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Using a unique longitudinal dataset tracking 116,026 students from Grade 1 to Grade 10, we examine the emergence, evolution, and drivers of gender gaps in academic achievement. We document large and widening female advantages: in English, the gap grows from 0.2 to 0.65 standard deviations (SD), and in math, from 0.1 to 0.4 SD. These patterns are consistent across cohorts, grades, and performance quartiles, and remain robust to the inclusion of classroom fixed effects. Adjusting for family background and teacher characteristics further enlarges the estimated gaps, particularly in higher grades. Importantly, the gaps persist even among opposite-gender siblings raised in the same household. Leveraging the random assignment of students to classrooms, we assess the causal effects of teacher gender and peer composition, but find these factors account for little of the observed gaps. In contrast, controlling for prior achievement-a proxy for baseline ability and unobserved individual heterogeneity-substantially attenuates the gaps. To further probe individual-level variation, we analyze traits such as diligence, hard work, and attentiveness among opposite-gender sibling pairs. We find that sisters consistently outperform their brothers on these dimensions, with disparities widening as students progress through grades. Taken together, our findings suggest that individual traits may play a central role in driving the widening gender gap over time.

Keywords: Gender achievement gap, peer effects, teacher gender, teacher bias, parental characteristics, individual traits, student behavior, mobility matrices, quantile regression.

JEL Code: I20, J11, J16

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1 Introduction

Gender disparities in academic performance often reveal stark contrasts, even among students attending the same schools, sharing classrooms, and being taught by the same teachers. In high-income countries, girls consistently outperform boys in reading and other language-based subjects, while boys typically excel in mathematics and science (Fryer Jr and Levitt, 2010; Guiso et al., 2008; Ellison and Swanson, 2023). In contrast, in low- and middle-income contexts such as rural India, boys tend to outperform girls across all academic domains, including reading, math, and science (Singh and Krutikova, 2017; Das and Singhal, 2021; Dickerson et al., 2015). These academic disparities are not just educational issues—they reflect and reinforce broader patterns of social and economic inequality. Girls who fall behind academically are more likely to drop out of school and enter low-paying, informal-sector jobs, contributing to persistent gendered cycles of disadvantage.

Despite substantial research documenting gender gaps in academic achievement, key questions remain: When do these gaps first emerge? How do they change with each additional year of schooling? And what drives them? Answering these questions requires rich longitudinal data that follow the same students over time and include detailed contextual information: household background, teacher quality, peer composition, and school input. However, such data are rare in low- and middle-income countries. Most studies rely on repeated cross-sectional data like ASER[1], which cannot capture within-student changes. Although panel datasets like Young Lives offer valuable insights, their limited granularity hinders precise identification of when gaps first emerge and the stages at which they widen.

Furthermore, while gender achievement gaps are widely documented, their underlying causes remain poorly understood, largely due to data limitations. Critical explanatory variables, such as parental resources, student traits, classroom environments, peer dynamics, and teacher characteristics, are rarely observed together. To our knowledge, no existing study-whether in developing or developed country contexts-comprehensively accounts for all these dimensions within the same set of students. Moreover, causal inference is complicated by endogeneity and selection: stronger teachers may be assigned to weaker or more disruptive students, and peer composition may reflect non-random sorting.

In India, two notable studies examine how being taught by a teacher of the same gender influences the gender achievement gap. For instance, Muralidharan and Sheth, 2016 show that while girls in Andhra Pradesh begin on par with boys, they fall behind by grade 5 - an effect mitigated by having a female teacher. Similarly, Rawal and Kingdon, 2010 report

[1]Annual Status of Education Report - Annual HH survey conducted across every rural district of India.

positive effects of female teachers on girls' outcomes, with no adverse impact on boys. However, these findings are restricted to the primary level, even though gender disparities often widen in higher grades. The role of peers in shaping gender achievement gaps is even less well understood. Dewan et al., 2024 analyze high school data to examine cohort-wise variation in gender composition, but their analysis does not extend to classroom-level dynamics, which more directly influence peer learning.

