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ABSTRACT

Gender Gaps in Cognitive and Noncognitive Skills: Roles of SES and Gender Attitudes*

Gender gaps in skills exist around the world but differ remarkably among the high and low-and-middle income countries. This paper uses a unique data set with more than 20,000 adolescents in rural India to examine whether socioeconomic status and gender attitudes predict gender gaps in cognitive and noncognitive skills. We find steep socioeconomic and attitude gradients in both cognitive and noncognitive skills, with bigger effect sizes for the socioeconomic status (SES) gradients. Our results suggest that a sizable improvement in gender attitudes would yield important gains for females, but substantial gains would come only from large improvements in household socioeconomic status. Overall, the household socioeconomic and cultural environment is significantly associated with the gender gaps in both cognitive and noncognitive skills.

JEL Classification: I21, I25, J13, J16, J24

Keywords: cognitive skills, noncognitive skills, gender attitudes, gender, India, children

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1 Introduction

The need to make gender equality one of the top five Sustainable Development Goals reflects both developed and developing countries' continued failure to overcome gender inequities. Because gender-based inequities start at a very early age, policymakers hope to limit gender gaps in later life by reducing gender inequities among children, especially through early life investments in education and health (Cunha and Heckman, 2008; Cunha et al., 2010; Crookston et al., 2013; Engle et al., 2011).[1]

Gender gaps in children exist around the world but differ regionally. Countries of the Organisation for Economic Co-operation and Development (OECD) saw a steady reversal of the male-female educational gender gap between 2009 and 2018, with females doing much better than males on schooling attainment and the reading scores of the Programme for International Student Assessment (PISA). In 2018, girls significantly outperformed boys in reading, by almost 30 points (OECD, 2020; Schleicher, 2019). Boys outperformed girls in math but only by 5 points. However, this reversal of the gender gap is not observed in the poorest and most populated parts of the world—Asia and sub-Saharan Africa. Boys in rural India, for example, outperform girls in reading, writing, and math (Singhal and Das, 2019). Similarly, standardized test results from 19 African nations show the average mathematics score among girls is lower than for boys (Dickerson et al., 2015).

Gender gaps in children are seen not just in cognitive skills but also in noncognitive skills and vary across high-income versus low- and middle-income countries. Bertrand and Pan (2013) show that male children in the United States are more likely than females to have behavioral problems and display conduct problems in school.[2] Wanless et al. (2013) show that the gender difference in behavioral problems observed among school children in the US is not observed in Asian societies like Taiwan, South Korea and China. Dercon and Singh (2013) in fact show that girls fare worse than boys on agency and self-esteem in both India and Ethiopia. The pro-male bias in agency in India and Ethiopia among adolescents is striking. The empirical evidence showing the importance of noncognitive skills (such as self-esteem, self-efficacy, risk appetite, competitiveness, Big Five personality traits) in explaining both skill accumulation and success in the labor market in both high-income and low- and middle-income countries is growing (Heckman et al., 2006; Dasgupta et al., 2015; Sharma

[1] Increases in schooling attainment are associated with improvements in earnings across countries and gender (Montenegro and Patrinos, 2013).

[2] Bertrand and Pan (2013, 34) assess behavioral problems using a series of questions that assess the "frequency with which a child argues, fights, gets angry, acts impulsively, and disturbs ongoing activities."

and Tarp, 2018; Kristoffersen et al., 2015).[3] It is therefore important to close gender gaps in both cognitive and noncognitive skills.[4]

Any effort to close the gender gaps in cognitive and noncognitive skills requires an understanding of the incidence of these gaps in low- and middle-income countries, but a scarcity of data on skills constrains this research.[5] This paper extends the current literature in important ways. First, we collected unique primary data on a large sample (more than 20,000 children between the ages of 8 and 14 years) to examine the prevalence of gender gaps in a range of skills: schooling attainment (e.g., enrollment and relative grade attainment), crystallized intelligence (e.g., performance on reading and math tests), fluid intelligence (e.g., performance on Raven's tests), and self-esteem and self-efficacy. In our preferred specification, we include a wide range of socioeconomic and demographic characteristics and fixed-effects that control for selection on time-invariant household- and village-level observed and unobserved characteristics.

Second, improving gender attitudes may be an important outcome in its own right. Further, closing gender gaps in education may not be sufficient to improve equity in labor force participation and earnings because of male-female gaps in gender attitudes (Evans et al., 2020). Therefore it is also important to examine the incidence of male-female gaps in gender attitudes and its correlates with household socioeconomic status.

Third, we pay close attention to the role of gender attitudes in cognitive and noncognitive aspects of skill accumulation. Recent experimental papers focus on identifying interventions that improve negotiation skills among adolescent girls in Zambia (Ashraf et al., 2020), promote gender attitudes among adolescents in Haryana (Dhar et al., 2018), and promote agency among adolescent girls in Rajasthan (Edmonds et al., 2019). The extent to which improvements in gender attitudes will translate to real economic gains for females in part depends on the role of gender attitudes in improving cognitive and noncognitive skills in low- and middle-income countries.[6] Despite the vast literature examining the correlates of

[3]Gender gaps in noncognitive skills are also important in explaining gender gaps in mental health (Churchill et al., 2020).

[4]Goldammer (2012) finds that noncognitive skills may explain a significant share of the Asian advantage in adult economic outcomes in the United States relative to Whites, Blacks, and Hispanics.

[5]A recent study by Evans et al. (2020) examines gender gaps in enrollment and educational attainment across many developing countries but does not have any measures on learning outcomes or noncognitive skills due to limited worldwide comparable data availability on these measures.

[6]In developed countries, even with more gender-equitable cognitive skills, the gaps in labor force participation, wage earnings, and promotions exist (O'Neill, 2003; Blau and Kahn, 2006). Poor negotiation skills, less willingness to compete, and willingness to take up low promotion tasks (Babcock et al., 2017) may explain male advantages in labor market outcomes.

women's attitudes toward gender and well-being using data from the World Values Survey (Tausch, 2019; Sweeting et al., 2014), and despite the attention on improving children's gender attitudes, there is no work that links children's gender attitudes with cognitive and noncognitive skills. We expand this line of inquiry by examining the correlates between children's gender attitudes and cognitive and noncognitive skills.

Fourth, we also examine the SES and attitude gradients in both cognitive and noncognitive skills. Schady et al. (2015) find a steep socioeconomic gradient in reading test scores across five countries in Latin America. The SES gradient in cognitive outcomes is also noted in all four countries of the Young Lives Study (Engle et al., 2011).[7] We add to this literature by examining not just socioeconomic gradients but also gender attitude gradients along both cognitive and noncognitive skills among children.

Our results indicate significant gender gaps in reading (in both native language and English), math, Raven's tests, and relative grade attainment. We also note significant gender gaps in self-efficacy among adolescents but find no gender gaps in self-esteem. All observed scores in cognitive and noncognitive aspects of human capital are consistently larger for males than for females. Our preferred specifications with household fixed effects show that the male-female gaps in reading in native language and English are 0.08 and 0.12 standard deviations, respectively. The male-female gaps in math, relative grade attainment, and self-efficacy are 0.12, 0.09, and 0.08 standard deviations, respectively. The associations between gender and skills, both cognitive and noncognitive, are robust to the inclusion of a wide range of controls, including village and household fixed effects as well as gender attitudes. Further, we follow the approach by Altonji et al. (2005) and Oster (2019) to estimate the extent of unobserved factors relative to observed ones, necessary to drive the estimated gender gap to zero. We show that the unobserved individual-level characteristics must be at least two times more likely to be correlated with gender than the observed variables in the regressions to fully explain the male-female gap in cognitive and noncognitive outcomes analyzed here—and that seems unlikely.

We find both family SES and the child's own gender attitudes to be important determinants of cognitive and noncognitive skills. We find that the positive SES gradient in both sets of skills is much stronger than the significant positive gradient in gender attitudes. We also find that the male advantage in cognitive outcomes disappears at higher levels of SES, and though it falls with higher levels of pro-female gender attitudes, the gap does not com-

[7]Fernald et al. (2011) estimate the SES gradient for multiple developmental domains including child health, receptive language, and executive functioning in Madagascar but do not examine noncognitive skills.

pletely disappear. Even at high levels of gender attitudes, the gender gap persists across the different quintiles of the SES distribution, whereas at high levels of SES, the gender gap exists only at the lowest quintiles of the gender attitude distribution; it disappears after that. Our results have two important policy implications with respect to eliminating the gender gap in skills: (1) small gains may be made from pushing the distribution of gender attitudes only marginally to the right; and (2) large gains may be made from pushing the distribution of household socioeconomic status substantially. Overall, our findings suggest that household socioeconomic and cultural environment have important associations with the gender gaps in both cognitive and noncognitive skills.

The rest of the paper is organized as follows. Section 2 describes the sampling strategy, our survey measures, and summary statistics. Section 3 presents the main results on the gender gaps in cognitive and noncognitive skills. Section 4 and 5 explore heterogeneity analysis and pathways. Robustness checks follow in Section 6, and lastly, concluding remarks are offered in Section 7.

2 Data

2.1 Sampling

We use unique data on more than 20,000 adolescent children between the ages of 8 and 14 years, randomly drawn from 158 rural villages across two districts in India. These are pre-intervention data, collected as part of a large-scale cluster randomized control trial aimed at changing adolescent behaviors in health, education, and gender attitudes. We randomly sampled on average 135 age-eligible children from each village and implemented household surveys and child surveys during August–November 2015. The sample distribution includes approximately equal distributions of children and households from both districts (Table 1).

2.2 Data collection

We administered the household surveys to parents of age-eligible children and the child surveys directly to the children of interest. The household survey collected data on standard household demographic characteristics (e.g., age, gender, enrollment status, completed grades of schooling, relationship to household head, and employment status for all household members), assets, expenditures on schooling, and participation in social protection

programs such as the MNREGA (Mahatma Gandhi National Rural Employment Guarantee Act). The child survey collected detailed data on enrollment, completed grades of schooling, and several measures of learning outcomes. We used the Annual Status of Education Report (ASER, 2018) testing tools to measure children's proficiency in basic math and language. The math tests asked students to recognize numbers (1–9, 10–99), complete simple two-digit subtraction problems, and complete simple three-digit division problems.

We also administered two tests for capturing basic language proficiency: a reading test was administered in the children's native language (e.g., Marathi, Telugu, or Urdu) and a similar one was administered in English. The two language proficiency tests ask students to recognize letters, words, and read a brief paragraph (grade 1 level) and a short story (grade 2 level). The ASER reading tests are widely used to measure learning and cognitive skills among children in India (Shah and Steinberg, 2017). We also administered a 10-item version of the Raven's progression matrices to capture analytical reasoning, similar to Dasgupta et al. (2020). While reading tests capture crystallized intelligence, Raven's progressive matrices are relevant for measuring fluid intelligence.

