiz competition, girls are not under-represented in the control group. Under the status quo, these are not outcomes where girls are disadvantaged.

For these outcomes, we find no effect of the intervention. The effect of the intervention on the percentage of girls among quiz representatives was not statistically significant (column 1).

Columns 2 to 3 show that the impact of the intervention on the percentage of comments given by girls and percentage of girls among class discussion participants, which are also insignificant. Our final outcome is how many groups of five students who self-formed to make posters were mixed-gender. Here, the mean in the control group is strikingly low (5%). We cannot reject that the intervention did not affect this outcome.

Therefore, we conclude that the intervention had little discernible impact on observed gender-equal behaviours at the classroom level. There are a few limitations worth noting. Our pilot sample size was too small to clearly indicate to us that two of our outcomes show no disadvantage for girls. Moreover, we had low power to detect changes in these outcomes. An ex post power analysis based on the estimated standard errors and control group standard deviation implies that we are powered to detect an effect that is 0.38 to 0.44 standard deviations. This minimum detectable effect is bigger than the effect size we estimated for our primary outcomes.

8.2 Findings from the Implicit Association Tests

8.2.1 Baseline
The IAT's *D measure* reveals how much faster students associate boys with good things, compared with girls and good things. Thus, a higher D measure indicates more implicit preference for boys. Figure 7 shows the distribution of D measure across the four districts by gender. As expected, boys display more implicit preference for boys, and vice

versa. Although the differences across districts are relatively small, it is interesting that girls' implicit preference for boys is stronger than vice versa.

**Figure 7: D measure (implicit preference for boys)**
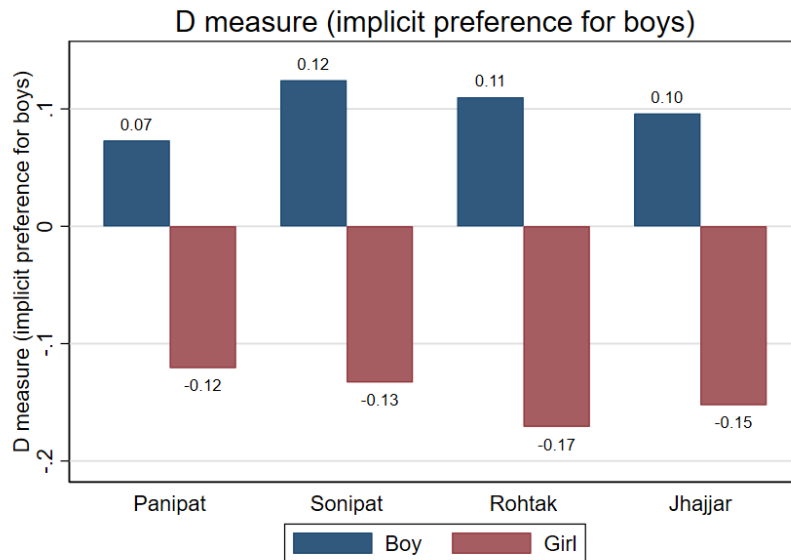
8.2.2 Endline

During endline we conducted two IATs. Half of the sample that took the IAT at baseline was randomly chosen to administer the same IAT (associate images of boys and girls with good and bad characteristics) and the other half took the second IAT in which they had to associate images of men and women with stereotypical jobs. Figures 8 and 9 show the results from both the IATs administered during endline.