The paper seeks to address these limitations in several ways. First, it uses a uniquely detailed longitudinal dataset of 116,026 students across 117 rural private schools in North India, tracking their annual performance in mathematics and English from grades 1 through 10. This twelve-year panel is unprecedented in the context of developing countries and provides the temporal depth and measurement consistency needed to study both the emergence and evolution of gender gaps. Second, the schools in the sample follow a uniform curriculum and assessment system aligned with the CBSE, ensuring that student evaluations are grade-appropriate and conducted under standardized conditions. Unlike studies that apply the same test to students in different grades, this setup allows for accurate tracking of grade-level learning outcomes and cross-cohort comparisons. Third, instead of focusing solely on average score differences, the study examines students' relative positions within the performance distribution using non-parametric methods such as transition matrices and directional rank mobility. This approach captures gender-specific patterns in academic mobility over time. Fourth, the data are rich in contextual variables that cover households, siblings, peers, teachers, and schools, enabling a comprehensive analysis of potential drivers of gender gaps. A key identification strategy leverages the quasi-random assignment of students to classrooms based on enrollment order, enabling causal estimation of peer composition and teacher gender effects. Fifth, by analyzing gender gaps within sibling pairs, the study controls for shared family environments, including unobserved parental inputs and household dynamics. Finally, it draws on a school-administered survey to capture individual student traits, such as aspirations, confidence, and study habits, that may mediate gender differences in academic achievement.

Our findings challenge the dominant narratives around gender disparities in rural India. Contrary to much of the existing literature, we find that girls consistently outperform boys across all grades and performance quartiles. In English, the gender gap begins at 0.218 standard deviations (SD) by the end of grade 1 and steadily rises to 0.643 SD by grade 10. These gaps persist across cohorts, grades, and within every quartile of the performance distribution. They remain robust even when tracking the same students over a ten-year period, ruling out selective attrition or new student entry as primary drivers. To account for classroom-level confounders—such as peer composition, teacher quality, or class environment—we include classroom fixed effects in grade-specific regressions.

The persistence of gaps within classrooms suggests they are not explained by unobserved classroom-level heterogeneity.

Interestingly, controlling for parental and teacher characteristics further widens the observed gender gaps, particularly in higher grades (Table 4). For example, in English, the unadjusted gaps in grades 6 through 10 are 0.585, 0.633, 0.646, 0.648, and 0.643 SD, respectively. After including parental and teacher controls, the gaps increase to 0.598, 0.659, 0.663, 0.651, and 0.703 SD. A similar trend is observed in math, where the gaps grow from 0.363–0.389 SD to 0.370–0.458 SD after adding these controls. These results suggest that family and teacher background do not explain the gender gap—in fact, excluding them may understate it. The pattern holds even within families, where sisters consistently outperform their brothers, pointing to limited explanatory power of household-level factors.

However, once we control for students' prior achievement by including lagged test scores, the estimated gender gaps shrink considerably (Table 4). In English, the gaps in grades 6 to 10 reduce from 0.598–0.703 SD to 0.338–0.326 SD. In math, the gaps decline from 0.370–0.458 SD to 0.145–0.278 SD. Since lagged scores proxy for individual-level heterogeneity, this reduction suggests that intrinsic traits—including ability, effort, and attention—are important contributors to the gender gap. To examine this, we analyze teacher-reported data on student diligence, attentiveness, and punctuality within a sample of opposite-gender siblings. This design allows us to net out parental and household influences. We find that sisters are 23.3 percentage points more likely to be reported as hardworking, 22.5 points more likely to submit assignments on time, and 21.8 points more likely to be attentive, compared to their brothers. In sum, while parental background, teacher quality, and peer effects matter, the widening gender gap in later grades appears to be most strongly linked to individual traits—especially those reflecting attention and sustained effort.

The remainder of this paper is organized as follows: section 2 describes our dataset, section 3 provides the estimation strategy, section 4 presents the main results, in section 5 we provide some robustness checks, and in section 6 we conclude.