To measure noncognitive skills and psychosocial competencies, we included a nine-item inventory on self-esteem and a five-item inventory on self-efficacy and agency (Dercon and Singh, 2013; Dercon and Sánchez, 2013). These measures were based on the Young Lives Survey, with some modifications. We also measured children's gender attitudes, similar to Dhar et al. (2019) and Edmonds et al. (2019). A unique aspect of our survey is that we collected data on children's performance on test scores and gender attitudes through household surveys and not school-based surveys. This is important because children's nonenrollment and absenteeism are considerable in low- and middle-income countries (Bernal et al., 2014; Tamiru et al., 2016), so scores on reading and writing tests and attitudes toward gender obtained from school-based surveys are likely to be skewed to the right and probably indicate a smaller gender gap favoring boys among students because of differential selection bias by gender.

2.3 Variable definitions

Cognitive and noncognitive skills

We use seven variables to capture children's competencies in cognitive and noncognitive domains of skill accumulation. The cognitive skills are reading score in the native language, reading score in English, math score, relative grade attainment, and Raven's score. The

noncognitive skills and psychosocial competencies are self-efficacy score and self-esteem score. The reading scores take values between 0 and 4, where 0 = the child cannot read even letters, 1 = the child can read letters, 2 = the child can read words, 3 = the child can read sentences (at the grade 1 level), and 4 = the child can read a paragraph (at the grade 2 level). The math score take values between 0 and 4, where 0 = the child is unable to read numbers, 1 = the child can recognize one-digit numbers, 2 = the child can recognize two-digit numbers, 3 = the child can perform a simple subtraction, and 4 = the child can perform a simple division. Children between 8 and 14 years should be able to read at least a grade-2 text and complete a simple subtraction problem. We define relative grade attainment as the ratio of a child's completed grades of schooling to the child's potential completed grade (based on age). It is a relative measure of a child's academic progression and accounts for grade repetition and initial enrollment when older (Mani et al., 2012). The Raven's score is the total number of correct answers obtained on the 10-item Raven's test that was constructed for this sample.

We closely follow Dercon and Singh (2013) and Dercon and Sánchez (2013) for constructing our scores on self-esteem and self-efficacy. The self-esteem measure is constructed based on children's agreement or disagreement with the following nine statements: (1) The job I do makes me feel proud; (2) I feel proud of the job my father (or mother) does; (3) I feel proud of my achievements at school; (4) I feel proud to show my friends or other visitors where I live; (5) I am happy with my shoes; (6) I am happy with my clothes; (7) I am happy about the work I do; (8) I am not worried that I don't have the correct school uniform; and (9) I am not worried that I do not have the right books, pencils, and other equipment. Each statement is recoded as a positive outcome and takes a value 1 if the child agrees with a positive outcome, 0 otherwise. The resulting self-esteem index is an average of these nine binary indicators and is the proportion of positive outcomes declared by a child: it measures a child's sense of self-worth, akin to confidence in experimental economics (Dasgupta et al., 2015).

The self-efficacy index has a similar construction. We use dummy variables to record children's agreement or disagreement with the following five statements: (1) I like to make plans for my future studies and work; (2) if I try hard, I can improve my situation in life; (3) if I study hard at school, I will be rewarded by a better job in future; (4) I have no choice about the work I do—I must work; and (5) other people in my family make all the decisions about how I spend my time. Each statement is recoded as a positive dummy variable. Self-efficacy is the average of these five binary variables. All cognitive and noncognitive outcomes

are defined in Panels A and B of Table 2, respectively.

Gender attitudes

We measure adolescents' gender attitudes in four domains: gender roles, freedom, education, and leadership. We also construct a composite gender attitude index that is based on the gender roles index, freedom index, education index and leadership index. First we compute the gender role index as an average of five binary variables (based on responses to five questions and statements) that each receive a value 1 if the child's view is pro-female, and 0 otherwise. The five questions and statements on gender roles are (1) between a brother and a sister, who should help their parents more with household chores? (2) when relatives give gifts, between a brother and a sister, who should receive the most gifts? (3) a father's job is to earn money for the family, and a mother's job is to look after the children; (4) between a brother and a sister, on whose medical care should the family spend more money? and (5) parents should give dowry for their girl's marriage.[8]

We follow the same method to construct three additional indices pertaining to gender attitudes: the freedom index, education index, and leadership index. The freedom index is based on children's responses (agree-disagree or yes-no) to the following three statements and questions that solicit children's opinions on female empowerment and independence: (1) a wife needs permission from her husband if she wants to go to the market; (2) a wife needs permission from her husband if she needs to visit the doctor; and (3) should girls play outdoor sports such as Football, Cricket, Kabaddi, Gilli-danda, Kho kho, Hopscotch, Satoliya (Pitthu)?

The education index is similarly based on three questions or statements, intended to capture children's acceptance of differential investment in education within a household: (1) between a brother and a sister, on whose education should the family spend more money? (2) a husband and his wife have the same level of education? and (3) should encourage boys to take more classes in science and mathematics.[9]

The leadership index uses three binary statements that reflect children's opinions (agree-disagree) on gender roles in leadership: (1) having a male headmaster or principal at school is better than a female; (2) religious leaders (e.g., priest, pastor, maulvi) should always be men; and (3) community leaders (e.g., sarpanch) should always be men. Lastly, the gender

[8]Responses to statements (3) and (5) are agree or disagree only; responses to questions (1), (2), and (4) can be same for both, more for boys, or more for girls.

[9]Responses to question (3) are agree or disagree only; responses to questions (1) and (2) can be same for both, more for boys or husbands, or more for girls or wives.

attitude index is computed as average of the gender roles index, freedom index, education index and the leadership index. Overall, a higher score on the gender attitude index as well as the four sub-indices reveals higher (lower) incidence of pro-female (pro-male) attitudes in the overall index as well as the specific sub-domains. All gender attitudes are defined in Panel C of Table 2.

Familial characteristics and investments

We also measure parental investments and child inputs (such as school enrollment, days absent from school, chores, and parental expenditure on schooling), defined in Panel D of Table 2. Lastly, family background characteristics that capture demographics, parental characteristics, and household resources are given in Panel E of Table 2. The key proxy for household socioeconomic status in our sample is household wealth. We use the principal component analysis method by Martorell (1992) and Filmer and Pritchett (2001) to construct the asset index, our measure of household SES.

2.4 Summary statistics

We present sample averages on cognitive outcomes, noncognitive outcomes, gender attitudes, and family background characteristics for males and females separately in Table 3. We also present gender differences in outcomes and background characteristics. For ease of interpretation, the table reports raw mean differences for all variables except relative grade attainment, Raven's test score, and self-efficacy and self-esteem indices, which are normalized with respect to the mean and standard deviation in the sample. Panel A of Table 3 shows that boys fare systematically better than girls on all five cognitive outcome variables. Unlike the reverse gender gaps observed in OECD countries, boys' performances on reading in their native languages average 5 percent of a standard deviation higher than girls'. Boys' performance in reading in English is even relatively higher, averaging 11 percent of a standard deviation higher than girls'. Girls lag behind in math skills as well: boys average 9 percent of a standard deviation higher than girls. The male-female gaps in learning are also evident in our measure of grade progression: the average boy is 0.09 standard deviations ahead of the average girl in terms of relative grade attainment. We also find that boys' competency on Raven's test scores is higher, 0.03 standard deviation ahead of girls'. The gender gaps in all five measures of cognitive skills are statistically significant at the 1 percent level.

Turning to gender differences in noncognitive outcomes reported in Panel B of Table 3, we observe no gender gaps in self-esteem but significant and sizable differences in self-

efficacy: the average boy is 0.07 standard deviation ahead of the average girl, reflecting a greater sense of control and mastery over his life.

We also examine gender gaps in chores and parental investments (pathways into skill accumulation) in Panel C of Table 3. The chores index captures the proportion of chores that a child has to do, of the eight chores used to construct this index. Girls have a higher burden than boys: they do on average 46 percent of all eight types of chores, while boys on average only do 20 percent of all chores. Additionally, a higher proportion of boys are enrolled in school (0.92 versus 0.87 percent for girls), and parents spend about 20 percent more money per child on boys' schooling annually than on girls' education.

Male-female differences in gender attitudes are summarized in Panel D of Table 3. Gender attitudes are coded to reflect pro-female views. They are systematically higher among girls, and differences are statistically significant (at the 1 percent level) for both the overall gender attitude index as well as the four subindices. Girls' attitudes on gender roles are 25 percent of a standard deviation higher than boys' attitudes, girls' attitudes on freedom are 10 percent of a standard deviation higher, girls' attitudes on education are 29 percent of a standard deviation higher, and girls' attitudes on leadership are 28 percent of a standard deviation higher. The overall gender attitude index shows that girls' overall gender attitudes are 32 percent of a standard deviation higher than that of boys' attitudes.

Lastly, in Panel E of Table 3, we report male-female differences in socioeconomic characteristics that we use in the rest of this analysis. Among the 25 variables reported in Panel E, only small differences exist in two variables: scheduled tribe and salaried employment, suggesting that gender is almost as good as randomly assigned to a child. That is, girls do not seem to be growing up in particularly more disadvantaged households than boys.

3 Results

3.1 Gender gaps in cognitive and noncognitive skills

We estimate the following regression model to capture gender gaps in skills:

$$Outcome_{i,hh} = \alpha + \beta Male_{i,hh} + \gamma X_{i,hh} + \eta_v + \epsilon_{i,hh} \quad (1)$$

where $Outcome_{i,hh}$ in equation (1) includes the full set of cognitive and noncognitive skills defined in Panels A and B of Table 2 for individual i in household hh. Male is a dummy

that takes a value 1 if male, 0 if female. X includes the full vector of controls described in Panel E of Table 2. We also account for village-level resources, such as access and type of schooling and aggregate shocks like rainfall and temperature variations, by including village fixed effects in the specifications. The coefficient estimate on the male dummy, β, captures average gaps between males and females conditional on all child and family observed characteristics as well as fixed village-level observed and unobserved characteristics. To account for unobserved correlations among children living in a village, we cluster our standard errors at the village level. To facilitate comparison in gender gaps across different outcomes, we standardize all outcome variables—cognitive and noncognitive skills with respect to the mean and standard deviation of the females in our sample. This allows us to interpret all coefficients on the "male dummy" in the regressions as effect sizes.

