# The Leaky Pipeline:
# When Career Expectations Meet Social Norms[*]

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## Abstract

Despite rising educational attainment for young women, traditional gender norms constrain female labor force participation in many developing countries. This study examines whether a school-based career exploration program (CEP) can shift adolescents' gendered labor market expectations in urban India. Using a school-level cluster-randomized controlled trial, we examine the causal impact of the CEP on final grade students' expectations regarding women's labor force participation and attitudes towards the male breadwinner norm. Descriptively, the expectation to work in the future is almost universal for young women when marriage and childbearing are not mentioned, but sharply drops when these life-changing events are mentioned for a similarly situated young woman. Further, over one-third of students perceive that a woman having higher earnings or higher education than her husband can lead to marital conflicts. The program significantly increases students' expectations that women will work after childbearing and reduces concerns about marital problems, potentially challenging traditional gender roles.

Keywords: gender norms, inequality, female labor force participation, career guidance, India
JEL codes: O10, O15, C93, I26, J13, J16

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# 1 Introduction

Women's labor force participation remains strikingly low in many parts of the world, not due to a lack of education or ability, but because of deep-rooted and persistent gender norms that restrict their economic roles (Jayachandran, 2020). These norms shape aspirations from an early age, reinforcing the view that women's primary responsibility lies within the household. Their effects are visible not only in adult labor market participation, but also in the career ambitions of adolescent girls and young women, often discouraging them from pursuing high-skilled, well-paid jobs and limiting their potential (Afridi, Dinkelman and Mahajan, 2018; Jha and Bhat, 2017). In India, gender norms influence women's career decisions, often discouraging them from pursuing opportunities despite education gains (Khanna and Sinha, 2015; Bernhardt et al., 2018). The constraining role of rigid gender norms appears particularly evident among urban women with secondary, but not tertiary, education, who have the lowest rates of labor force participation. Many in this group express interest in jobs they are not qualified for, pointing to gaps in information, skills, and perceived opportunity (Fletcher, Pande and Moore, 2017).

This study examines how gender norms and career expectations intersect at a critical point, specifically in a young woman's life, at the end of secondary school. Focusing on 17-year-old students in urban India, we ask three questions: (i) How do young women's expectations about labor force participation shift when marriage and childbearing come into consideration? (ii) How do young women and men view potential marital conflict arising from a woman having higher earnings or education than her husband? (iii) What is the causal impact of a low-cost, school-based career exploration program (CEP) on these expectations and beliefs?

To answer these questions, we study a school-level cluster-randomized controlled trial of a CEP designed and delivered by a partner NGO. The program aimed to expand students' awareness of professional career pathways and encourage reflection on their future roles. Our analysis here focuses on the program's impact on students' expectations about women's labor force participation and their views on gendered dynamics within marriage. With a focus on the perception of gender roles and gendered expectations, this study is complementary to our prior work on how career exploration in secondary school impacts what students aspire to do and choose to do after secondary school (Asri, Asri and Hoeffler, 2025).[1]

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[1] The field experiment with the primary outcomes examined in Asri, Asri and Hoeffler (2025) was preregistered under AEARCTR-0009977.

From our control group, we observe that 96% of young women expect to work in the future when marriage and children are not mentioned. However, these expectations drop dramatically in hypothetical scenarios involving another young woman's marriage (73%), childbirth (40%), and post-childbirth (25%). Young men hold even more conservative views about women's labor force participation. Moreover, more than one-third of young men and women believe that a woman earning more or being more educated than her husband would "almost certainly" cause marital problems, reflecting the prevalent male-breadwinner norm dictating that men should earn more than their wives.

While the CEP does not affect expectations about women working before or after marriage, it significantly increases the percentage of students expecting women to work three years after childbirth. It also reduces the share of students who believe that a woman having higher earnings or education than her husband could cause marital conflict. These results suggest that even relatively low-cost career orientation interventions can begin to shift attitudes around gender roles and women's economic participation.

This study contributes to three different strands of literature. First, we contribute to a growing literature on how social norms and misperceptions about peer attitudes, rather than progressive personal preferences, restrict women's labor force participation, professional ambitions, and aspirations. Seminal work in Saudi Arabia by Bursztyn, González and Yanagizawa-Drott (2020) and studies from India (Khanna and Sinha, 2015; Bernhardt et al., 2018) show how even progressive personal beliefs can be overridden by perceived social expectations. We extend this literature by focusing on relatively educated young women in urban India who are nearing the end of secondary school in the Indian context, a group rarely studied in this context. We examine both their perceptions of prevailing gender norms and the extent to which these perceptions are malleable.

Second, we contribute to the literature on the career-family trade-off, which both theoretically and empirically explains gender differences in labor market outcomes (e.g., Zhang and Zou, 2023; Adda, Dustmann and Stevens, 2017). These trade-offs are particularly high in settings like India, where marriage and fertility remain central to a woman's life trajectory.

Third, we contribute to growing evidence that information, mentoring, and career guidance can influence young people's choices and aspirations (Resnjanskij et al., 2024; Schwartz, 2015; Kessel, Mollerstrom and Van Veldhuizen, 2021). While much of this work has focused on education and employment choices, we show that such programs can also shift gendered expectations and marriage-related beliefs, areas typically thought to be deeply entrenched.

Finally, we also intersect with a literature examining how women's career orientation impacts marital outcomes. Several studies have found that ambitious women face marital penalties that men do not. On a platform for matchmaking, Dhar (2023) shows that female profiles signaling that women want to work after marriage receive substantially fewer requests from male profiles than women who indicate that they have never worked and Bertrand, Kamenica and Pan (2015) documents how deviations from male breadwinner norms (e.g., women earning more than their husbands) can lead to marital dissatisfaction in India. Further away from the studied context, Folke and Rickne (2020) show with Swedish registry data that leadership positions increase the likelihood of divorce for women but not for men. Our study complements this work by showing that beliefs on women's career aspirations impacting marital outcomes are prevalent among adolescents and can be partially shifted before they fully materialize in adult behavior.

The remainder of this paper is structured as follows. Section 2 describes the context and the experimental design, Section 3 describes our empirical strategy, Section 4 presents our results, and Section 5 concludes.

# 2 Background and experimental design

## 2.1 Context

To examine how career exploration may impact young women's expectations to work in the future, especially in connection to life-changing events such as marriage and child-bearing, we use survey data from a randomized control trial conducted in 45 schools without fees, spread across 5 districts in a northern metropolitan city, where the CEP program was implemented in 22 randomly selected schools.[2] We work with students in the 12th grade, i.e., the final grade of secondary school, close to making life-changing decisions for their skill formation. Students are, on average, almost 17 years old at the time of the baseline. We further focus on young women as they face the risk of belonging to a group of women with intermediate levels of education that have been shown to have the lowest rates of female labor force participation, especially in urban settings (Fletcher, Pande and Moore, 2017).

Students in the RCT are primarily female and from economically vulnerable households who are either from the low-income or lower-middle income class, where the male bread-winner norm and home production are valued, shaping the expectations for women to earn less than their husbands and assume domestic responsibilities.

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[2]Based on our administrative approvals, we are not disclosing the name of the city.

Representative data from 2016 from the National Family Health Survey (NFHS) shows for young women between 18 and 30 years of age, similar to our target group, that even though 66% continue higher education after finishing secondary school, only 20% of them enter the labor force (International Institute for Population Sciences , IIPS). Further, when women who want to work are asked to state the type of jobs they prefer, they tend to state occupations which allow them to balance work and household responsibilities (Fletcher, Pande and Moore, 2017).

## 2.2 Intervention

We collaborate with the local school authorities for school access and a local NGO for the intervention. We obtained official approvals from the competent authorities to carry out the project in 45 secondary schools through our partnership with a local NGO working with 11th and 12th graders in and outside secondary schools since 2016. For this study, we focus on 12th-grade students in schools where the partner NGO previously did not work and schools of intermediate size as proxied by the number of sections in the 12th grade, i.e., having between 4 and 6 sections. These are the students who are in their final year of high school, who have already chosen their high school track 2 years ago in 10th grade, and are in the last year of high school, after which they choose whether to continue with tertiary education or not.[3]

The CEP consists of 15 sessions, each lasting 40-45 minutes, and is implemented in all 12th-grade classrooms during school hours in 22 randomly selected schools, while no intervention is implemented in the remaining 23 schools. The team from the implementing organization coordinated with each treatment school on a one-to-one basis to arrange the time slots for the sessions so that regular studies and, in particular, exam-relevant classes would not be affected. For example, every week, head teachers would identify time slots in the schedule that could be used for career exploration sessions while accounting for the grade-specific curriculum and schedule. Each school has, on average, 5 sections with a strength of 40 students per classroom, with 106 classrooms assigned to the treatment and 114 classrooms assigned to the control.