2 Dataset

2.1 About the Schools

We collect data from a chain of 117 rural private schools (Akal Academies[2]) in north India. The schools span rural areas of Punjab, Haryana, Uttar Pradesh, Rajasthan, and Himachal

[2]The schools are run by an NGO named Kalgidhar Trust - Baru Sahib. Headquartered in a remote and rural mountainous region of Himachal Pradesh, it is a non-profit organization that mainly works in the field of rural education.

Pradesh. Punjab hosts the majority with 94 schools, followed by Haryana with 15, and four each in Uttar Pradesh and Rajasthan. The mother branch is located in a rural hill-pocket in Himachal Pradesh. Of the 129 schools, 95 offer education up to the Senior Secondary level (Grade 12), 19 provide education up to Grade 10, and the remaining schools cover grades ranging from 5 to 9. All Akal Academies adhere to the National Curriculum Framework and are affiliated with the Central Board of Secondary Education (CBSE), a national education board overseen by the Government of India. The curriculum is standardized across all schools, with uniform mid-year and year-end exams. To ensure unbiased evaluation, the answer scripts are graded by teachers from randomly selected Akal Academies.

2.2 Data and Variables

The dataset comprises English and math scores corresponding to 1,16,026 students (across grades 1 to 12) in all the year-end exams they took from the year 2012 till 2023. Among these 37 percent students are female and the rest male. Our main independent variable is student gender. Further, we also collect information on parental, teacher and class characteristics for roughly 70 percent of these students. In Table 1 we present these variables and provide a brief description.

2.3 Description of Sample by Grade and Year

The data used in this paper were collected over 12 years from 2012-13 to 2023-24. The data set comprises annual English and math scores corresponding to 1,16,026 students (in grades 1 through 10) on all the end-of-year exams they took from 2012 until 2023. Since the data include test scores for all students in grades 1 to 10 enrolled in the Akal Academies chain during this period, the study tracks multiple cohorts as they progress through their schooling. A cohort consists of all students who generally enter the school together and study in the same grade in any given year. A new entrant who joins the school in a later grade is considered part of the cohort to which his classmates or peers belong. The oldest cohort was in grade 10 in 2012, while the youngest cohort was in grade 1 in 2023. In Table 12 we break the total sample by grade and year. Each element in the table shows the number of students studying in a specific grade and year. For example, Grade 1 had 3,705 students in 2012, 4,198 in 2013, 5,074 in 2014 and so on. The diagonal movements (from top left to bottom right) comprise students who belong to the same cohort. Note that while some cohorts have been tracked for longer periods, others have not. For example, cohorts that entered grade 1 in 2012, 2013, or 2014 have been followed through grade 10. In contrast, cohorts that were already in the higher grades in 2012 could only be tracked for shorter periods. Note that not all 3705 students in grade 1 in 2012 moved to grade 2. Some left their school and joined a different school (not belonging to our dataset) while a few others joined one of the schools belonging to our dataset in grade 2 in 2013. Further the sample size falls on moving across a column (over grades) and the fall is larger from the year 2012 till 2016. [3]

3 Empirical Model

To render test scores of students across different cohorts comparable we first standardise[4] scores within the set of students who take the same exam. Next corresponding to a specific grade g, we pool all the z-scores. This will include z-scores of students who were in grade g in year t, students in grade g in year $t+1$ and so on. Since the period of our study ranges from 2012 to 2023, we gather z scores for all students who were in grade g between 2012 and 2023.

3.1 Estimating Existence of the Gender Achievement Gap

Specific to each grade, we run the following OLS regression[5].

$$Y_{ics} = \alpha + \beta female_i + \lambda_c + \omega_s + u_{ics} \tag{1}$$

Here Y_{ics} denotes the standardized score of the student i in the cohort c belonging to the school s. $female_i$ denotes the dummy for gender. Since all students specific to a given grade g belong to different cohorts (or time periods), therefore we add a term for cohort fixed effects (λ_c). Further, ω_s accounts for the fact that these students belong to different schools. Note that β corresponding to a given grade g denotes the average gender gap observed across all grade g students of our dataset. These set of students (grade g students across all periods of our study) are again followed when they enter grade $g+1$, move to grade $g+2$ and so on. Therefore comparing β for each successive grade will provide insights into how gender gaps change as students move from one grade to the next.