In Column 1 of Table 4, we present the unconditional gender gaps for each cognitive and noncognitive outcome. In Column 2, we present the gender gap conditional on family background characteristics, and in Column 3, our preferred specification, we present the gender gap conditional on both family background characteristics as well as village fixed effects (as specified above in equation (1)). We find that the male-female gap in reading in the native language is 0.047 standard deviations and remains unchanged across columns. Next, the male-female gap in reading English is almost double the gap in reading in the native language, at 0.11 standard deviations, and once again remains unchanged with the addition of family background controls as well as village-level fixed effects. The male-female gaps in math and relative grade attainment are 0.09 and 0.08 standard deviations, respectively, and remain stable cross columns. We find that males are 0.03 standard deviations ahead of females in the Raven's test (in Column 1 of Table 4), but this gap is fully accounted for by the controls in Column 3 of Table 4. We next compare unconditional and conditional male-female gaps in noncognitive skills, reported in Panel B of Table 4. We find no gender gaps in self-esteem. However, we report notable gender gaps in self-efficacy. Males have 0.06 standard deviations higher agency than females, and the gap persists even after controlling for the full set of family and village controls in Column 3.

Adding controls is important for removing confounders and addressing omitted-variable bias. It can also improve the precision and reduce the standard errors in the model (Cinelli et al., 2020). It is not surprising that adding the family background characteristics and other controls, including village fixed effects, does not change the gender gaps noted across Columns 1–3 of Table 4 because there are no gender differences in most family background factors, shown in Table 3. That is, gender is orthogonal to most family background characteristics,

and hence omitting them in Column 1 does not bias the coefficient estimates on the male dummy. However, the R-squared increases from 0.01 in Column 1 of Table 4 for the reading score in the native language to 0.25 in Column 3. The substantial improvement in R-squared between Columns 1 and 3 of Table 4 is noted across all variables, which suggests that the additional controls are important predictors of the cognitive and noncognitive outcomes and, as a result, also increase the precision of our estimates in Column 3.

3.2 Male-female gaps in gender attitudes

Next, we estimate male-female gaps in gender attitudes using equation (1), where we replace the outcome variables by the gender attitudes presented in Panel C of Table 3. Similar to Table 4, we present both unconditional and conditional male-female gaps in the overall gender attitude (index) as well the four sub-indices (gender roles, education, leadership and freedom) in Table 5. We find that males' gender attitudes are 0.23 standard deviations worse than females' attitudes towards gender and this difference remains unchanged across columns. Turning to the specific sub-indices, we find large male-female differences in gender attitudes toward gender roles, education, leadership and freedom as well, with girls exhibiting consistently more pro-female attitudes than boys in all domains. We find that the male-female gap in attitudes toward gender roles reported in Table 5 is –0.26 standard deviations and similarly remains unchanged across columns, which shows that females have significantly more pro-female attitudes. Next, the male-female gaps in attitudes toward education, leadership, and freedom are, respectively, –0.31, –0.28, and -0.09 standard deviations and once again remain unchanged with the addition of family- and child-level controls as well as village-level fixed effects. Girls consistently exhibit more pro-female attitudes than boys. These gender gaps in attitudes could possibly explain some of the male-female gap in cognitive and noncognitive outcomes previously reported in Table 4.

3.3 Role of gender attitudes in skills

Even for boys and girls with similar family backgrounds, it is possible that the boys' attitudes toward gender are such that they do not participate in any household chores, and that the consequent additional burden on girls makes it difficult for them to spend time on homework or concentrate in school. To explore this issue, in Table 6 we assess the effects of adding the four gender attitude sub-indices on the right-hand side of equation (1) on the associated size and significance of the male-female differences in cognitive and noncognitive outcomes.

In Column 1 of Table 6, compared with the gender gap in skills reported in Column 3 of Table 4, we find a significant increase in the gender gap across all cognitive outcomes. The gender gap in reading score in the native language is 0.07 standard deviations in Column 1, Table 6, reading score in English is 0.13 standard deviations, math score is 0.11 standard deviations, relative grade attainment is 0.08 standard deviations, Raven's test score is 0.03 standard deviations, and self-efficacy is 0.07 standard deviations. All reported gaps are significant at the 1 percent level. The R-squared improvement in Column 1 of Table 6 (compared with Column 3 of Table 4) suggests that gender attitudes play an important role in determining cognitive and noncognitive outcomes, and that omitting them biases the gender gap downward in Table 4.[10] This is consistent with the finding that girls exhibit consistently more pro-female attitudes than boys in Table 5. In Column 2 of Table 6, we replace the gender attitude sub-indices with the overall gender attitude fixed effects to examine male-female gaps within a given level of attitude, and we find that the male-female gaps remain consistently large and significant across all cognitive outcomes as well as self-efficacy.

Lastly, a preference for sons might be a concern in our sample and bias the estimated gender gaps in cognitive and noncognitive skills (Jayachandran and Pande, 2017). Households preferring to have sons might treat boys and girls differently. To address possible endogeneity concerns arising from this possible gender selection bias, we reestimate equation (1) with gender attitudes as additional controls as well as household fixed effects to control for household-specific unobserved fixed variables, such as son-preference. Doing this allows us to exploit within-household differences in the treatment of boys to purge our estimates of the gender gap in outcomes from differences in son preference across households. These findings are reported in Column 3 of Table 6. The male-female gaps in cognitive outcomes and self-efficacy remain sizable and significant even after we account for possible son preference in our sample.

3.4 Gender attitude gradient in skills

Next, to investigate the attitude gradient in cognitive and noncognitive scores, in Panel A of Table 7 we present the coefficients on the wealth and attitude quintiles obtained with the specification used in Column 2 of Table 6, where the coefficients on the attitude quintiles capture the magnitude of the attitude gradient in quintile k relative to the bottom quintile

[10] In Appendix Table A1 we report the full set of attitude coefficients used in Column 1, Table 6 and show that all four pro-female gender attitude measures are significantly positively correlated with outcomes.

(omitted category). We document steep attitude gradients across several cognitive outcomes. In Columns 1 and 2 we find that the gap in native and English language reading scores between children in Q2 vs Q1 are 0.05 and 0.07 standard deviations (though this difference is not significant even at the 10 percent level for native language reading scores) respectively, and the gap between children in Q5 vs Q1 triples to 0.19 and 0.16 standard deviations. Similarly, in Columns 3 and 4, children from households in Q5 score, on average, 0.20 and 0.25 standard deviations higher on math and Raven's test, respectively, than children in Q1. Turning to noncognitive skills, there is some evidence that higher gender attitudes (being in Q5 versus Q1) are correlated with greater self-efficacy. Interestingly, the gender attitude gradient is negatively correlated with self-esteem—that is, more pro-female attitudes are correlated with lower degrees of self-esteem, and the effects are steep across the attitude gradients.

3.5 SES gradient in skills

In Panel B of Table 7 we present the SES gradient in skills for our preferred specification reported in Column 2 of Table 6, where the coefficients on the SES quintiles capture the magnitude of the SES gradient in quintile k relative to the bottom quintile (omitted category). These coefficient estimates are large and statistically significant across almost all measures of cognitive and noncognitive skills except self-esteem, and only larger levels of wealth seem to matter for Raven's test score, as reported in Column 5 of Table 7. We find a steep SES gradient in reading scores (both native language and English), math scores, and self-efficacy. The gap in native and English language reading scores between children in Q2 and Q1 is 0.18 standard deviations, and the gap doubles to 0.36 standard deviations for children in Q5 vs Q1. Similarly, the gap in math scores jumps from 0.13 standard deviations in Q2 (vs Q1) to 0.36 standard deviations in Q5 (vs Q1). By contrast, the SES gradient in relative grade attainment is largely flat through Q2-Q5 (vs Q1) with no significant differences in the SES gradient between the second and fifth quintile (p-value = 0.29). For the Raven's score, we find no differences among children in Q2 (vs Q1) and Q3 (vs Q1), but learning advantages appear at Q4 and Q5 (vs Q1). Finally, we find a steep SES gradient in noncognitive skills as well, though the gradient is far less steep than for cognitive skills. These results are consistent with previous findings by Schady et al. (2015) and Fernald et al. (2011), who identify steep socioeconomic gradients in receptive vocabulary, attention, working memory, and receptive language ability for children from several Latin American countries.

4 Heterogeneity analysis

4.1 Gender gaps by SES and gender attitudes

Even similar home environments for boys and girls might conceal important socioeconomic influences in the gender gap in cognitive and noncognitive skills. For example, girls raised in richer households might have less disadvantage in terms of being able to achieve cognitive and noncognitive outcomes than girls raised in poorer households. This could happen, for instance, because richer households discriminate less between boys and girls, or because larger resources mitigate the effect of discrimination for children in households with higher SES. Similarly, we might expect larger gender gaps in outcomes in samples of children with more male-biased attitudes. Such a finding would support the idea that attitudes matter for the formation of cognitive and noncognitive skills. In fact, the literature notes that girls' underperformance in mathematics relative to boys' disappears in more gender-equal cultures: girls perform, on average, 22.6 points lower than boys in Turkey but 14.5 points higher than boys in Iceland (Guiso et al., 2008). Hence, although we may not find differences in household socioeconomic environment for boys and girls on average, this does not imply that the home environments are not contributing factors in the gender gap in cognitive and noncognitive skills. To investigate this possibility, we next look at the variation in gender gap in cognitive and noncognitive outcomes by SES and gender attitude levels. To do this, in Table 8 we reestimate equation (1) across different quintiles of the SES index and different quintiles of the gender attitude index controlling for a full set of family and child level characteristics and village fixed effects.[11]

In Panel A of Table 8 we present the gender gap in cognitive and noncognitive skills across the different attitude quintiles—that is, we reestimate the gender gap across the attitude distribution, dividing our sample of children into five attitude quintiles. The sizes of the gender gaps in native and English language reading scores, math scores, and relative grade attainment consistently decrease as we move to higher attitude quintiles. Specifically, the gender gaps in reading scores in native language, English scores, math scores, and relative grade attainment decline from 0.12, 0.16, 0.15, and 0.10 standard deviations, respectively, in Q1 (where the gender gaps are all significant at the 1 percent level) to 0.02, 0.10, 0.009, and 0.05 standard deviations in Q5 (where the gender gaps are only significant for reading score in English and relative grade attainment). For the native language reading score and math

[11] We show in Appendix Table A3 that family and child level characteristics differ substantially across the attitude quintile and hence we must control for these in the RHS while estimating the gender gaps for the different sub samples of attitudes and SES in our sample.

score, the gender gaps seem to disappear once we reach Q5. Interestingly, the sign of the gap in the Raven's test score is reversed once we move to higher quintiles. The differences in attitudes among children belonging to different quintiles are large. Qualitatively, children in Q1 agree with pro-female statements 33 percent of the time, whereas children in the Q5 agree with pro-female statements 85 percent of the time. Moving from Q1 to Q5 therefore is associated with a significant improvement in gender attitudes. Overall, these results provide evidence that pro-female gender attitudes are associated with lower gender gaps in cognitive outcomes, which suggests that, if this reflects in part causal effects, interventions focused on improving gender attitudes (making them more pro-female) can be very valuable (Dhar et al., 2018).