The program aims to guide and encourage students to explore career options and plan their professional future. It is divided into five steps (Table 1) in which the sessions are

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[3]In the Indian context, 12th grade is the final year of secondary school, after which students transition to career paths such as university education typically conditional on passing an entrance exam, vocational training, or to the labor force. This grade is particularly critical as the structured and protected school environment ends here. This transition can be especially challenging for young women, as they may face restrictions on continuing their education or labor force participation due to mobility constraints, societal expectations, or early marriage.

designed to help students identify their strengths, interests, and talents, consider their barriers and constraints, identify suitable careers, make plans to pursue a career path, and identify people who can support them.

Table 1: Steps of the CEP

| Step 1: Start to think! | Students start thinking about the world of careers and their interests. |
|---|---|
| Step 2: Think openly! | Students explore more than 70 careers from more than 12 different sectors and industries with provided materials and expert videos. |
| Step 3: Know yourself! | Students focus on learning about themselves understanding their own strengths and interests. |
| Step 4: Prepare to succeed! | Students get to know more than 200 institutes offering a wide range of interesting courses and other opportunities enabling you to pursue your preferred career. |
| Step 5: Choose your path! | Students choose their own path to pursue their goals with information materials and videos, including tips from role models. |

Students are not expected to complete their planning by going through these steps once; instead, the program provides the flexibility to go through each step a few times until they feel comfortable preparing a plan of action. Towards the end of the program, students prepare a plan of action and present this to all other 12th-grade students in their school and their teachers during the so-called celebratory "showcase event" during the final session.

The program is designed to set realistic expectations based on constraints, such as financial constraints, academic ability, or regulations specific to the education system in India.[4] The facilitators encourage students in a structured manner to consider their strengths and interests, the situation they are living in, and the financial constraints they are facing. Facilitators are also trained to be transparent about the competitiveness of specific career paths, such as becoming a civil servant or a professional sports player. The facilitators motivate students to have a backup plan if they choose competitive or risky career paths.

Apart from the activities led by the facilitators, students also obtain personalized access to an online platform created by the NGO, which provides information on many career paths and sectors of work, as well as videos and interviews from people who already work in occupations of interest. Students in small groups of 2-3 are provided tablets during the sessions to jointly explore careers on the platform.

Facilitators always work in pairs, with one facilitator leading the session and the other supporting in the background. In co-educational schools, facilitators are a mixed-gender

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[4]For instance, access to specific subjects at university requires completing secondary school in a particular stream, such as the "Commerce stream" for studying Economics or the "Science stream" for studying medicine or engineering.

pair; in single-sex schools, facilitators have the same gender as the students. Facilitators are, on average, five years older than the students, typically enrolled in tertiary education but from a similar community as the students. This helps the students relate to the facilitators. In addition to the in-person meetings, facilitators also used WhatsApp groups to interact with the students and allow the students to interact with each other. Further, facilitators had bilateral conversations with the students. The NGO provided online materials on various career paths for all participating students, and students created their own personal and password-protected profiles in one of the first sessions.

## 2.3 Causal pathways

The CEP addresses lack of self-awareness, incomplete information, resource constraints, low aspirations, and lack of role models as underlying **problems**. The program with its **inputs** encourages self-awareness, provides information sources, guides students' career exploration through relatable facilitators, and encourages students to communicate with people around them, including potential supporters and gatekeepers.

As examined in Asri, Asri and Hoeffler (2025), the intervention is expected in the short term to make students more aware of their strengths and interests, the variety of career paths, and returns to skill formation influencing their career and occupational choices. Beyond these impacts, the classroom-based activities of making plans for future careers can also impact gender norms and perceived gender roles, which we examine here.[5]

Given the group sessions in the classroom in which all students think about their future, explore a variety of career paths and access relevant information on opportunities, we expect them to become more familiar with the idea of women pursuing careers and women working, and less likely to support traditional gender roles in which men have higher education/earnings than their wives. On the one hand, this could stem from developing their aspirations for a career and being more open-minded about the type of career; on the other hand, it may also be that the CEP increases the likelihood of young women and young men expecting other young women to work in the future.

Given the program's design and sessions' content, we expect that the impacts could be driven through five mediators that we explain in more detail in Section 3.5:

(i) Alleviation of information constraints

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[5]The registered report describing the field experiment is available here. The field experiment was implemented as planned in the registered report. We examine alternative impacts here and refer the reader to Asri, Asri and Hoeffler (2025) for the impacts on students' career plans in the short-term and career choices in the medium-term.

(ii)  Raising aspirations regarding educational achievements and future earnings

(iii)  Peer effects

(iv)  Family/community support

(v)  Facilitator as a role model

## 2.4  Research procedures and timeline

The implementation of the CEP is randomized at the school level, and within a treatment school, all 12th graders in their respective sections are exposed to the intervention. We chose a school-level randomized controlled trial to minimize the probability and extent of spill-over effects (Muralidharan, 2017). Given that school-specific activities occur frequently in this context, we expect any spill-over effect to be unlikely and minor and, if at all, lead to an attenuation bias for the measured impact. School principals, teachers, and students were not informed about the study's objectives and the research-specific assignments into treatment and control groups. We implement this by informing school principals and teachers only about what will happen in their school and our broader motivation for data collection to assess the need for career guidance in low-cost schools.

Based on these considerations, in spring 2023, the local school authority sent letters to 45 medium-sized secondary schools without fees across a metropolitan city in Northern India. The letters described the data collection requirements for all schools, and if in the treatment group, the practical requirements for implementing the CEP sessions. Once schools had received the letters, our team contacted the schools and fixed dates for the baseline data collections in schools, which focused on students' socio-demographic information and students' career plans.

After the baseline, in fall 2023, the implementing partner organization conducted the CEP during school hours in 22 schools, of which 17 were girls' schools, four co-educational schools, and one boys' school, given our primary interest in young women's career choices. No program was implemented in the control group of 18 girls' schools, four co-educational schools, and one boys' school.

In November-December 2023, we collected endline data on students' future plans, expectations, and views. Our primary outcome variables on female labor force participation expectations were collected from all participants. At the same time, questions regarding the impact of earnings and education differences on marital problems were randomized at the individual level. Half of the respondents were asked about earnings differences and the other half about education differences, regardless of their assignment to the treatment

or control groups. The research procedures are visualized in Figure 1.

Figure 1: Research procedures and timeline

| Spring-summer 2023 | School authority sends letter to **45 medium-sized secondary schools** – across metro city in Northern India | |
| | Baseline survey in schools during school hours – 12th graders: socio-demographics and student's career plans (n=6549) | |
| Fall 2023 | 22 schools: (17 Girls, 4 Coed, 1 Boys) Career exploration program during school hours | 23 schools (18 Girls, 4 Coed, 1 Boys) No session, status quo |
| Nov-Dec 2024 | Endline data collection: <u>Focus on future plans</u> (n=6703) | |

# 3  Data and empirical strategy

## 3.1  Data

We use baseline and endline data from a pre-registered field experiment on how the CEP can improve students' career choices. These data are further complemented by administrative data provided by our partner NGO. The baseline and endline surveys were filled out by students on tablets provided by our team in the classroom. We surveyed approximately 75% of all registered students, corresponding to average attendance rates in this type of school setting (Baruah, 2022).

Our baseline data contains socioeconomic information of the students, a module to measure social desirability, and current access to career guidance privately and in school. The endline survey captures students' career plans in general as well as their expectations and attitudes. **For this study, we focus on expectations regarding future labor force participation and how these expectations are linked to marriage and childbearing, as well as attitudes towards marital problems.**

We examine how students view their own future labor force participation and the labor force participation of a young woman who goes to a similar school and lives in a similar neighborhood, building on our ongoing work on how career guidance impacts students' career choices. We subsequently asked students for their view on the statement that women having higher earnings or higher levels of education would "almost certainly" cause marital problems.

While we mentioned expectations towards women as very relevant for career aspirations and choices in our pre-registration and pre-analysis plan, we did not pre-register the analysis focused on these outcomes, and Appendix A describes the deviations from the pre-analysis plan.

## 3.2   Hypotheses

Based on our theory of change (Section 2.3), we examine the following hypotheses:

We expect to see, descriptively, a downward slope in students' expectations once marriage and childbearing are mentioned, as these are closely linked with the expectation of women assuming domestic responsibilities. Based on this, we formulate our first hypothesis.

H1 - descriptive: Students' expectations for future labor force participation are highest when they are asked about themselves, and marriage and childbearing are not mentioned, but are lower for a similarly situated young woman when marriage and childbearing are mentioned.

In India, the male-breadwinner norm is prevalent, implying that men are primarily responsible for the household's income, while women are expected to manage household chores. Relatedly, even if there is no specific gender norm, there is a perception that men dislike if their wife is more educated than themselves and perceive this as a potential source of marital problems. We therefore expect a relevant share of students to agree with the statement, but we do not have any empirical benchmark for our expectation. Yet, we have descriptive research hypotheses on the male breadwinner norm being more prevalent when the statement is framed around earnings differences than educational differences, and among male students than female students.

H2a - descriptive: We expect agreement with the male breadwinner norm to be more prevalent when the statement is framed around earning differences compared to framing it around education differences.

H2b - descriptive: We expect agreement with the male breadwinner norm to be more prevalent among male than female students.