Figure 8: Good versus bad IAT

Figure 9: Occupation IAT

D measure (implicit preference for boys)
Occupation IAT

Observations: 3,198
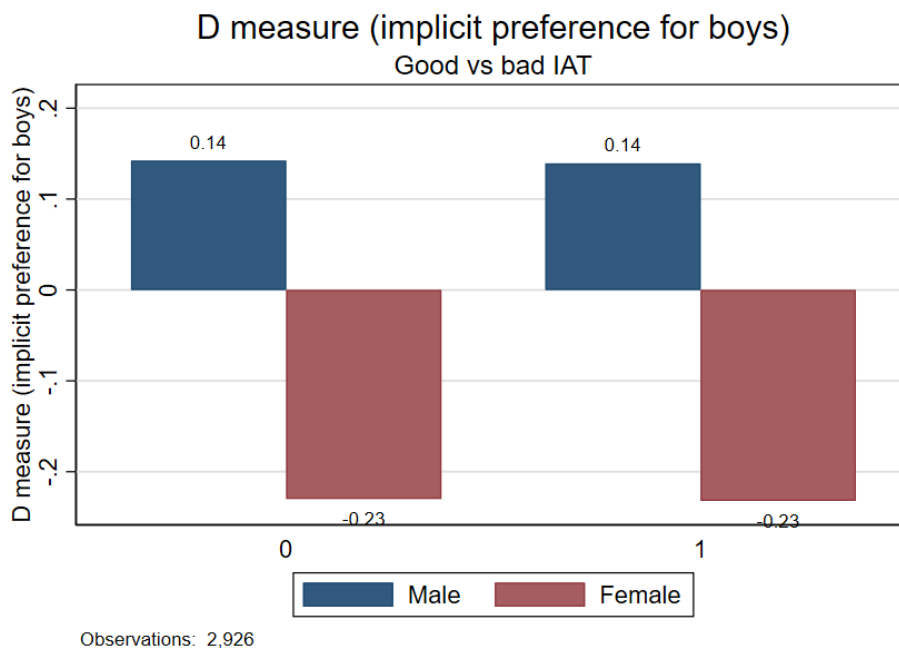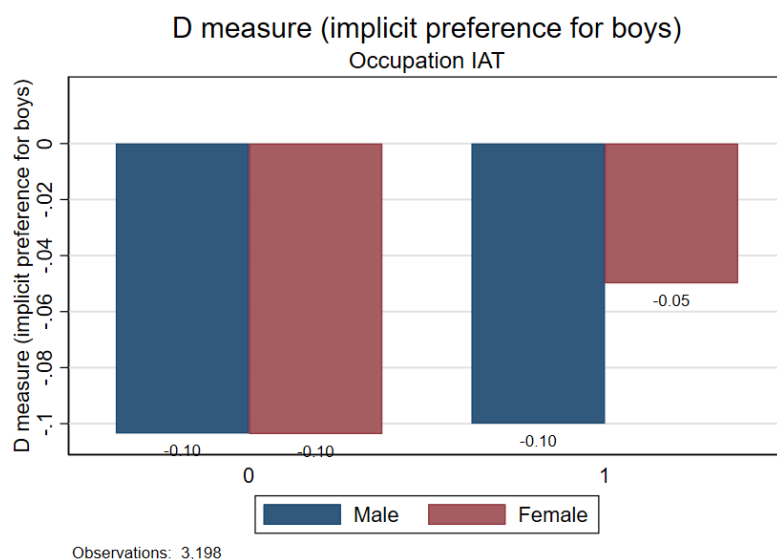
8.3 Findings from the tracking exercise

We conducted three extensive tracking exercises to update the contact details of respondents: twice, between the baseline and endline surveys; and once, a year after the endline survey. Updated respondent details have really helped us in minimising attrition during endline survey and will definitely help us in minimising attrition while conducting the second endline that is being planned for later this year or for other survey exercises that we are planning to conduct in order to measure long-term impact of the Breakthrough programme. Here are the results from the tracking surveys completed until now.

8.3.1 Tracking exercise 1: January to March 2015
The team was able to track 98.57 per cent of the students during the midline tracking exercise of 2015. We find that 47.9 per cent of the total students tracked were from the treatment group. Out of the total number of students who were tracked, 99.59 per cent were still in school. We also find that 55.2 per cent of school-going children were girls.

8.3.2 Tracking exercise 2: February to June 2016
The team was able to track 93.8 per cent of the students during the midline tracking exercise of 2016. We find that 47.3 per cent of the total students tracked were from the treatment group. Out of the total number of students who were tracked, 96.53 per cent were still in school. We also find that 52.7 per cent of school-going children were girls.

8.3.3 Tracking exercise 3: January to May 2018
The team was able to track 95.27 per cent of the students during the midline tracking exercise of 2016. We find that 47.4 per cent of the total students tracked were from the treatment group. Out of the total number of students who were tracked, 82.6 per cent were still in school. We also find that 56.7 per cent of school-going children were girls. In addition, we find that 2.22 per cent of our sample students are now married.

8.4 Findings from the qualitative work

The qualitative study examined changes in the realm of knowledge, attitudes and personal traits. The findings were gathered by Catalyst Management Services. The team designing the randomised evaluation and conducting the quantitative analysis was not directly involved in collecting the qualitative data or generating the following conclusions.

8.4.1 Changes in mindset
Beneath the many changes – such as in mobility, resource allocation, and interactions between boys and girls – are changes in the mindset of students and their families and community members that girls are equal to boys and there is no place for discrimination.

8.4.2 Conceptual understanding
The sessions on rights and equality between boys and girls were the most-liked sessions of the programme. Understanding these notions implies that they would then be able to transfer the notion to different contexts and, in many cases, students refer to equality. In control schools the concept of gender equality was missing.

8.4.3 Critical thinking, questioning and reasoning
Students have started questioning the discrimination that they experienced or observed, in respect of mobility, dress or interacting with boys. Questioning norms is a first step in effecting change. The format of the Taaron ki Toli session has instilled a habit of critical thinking and reasoning among the students. This is something that will stay with them, and other issues in their life may get evaluated through the same lens.