Next, in Columns 6 and 7 of Table 8 we look at gender gaps in noncognitive outcomes across attitude quintiles. Consistent with our findings thus far, we do not find significant gender gaps in self-esteem across attitude quintiles. We do, however, document a significant gender gap in self-efficacy at Q1, Q3 and Q4. The gap disappears at Q5, where the coefficient on the male dummy decreases to 0.03 and appears statistically insignificant, suggesting that boys and girls with strongly pro-female attitudes do not differ in terms of levels of self-efficacy. From these results we conclude that attitudes do not matter as much for noncognitive skills as they do for cognitive skills.

In Panel B of Table 8 we examine the gender gap in cognitive and noncognitive skills across SES quintiles. We first examine the gender gap in cognitive outcomes. Across the SES quintiles in Columns 1–5, the sizes of the gender gap in native and English language reading scores, math scores, and relative grade attainment consistently decrease as we move to higher SES quintiles. We find that in the highest SES quintiles, the gender gap even disappears for all cognitive outcomes. For instance, the gender gap in the native language reading score goes from 0.11 (where it is significant at 1 percent level) standard deviations in the poorest SES quintile (Q1) to 0.003 in the richest SES quintile (Q5) where the gap is no longer significant at even the 10 percent level. Similarly, the gender gap in math score and relative grade attainment goes from 0.16 and 0.21 standard deviations, respectively, in Q1 to 0.05 and –0.01 standard deviations in Q5 (where they are not significant at even the 10 percent level). This is strong evidence that the gender gaps in cognitive skills are smallest or even nonexistent in richer households, and that poorer socioeconomic status might be particularly detrimental to girls' cognitive development. Additionally, most of our households come from rural villages in India where SES varies widely across families in our sample. The standardized SES gap between the Q1 and Q5 is considerable: the poorest

quintile (Q1) is 1.3 standard deviations below the sample mean, while the richest quintile (Q5) is 1.5 standard deviations above the sample mean. Qualitatively, of the 24 items (e.g., chair, bed, table, TV) used to construct the asset index (used as a proxy for SES), households in Q1 own only four of these items, whereas households in Q5 own 12 items. Our results suggest that if these associations reflect causality, only a sizable increase in SES can completely eradicate the gender gaps in cognitive development. In contrast, the gender gap in Raven's test scores appears relatively similar across poorer and richer families and is insignificant even in four of the five quintile groups. This result is to be expected, since many researchers[12] find that fluid intelligence is not determined by socioeconomic characteristics and also not inherently higher or lower in one sex.

Turning to noncognitive outcomes, a more nuanced picture emerges. Although there is no gender gap in self-esteem across the different SES quintiles, a gender gap in self-efficacy persists across all SES quintiles, and its size does not significantly vary across Q2 through Q5. We do find that the gender gap in self-efficacy seems to disappear at Q5. Overall, SES does not seem to matter as much for the gender gap in noncognitive outcomes as it does for cognitive outcomes.

4.2 Complementarity between attitudes and SES

So far we have identified SES and gender attitudes as two independent drivers of the gender gap in outcomes. In this section we explore whether SES and attitudes are complementary in their effect on cognitive and noncognitive skills.

In Panel A of Table 9, we show the gender gap in outcomes by attitude quintiles, where we hold SES constant at high levels (Q4 and Q5). Except for attitudes at Q1 where we still find significant gender gaps in outcomes, in Q2–Q5, once we hold SES at high values, the gender gap in several cognitive outcomes disappears, suggesting that if girls belong to high SES families then only very low gender attitudes hurt females' progress at this age. We find a similar pattern in Panel B of Table 9, where we examine gender gaps by SES quintiles, this time holding attitudes constant at high values (Q4 and Q5) across all SES quintiles. At high levels of attitudes, only SES affects gender gaps in outcomes at lower quintiles (except for reading in English where it persists at Q2 and Q3 as well) and completely disappears at Q4 and Q5. This shows that with high gender attitudes, the gender gap in several cognitive outcomes exists only at lower levels of SES but disappears with higher SES. Interestingly, Panels A and B of Table 9 suggest that for SES and pro-female gender attitudes, having

[12] An exception is Maluccio et al. (2009).

high values of either one or the other may be sufficient to remove the gender gap in several cognitive outcomes, at least in the rural Indian villages studied.

Further, we examine if the gender attitudes vary by household SES, and in Appendix Table A2 we provide summary statistics for all attitudes indices by SES quintiles and find that gender attitudes remain fairly similar across the different SES quintiles.

5 Pathways

We now explore the different pathways through which SES and attitudes could differentially affect girls' and boys' cognitive skills. For instance, it could be the case that poorer families may require more help with chores and that this burden weighs more heavily on girls than on boys. Similarly, households with less pro-female attitudes might find it reasonable to ask girls to perform household chores more than boys; that would reduce the time girls can dedicate to their studies. To investigate these possible mechanisms, we assess gender gaps in school enrollment, absenteeism, chores, and educational expenses. In Table 10 we reestimate equation (1) separately for the different quintiles of the attitude index and SES index in Panels A and B, respectively.

We find that less pro-female attitudes lead to higher gender gaps in enrollment and educational expenditures but that with better attitudes, the gaps are lower. However, we find no gender gaps in the number of days absent from school. We do find that across all attitude quintiles, girls consistently must perform more chores than boys. This is consistent with our finding in Panel A of Table 8, where we show that gender gaps in English reading and relative grade attainment persist, even as they decrease with higher attitudes, across the attitude quintiles. Even in pro-female households, girls have more chores than boys, which could explain why the gaps in some cognitive skills persist. In Panel B of Table 10 we find that less wealth results in higher gender gaps in enrollments. The gender gap in the chores also goes from 1.09 standard deviations in Q1 to 0.79 standard deviations in Q5 but doesn't disappear. Gender gaps in chores remain high across the different points in the attitude and SES distribution. Lastly, we examine gender gaps in parental expenditures on child schooling and find significant gender gaps in expenditures across the entire distribution of the attitudes and SES. The gender gaps in schooling expenditures decline with pro-female attitudes but increase with high SES where households apparently are able to afford to make the gaps larger.

These results complement our findings in Table 8 and help us comment on the possible

mechanisms behind girls' lower cognitive scores. We find that girls carry a distinctly heavier burden of chores than boys, girls are less likely to be enrolled in school, and girls' parents spend less money on their education—all of which, taken together, probably impede girls' cognitive skills.

6 Robustness

We show that the gender gaps reported in Table 6 are robust to Type I error–related concerns. Since Type I error increases in the number of outcomes tested, to account for overrejection of the null, we report sharpened two-stage q-values in Column 3 of Table 6, following the procedure proposed by Benjamini et al. (2006) and implemented by Anderson (2008). We find that our results are robust to Type I error.

Next, we present results from the Oster coefficient stability test. In Column 1 of Table 11 we show the estimated gender gap obtained from Column 3 of Table 6. In Columns 2–4 of Table 11, we successively compute δ, the relative degree of selection on unobserved variables to observed variables necessary to drive the gender gap to zero, assuming different values for Rmax (the R-squared from a hypothetical regression of the outcome on male dummy and both observed and unobserved controls). This is equivalent to computing the relative degree of selection on unobserved variables to selection on observed variables necessary to eliminate our estimated gender gap. As expected, across all dependent variables, our δ estimates are all well above the threshold value of 1, which confirms that we would need an unrealistically high selection on unobserved variables to find no gender gap in outcomes. The most striking example is in Column 2, for reading scores in English: assuming an Rmax value of 0.4, we would need selection on unobserved variables to be 15 times as high as selection on observed variables to explain away this gender gap. Similarly, using an Rmax value of 1 (best-case specification), we would need the selection on unobserved variables to be at least three times more than selection on observed variables to drive the gender gap in English reading scores to zero. Overall, the Oster (2019) tests suggest that it is unlikely that omitted variables can drive the gender gap to zero in our specifications.

We also show that our results are robust to variable definition. We reconstruct the gender attitude index now using the principal component analysis method (like the asset index/SES index construction) and re-examine the attitude gradient in skills in Appendix Table A4, and replicate the gender gaps in skills by attitudes in Appendix Table A5. We find that our results on both the attitude gradients and heterogeneities are qualitatively similar

to the results presented in Tables 7 and 8 previously.

7 Conclusion

Our analysis of gender gaps in cognitive and noncognitive skills points to a number of important findings. First, children in our Indian sample display large gender gaps in cognitive and noncognitive outcomes, all favoring males. Second, the gradient in children's gender attitudes is steep, but third, the household socioeconomic status gradient is even steeper. Fourth, gender gaps in skills somewhat persist even at the highest quintile of the attitude distribution but completely disappears at the highest quintile of the socioeconomic status distribution.

Following the approach of Altonji et al. (2005) and Oster (2019), the unobserved individual-level characteristics must be at least two times more likely to be correlated with gender than the observed variables in the regressions to fully explain the male-female gap in cognitive and noncognitive skills analyzed here. That, however, seems unlikely, thereby lessening concerns that omitted variables drive the true gender gaps in skills to zero.

Our results suggest that significant increase in gender attitudes would yield important gains for females, but substantial gains would come only from large improvements in household socioeconomic status. Overall, the household socioeconomic and cultural environment significantly predict the gender gaps in both cognitive and noncognitive skills.