The CEP encourages the students to explore different career options and to prepare a plan of action to pursue their career objectives. This may make their expectations regarding working in the future more concrete and may increase the share of female students who see themselves working in the future. We do not expect any impact on male students, as already in the status quo, almost all male students expect to be working in the future.

H3 - causal: The CEP increases the share of female students who see **themselves working in the future**.

Participation in the CEP also involves being together with other students, exploring different career options. Hence, students see their peers doing so and may imagine that similar activities may also happen at other schools. We expect this to increase the likelihood of expecting other young women to be working both one year before marriage (H3) and one year after marriage (H4).

H4 - causal: The CEP increases the share of students who see **a similarly situated young woman before marriage** working.

H5 - causal: The CEP increases the share of students who see **a similarly situated young woman after marriage** working in the future.

Turning now to working three years after childbearing as our outcome of interest, CEP may encourage students to reflect on how domestic responsibilities, including caring for children and labor force participation, could be managed in the future. We focus on three years after childbearing, as this allows parents to access kindergarten and preschools. An alternative mechanism could be that young women see themselves getting married to a different type of spouse who is either willing to share the childcare responsibilities or supportive of using kindergarten and pre-school facilities.

H6 - causal: The CEP increases the share of young women who see **a similarly situated young woman three years after childbearing** working in the future.

Finally, as young women and men explore career options, they are familiarized with the idea that both genders can pursue high-skilled and well-paid occupations, which in turn makes them less likely to agree to a statement on women having higher earnings or education as a cause of marital problems.

H7 - causal: The CEP reduces the likelihood that a student agrees with the statement that a woman having higher earnings/education than her husband would almost certainly cause marital problems.

## 3.3 Operationalization

To examine these hypotheses, we first elicit students' own expectations regarding their labor force participation in the future without referring to marriage or childbearing and subsequently use a vignette approach to elicit their labor force expectations for a similarly situated young woman. All outcome variables analyzed in this paper were collected during

our endline survey in fall 2023. We describe all relevant survey questions here and provide the list of questions in Appendix B.

**Expectation to work in the future** We ask students whether they see themselves working in the future.

After this, we ask students at what age they see themselves getting married ($X_G$) and male students at what age they think a similarly situated young woman should get married ($X_B$).[6] For the vignette questions, we then introduce "Sameera" who goes to a similar school and is from a similar neighborhood as the student.

While it was acceptable to ask students about their own intended age at marriage (X), we could not ask them about their own expected age at childbearing. Given the context and the age of the students, this would have been too intrusive and not allowed to be asked within a school setting. Further, students' answers might have been more socially desirable when reporting about themselves than about a young woman like them and we therefore introduced "Sameera".[7]

**Expectation that Sameera would work before marriage / after marriage:** We inform the student that Sameera gets married at age X and subsequently ask the students whether they see Sameera working at age X-1 and at age X+1. X is equal to $X_G$ for female students and $X_B$ for male students. In case students do not expect to get married themselves, we use the gender-specific average marriage age as computed from the National Family Health Surveys 2015/2016.

Subsequently, we ask all the students at what age they see Sameera having her first child (Y), and continue asking a question about Sameera after informing the student that Sameera had her first child at age Y.

**Expectation that Sameera would work three years after childbearing:** We ask whether the student sees Sameera working three years after having her first child.

To elicit students' views on women having higher earnings or education than their husbands, we ask **randomly selected 50% of the students** to indicate their view on the earnings-related statement and the remaining 50% of the students to share their views on the education-related statement:

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[6]Students can also indicate that they do not seem themselves getting married or that they think a similarly situated young woman would not get married (only 6.74% of the female students and 6.49% of the male students).

[7]Since the treatment did not cause any significant difference in the expected age at marriage for students in treatment schools vs. control schools, the students are not exposed to significantly different ages in these questions.

**Earnings statement:** If a woman earns more money than her husband, it is almost certain to cause marital problems.

**Education statement:** If a woman has a higher level of education than her husband, it is almost certain to cause marital problems.

Figure 2 visualizes the survey flow, and the survey questions are shown in Appendix B.

Figure 2: Survey flow
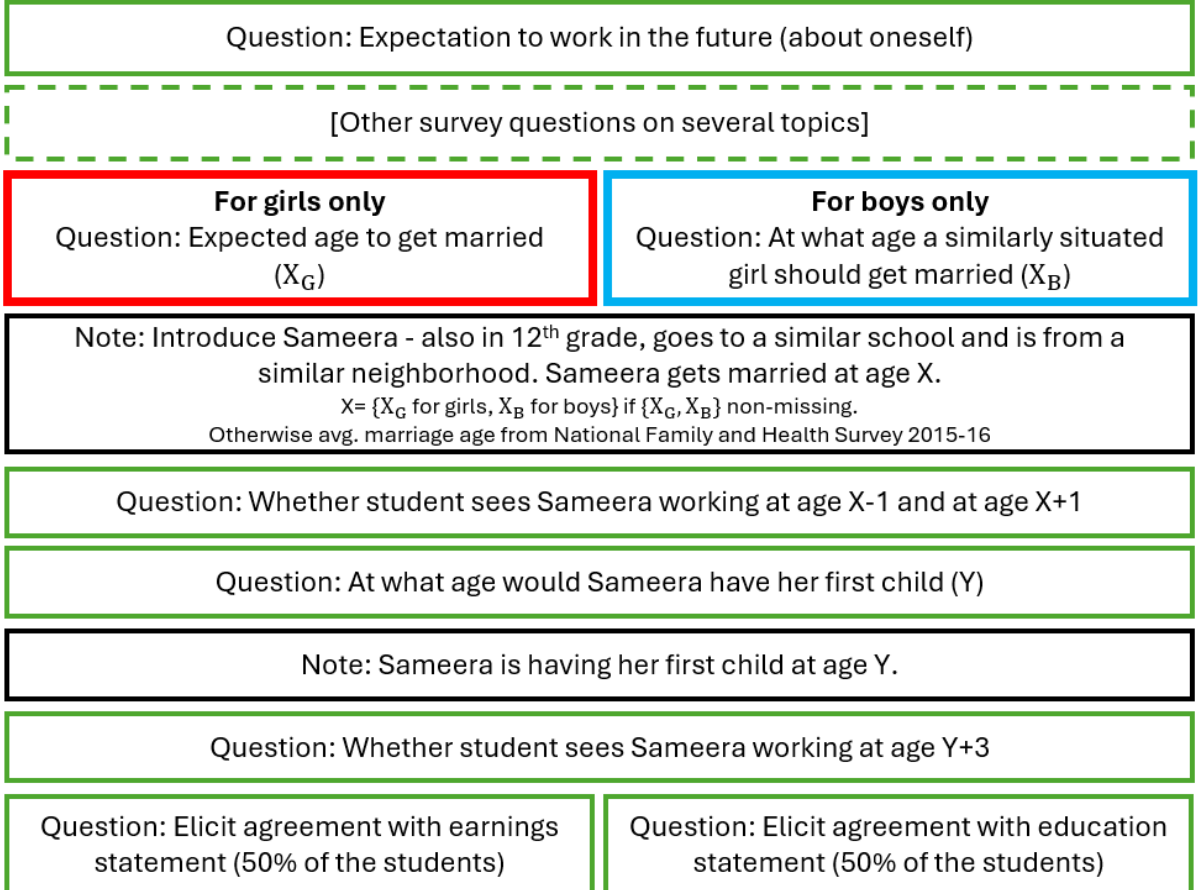


## 3.4 Empirical specification

We start our analysis with balance checks comparing the baseline variables for individuals in treatment schools and control schools using the following specification with covariates X at the baseline ($t = 0$) of respondent i from school s regressed on the treatment status that varies at the school level and district fixed effects $\gamma_d$ since we stratify at the district level with standard errors clustered at the school level:

$$X_{0isd} = \alpha + \beta T_s + \gamma_d + \epsilon_{is} \tag{1}$$

Next, we will present the descriptive evidence on students' expectations for their labor force participation and for the labor force participation of another similarly situated young woman (H1), as well as the distributions of the views ranging from strong disagreement to strong agreement on whether earnings or educational differences between wife and husband would cause marital problems (H2a and H2b). We focus here on the control group students to demonstrate students' expectations and views, who are, by design, not exposed to the intervention.

In the following, we will estimate the intention to treat (ITT) effect, regressing the outcomes of interest measured for individual i in school s on the treatment status and district fixed effects, comparing students in treatment group schools to students in control group schools. Standard errors are clustered at the school level:

$$Y_{is} = \alpha_1 + \beta_1 T_s + \delta X_{0is} + \omega_{is} \tag{2}$$

The estimations of causal impacts from the treatment follow our pre-analysis plan regarding the empirical specification and covariates. As covariates, we include the gender of the student, age, in which stream they are studying, having siblings, having an older sister, having an older brother, having received career counseling before the CEP, household size, and total number of assets owned by the household whether the student goes to a co-educational school and district fixed effects.