[3] This is because during these years, a large proportion of schools were in their nascent years and only offered schooling till grade 2. With each incremental year schools were able to ramp up their infrastructure and offer schooling for one additional grade. Therefore the total number of students fall as we move up the grade ladder.

[4] $\left(\frac{\text{Score}-\text{Mean}}{\text{Standard Deviation}}\right)$

[5] We do not run a pooled regression, as estimating separate models for each grade allows the fixed effects and constant terms to vary flexibly across grades. This approach also aligns more closely with the methodology used in the existing literature Muralidharan and Sheth, 2016; Fryer Jr and Levitt, 2010; Lai, 2010; Bharadwaj et al., 2012.

3.2 Estimating Dynamic Gender Gaps

3.2.1 Value-Added Regression

Note that the coefficient β for a given grade g captures the cumulative gender achievement gap up to that point. As such, it does not disentangle newly emerging disparities between consecutive grades from the persistence of pre-existing differences established in earlier years. Hence, we employ the following regression (commonly known as value-added regression [6]) where we regress each period's achievement on previous period's achievement, gender dummy and other controls.

$$Y_{ics} = \alpha + \mu L_{ics} + \beta female_i + \lambda_c + \omega_s + u_{ics} \tag{2}$$

Here, L_{ics} denotes lagged standardized score for individual i. It controls for the knowledge with which the student enters the classroom. β now captures the marginal gaps that emerge as individuals move from one grade to the next. Further, mean gaps obscure a great deal heterogeneity since they don't provide information on male-female gaps across various points in the test score distribution. Therefore, we estimate equation (1) using quantile regression technique. This allows us to estimate β coefficient corresponding to any quantile for a given grade.

In addition, how do male and female students move across the performance distribution as they advance through grades? Do initially low-performing males keep pace with females of similar ability, or do notable gender differences emerge in their movement across the performance spectrum? Limited mobility suggests persistent achievement gaps—a concerning scenario—while greater mobility implies transitory gaps that are more manageable. In fact, large gaps between different individuals are less troubling than small but persistent gaps among the same individuals.

To compare male–female gains within specific percentile groups of the previous grade, we use a logit regression framework. The dependent variable equals 1 if the change (δ) in standardized scores from grade $g-1$ to g exceeds a given threshold. Regressions are run separately by quartile. For example, to compare Grade 1 to Grade 2 gains among students in the bottom 25th percentile of Grade 1, we restrict the sample to that group.

Each grade's score distribution is divided into four quartiles: bottom 25%, 25–50%, 50–75%, and top 25%. Within each quartile and grade transition, we estimate the following logit model.

[6] This regression has been extensively used in the literature. For instance see Singh and Krutikova, 2017, Muralidharan and Sheth, 2016, Lai, 2010, etc.

$\Pr(D_{ics}^{(g,g-1)Q}1|female_i, Y_{ics}^{(g-1),Q}) =$

$$\frac{1}{1+e^{-}(\alpha+\beta_1 female_i+\beta_2 Y_{ics}^{(g-1),Q}+\lambda_c+\omega_s)} \tag{5.1}$$

Here $D_{ics}^{(g,g-1)Q}$ is a dummy variable indicating the change in standardized scores when moving from grade $g-1$ to grade g for individuals who sat in the quartile Q in grade $g-1$. $Y_{ics}^{(g-1),Q}$ denotes standardized scores for individuals who lied in the quartile Q of the grade $g-1$. We consider the following scenarios: i) $\delta < 0$, ii) $\delta \leq -0.1$, iii) $\delta \leq -0.2$, iv) $\delta \leq -0.3$ and v) $\delta > 0$, vi) $\delta \geq 0.1$, vii) $\delta \geq 0.2$, viii) $\delta \geq 0.3$. Values of δ less than 0 indicate a fall in performance while values of δ greater than 0 indicate a rise in performance. Thus, for every pair of consecutive grades and for each quartile, we run 8 regressions.