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Tables

Table 1: Sample distribution

Districts	Villages	Households	Children
Palghar	78	6089	9910
Kurnool	80	5652	10352
Total	158	11741	20262

Table 2: Variables definitions

Variable name	Definitions
Panel A: Cognitive skills	
Reading score in native language	Takes values between 0 and 4 where 0 – when the child is unable to read even letters, 1 – if the child can read letters, 2 – if the child can read words, 3 – if the child can read sentences (grade 1 level text), and 4 – if the child can read a paragraph (grade 2 level text)
Reading score in English	Takes values between 0 and 4 where 0 – when the child is unable to read even letters, 1 – if the child can read letters, 2 – if the child can read words, 3 – if the child can read sentences (grade 1 level text), and 4 – if the child can read a paragraph (grade 2 level text)
Math score	Takes values between 0 and 4 where 0 – is when the child is unable to read numbers, 1 – if the child can recognize one-digit numbers, 2 – if the child can recognize two-digit numbers, 3 – if the child can perform a simple subtraction, 4 – if the child can perform a simple a division
Relative grade attainment	Actual grades completed/potential grades (where potential grade is the age-appropriate grade the child should have completed had the child started school on time and progressed without grade repetition)
Raven's score	Total no. of correct responses on the 10-item Raven's test
Panel B: Noncognitive skills	
Self-esteem	Averaged over the following 9 binary variables: =1 if child feels proud of the job she/he does, =1 if child feels proud of the jobs her/his parents do, =1 if child feels proud about her/his school achievements , =1 if the child feels proud of where she/he lives , =1 if the child is happy with her/his shoes, =1 if the child is happy about her/his clothes, =1 if is happy about the work she/he does, =1 if the child is not worried about not having the correct uniform, =1 if the child is not worried about not having the correct books, pencils or tools

Table 2 – continued from previous page

Variable name	Definitions
Self-efficacy	Averaged over the following 5 binary variables: =1 if 1 if the child likes to make plans for her/his future studies/work, =1 if the child feels that she/he can improve her/his situation in life if she/he works hard, =1 if the child feels that she/he will get a better job if she/he studies hard, =1 if the child has some choice about the work she/he does, =1 if, aside from his family members, the child can make decisions about how he spends his time
Panel C: Gender Attitudes	
Gender roles	Averaged over the following five binary variables: =1 if child thinks boys should help more with household chores or that girls and boys should help equally , =1 if child thinks girls should not receive less gifts than boys, =1 if child disagrees that a father's job is to earn money for the family, and a mother's job is to look after the children, =1 if child thinks parents should not spend more money on boys' medical care (compared to girls), =1 if child thinks parents should not give dowry for their girl's marriage
Education	Averaged over the following three binary variables: =1 if child disagrees that parents should spend more on boys' education vs girls' education, =1 if child disagrees that husband should have higher level of education than wife, =1 if child disagrees that that teachers should encourage boys more than girls to take math/science classes
Leadership	Averaged over the following three binary variables: =1 if child disagrees that having a male masterhead/principal is better, =1 if child disagrees that having a male religious leader is better, =1 if child disagrees that having a male community leader is better
Freedom	Averaged over the following three binary variables: =1 if child disagrees that women should get the husband's permission to go shopping, =1 if child disagrees that women should get the husband's permission to go see a doctor, =1 if child thinks girls should be allowed to play football, cricket or hopscotch

Table 2 – continued from previous page

Variable name	Definitions
Gender attitude	Averaged over the following variables - gender roles index, freedom index, education index and leadership index
Panel D: Child and parental inputs	
School enrollment	School enrollment status of a child
Days absent	No. of days absent from school
Chores	Average over the following 8 binary variables: 1 if child usually cooks, =1 if child usually sweeps, =1 if child usually cleans, =1 if child usually washes, =1 if child usually fetches water, =1 if child usually takes care of younger kids, =1 if child usually takes care of elderlies, =1 if child usually helps parents with their work, =1 if child usually takes care of the cattle
Schooling expenditure (in Rupees)	Amount spent on child schooling in the last year
Panel E: Family background characteristics and SES	
Age	Age in years
Male	=1 if male
Salaried	=1 if main source of household income is salaried work
BPL	=1 if household has below poverty line card
MNREGA	=1 if household receives benefits from MNREGA
Mother's age	Mother's age in years
Mother's schooling	Mother's completed grades of schooling
Father's age	Father's age in years
Father's schooling	Father's completed grades of schooling
Household size	Number of individuals in a household
SES	Asset index constructed using principal component analysis
SC	=1 if belongs to scheduled caste
ST	=1 if belongs to scheduled tribe
OBC	=1 if belongs to other backward caste
Hindu	=1 if Hindu
Drinking water	=1 if household has access to drinking water
Lighting	=1 if household has access to lighting
Cooking fuel	=1 if household has access to cooking fuel
Toilets	=1 if household has access to toilets
Grandparents' presence	=1 if grandparents in the household

Table 3: Summary Statistics

	Mean pooled (1)	Mean males (2)	Mean females (3)	Difference (standard error) (4)
Panel A: Cognitive skills				
Reading score in native language	3.90	3.93	3.87	0.061**
	(1.259)	(1.227)	(1.293)	(0.024)
Reading score in English	2.44	2.53	2.34	0.183***
	(1.570)	(1.567)	(1.566)	(0.029)
Math score	3.40	3.44	3.35	0.096***
	(1.006)	(0.984)	(1.027)	(0.019)
Relative grade attainment*	NA	0.04	-0.05	0.087***
		(0.931)	(1.069)	(0.023)
Raven's test score*	NA	0.01	-0.01	0.028*
		(0.998)	(1.002)	(0.017)
Panel B: Noncognitive skills				
Self-esteem*	NA	0.003	-0.001	0.004
		(0.963)	(1.039)	(0.018)
Self-efficacy*	NA	0.03	-0.04	0.068***
		(0.973)	(1.027)	(0.019)
Panel C: Child and parental inputs				
School enrollment	0.9	0.92	0.87	0.051***
	(0.29)	(0.264)	(0.332)	(0.007)
Days absent	1.33	1.37	1.28	0.088***
	(2.012)	(2.079)	(1.931)	(0.032)
Chores	0.32	0.20	0.46	-0.260***
	(0.263)	(0.179)	(0.272)	(0.008)
Schooling expenditure	533.42	580.71	481.54	99.166***
	(885.7)	(925.9)	(836.4)	(13.493)
Panel D: Gender Attitudes				
Gender roles	0.65	0.63	0.68	-0.049***
	(0.200)	(0.206)	(0.191)	(0.005)
Education	0.68	0.65	0.73	-0.081***
	(0.274)	(0.281)	(0.259)	(0.008)
Leadership	0.38	0.33	0.43	-0.101***
	(0.359)	(0.350)	(0.361)	(0.011)
Freedom	0.49	0.48	0.51	-0.029***
	(0.295)	(0.290)	(0.300)	(0.007)

Table 3 – continued from previous page

	Mean pooled	Mean males	Mean females	Difference (standard error)
	(1)	(2)	(3)	(4)
Gender attitude	0.55	0.52	0.58	-0.065***
	(0.199)	(0.198)	(0.195)	(0.006)
Attitude quintile 1	0.33	0.32	0.34	-0.023***
	(0.0811)	(0.0878)	(0.0663)	(0.003)
Attitude quintile 2	0.462	0.463	0.462	-0.001
	(0.0206)	(0.0207)	(0.0204)	(0.001)
Attitude quintile 3	0.550	0.550	0.550	0.000
	(0.0243)	(0.0241)	(0.0246)	(0.001)
Attitude quintile 4	0.665	0.663	0.667	-0.004***
	(0.0352)	(0.0348)	(0.0355)	(0.001)
Attitude quintile 5	0.850	0.857	0.856	0.001
	(0.0884)	(0.0904)	(0.0870)	(0.005)
Panel E: Family and child characteristics				
Age (in years)	11.10	11.11	11.09	0.017
	(1.923)	(1.926)	(1.920)	(0.030)
Male	0.52	NA	NA	NA
	(0.499)			
SC	0.140	0.142	0.137	0.006
	(0.347)	(0.350)	(0.343)	(0.005)
ST	0.425	0.418	0.433	-0.015**
	(0.494)	(0.493)	(0.496)	(0.007)
OBC	0.400	0.404	0.396	0.008
	(0.490)	(0.491)	(0.489)	(0.007)
Hindu	0.917	0.916	0.919	-0.003
	(0.276)	(0.278)	(0.274)	(0.004)
Salaried	0.025	0.023	0.027	-0.004*
	(0.156)	(0.150)	(0.163)	(0.002)
BPL	0.859	0.863	0.856	0.006
	(0.348)	(0.344)	(0.351)	(0.005)
MNREGA	0.440	0.439	0.442	-0.003
	(0.496)	(0.496)	(0.497)	(0.008)
Mother's age	35.71	35.73	35.69	0.032
	(6.068)	(6.155)	(5.972)	(0.090)
Mother's schooling	9.50	9.57	9.44	0.133
	(26.66)	(26.79)	(26.53)	(0.553)
Father's age	40.26	40.24	40.27	-0.033
	(6.350)	(6.401)	(6.293)	(0.097)
Father's schooling	12.14	12.46	11.80	0.663

Table 3 – continued from previous page

	Mean pooled	Mean males	Mean females	Difference (standard error)
	(1)	(2)	(3)	(4)
	(27.61)	(28.09)	(27.07)	(0.466)
Household size	2.75	2.75	2.76	-0.010
	(1.317)	(1.324)	(1.309)	(0.021)
SES	2.97	2.99	2.96	0.030
	(1.415)	(1.414)	(1.416)	(0.025)
SES quintile 1	-2.525	-2.525	-2.525	0.001
	(0.592)	(0.589)	(0.595)	(0.015)
SES quintile 2	-1.068	-1.070	-1.067	-0.003
	(0.313)	(0.313)	(0.313)	(0.009)
SES quintile 3	-0.110	-0.114	-0.107	-0.006
	(0.252)	(0.251)	(0.252)	(0.007)
SES quintile 4	0.863	0.862	0.864	-0.002
	(0.323)	(0.321)	(0.325)	(0.010)
SES quintile 5	2.858	2.837	2.882	-0.045
	(1.263)	(1.226)	(1.303)	(0.035)
Drinking water	0.470	0.470	0.476	-0.007
	(0.499)	(0.499)	(0.499)	(0.008)
Lighting	0.995	0.995	0.995	-0.000
	(0.0715)	(0.0718)	(0.0710)	(0.001)
Cooking fuel	0.247	0.248	0.246	0.002
	(0.431)	(0.432)	(0.430)	(0.008)
Toilets	0.300	0.296	0.303	-0.007
	(0.458)	(0.457)	(0.460)	(0.007)
Grandparents' presence	0.087	0.084	0.090	-0.006
	(0.281)	(0.277)	(0.286)	(0.004)
Observations	20262	10600	9662	

Notes: In Columns 1-3, standard deviations reported in parenthesis. In Column 4, robust standard errors clustered at the village level in parenthesis. *** p<0.01, ** p<0.05, * p<0.10. Variables with asterisks have been standardized for ease of interpretation. Attitude quintiles in the table are based on the gender attitude variable in Panel D.