8.4.4 Conviction
Some students are able to convince others to effect change. Convincing is best achieved through conviction. The programme, by dealing with concepts and using fun and adolescent-friendly methodologies to get the message across, has instilled conviction, rather than merely learning, in the students. This, too, is an important trait that assures 'stickiness' of concepts.

8.4.5 Assertiveness
Empowering students, especially girls, to stand up for themselves and demand their rights is an important contribution of the programme. Some girls had an assertive tone and firmness in their plans, traits the programme appears to have built up.

8.4.6 Confidence
Both boys and girls share that the programme has made them more confident.

8.4.7 Sharing
Students, particularly girls have also got the confidence to share and talk to parents about what they have learnt, or what they believe should change in gender-based engagements at home and outside. By sharing, they may or may not beget change, but they are raising the issue with the family or community, making them aware that there is a new discourse that their child is aware of. Some students mentioned difficulties they had sharing the issues, with parents either not happy with what is being shared, or explaining that the learning is good but changes difficult to effect.

8.4.8 Communication and articulation

The understanding of communication and articulation was observed by the data investigators of the study, who found that the control school students were hesitant, not able to clearly put across their points, and that some also seemed nervous. Treatment school students in contrast were able to articulate their points and share their opinions and experiences well.

The overall findings from the qualitative work are in line with the results of the randomised evaluation, which reports an improvement in gender attitudes and behaviour in children from treatment schools.

9. Discussion

We understand that the attitude change could be sufficient to prompt behavioural changes in some areas, such as interaction with the opposite sex, as can be seen in the results. However, it might be difficult for students to enact behavioural changes in other areas, such as contributing to household chores and decision-making. This could be because the adult family members or parents of the participants are the ultimate decision-makers in these aspects and, since the intervention does not target them, it might be difficult to change them. However, we would also highlight that the idea behind the intervention is to break the cycle of gender discrimination. We expect the programme participants to depict more gender-equal behaviour when they become parents and decision-makers in future. We plan to track this behaviour in the long run. The theory of change/goal of the programme was not to have major behavioural change in the short run when the students are minors, not adults; the programme's main goal was to engender attitude change that might translate into major behavioural change in 5 or 10 or 15 years. Obviously, those measures are beyond the scope of this grant and report, but are and have always been the overall goal of this research project.

Another point to note is that these findings should be read with caveats. First, just because we find strong effects of the intervention in this setting does not imply that the findings will readily extend to all places, populations or environments. The results of a similar intervention might be very different in places with more or less severe gender discrimination, which would have different gender attitudes at baseline. A priori, it is difficult to know whether more gender-egalitarian attitudes would facilitate or hinder programme adoption, or vice versa. In other environments, social conditions, such as explicit restrictions on interactions between boys and girls, might prevent programme participation and consequently attitude change. It is also possible that, since the intervention is two and a half years long, if this intervention was tried in a context where the dropout rate was high (in contrast to the public schools where the intervention was conducted and the dropout rate was low), students might have less exposure to the programme, so the effects would be smaller. In addition, enrolment in government secondary schools is high but not universal, so a programme based in secondary school does not reach the 17.86 per cent[10] of students who have dropped out by then. In addition, in our case, the programme does not reach students in private schools. While

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[10] National Institute of Educational Planning and Administration, New Delhi, website: <http://dise.in>.

we cannot say with our data whether the findings would generalise to private school students, when the government comes to scaling up the programme, if it makes the curriculum mandatory and/or embeds it in textbooks, then in principle private school students could be reached.

Second, we do not take a strong view on which elements of the intervention are the most effective in changing attitudes or outcomes. Unpacking these elements requires variation in implementation, which was not the case in this experiment. However, learning the most effective parts of intervention might have important policy implications, and we leave that to future studies.

Third, the current analysis reports the short-term, immediate impacts of the programme on gender attitudes, aspirations and behaviour. Equally interesting is whether the short-term treatment effects might sustain in the long run, leading to changes in educational achievement, occupational choice, marriage and fertility even after the intervention has ended. Examining long-term effects requires tracking the respondents into adulthood, and we leave that to future research as well.

10. Specific findings for policy and practice

The intervention was an efficacy trial where Breakthrough recruited and trained facilitators to conduct classroom sessions. The preliminary findings suggest that the programme participants report more gender-equal attitudes and behaviour. Given these positive findings, prima facie, this programme seems to be a promising solution that can be implemented at scale through government systems. Going forward, one potential way of doing so would be to embed the already developed curriculum into school systems. These sessions can be conducted by government school teachers with minimal training. For example, either regular teachers could teach them, with the assistance of lesson plans and multimedia tools, or the government could hire special-purpose 'gender equity' teachers who each cover, say, 20 schools, spending a day at each school (sequentially teaching 1-hour sessions to different classrooms); in this model, students would participate in 1 session per 20 school days, or about 1 session per month. This approach may lead to a reduction in the cost of implementing the programme, but more importantly scale up through the government rather than NGO staff.