We further estimate the local average treatment effect (LATE), indicating the impact of the CEP for those students who participated regularly in the sessions, which we define as participating in at least 10 sessions, corresponding to the median number of sessions attended by students in our sample. That is, we capture the causal effects among the actual compliers or a subset of participants who meaningfully engage with the treatment.[8]

## 3.5 Mediation analysis

As outlined above, different mechanisms could explain the program's impact on students' expectations regarding labor force participation and attitudes regarding women having higher earnings/education than their husbands. We conduct a mediation analysis following the approach developed by Heckman, Pinto and Savelyev (2013) and Heckman and Pinto (2015) to measure the relevance of potential channels for the treatment effect.[9]

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[8]By conditioning on actual participation levels, we are focusing on a group whose behavior suggests they were responsive to treatment assignment. While this approach relies on post-assignment information, it still provides useful and relevant insights, for example, it shows the program's impact among those who engage with it regularly.

[9]For the here-followed application of the mediation analysis, see (Resnjanskij et al., 2024).

This mediation analysis enables us to decompose how much of the program impact can be attributed to different observable mechanisms called mediators. We focus on five mediators that can explain the impact on the primary outcome variables. Informed by our theory of change, these mediators focus on information, aspirations, peer effects, family/community support, and facilitator effects as the relevant channels for the impact. With this method, we will decompose the impact into six shares, of which five will be attributed to these expected mediators, and one share will remain as the unexplained remainder of the treatment effect.

Assuming that the outcome can be expressed as a linear combination of the $k = 5$ mediators $M_i^k$ and a vector of baseline demographic characteristics $X_0is$, we can write the baseline equation as:

$$Y_{is} = \alpha + \beta^{\text{residual}} T_{cs} + \sum_k \theta^k M_i^k + \delta X_{0is} + \gamma_s + \varepsilon_{is} \tag{3}$$

The effect that the mediation analysis cannot capture is captured by the coefficient $\beta^r esidual$, and the share of the treatment effect explained by combined changes in the mediators that we can observe is $1 - \frac{\beta^r esidual}{\beta}$. We further estimate the effects of the treatment on the respective mediators such that:

$$M_{is}^k = \alpha_o^k + \beta_1^k T_{is} + \delta_1^k X_{0is} + \gamma_{0_s} + v_{is} \tag{4}$$

Therefore, the kth mediator's contribution to the share of the overall treatment effect is the direct effect of the mediator, $\theta^k$, weighted by the proportion of the treatment effect on the mediator and the total treatment effect, that is:[10]

$$ShareM_k = \theta \frac{\beta_1^k}{\beta_1} \tag{5}$$

The analysis will, therefore, allow us to understand to what extent the overall impact on labor force participation expectations and attitudes regarding women having higher earnings/education than their husbands is driven by one of these five mechanisms, each addressing the underlying problems of the imperfect human capital allocation in the labor market:

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[10]This estimated effect is an upper bound of the mediator effect since the mediation effect relies on the assumption that the error term including any unobserved mediators is orthogonal to the included mediators.

**Information**: Students can explore different career options and learn about the pathways to achieving their career objectives. This can inform students' expectations and attitudes. We measure this by asking students to list up to three occupations that they feel would be good for them and to indicate for each of these occupations how well they feel informed. This allows us to categorize a student as well informed if the student indicates "completely informed for at least one occupation. If this mechanism plays a role, it implies that students adjust their expectations regarding labor force participation due to additional information obtained on career options.

**Education and salary aspirations**: As students explore different careers independently and jointly with their peers and are exposed to young women as facilitators a few years ahead of them who have already made relevant career choices, they may have higher educational and income aspirations which may then translate into more progressive expectations and attitudes. We measure this by asking students for their aspired level of education and salary expectations for their first job. We distinguish between education and salary aspirations.

**Peer effects**: Given the program implementation in the classroom, students are encouraged to discuss their career plans with their peers and explore different career options jointly. These interactions among students increase the likelihood of students attending sessions, exploring different careers, and reflecting on them. It can also foster teamwork and fill the gaps in their knowledge, as students are expected to share complementary information with each other. We capture this potential peer effect in two ways.

– Peer communication: This channel captures whether talking to peers is a relevant source of information for students' future choices or whether talking about the future is a topic of discussion among students' peers.

– Peer influence: This channel captures to what extent students are influenced by their friends planning to continue skill formation in the endline or continuing skill formation in the follow-up using the data from up to six other students in their grade that they speak to the most.

**Community**: The CEP encourages students to share their career objectives with family members and/or community members to identify potential supporters. This addresses the possible lack of social support in pursuing a career objective. We measure this by asking students whether they get any relevant information from a family member or someone in their community, and whether they get support

from a family member or someone in their community to achieve their professional objectives. Evidence for this mechanism would imply that the CEP improves students' expectations and views by encouraging students to obtain support from their families and or people in their community.

**Facilitators**: The facilitators leading the CEP sessions are from similar backgrounds and schools but have already made career decisions. They may act as role models, helping students update their beliefs about their ability to pursue certain career paths. We ask students whether there is someone around them who inspires them, whom they know personally, with one of the answer options referring to the CEP facilitator. Evidence for this mechanism would imply that the CEP improves students' expectations and attitudes by providing a role model.

In the Appendix Table B2, we show the survey questions and answer options used for all the mediators as well as the coding.

# 4 Results

## 4.1 Balance checks

Table 2 shows that all variables are balanced when comparing the treatment and control group except for the age of the students, which is 0.12 years higher in the control group than in the treatment group at the time of the baseline.[11] We, therefore, account for this minor age difference in all specifications.

Students in our sample are primarily female (89%) and at the time of the baseline survey, close to 17 years of age. Having decided on their specialization at the end of the 10th grade, the 12th grade students in our sample are mostly in the Arts Stream (70%), followed by Commerce Stream (21%) and Science Stream (9%). Most students have an older brother (43%) or sister (or both). Almost all the students have a sibling (98%) and many of them have an older brother or older sister (43-46%). Almost all the students have a sibling (97%) and an older brother (45%) or older sister (45%). The students are from households with, on average, 5.45 household members that own, on average, 3 out of 6 assets.[12]   About 52.5% of the students received formal or informal career

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[11]Due to organizational issues, the survey teams conducted the baseline in the control group about six weeks later than the baseline in the treatment group causing a mechanic difference in the age of treatment and control group students.

[12]We asked students whether their households owned a motor cycle or scooter, a car or 4-wheeler, a television, a washing machine, a television, a fridge and an air-condition and the students reported ownership as follows: 51% own a motor cycle or scooter, 13% own a car of 4-wheeler, 82% own a television, 84% own a fridge and 22% own an air-condition.

guidance before, and about 15% of the students go to a co-educational school. Despite the metropolitan setting and a relatively educated and young target group, the perception of gender roles is widespread at baseline: 38% of the students agree with the statement that it is women's most important role to take care of the household and family, and 30% agree that preference should be given to men when jobs are scarce. 61% of the students report that no woman from their household has worked outside the house in the last two years. Students tend to give socially desirable answers with an index of 4.4 out of 6 when being asked questions from a short version of the Marlow-Crowne social desirability scale (Crowne and Marlowe, 1960) and following closely (Dhar, Jain and Jayachandran, 2022).

From the administrative data at the school level in Table 3, we observe that school-level variables are balanced too including the shares of students in arts (70%), commerce (21%) and science streams (10%), the shares of students going to girls schools (78%), co-educational (18%) and boys schools (4%), the number of 12th graders per school (175), the number of students per section (40) and the number of 12th grade sections in a school (4.9). Students from all 12th-grade sections at a school participate in the surveys, and if it is a treatment school, the CEP is implemented in all sections.

Table 2: Balance table - Student surveys

| Variable | (1) Control | (2) Treatment | (3) Difference (C-T) | (4) Observations |
|---|---|---|---|---|
| Female as the gender of students | 0.898 | 0.883 | -0.015 | 5,381 |
| | (0.303) | (0.322) | (0.072) | |
| Age | 16.836 | 16.714 | -0.122*** | 5,381 |
| | (0.753) | (0.751) | (0.040) | |
| Stream: Arts | 0.702 | 0.697 | -0.005 | 5,381 |
| | (0.458) | (0.460) | (0.056) | |
| Stream: Commerce | 0.203 | 0.218 | 0.015 | 5,381 |
| | (0.402) | (0.413) | (0.034) | |
| Stream: Science | 0.095 | 0.085 | -0.010 | 5,381 |
| | (0.294) | (0.279) | (0.042) | |
| Has a sibling | 0.978 | 0.980 | 0.003 | 5,381 |
| | (0.148) | (0.139) | (0.003) | |
| Older brother | 0.462 | 0.434 | -0.028 | 5,381 |
| | (0.499) | (0.496) | (0.021) | |
| Older sister | 0.452 | 0.438 | -0.014 | 5,381 |
| | (0.498) | (0.496) | (0.021) | |
| Household size | 5.485 | 5.414 | -0.070 | 5,381 |
| | (1.692) | (1.782) | (0.093) | |
| No. of assets out of 6 | 3.009 | 3.073 | 0.065 | 5,381 |
| | (1.471) | (1.543) | (0.128) | |
| Received guidance before | 0.518 | 0.538 | 0.020 | 5,381 |
| | (0.500) | (0.499) | (0.034) | |
| Co-educational school | 0.175 | 0.141 | -0.034 | 5,381 |
| | (0.380) | (0.348) | (0.114) | |
| Women - household | 0.377 | 0.376 | -0.001 | 5,381 |
| | (0.485) | (0.484) | (0.026) | |
| Men - job | 0.304 | 0.297 | -0.008 | 5,381 |
| | (0.460) | (0.457) | (0.021) | |
| No woman works | 0.620 | 0.598 | -0.023 | 5,381 |
| | (0.485) | (0.490) | (0.023) | |
| Social desirability index (1-6) | 4.402 | 4.346 | -0.056 | 5,381 |
| | (1.106) | (1.135) | (0.039) | |
| Observations | 2,958 | 2,423 | 5,381 | |

Standard errors are shown in parentheses.
Source: Baseline survey conducted in summer 2023.