Table 4: Gender gaps in cognitive and noncognitive skills

	Unconditional gender gaps (1)	Conditional gender gaps (2)	Conditional gender gaps (3)
Panel A: Cognitive skills			
Reading score in native language	0.047**	0.049***	0.047***
	(0.019)	(0.018)	(0.018)
R-squared	0.001	0.132	0.249
Reading score in English	0.117***	0.112***	0.110***
	(0.018)	(0.017)	(0.016)
R-squared	0.003	0.209	0.307
Math score	0.093***	0.090***	0.094***
	(0.018)	(0.016)	(0.016)
R-squared	0.002	0.200	0.305
Relative grade attainment	0.081***	0.075***	0.077***
	(0.022)	(0.021)	(0.021)
R-squared	0.002	0.182	0.272
Raven's test score	0.028*	0.018	0.010
	(0.017)	(0.016)	(0.015)
R-squared	0.000	0.071	0.226
Panel B: Noncognitive skills			
Self-esteem	0.004	0.001	0.003
	(0.017)	(0.017)	(0.016)
R-squared	0.000	0.016	0.108
Self-efficacy	0.066***	0.064***	0.063***
	(0.019)	(0.019)	(0.018)
R-squared	0.001	0.012	0.169
Family and child level characteristics	No	Yes	Yes
Village fixed effects	No	No	Yes

Notes: Each cell here presents the coefficient on the male dummy obtained from different regressions of the outcomes (indicated in Panels A and B) on the male dummy and selected covariates. In Column 1, we report gender gaps for all outcomes. In Column 2, we report gender gaps controlling for family- and child-level characteristics listed in Panel E, Table 3. In Column 3, we report gender gaps controlling for family- and child-level characteristics as well as village fixed effects. Robust standard errors clustered at the village level in parenthesis. *** p<0.01, ** p<0.05, * p<0.10.

Table 5: Gaps in gender attitudes

	Unconditional gender gaps	Conditional gender gaps	Conditional gender gaps
	(1)	(2)	(3)
Gender attitude	-0.235***	-0.233***	-0.233***
	(0.021)	(0.021)	(0.020)
R-squared	0.026	0.095	0.318
Gender roles	-0.255***	-0.255***	-0.260***
	(0.026)	(0.027)	(0.026)
R-squared	0.015	0.065	0.212
Education	-0.312***	-0.315***	-0.306***
	(0.030)	(0.029)	(0.028)
R-squared	0.022	0.045	0.201
Leadership	-0.279***	-0.274***	-0.276***
	(0.030)	(0.029)	(0.029)
R-squared	0.02	0.063	0.228
Freedom	-0.095***	-0.089***	-0.089***
	(0.022)	(0.023)	(0.023)
R-squared	0.002	0.049	0.252
Family and child level characteristics	No	Yes	Yes
Village fixed effects	No	No	Yes

Notes: Each cell represents the coefficient on the male dummy obtained from different regressions of the gender attitude variables on the male dummy and selected covariates. In Column 1 we report unconditional gender gaps for all attitudes. In Column 2, we report gender gaps controlling for family- and child-level characteristics. In Column 3, we report gender gaps controlling for family- and child-level characteristics as well as village fixed effects. *** p<0.01, ** p<0.05, * p<0.10. Robust standard errors clustered at the village level in parenthesis.

Table 6: Gender gaps in skills, controlling for gender attitudes

	Conditional gender gaps with gender attitudes	Conditional gender gaps with gender attitude fixed effects	Conditional gender gaps with gender attitude and household fixed effects
	(1)	(2)	(3)
Panel A: Cognitive skills			
Reading score in native language	0.070***	0.064***	0.077***
	(0.019)	(0.019)	(0.022)
Sharpened q-values			[0.002]
R-squared	0.256	0.253	0.687
Reading score in English	0.130***	0.123***	0.124***
	(0.017)	(0.017)	(0.022)
Sharpened q-values			[0.001]
R-squared	0.311	0.310	0.722
Math score	0.113***	0.110***	0.117***
	(0.017)	(0.017)	(0.022)
Sharpened q-values			[0.001]
R-squared	0.314	0.307	0.702
Relative grade attainment	0.084***	0.082***	0.090***
	(0.023)	(0.023)	(0.027)
Sharpened q-values			[0.002]
R-squared	0.275	0.273	0.689
Raven's test score	0.033**	0.032**	0.026
	(0.016)	(0.016)	(0.018)
Sharpened q-values			[0.068]
R-squared	0.236	0.230	0.765
Panel B: Noncognitive skills			
Self-esteem	-0.019	-0.023	-0.030
	(0.016)	(0.017)	(0.020)
Sharpened q-values			[0.068]
R-squared	0.114	0.115	0.690
Self-efficacy	0.074***	0.073***	0.069***
	(0.019)	(0.019)	(0.019)
Sharpened q-values			[0.001]
R-squared	0.178	0.172	0.683
Family and child level characteristics	Yes	Yes	Yes
Village fixed effects	Yes	Yes	Yes
Attitude fixed effects	No	Yes	Yes
Household fixed effects	No	No	Yes

Notes: Each cell represents the coefficient on the male dummy obtained from different regressions of the outcome (indicated in Panels A and B) on the male dummy and selected covariates. In Column 1, we report gender gaps controlling for gender attitudes, family- and child-level characteristics as well as village fixed effects. In Column 2, we report gender gaps controlling for family- and child-level characteristics, attitude-quintile fixed effects and village fixed effects. Finally, in Column 3 we report gender gaps controlling for family- and child-level characteristics, attitude-quintile fixed effects, village fixed effects, and household fixed effects. Sharpened q-values are reported in brackets in Column 3. *** p<0.01, ** p<0.05, * p<0.10. Robust standard errors clustered at the village level in parenthesis.

Table 7: Attitude and SES gradients in cognitive and noncognitive skills

	Reading score in native language	Reading score in English	Math score	Relative grade attainment	Raven's test score	Self-esteem	Self-efficacy
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Attitude quintiles							
Attitude Q2 (vs Q1)	0.047	0.071**	0.037	-0.009	-0.023	-0.123***	-0.046
	(0.030)	(0.031)	(0.028)	(0.025)	(0.034)	(0.037)	(0.040)
Attitude Q3 (vs Q1)	0.072**	0.123***	0.120***	0.026	0.011	-0.241***	0.034
	(0.033)	(0.030)	(0.031)	(0.028)	(0.046)	(0.042)	(0.040)
Attitude Q4 (vs Q1)	0.062*	0.021	0.096***	0.027	0.117***	-0.202***	0.038
	(0.036)	(0.030)	(0.034)	(0.030)	(0.042)	(0.048)	(0.053)
Attitude Q5 (vs Q1)	0.192***	0.156***	0.198***	0.077**	0.253***	-0.252***	0.226***
	(0.038)	(0.034)	(0.036)	(0.037)	(0.060)	(0.058)	(0.046)
p-value from F-test (Q1=Q2=Q3=Q4=Q5)	<0.01	<0.01	<0.01	0.104	<0.01	<0.01	<0.01
p-value from t-test (Q5=Q2)	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
Panel B: SES quintiles							
SES Q2 (vs Q1)	0.183***	0.097***	0.135***	0.160***	0.033	-0.043	0.060**
	(0.029)	(0.031)	(0.030)	(0.027)	(0.040)	(0.029)	(0.028)
SES Q3 (vs Q1)	0.227***	0.184***	0.229***	0.165***	0.058	0.012	0.091**
	(0.032)	(0.035)	(0.032)	(0.030)	(0.044)	(0.039)	(0.037)
SES Q4 (vs Q1)	0.329***	0.265***	0.303***	0.192***	0.109**	-0.035	0.163***
	(0.035)	(0.039)	(0.034)	(0.037)	(0.051)	(0.044)	(0.037)
SES Q5 (vs Q1)	0.361***	0.359***	0.361***	0.191***	0.157**	-0.050	0.147***
	(0.040)	(0.046)	(0.039)	(0.037)	(0.063)	(0.050)	(0.044)
p-value from F-test (Q1=Q2=Q3=Q4=Q5)	<0.01	<0.01	<0.01	<0.01	0.147	0.266	<0.01
p-value from t-test (Q5=Q2)	<0.01	<0.01	<0.01	0.291	0.0282	0.869	0.022
Family and child level characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Village fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,057	19,057	19,057	19,057	19,057	19,057	19,057
R-squared	0.253	0.310	0.309	0.273	0.233	0.124	0.117

Notes: Each column presents coefficients on the attitude quintiles and SES quintiles included in regressions reported in Column 2, Table 6. Robust standard errors clustered at the village level in parenthesis. *** p<0.01, ** p<0.05, * p<0.10.

Table 8: Heterogeneity Analysis

	Reading score in native language	Reading score in English	Math score	Relative grade attainment	Raven's test score	Self-esteem	Self-efficacy
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: by attitude quintiles							
Attitude Q1	0.123***	0.166***	0.149***	0.107**	0.089***	-0.068**	0.115***
	(0.030)	(0.028)	(0.031)	(0.042)	(0.029)	(0.027)	(0.027)
	5,763	5,763	5,763	5,763	5,763	5,763	5,763
Attitude Q2	0.024	0.119***	0.094**	0.082*	0.096***	0.012	0.058
	(0.036)	(0.038)	(0.040)	(0.042)	(0.033)	(0.035)	(0.043)
	2,872	2,872	2,872	2,872	2,872	2,872	2,872
Attitude Q3	0.088**	0.130***	0.173***	0.081**	0.127***	0.038	0.074*
	(0.037)	(0.037)	(0.033)	(0.038)	(0.042)	(0.037)	(0.038)
	2,944	2,944	2,944	2,944	2,944	2,944	2,944
Attitude Q4	0.072**	0.097***	0.107***	0.051**	-0.074**	-0.033	0.095***
	(0.031)	(0.033)	(0.029)	(0.025)	(0.034)	(0.038)	(0.035)
	3,875	3,875	3,875	3,875	3,875	3,875	3,875
Attitude Q5	0.026	0.105***	0.009	0.055*	-0.080**	0.025	0.037
	(0.032)	(0.035)	(0.032)	(0.029)	(0.040)	(0.028)	(0.034)
	3,584	3,584	3,584	3,584	3,584	3,584	3,584
Panel B: by SES quintiles							
SES Q1	0.109***	0.109***	0.169***	0.210***	0.040	-0.037	0.073**
	(0.039)	(0.032)	(0.033)	(0.040)	(0.035)	(0.042)	(0.034)
	3,733	3,733	3,733	3,733	3,733	3,733	3,733
SES Q2	0.107***	0.170***	0.114***	0.084**	0.046	-0.027	0.090***
	(0.033)	(0.032)	(0.030)	(0.033)	(0.032)	(0.029)	(0.031)
	3,856	3,856	3,856	3,856	3,856	3,856	3,856
SES Q3	0.077**	0.152***	0.117***	0.070*	0.096***	-0.038	0.087**
	(0.037)	(0.034)	(0.032)	(0.036)	(0.026)	(0.028)	(0.033)
	3,769	3,769	3,769	3,769	3,769	3,769	3,769
SES Q4	0.051*	0.147***	0.116***	0.040	0.013	-0.014	0.092***
	(0.027)	(0.031)	(0.030)	(0.030)	(0.031)	(0.032)	(0.032)
	3,871	3,871	3,871	3,871	3,871	3,871	3,871
SES Q5	0.003	0.047	0.050	-0.019	0.007	-0.008	0.046
	(0.025)	(0.034)	(0.031)	(0.027)	(0.031)	(0.038)	(0.031)
	3,808	3,808	3,808	3,808	3,808	3,808	3,808
Family and child level characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Village fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Each cell presents the coefficient on the male dummy obtained from different regressions of the outcomes (listed in Columns 1-7) on the male dummy and other selected covariates (obtained with the specification used in Table 6 Column 1), successively stratifying our sample by attitude quintiles and SES quintiles. Robust standard errors clustered at the village level in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table 9: Complementarity between Attitudes and SES