Breakthrough's school-based intervention in Haryana has also fed into programmes of other organisations such as Pratham, which is implementing a part of this programme in collaboration with Breakthrough in Punjab, and the International Center for Research on Women's programmes targeted at increasing the employability of adolescent girls in Jharkhand and Delhi.

Breakthrough has also started to advocate for scale-up in Haryana and adapting the programme to other states, such as Uttar Pradesh, which face similar problems. Breakthrough has also started a conversation with the Government of India to scale up its programme in 61 more districts across the nation through the government's Beti Bachao, Beti Padho (Save the Girl Child, Educate the Girl Child) scheme. In order to facilitate this scale-up path, Breakthrough has started discussions to codify its curriculum so that it can be used by others – not just the government but other NGOs, too – and we are helping them with that.

J-PAL has also held various meeting and sessions with Breakthrough to discuss the generalisability framework and how Breakthrough can apply the framework to its own programme and think about a scale-up model. J-PAL has helped by providing a structure that Breakthrough could follow to document and codify the implementation in detail. In the coming months, J-PAL is going to assist Breakthrough in coming up with a structured scalable model of the programme; and packaging the programme so it can be diffused and scaled up by governments and civil society organisations, in and outside of India, even while Breakthrough incorporates lessons into its own work in other areas.

Appendixes

Appendix A: Social desirability score

The following questions from Crowne and Marlowe (1960) were asked at baseline with agree/disagree options. A low score means respondents answered in a socially undesirable direction all the time. A mid-score means that respondents tended to show an average degree of concern for social desirability. A high score means respondents were highly concerned about social approval.

(a) It is sometimes hard for me to go on with my work if I am not encouraged.
(b) I sometimes feel resentful when I don't get my way.
(c) On a few occasions, I have given up doing something because I thought too little of my ability.
(d) There have been times when I felt like rebelling against people in authority even though I knew they were right.
(e) No matter who I'm talking to, I'm always a good listener.
(f) There have been occasions when I took advantage of someone.
(g) I'm always willing to admit it when I make a mistake.
(h) I sometimes try to get even rather than forgive and forget.
(i) I am always courteous, even to people who are disagreeable.
(j) I have never been irked when people expressed ideas very different from my own.
(k) There have been times when I was quite jealous of the good fortune of others.
(l) I am sometimes irritated by people who ask favours of me.
(m) I have deliberately said something that hurt someone's feelings.

Appendix B: Cost-effectiveness analysis

We have been coordinating with Breakthrough to collect all the costs associated with the programme. We have been able to gather basic cost data and have created a simple model and calculated the cost to train one child on the gender curriculum created by Breakthrough. We have yet to receive the detailed cost data from Breakthrough and can conduct a more in-depth analysis after that.

Online appendixes

Note to the reader: the following appendixes are only available online and have been published as they were received from the authors. They have not been copy-edited or formatted by 3ie.

Online appendix A: Survey instruments

Student survey instrument baseline:
http://www.3ieimpact.org/sites/default/files/2019-01/ie89-appendix-student_survey_instrument_baseline.pdf

School survey instrument baseline:
http://www.3ieimpact.org/sites/default/files/2019-01/ie89-appendix-school_survey_instrument_baseline.pdf

Parent survey instrument baseline:
http://www.3ieimpact.org/sites/default/files/2019-01/ie89-appendix-parent_survey_instrument_baseline.pdf

Midline survey instrument 1:
http://www.3ieimpact.org/sites/default/files/2019-01/ie89-appendix-midline_survey_1_instrument_0.pdf

Midline survey instrument 2:
http://www.3ieimpact.org/sites/default/files/2019-01/ie89-appendix-midline_survey_2_instrument_0.pdf

Student survey instrument endline:
http://www.3ieimpact.org/media/filer_public/2018/12/13/ie89-appendix-student_survey_instrument_endline.pdf

School survey instrument endline:
http://www.3ieimpact.org/sites/default/files/2019-01/ie89-appendix-student_survey_instrument_baseline.pdf

Online appendix B: Pre-analysis plan

http://www.3ieimpact.org/sites/default/files/2019-01/ie89-appendix-breakthrough_pre-analysis_plan_nov_2016.pdf

Online appendix C: Descriptive statistics

Baseline survey report:
http://www.3ieimpact.org/sites/default/files/2019-01/ie89-appendix-baseline_survey_report_0.pdf

Midline tracking report:
http://www.3ieimpact.org/sites/default/files/2019-01/ie89-appendix-midline_survey_report_0.pdf

Endline descriptive statistics:
http://www.3ieimpact.org/media/filer_public/2018/12/13/ie89-appendix-endline_descriptive_statistics.pdf

Online appendix D: .do files

The .do files have been provided separately and are available on 3ie's Dataverse.

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