Table 3: Balance table - School variables

| Variable | (1) Control | (2) Treatment | (3) Difference (C-T) | (4) Observations |
|---|---|---|---|---|
| Arts stream students | 0.705 | 0.686 | -0.019 | 45 |
| | (0.181) | (0.178) | (0.054) | |
| Commerce stream students | 0.201 | 0.218 | 0.017 | 45 |
| | (0.105) | (0.125) | (0.034) | |
| Science stream students | 0.094 | 0.096 | 0.002 | 45 |
| | (0.135) | (0.157) | (0.044) | |
| Girls school | 0.783 | 0.773 | -0.010 | 45 |
| | (0.422) | (0.429) | (0.127) | |
| Co-educational school | 0.174 | 0.182 | 0.008 | 45 |
| | (0.388) | (0.395) | (0.117) | |
| Boys school | 0.043 | 0.045 | 0.002 | 45 |
| | (0.209) | (0.213) | (0.063) | |
| N of 12th graders | 180.696 | 168.773 | -11.923 | 45 |
| | (81.100) | (66.324) | (22.143) | |
| N of students per section | 39.491 | 40.343 | 0.851 | 45 |
| | (8.216) | (7.608) | (2.363) | |
| N of sections | 4.957 | 4.818 | -0.138 | 45 |
| | (1.581) | (1.402) | (0.446) | |
| Observations | 23 | 22 | 45 | |

Standard errors are shown in parentheses.
Source: Administrative data of schools collected in spring 2023.

## 4.2 Descriptive statistics

As reported in the endline, almost all students in our sample expect to get married. Approximately 93% of the female and male students expect to get married. Female students, on average, expect to get married at age 26, and male students expect to get married at age 24. The expected age at marriage is not impacted by the treatment.[13]

We examine descriptively H1 on how students' expectations regarding labor force participation vary when asked about themselves without mentioning marriage or childbearing, and when asked about a similarly situated young woman before marriage, after marriage, and after childbearing. Indeed, expectations regarding labor force participation are highest when asked about themselves (97% of male students and 96% of female students) and then expectations drop substantially when asked about a similarly situated young

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[13]Young men may want to get married sooner than young women for a variety of reasons, as for them and their families, it is connected to receiving dowry and the prospective daughter-in-law taking over domestic responsibilities. Female students, however, may report a later preferred age at marriage linked to the aspiration of completing education first and potential constraints that may result from their in-laws' expectations regarding domestic responsibilities.

woman before marriage (55% by male students and 74% by female students) and after marriage (30% by male students and 41% by female students) and after childbearing (21% by male students and 25% by female students). These substantially decreasing expectations on female labor force participation are visible for male and female students, but male students tend to be more pessimistic about the female labor force participation of a similarly situated young woman, potentially because they know better their parents' expectations towards a prospective daughter-in-law, given the norm of patrilocality, or because of their own preferences. Young women appear to have an optimistic view on their own future in the labor market, but a rather pessimistic view for similarly situated young women once marriage and childbearing are mentioned.

Examining students' attitudes on a woman having higher earnings or higher education, and her husband leading to marital conflicts, allows us to test H2a and H2b. We first expected that students would be more likely to perceive earnings differences as a cause of marital conflict than education differences (H2a) and that agreement with earnings or education differences causing marital conflicts is more prevalent among male than female students. We find that 43% of the male students and 37% of the female students think that a wife having higher earnings than her husband will "almost certainly" cause marital problems, and that 37% of the male students and 38% of the female students think that a wife having higher education than her husband would "almost certainly" lead to marital conflicts. Hence, we find that male students (but not female students) are indeed more likely to agree with the statement when it is framed around earnings differences than with the statement framed around educational differences, and find evidence for H2a but only for boys. Similarly, now only for the earnings statement, we find that agreement tends to be higher among male students than female students.

Figure 3: Expectations - female labor force participation (only control group)



N = 303 males and 2655 females

Male    Female

Figure 4: Women having higher earnings/education than husbands causes marital problems (only control group)



N = 170 males and 1343 females          N = 133 males and 1312 females

Male    Female

## 4.3   Regression results

Turning now to the analysis testing our causally identified hypotheses in Table 4, we do not find empirical support for the hypotheses on the CEP increasing the share of students seeing themselves working in the future (H3) or the share of students seeing another

similarly situated young woman one year before (H4) or one year after marriage (H5) working. While there is little scope to improve the expected labor force participation (as it stands already at 96.5%), the lack of an impact of the CEP on expected labor force participation one year before and after marriage goes against our expectations. However, the CEP increases students' expectation of a similarly situated young woman to be working three years after childbearing by about 2 percentage points as an intention-to-treat effect corresponding to an effect size of 9% of the control group mean value. The local average treatment effect for the compliers - those students who attended the CEP sessions regularly - is 4.4 percentage points or 18% of the control group mean value. In all specifications, though correlational, female students have substantially higher expectations towards women working, except for the first one, where both female and male students' expectations were very close to 100%.

One potential explanation for the unexpected finding of no treatment impacts for one year before and after marriage is that young women's bargaining power right before and right after marriage is generally perceived to be relatively low. First, the young women's parents are concerned about not finding a suitable groom if their daughter is working, and later, parents-in-law expect their daughter-in-law to fulfill her domestic responsibilities. Such societal expectations are one way to explain why the CEP does not have an effect. Only later, after at least three years of childbearing, students may see women in a position to develop some bargaining power, allowing them to work and pursue some professional objective.

With respect to the view that men are supposed to have higher earnings and higher education than their wives[14], we find that the CEP significantly reduces the share of students who think that earnings or educational differences (H7) would cause marital problems by 5.2 and 4.1 percentage points, respectively, for the ITT and 11.0 and 8.4 percentage points for regularly participating students, as shown by the LATE estimations. Hence, given the control group mean value, the effect sizes are 14% and 11% of the control group mean for the ITT and 29% and 22% of the control group mean for the LATE. This highlights that the CEP can address adolescents' perception that earnings or educational differences between wife and husband are perceived as "almost certainly" causing marital problems, potentially deterring young women's career choices. As shown descriptively before, young women are 7 percentage points less likely to agree to the statement that earning differences would cause marital problems, but equally likely to perceive educational differences as a cause for marital problems.

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[14]One of the two statements was randomly selected to be shown to a student.

Table 4: Career guidance impact on the expectations to work

| | Own future | | Before marriage | | After marriage | | After child | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| CEP | 0.002 | 0.001 | 0.012 | 0.006 | 0.005 | 0.005 | 0.023** | 0.021** |
| | (0.007) | (0.006) | (0.025) | (0.015) | (0.018) | (0.013) | (0.010) | (0.008) |
| Female as the gender of students | | 0.005 | | 0.185*** | | 0.092*** | | 0.070*** |
| | | (0.010) | | (0.025) | | (0.023) | | (0.021) |
| N | 5381 | 5381 | 5381 | 5381 | 5381 | 5381 | 5381 | 5381 |
| *Panel B: LATE* | | | | | | | | |
| Regular CEP attendance | 0.004 | 0.003 | 0.025 | 0.012 | 0.011 | 0.011 | 0.047** | 0.044*** |
| | (0.013) | (0.012) | (0.049) | (0.030) | (0.037) | (0.027) | (0.021) | (0.017) |
| Female as the gender of students | | 0.005 | | 0.185*** | | 0.092*** | | 0.070*** |
| | | (0.010) | | (0.024) | | (0.023) | | (0.019) |
| N | 5381 | 5381 | 5381 | 5381 | 5381 | 5381 | 5381 | 5381 |
| Controls | ✗ | ✓ | ✗ | ✓ | ✗ | ✓ | ✗ | ✓ |
| Control group mean | 0.965 | 0.965 | 0.720 | 0.720 | 0.395 | 0.395 | 0.247 | 0.247 |