	Reading score in native language	Reading score in English	Math score	Relative grade attainment	Raven's test score	Self-esteem	Self-efficacy
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Gender gap by attitude quintiles (holding SES at Q4 and Q5)							
Attitude Q1	0.119***	0.209***	0.210***	0.048	0.102***	-0.065*	0.134***
	(0.034)	(0.033)	(0.039)	(0.044)	(0.038)	(0.034)	(0.036)
	2,456	2,456	2,456	2,456	2,456	2,456	2,456
Attitude Q2	-0.001	0.058	0.047	0.058	0.003	0.015	0.072
	(0.047)	(0.064)	(0.067)	(0.052)	(0.052)	(0.056)	(0.064)
	1,159	1,159	1,159	1,159	1,159	1,159	1,159
Attitude Q3	-0.022	0.074	0.111**	-0.029	0.065	-0.019	0.002
	(0.057)	(0.058)	(0.053)	(0.059)	(0.058)	(0.054)	(0.064)
	1,166	1,166	1,166	1,166	1,166	1,166	1,166
Attitude Q4	-0.000	-0.005	0.036	-0.061**	-0.129**	-0.042	0.046
	(0.043)	(0.048)	(0.049)	(0.030)	(0.051)	(0.053)	(0.051)
	1,467	1,467	1,467	1,467	1,467	1,467	1,467
Attitude Q5	0.004	0.059	-0.020	0.012	-0.131**	0.047	0.070
	(0.045)	(0.054)	(0.049)	(0.045)	(0.059)	(0.046)	(0.051)
	1,349	1,349	1,349	1,349	1,349	1,349	1,349
Panel B: Gender gap by SES quintiles (holding attitudes at Q4 and Q5)							
SES Q1	0.068	0.094*	0.150***	0.187***	-0.085	-0.046	0.044
	(0.054)	(0.052)	(0.046)	(0.050)	(0.060)	(0.052)	(0.052)
	1,562	1,562	1,562	1,562	1,562	1,562	1,562
SES Q2	0.039	0.171***	0.053	0.026	-0.019	0.008	0.096**
	(0.043)	(0.052)	(0.043)	(0.039)	(0.050)	(0.046)	(0.039)
	1,626	1,626	1,626	1,626	1,626	1,626	1,626
SES Q3	0.070	0.118**	0.073	0.060	-0.088*	-0.081*	0.143***
	(0.056)	(0.059)	(0.049)	(0.046)	(0.046)	(0.045)	(0.053)
	1,396	1,396	1,396	1,396	1,396	1,396	1,396
SES Q4	0.011	0.093	0.035	-0.022	-0.127*	0.008	0.075
	(0.050)	(0.057)	(0.048)	(0.047)	(0.066)	(0.055)	(0.053)
	1,279	1,279	1,279	1,279	1,279	1,279	1,279
SES Q5	0.001	-0.014	-0.027	-0.023	-0.124***	0.004	0.029
	(0.038)	(0.049)	(0.047)	(0.029)	(0.040)	(0.049)	(0.045)
	1,545	1,545	1,545	1,545	1,545	1,545	1,545
Family and child level characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Village fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Each cell presents the coefficient on the male dummy obtained from different regressions of the outcomes (listed in Columns 1-4) on the male dummy and other selected covariates (obtained with the specification used in Table 6 Column 1), successively stratifying our sample by attitude quintiles and SES quintiles. Robust standard errors clustered at the village level in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table 10: Pathways

	School enrollment	Days absent	Chores	Schooling expenditure
	(1)	(2)	(3)	(4)
Panel A: Gender gaps stratified by attitude quintiles				
Attitude Q1	0.073***	0.068	-0.931***	0.176***
	(0.013)	(0.066)	(0.039)	(0.031)
	5,763	5,193	5,763	5,763
Attitude Q2	0.030**	-0.054	-0.934***	0.098***
	(0.012)	(0.114)	(0.054)	(0.031)
	2,872	2,636	2,872	2,872
Attitude Q3	0.042***	0.183**	-0.882***	0.105***
	(0.013)	(0.072)	(0.040)	(0.037)
	2,944	2,659	2,944	2,944
Attitude Q4	0.062***	0.007	-0.957***	0.135***
	(0.009)	(0.069)	(0.031)	(0.030)
	3,875	3,480	3,875	3,875
Attitude Q5	0.030***	0.060	-0.932***	0.094**
	(0.009)	(0.068)	(0.048)	(0.036)
	3,584	3,265	3,584	3,584
Panel B: Gender gaps stratified by SES quintiles				
SES Q1	0.056***	0.137**	-1.092***	0.075***
	(0.012)	(0.053)	(0.045)	(0.018)
	3,733	3,099	3,733	3,733
SES Q2	0.062***	0.051	-1.056***	0.059***
	(0.012)	(0.055)	(0.044)	(0.021)
	3,856	3,454	3,856	3,856
SES Q3	0.064***	0.019	-0.888***	0.158***
	(0.013)	(0.067)	(0.049)	(0.029)
	3,769	3,441	3,769	3,769
SES Q4	0.059***	0.008	-0.885***	0.163***
	(0.011)	(0.082)	(0.037)	(0.035)
	3,871	3,589	3,871	3,871
SES Q5	0.023***	0.030	-0.798***	0.166***
	(0.007)	(0.066)	(0.039)	(0.060)
	3,808	3,650	3,808	3,808
Family and child level characteristics	Yes	Yes	Yes	Yes
Village fixed effects	Yes	Yes	Yes	Yes

Notes: Each cell presents the coefficient on the male dummy obtained from different regressions of the outcomes (listed in Columns 1-4) on the male dummy and other selected covariates (obtained with the specification used in Table 6 Column 1), successively stratifying our sample by attitude quintiles and wealth quintiles. Robust standard errors clustered at the village level are in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table 11: Gender Gap Coefficient Stability

	(1)	Rmax=0.4 (2)	Rmax=0.6 (3)	Rmax=0.8 (4)	Rmax=1 (5)
Panel A: Cognitive skills					
Reading score in native language	0.070***				
	(0.019)				
R-squared	0.256				
δ for β =0 given Rmax		15.19	6.54	4.17	3.06
Reading score in English	0.130***				
	(0.017)				
R-squared	0.311				
δ for β =0 given Rmax		27.40	8.86	5.29	3.77
Math score	0.113***				
	(0.017)				
R-squared	0.314				
δ for β =0 given Rmax		38.67	12.62	7.54	5.37
Relative grade attainment	0.084***				
	(0.023)				
R-squared	0.275				
δ for β =0 given Rmax		21.31	8.38	5.21	3.78
Raven's test score	0.033**				
	(0.016)				
R-squared	0.236				
δ for β =0 given Rmax		-1.17	-0.68	-0.48	-0.37
Panel B: Noncognitive skills					
Self esteem	-0.019				
	(0.016)				
R-squared	0.428				
δ for β =0 given Rmax		21.38	11.48	7.85	5.96
Self efficacy	0.074***				
	(0.019)				
R-squared	0.178				
δ for β =0 given Rmax		16.81	5.02	5.02	2.95
Observations	19,057				

Notes: Following Oster (2019), this table presents estimated δ values (relative amount of selection on unobserved variables necessary to drive our coefficient estimate on the male dummy to zero) obtained with different Rmax values (R-squared from a hypothetical regression of the outcome on the male dummy and both observed and unobserved controls). The first column shows the gender gap obtained from regressing the outcome variables in Panels A and B on family- and child-level characteristics and village fixed effects (Column 1 of Table 6). In Columns 2, 3 and 4 we show the evolution of δ when we increase Rmax. Robust standard errors clustered at the village level in parenthesis. *** p<0.01, ** p<0.05, * p<0.10.

Appendix

Table A1: Regression results from Table 6, Column 1

	Reading score in native language	Reading score in English	Math score	Relative grade attainment	Raven's test score	Self-esteem	Self-efficacy
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Gender roles	0.062***	0.042	0.064***	-0.006	0.131***	-0.001	0.047
	(0.023)	(0.026)	(0.018)	(0.017)	(0.034)	(0.038)	(0.035)
Education	0.041**	0.028	0.037**	0.023	0.017	0.010	-0.033
	(0.017)	(0.017)	(0.017)	(0.015)	(0.024)	(0.024)	(0.029)
Leadership	0.014	0.021	-0.014	-0.004	-0.018	-0.094***	0.010
	(0.019)	(0.017)	(0.017)	(0.013)	(0.031)	(0.022)	(0.024)
Freedom	0.084***	0.068***	0.117***	0.079***	0.113***	-0.062**	0.143***
	(0.020)	(0.020)	(0.019)	(0.018)	(0.027)	(0.026)	(0.025)
SES Q2	0.183***	0.095***	0.135***	0.160***	0.036	-0.042	0.063**
(vs Q1)	(0.028)	(0.031)	(0.029)	(0.027)	(0.039)	(0.029)	(0.028)
SES Q3	0.225***	0.181***	0.226***	0.163***	0.057	0.012	0.090**
(vs Q1)	(0.031)	(0.035)	(0.031)	(0.030)	(0.044)	(0.039)	(0.036)
SES Q4	0.328***	0.263***	0.301***	0.190***	0.111**	-0.036	0.164***
(vs Q1)	(0.034)	(0.039)	(0.033)	(0.036)	(0.050)	(0.044)	(0.037)
SES Q5	0.363***	0.356***	0.362***	0.193***	0.167***	-0.047	0.159***
(vs Q1)	(0.040)	(0.047)	(0.038)	(0.037)	(0.062)	(0.050)	(0.044)
Family and child level characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Village fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,057	19,057	19,057	19,057	19,057	19,057	19,057
R-squared	0.256	0.311	0.314	0.275	0.236	0.114	0.178

Notes: Each column represents the full set of coefficient estimates obtained with the specification used in Table 6 column 1, from regressions of outcomes (indicated in Panels A of Table 3) on the male dummy while controlling for gender attitude indices, family (Panel C of Table 3) and village level factors. Standard errors are clustered at the village level. *** p<0.01, ** p<0.05, * p<0.10.