*Notes:* The dependent variable indicates whether the girl/boy plans to work in the future for pay (1) and (2). For model (3) - (8), the dependent variables for girls(boys) indicates whether a girl like her (a girl in a similar school like yours) would work in the future for pay before marriage (3) and (4), after marriage (5) and (6), and after childbearing (7) and (8) respectively. In Panel B, we instrument whether the student attended a higher number of sessions than the median with the school-level random assignment to the treatment group. All odd column specifications are without controls and even column specifications include baseline covariates, school type fixed effects, and district fixed effects. Standard errors are clustered at the school level for all specifications. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Career guidance impact on the perception that earnings and education differences between wife and husband cause marital problems

|  | Earnings | | Education | |
| --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) |
| CEP | -0.051** | -0.052** | -0.037* | -0.041** |
|  | (0.022) | (0.020) | (0.020) | (0.018) |
| Female as the gender of students |  | -0.073** |  | 0.005 |
|  |  | (0.033) |  | (0.020) |
| N | 2742 | 2742 | 2639 | 2639 |
| *Panel B: LATE* | | | | |
| Regular CEP attendance | -0.106** | -0.110*** | -0.073* | -0.084** |
|  | (0.046) | (0.042) | (0.040) | (0.036) |
| Female as the gender of students |  | -0.072** |  | 0.001 |
|  |  | (0.030) |  | (0.023) |
| N | 2742 | 2742 | 2639 | 2639 |
| Controls | ✗ | ✓ | ✗ | ✓ |
| Control group mean | 0.375 | 0.375 | 0.379 | 0.379 |

*Notes:* The dependent variable indicates whether the respondent thinks that a woman with a higher income (1-2) or higher education (3-4) than her husband almost certainly causes marital problems. In Panel B, we instrument whether the student attended a higher number of sessions than the median with the school-level random assignment to the treatment group. All odd column specifications are without controls and even column specifications include baseline covariates, school type fixed effects, and district fixed effects. Standard errors are clustered at the school level for all specifications. Standard errors are clustered at the school level.
$^{*}$ $p < 0.1$, $^{**}$ $p < 0.05$, $^{***}$ $p < 0.01$

To account for multiple inference across closely related outcomes, we follow the procedure proposed by Anderson (2008) and report both raw p-values and Benjamini–Hochberg (BH) q-values, which control the false discovery rate. Figure 5 shows the treatment effects on the six outcomes. The top panel shows ITT estimates and the bottom panel shows the LATE estimates. We observe statistically significant impacts on expectations around post-childbearing labor participation and concerns about education- and income-related marital conflict, even after adjusting for multiple comparisons.

Figure 5: Correcting p-values following Anderson (2008)
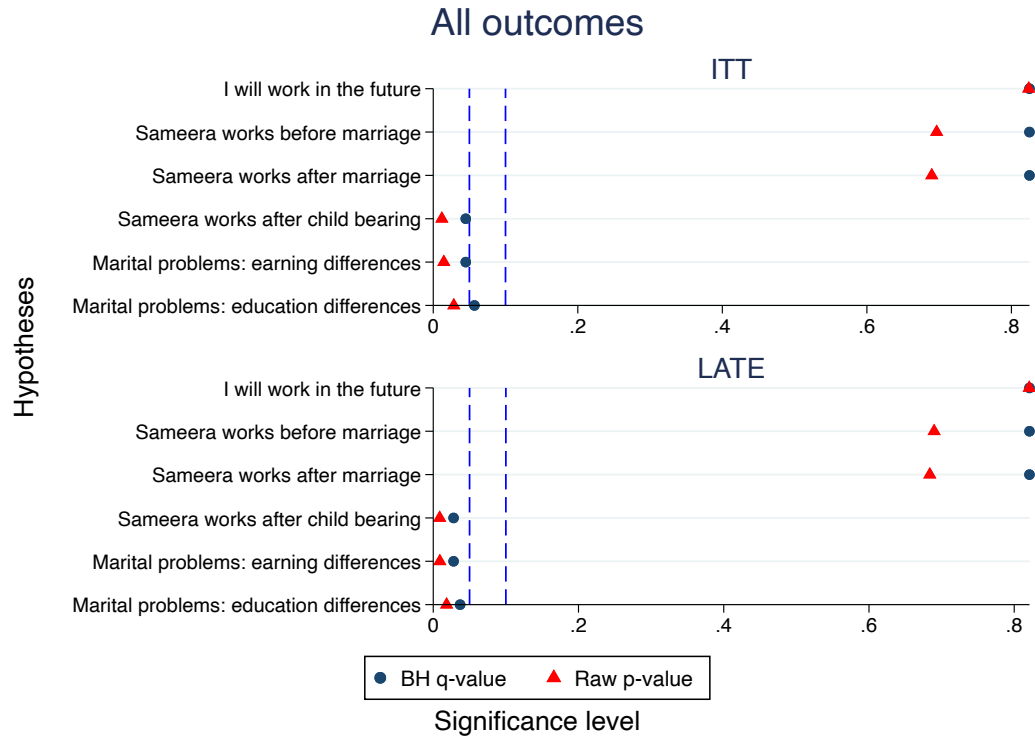
## Mediation analysis

What drives the results of the impact of the CEP in Table 4 and Table 5? Figure 6 highlights the key mediators that explain the impact of the CEP on both perceptions of labor force participation after childbearing and marital problems if a woman has higher earnings or higher education than her husband.

Overall, the hypothesized mediators explain relatively little of the variation in the treatment effects. The hypothesized mediators explain only 7% of the impact variation for working after childbearing, 5% of the impact variation on seeing earnings differences as a cause for marital problems, and 24% of the impact on seeing educational differences as a cause for marital problems. The most relevant mediators appear to be seeing facilitators as a source of information and inspiration, and the alleviation of information constraints

First, information provision drives the impact on seeing a similarly situated young woman working after childbearing (4%) and of the reduced agreement of viewing differential education as a cause of marital problems (8%). Second, raising salary expectations marginally contributes to explaining all three impacts - 2% of the impact on seeing a similarly situated young woman working after childbearing, 1% of the impact on seeing earnings differences leading to marital conflicts, and 2% on seeing educational differences leading

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to marital conflicts. Third, the mediator of identifying supporters in the community also contributes to explaining the impacts of the CEP on all three outcome variables - 1% for working after childbearing, 2% for differential earnings, and 4% for differential education. Fourth, peers' influence only contributes to explaining the impact on differential earnings, and fifth, perceiving facilitators as a source of information and inspiration explains 10% of the impact of the CEP, reducing the share of students agreeing with the statement of educational differences leading to marital problems.

Figure 6: Mechanisms from mediation analysis
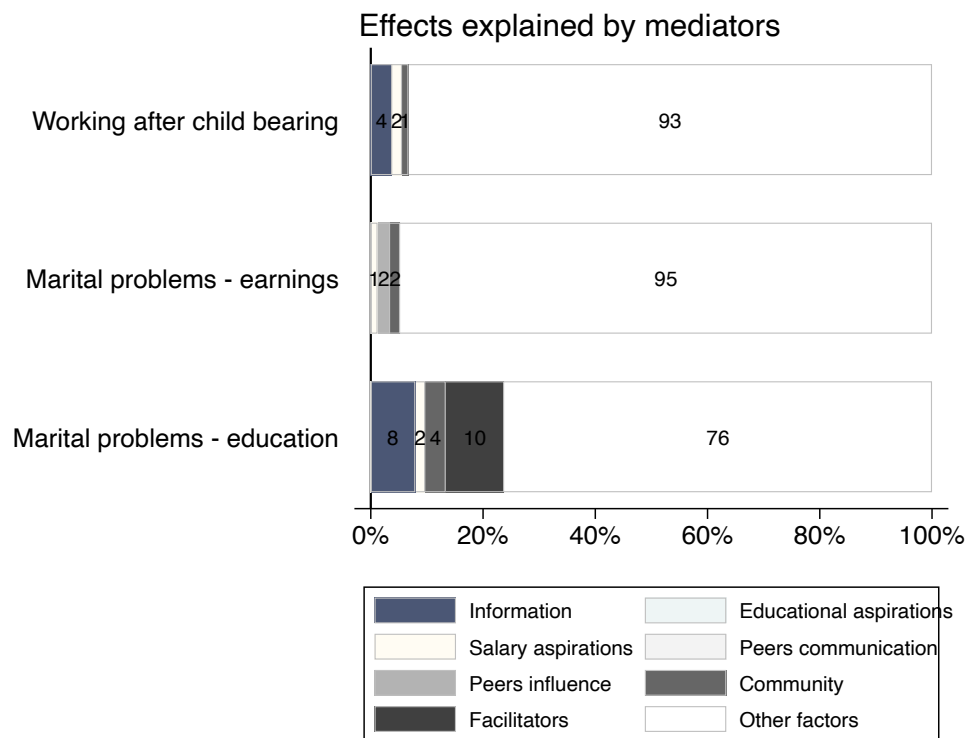


Overall, the mediation analysis documents that alleviation of information constraints, seeing facilitators as a source of information and inspiration and to a lesser extent peer influence, identifying supporters in the community and raising salary expectation explain a rather small share of the impact of CEP with the impacts on working after childbearing and differential earnings causing martial problems remaining largely unexplained. One explanation is that the program largely focused on facilitating students' exploration of career options and provided access to a variety of sources of information. The program gives less attention to specific societal expectations and hence the mediators hypothesized here explain only little of the observed impacts pointing us to a potential limitation of the program and of our analysis here that primarily had the educational plans of students in mind explaining potentially why the mediators explain a larger share of the impact observed for perceiving educational differences as potential cause for marital problems.

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# 5  Conclusion

This study sheds light on how persistent and largely internalized gender norms may affect women's labor force participation in urban India. Our descriptive findings show a stark contrast between young women's aspirations and the constraints they anticipate a young woman like them could face in the future. While nearly all female students expect to work in the future when no family-related context is provided, these expectations decline dramatically for a similarly situated young woman before marriage, after marriage, and three years after childbearing. Expectations fall from near universality to 74% one year before marriage, 40% one year after marriage, and just 25% three years post-childbearing. Male students report even more conservative views, further reinforcing the norms. These patterns show the powerful influence of societal norms that dictate women's roles, primarily as homemakers, particularly after critical life events like marriage and motherhood.

We also document widespread beliefs that challenge women's upward mobility within marriage. Our results indicate that traditional beliefs regarding the consequences of women earning more and having higher education than their husbands remain prevalent. Over one-third of male and female respondents believe such a difference would cause marital problems. This perception shows a strong adherence to the male breadwinner norm and the costs that women may face if they even plan to deviate from such traditional gender roles. Such beliefs may also serve as internalized constraints on young women's career ambitions and lower aspirations in anticipation of such backlash.

To explore whether such deep-rooted attitudes can be changed, we evaluate a school-based career exploration program (CEP) implemented among 12th-grade students in urban India. The CEP exposed students to career information and encouraged reflection on personal and professional futures. Although we did not observe significant changes in young women's expectations of their labor force participation or that of similarly situated young women before or after marriage, the CEP increased the likelihood that students expect a similarly situated young woman to work three years after having her first child. This shift suggests that career guidance interventions can reshape the attitudes towards motherhood and employment, a domain where norms appear particularly rigid.

Moreover, the program also significantly reduced the share of students who believed that a woman having higher earnings or education than her husband would lead to marital problems. This change shows that early career-oriented interventions can effectively shift norms such as the male breadwinner norm and facilitate more equitable views on gender roles within the family. Together, these findings point to the potential for school-based programs to affect not only educational and occupational trajectories but also beliefs

about gender roles.

This study highlights the critical need for ongoing efforts to challenge and reshape rigid gender norms to foster a more inclusive labor market and social environment for women. While our study provides valuable insights into shifting the beliefs about labor force participation and women's relative earnings or education, it also shows where the norms, such as female employment before and after marriage, can still be rigid. Understanding the barriers to change in these areas remains important for future work.

There is also a need to better understand the mechanisms through which such programs impact the students. Are changes in beliefs/expectations driven only by exposure to information, by raising aspirations, through relatable role models, or by classroom discussions and peer interactions? Unpacking these channels can help design more targeted and scalable interventions. Finally, while this study focuses on short-term results, future work could examine the longer-term impacts of interventions like career guidance and/or career exploration. This would provide critical insights into understanding how best to empower young women and redefine their roles in both professional and domestic environments. Our findings show the importance of integrating gender-sensitive career guidance into educational policy, especially in contexts where traditional norms constrain young women's opportunities.

**Declaration of generative AI and AI-assisted technologies in the writing process**

During the preparation of this work, the authors used ChatGPT in order to improve language and readability. After using this tool/service, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

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# Appendix

# A   Deviations from the pre-analysis plan

## Outcomes

Our pre-analysis plan mentioned the importance of marriage-related expectations toward young women but did not pre-specify the outcomes that we focus on here. For the results on the main pre-registered outcomes, we refer the reader to Asri, Asri and Hoeffler (2025).

## LATE estimation

Our pre-analysis plan mentioned that incomplete school attendance is a relevant problem in our setting. Observing the variation in the number of sessions students participated in motivates us to examine the LATE in addition the to the ITT. We did not plan for this at the time of the pre-registration because attendance data had to be collected by the implementing organization and we could not be sure about the facilitators' capacity to collect accurate attendance data.

## Mediators

In the pre-registration, the information variable was defined as a binary indicator equal to 1 if a student had complete knowledge of at least one of the three careers they wished to pursue, and 0 otherwise. However, in the current analysis, we adapt this definition by standardizing the variable relative to the median level of information within the sample. Under this revised coding, students who report more knowledge about a broader range of careers than the median respondent are assigned a value of 1, while those with less information are coded as 0. A similar approach is applied to the educational and salary aspiration outcomes. We use a median split to code students as having "higher" aspirations (coded as 1) if their reported educational or salary goals exceed the sample median, and 0 otherwise. From our point of view, this adjustment is methodologically more appropriate since it captures better the variation across students in terms of information received, educational aspiration, and salary aspiration.

# B Survey questions for outcome variables

The following tables show the survey questions for our outcome and mediation variables that were part of a longer endline survey, taking overall approximately 20 to 25 minutes. An initial short instruction was given by a research associate, taking about 10 minutes before the start of the survey. All students answered the questionnaire in Hindi, which is also the language of instruction at school. All students answered the survey on provided tablets in the classroom, and research associates, as well as survey assistants, were available in case students needed any (primarily technical) support.

Table B1: Outcome variables

| Survey question | Answer options |
|---|---|
| In the future, do you see yourself working to earn money? | No — Rather no — Rather yes — Yes |
| To female students: What is the most likely age for you to get married? (X_G) | Integer value |
| To male students: Think about a girl in 12th grade in a school similar to yours. At what age do you think she should get married? (X_B) | Integer value |
| Like you, Sameera is in XIIth grade. She will get married at the age X. What do you think Sameera would be doing in the following situations: | |
| What do you think Sameera will be doing when she is X-1 years old? | Working for pay/looking for work — Study — Household work — Involuntarily unemployed Voluntarily unemployed — Other |
| What do you think Sameera will be doing when she is X+1 years old? | Working for pay/looking for work — Study — Household work — Involuntarily unemployed Voluntarily unemployed — Other |
| Sameera got married at age X. According to you, at what age (Y) should she get her first child? | Integer value |
| Do you see Sameera working when she is Y+3 years old? | No — Rather no — Rather yes — Yes |
| If a woman earns more money than her husband, it's almost certain to cause problems. | Strongly disagree — Disagree — Agree — Strongly agree |
| If a woman has a higher level of education than her husband, it's almost certain to cause problems. | Strongly disagree — Disagree — Agree — Strongly agree |

Table B2: Mediators - obtaining information and raising aspirations

| Mechanism | Survey question | Variable coding | Variable type |
|---|---|---|---|
| Information | Write up to three careers that you think are good for you: First career: Second career: Third career:<br><br>For each entered career: How well informed are you about this career?<br><br>Answer options: 1) Not informed 2) Little informed 3) Somewhat informed 4) Completely informed | We code a binary variable equal to 1 if a student indicates "completely informed" for at least one career and 0 otherwise. | Binary |
| Education aspirations | What is the highest level of education you want to finish? | We code binary variables for each option chosen and use in the regression the lowest education level ("12th pass") as reference category. | Binary |
| Salary aspirations | What are your salary expectations for your first work or job?<br><br>1) Less than Rs. 10,000 per month 2) Rs. 10,000–Rs. 19,999 per month 3) Rs. 20,000–Rs. 29,999 per month 4) Rs. 30,000–Rs. 39,999 per month 5) Rs. 40,000–Rs. 49,999 per month 6) Rs. 50,000 per month and more | We code binary variables for each option chosen and use in the regression the lowest salary expectation ("Less than Rs. 10,000 per month") as reference category. | Binary |

Table B3: Mediators - peer effects

| Mechanism | Survey question | Variable coding | Variable type |
|---|---|---|---|
| Peer communication | Regarding what you would be doing after 12th, where do you get relevant information from? [Select most important and second-most important source.]<br>1) Internet<br>2) From peers/other students<br>3) From family members/relatives<br>4) From teachers in my school<br>5) Career guidance program in my school a few weeks ago<br>6) Acquaintances<br>7) Other<br><br>What do you and your friends talk most frequently about? [select most important and second most-important]<br>1) Travel<br>2) Movies<br>3) Hobbies<br>4) Work or job<br>5) Other people<br>6) About school<br>7) Other | We code a binary variable equal to 1 if respondent selects "Talking to peers" in the first question or "work or job" in the second question and 0 otherwise. | Binary |
| Peer influence | Name 5 students in your grade that you talk with the most (baseline). [Select from the list of students] | We code a variable indicating the number of friends (0-5) who plan to continue (endline) or continue (follow-up) skill formation. | Integer |

Table B4: Mediators - family/community support and facilitator effects

| Mechanism | Survey question | Variable coding | Variable type |
|---|---|---|---|
| Community | Regarding what you would be doing after 12th, where do you get relevant information from? [Select most important and second-most important source.] 1) Internet 2) From peers/other students 3) From family members/relatives 4) From teachers in my school 5) Career guidance program in my school a few weeks ago 6) Acquaintances 7) Other <br><br> Is there someone in your family supporting you in what you want to do in the future? Is there someone outside your family supporting you in what you want to do in the future? 1) No, there is no one. 2) Yes, there is a woman. 3) Yes, there is a man. | We code a binary variable equal to 1 if respondent selected "From family members/relatives" or "Acquaintances" or in the following two questions "Yes, there is a man/woman" and 0 otherwise. | Binary |
| Facilitators | Is there someone around you, that inspires you whom you know personally? 1) No, there isn't anyone. 2) Yes, this person stays in my house. 3) Yes, this person is my teacher (tuition or school). 4) Yes, this person is a career counsellor visiting my school. 5) Other, please specify. | We code a binary variable equal to 1 if respondent selected "Yes, this person is a career counsellor visiting my school" and 0 otherwise | Binary |

# C    Additional figures - expectations on labor force participation

This section shows the additional descriptive figures for the expectation of labor force participation as well as the beliefs about earning and education differences causing any marital problems, for male and female students separately and for the treatment and the control groups separately.