Table A2: Mean attitudes by SES quintiles

	SES Q1 (1)	SES Q2 (2)	SES Q3 (3)	SES Q4 (4)	SES Q5 (5)
Gender Attitude	0.57	0.56	0.55	0.52	0.56
	(0.200)	(0.205)	(0.198)	(0.185)	(0.203)
Gender roles	0.66	0.66	0.65	0.63	0.66
	(0.209)	(0.197)	(0.194)	(0.197)	(0.201)
Education	0.68	0.69	0.68	0.67	0.70
	(0.269)	(0.275)	(0.276)	(0.28)	(0.268)
Leadership	0.40	0.40	0.37	0.33	0.39
	(0.365)	(0.361)	(0.352)	(0.34)	(0.371)
Freedom	0.52	0.50	0.49	0.46	0.48
	(0.307)	(0.301)	(0.298)	(0.277)	(0.288)
Observations	4184	4116	3989	4050	3923

Notes: standard deviations in parenthesis.

Table A3: Child and family characteristics by attitude quintiles

	Attitude Q1	Attitude Q2	Attitude Q3	Attitude Q4	Attitude Q5	Joint F-test p-value
	(1)	(2)	(3)	(4)	(5)	
Age	10.95	11.04	11.09	11.20	11.28	<0.01
	(1.924)	(1.840)	(1.932)	(1.933)	(1.947)	
Male	0.62	0.54	0.53	0.47	0.41	<0.01
	(0.485)	(0.499)	(0.499)	(0.499)	(0.492)	
SC	0.17	0.15	0.14	0.13	0.10	<0.01
	(0.373)	(0.357)	(0.342)	(0.334)	(0.307)	
ST	0.31	0.36	0.44	0.51	0.55	<0.01
	(0.463)	(0.481)	(0.496)	(0.500)	(0.497)	
OBC	0.48	0.46	0.39	0.33	0.31	<0.01
	(0.500)	(0.499)	(0.488)	(0.469)	(0.463)	
Hindu	0.90	0.89	0.90	0.93	0.96	<0.01
	(0.294)	(0.310)	(0.295)	(0.257)	(0.207)	
Salaried	0.01	0.01	0.02	0.03	0.05	<0.01
	(0.119)	(0.118)	(0.125)	(0.167)	(0.226)	
BPL	0.90	0.88	0.86	0.82	0.82	<0.01
	(0.302)	(0.324)	(0.344)	(0.382)	(0.386)	
MNREGA	0.55	0.51	0.41	0.36	0.33	<0.01
	(0.498)	(0.500)	(0.492)	(0.481)	(0.469)	
Mother's age	35.42	35.70	35.75	35.95	35.89	0.267
	(6.050)	(6.032)	(5.972)	(6.149)	(6.100)	
Mother's schooling	12.11	13.65	9.37	6.42	5.55	<0.01
	(30.72)	(32.24)	(26.32)	(21.05)	(18.37)	
Father's age	40.08	40.16	40.44	40.45	40.26	0.376
	(6.367)	(6.138)	(6.593)	(6.534)	(6.071)	
Father's schooling	15.69	16.77	10.44	8.12	8.47	<0.01
	(32.31)	(33.27)	(25.04)	(20.90)	(20.59)	
Household size	2.75	2.64	2.75	2.81	2.78	0.014
	(1.328)	(1.207)	(1.311)	(1.379)	(1.315)	
SES	3.05	3.01	2.93	2.90	2.93	0.106
	(1.390)	(1.389)	(1.422)	(1.420)	(1.456)	
Drinking water	0.36	0.44	0.49	0.56	0.58	<0.01
	(0.479)	(0.497)	(0.500)	(0.497)	(0.494)	
Lighting	0.99	0.99	0.99	1.00	1.00	0.870
	(0.073)	(0.079)	(0.073)	(0.066)	(0.066)	
Cooking fuel	0.28	0.25	0.25	0.21	0.24	<0.01
	(0.447)	(0.431)	(0.436)	(0.405)	(0.426)	
Toilets	0.23	0.28	0.30	0.34	0.37	<0.01
	(0.422)	(0.449)	(0.459)	(0.475)	(0.484)	
Grandparents' presence	0.10	0.07	0.08	0.08	0.09	0.160
	(0.295)	(0.261)	(0.272)	(0.274)	(0.290)	
Observations	6073	3037	3155	4125	3868	

Notes: Robust standard errors clustered at the village level in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table A4: Attitude and SES gradients in cognitive and noncognitive skills with PCA-based attitude index

	Reading score in native language	Reading score in English	Math score	Relative grade attainment	Raven's test score	Self-esteem	Self-efficacy
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: by Attitude quintiles							
Attitude Q2 (vs Q1)	0.064**	0.127***	0.058**	0.018	0.014	0.031	0.057
	(0.026)	(0.031)	(0.028)	(0.027)	(0.032)	(0.033)	(0.043)
Attitude Q3 (vs Q1)	0.103***	0.121***	0.127***	0.040	0.064*	0.073**	-0.095**
	(0.031)	(0.032)	(0.030)	(0.027)	(0.034)	(0.037)	(0.042)
Attitude Q4 (vs Q1)	0.090**	0.056*	0.112***	0.041	0.139***	0.139***	-0.110**
	(0.035)	(0.032)	(0.035)	(0.031)	(0.040)	(0.040)	(0.048)
Attitude Q5 (vs Q1)	0.221***	0.191***	0.223***	0.093**	0.308***	0.253***	-0.174***
	(0.041)	(0.040)	(0.042)	(0.040)	(0.071)	(0.048)	(0.063)
p-value from F-test (Q1=Q2=Q3=Q4=Q5)	<0.01	<0.01	<0.01	0.161	<0.01	<0.01	<0.01
p-value from F-test (Q1=Q5)	<0.01	0.0832	<0.01	0.0223	<0.01	<0.01	<0.01
Panel B: by SES quintiles							
SES Q2 (vs Q1)	0.183***	0.096***	0.134***	0.160***	0.033	0.028	-0.040
	(0.028)	(0.031)	(0.030)	(0.027)	(0.040)	(0.027)	(0.029)
SES Q3 (vs Q1)	0.225***	0.182***	0.228***	0.165***	0.057	-0.016	0.013
	(0.032)	(0.036)	(0.032)	(0.030)	(0.045)	(0.033)	(0.039)
SES Q4 (vs Q1)	0.329***	0.265***	0.302***	0.192***	0.110**	0.021	-0.034
	(0.035)	(0.039)	(0.034)	(0.037)	(0.050)	(0.038)	(0.044)
SES Q5 (vs Q1)	0.361***	0.357***	0.359***	0.191***	0.158**	0.141***	-0.042
	(0.040)	(0.047)	(0.039)	(0.037)	(0.063)	(0.042)	(0.050)
p-value from F-test (Q1=Q2=Q3=Q4=Q5)	<0.01	<0.01	<0.01	<0.01	0.130	<0.01	0.320
p-value from F-test (Q1=Q5)	<0.01	<0.01	<0.01	0.286	0.026	<0.01	0.971
Family and child level characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Village fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,057	19,057	19,057	19,057	19,057	19,057	19,057
R-squared	0.252	0.309	0.307	0.272	0.230	0.115	0.172

Notes: Each column represents the full set of coefficient estimates obtained with the specification used in Table 6 column 1, from regressions of outcomes (indicated in Panels A of Table 3) on the male dummy while controlling for gender attitude quintile fixed effects obtained with principal component analysis, and village fixed effects. Standard errors are clustered at the village level. *** p<0.01, ** p<0.05, * p<0.10.

Table A5: Reproducing table 8 panel A with PCA-based attitude indices

	Reading score in native language	Reading score in English	Math score	Relative grade attainment	Raven's test score	Self-esteem	Self-efficacy
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Attitude Q1	0.082**	0.160***	0.158***	0.108**	0.066**	0.010	0.086***
	(0.036)	(0.029)	(0.031)	(0.046)	(0.031)	(0.033)	(0.030)
	3,875	3,875	3,875	3,875	3,875	3,875	3,875
Attitude Q2	0.099***	0.137***	0.124***	0.082**	0.141***	-0.059*	0.089***
	(0.034)	(0.033)	(0.037)	(0.041)	(0.036)	(0.032)	(0.032)
	4,060	4,060	4,060	4,060	4,060	4,060	4,060
Attitude Q3	0.080**	0.114***	0.149***	0.086**	0.096**	-0.002	0.080**
	(0.034)	(0.035)	(0.032)	(0.035)	(0.040)	(0.036)	(0.032)
	3,595	3,595	3,595	3,595	3,595	3,595	3,595
Attitude Q4	0.075**	0.103***	0.119***	0.074***	-0.078**	-0.021	0.092**
	(0.031)	(0.031)	(0.029)	(0.027)	(0.033)	(0.037)	(0.037)
	3,973	3,973	3,973	3,973	3,973	3,973	3,973
Attitude Q5	0.023	0.091**	-0.003	0.030	-0.051	-0.004	0.045
	(0.034)	(0.035)	(0.034)	(0.028)	(0.036)	(0.028)	(0.030)
	3,531	3,531	3,531	3,531	3,531	3,531	3,531
Family and child level characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Village fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Each cell presents the coefficient on the male dummy obtained from different regressions of the outcomes (listed in Columns 1-7) on the male dummy and other selected covariates (obtained with the specification used in Table 6 Column 1), successively stratifying our sample by attitude quintiles fixed effects obtained with principal component analysis and SES quintiles. Robust standard errors clustered at the village level are in parentheses. *** p<0.01, ** p<0.05, * p<0.10.