Figure C1: Expectations - female labor force participation (treatment and control group)
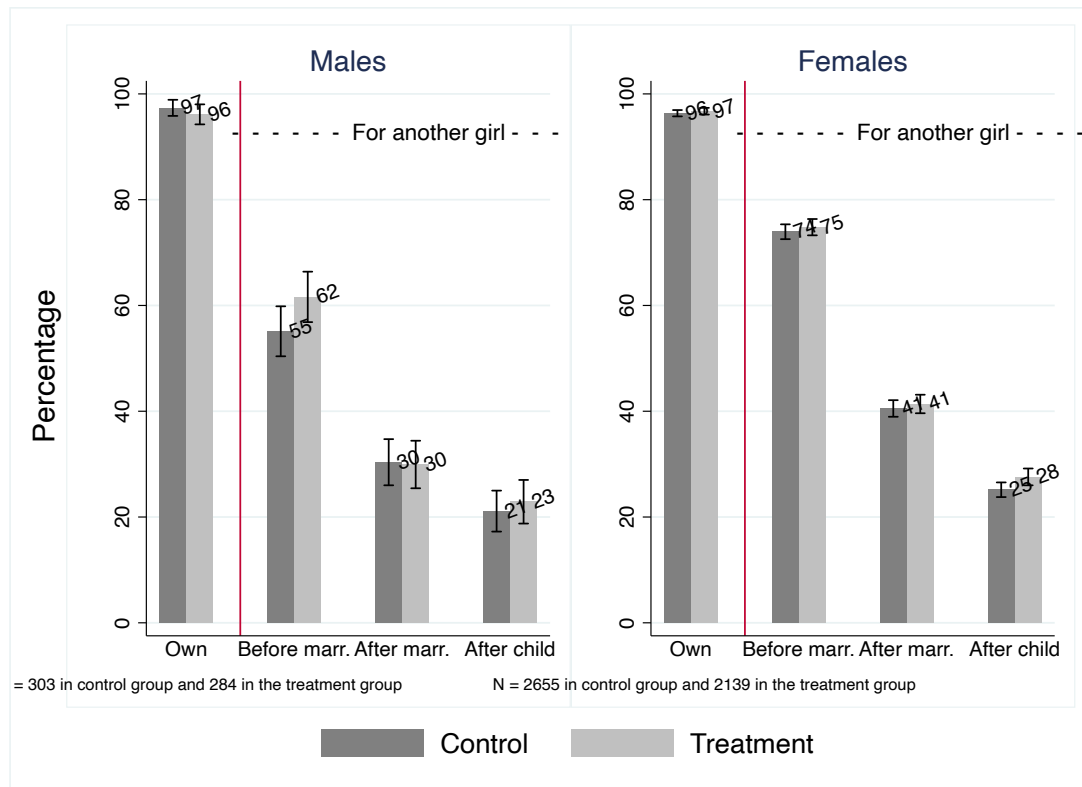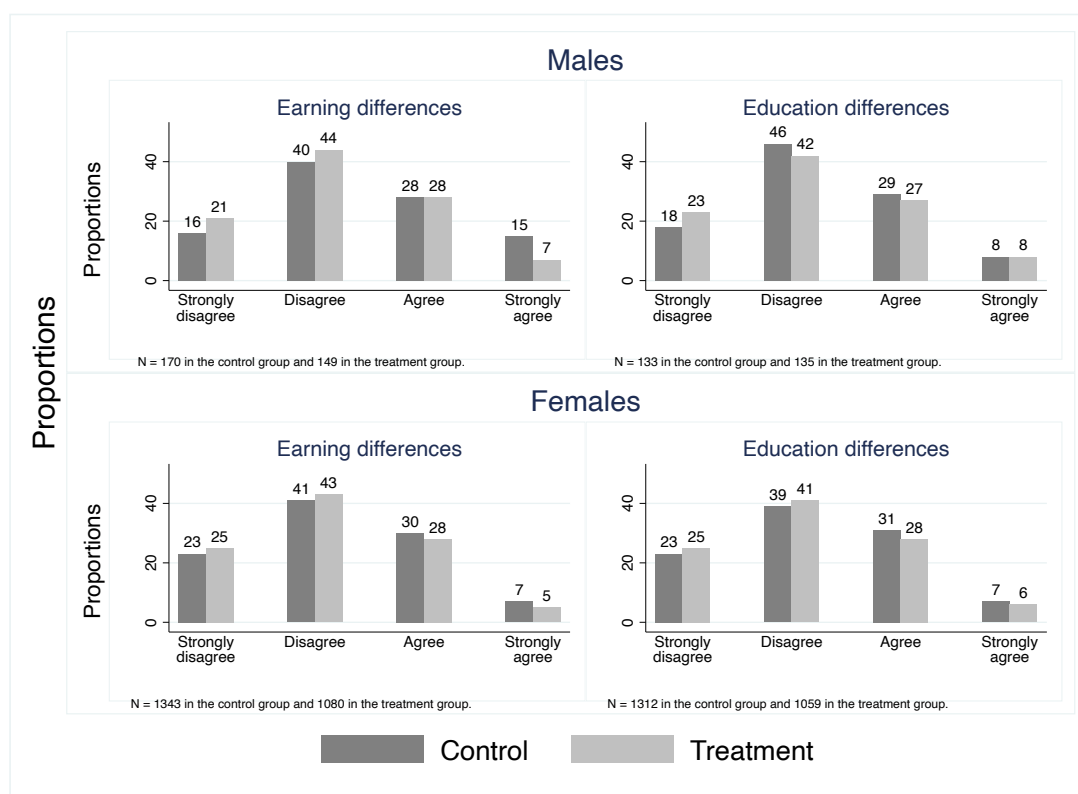
Figure C2: Women having higher earnings/education than husbands cases marital problems (treatment and control group)



# D  Mediation

This section shows the regressions for how the treatment affects the mediators, as well as how the outcomes are affected by the mediators individually, as well as all of them together.

Table D1: Treatment effects on mediators and mediators effects on outcomes

| | Treatment | Work | | Earnings-difference | | Education-difference | |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| | | Single | Full | Single | Full | Single | Full |
| Information | 0.124*** | 0.017 | 0.007 | -0.005 | -0.007 | 0.033 | 0.026 |
| | (0.021) | (0.012) | (0.012) | (0.016) | (0.017) | (0.023) | (0.022) |
| Educational aspiration | -0.008 | 0.074*** | 0.067*** | 0.028 | 0.026 | 0.023 | 0.007 |
| | (0.015) | (0.017) | (0.017) | (0.021) | (0.021) | (0.022) | (0.022) |
| Salary aspiration | 0.019 | 0.030*** | 0.020* | 0.032* | 0.033* | 0.046** | 0.039** |
| | (0.019) | (0.010) | (0.010) | (0.019) | (0.020) | (0.018) | (0.018) |
| Peer communication | -0.008 | 0.029** | 0.025* | -0.001 | -0.002 | 0.049** | 0.046** |
| | (0.014) | (0.012) | (0.013) | (0.018) | (0.019) | (0.020) | (0.021) |
| Peer influence | -0.092 | 0.005 | 0.003 | -0.010 | -0.013 | 0.009 | 0.007 |
| | (0.116) | (0.005) | (0.004) | (0.009) | (0.008) | (0.007) | (0.007) |
| Community support | 0.018 | 0.017 | 0.013 | 0.051** | 0.050** | 0.084*** | 0.083*** |
| | (0.011) | (0.016) | (0.016) | (0.021) | (0.021) | (0.030) | (0.030) |
| Facilitators | 0.132*** | -0.037 | -0.034 | -0.053** | -0.052* | 0.025 | 0.033 |
| | (0.012) | (0.023) | (0.023) | (0.026) | (0.027) | (0.027) | (0.027) |
| N | | | 5352 | | 2729 | | 2623 |

*Notes:* As pre-registered, all specifications include baseline covariates. The first column shows the effect of the treatment on the mediator. The columns 2, 4, and 6 show the effects of each of the mediators on the outcome variables as in the heading of the columns. The columns 3, 5, and 7 show the full model with all mediators together in a single specification. Standard errors are clustered at the school level. $^{*}\ p < 0.1$, $^{**}\ p < 0.05$, $^{***}\ p < 0.01$