4 Results

4.1 Existence of the Gender Achievement Gap

Table 2 reports regression estimates of the gender achievement gap in English and math based on Eq (1). Given the presence of 23 student cohorts, we include cohort fixed effects (column 2 for English, column 6 for math) and find that both the magnitude and trend of the gender gap remain unchanged. The results are similarly robust to adding school fixed effects (column 3 for English, column 7 for math).

English: The gender gap in favor of females is evident from Grade 1 onward, where girls outperform boys by 0.218 standard deviations (SD). This gap rises to 0.309 SD in Grade 2 and 0.502 SD by the end of primary school (Grade 5). In post-primary grades, the gap further increases to 0.632, 0.645, and 0.647 SD in Grades 7, 8, and 9, respectively, reaching 0.643 SD by Grade 10.

Math: Girls lead by 0.12 SD at Grade 1, with the gap widening steadily. It reaches 0.219 SD by Grade 5 and grows to 0.446 SD by Grade 8. The gap stabilizes thereafter, standing at 0.389 SD in Grade 10.

Table 3 presents quantile regressions based on Eq (2), reporting the coefficient on the gender dummy at the 10th, 25th, 50th, 75th, and 90th percentiles. The results reinforce our earlier findings: gender gaps favoring females are persistent across all grades and quantiles.

English: Gaps increase with grade level across all quantiles. For a given grade, gaps are largest at lower quantiles and diminish at higher ones, indicating that gender disparities are more pronounced among lower-performing students.

Math: In primary grades, gaps are also more pronounced at lower quantiles. In post-primary grades, the gap is relatively uniform across the bottom 75% of the distribution, with weaker differences at the top quantile. The gaps are largest at the 25th, 50th, and 75th percentiles. Panel B estimates the annual change in girls' relative scores using an interaction between student gender and grade. In English, the gender gap widens by 0.05 SD per year; in math, it increases by 0.04 SD annually in favor of girls.

4.2 Dynamic Gender Gaps

Next, we study the incremental gaps that emerge with every subsequent year of schooling. The results are presented in Table 2 (column 4 for English, column 8 for math). Note that the incremental gaps for both math and English are positive, which implies that with each additional year marginal gaps emerge in favor of females.

4.2.1 Divergence in Male-Female Scores

Further to examine how gender differences evolve across the performance distribution and over time, we adopt a simple panel-based approach. We generate nonparametric plots for each grade, comparing current achievement against prior achievement percentiles separately for boys and girls. If the gap in grade $g + 1$ simply reflects that in grade g, the plots will align—implying no new divergence conditional on initial performance. A consistent gap across the distribution would appear as parallel curves offset by a constant intercept. In contrast, varying slopes would indicate that the gender gap depends on prior performance. If the plots cross, it suggests a reversal in the gap's direction, with higher-performing students of one gender overtaking the other. This implies that gender disparities may emerge at specific achievement levels, even if they are not evident in aggregate patterns.

Divergence in English: At each grade level, the plot for females shows a consistent upward parallel shift relative to males (Fig. 2), indicating that girls outperform boys with equivalent prior performance when transitioning from grade g to $g + 1$. This pattern holds across the distribution: boys who matched girls in a given grade tend to fall behind in the next. Further in grades 9 and 10, low-performing girls exhibit even larger gains than comparable boys.

Divergence in Math: For math, the female plot generally lies above the male plot but the shift is not parallel (Fig. 3). The gap is narrower at the top of the distribution, suggesting that high-performing girls make modest gains relative to boys. The pattern is clearest in the transition from grade 1 to 2, where low-performing girls gain more than boys, and the gap narrows with rising performance. Similar trends appear in grades 2–3 and 3–4. However, from grade 4 onward, the female plot becomes a near-parallel upward shift across the distribution, indicating consistent advantages for girls from grade 4 to 10. Furthermore, mobility trajectories from Grade 1 to Grade 10 for students tracked throughout show that, at every percentile, the curve for girls lies well above that for boys (see Fig.4).

4.2.2 Results from the Logit Regression

English Table 18 reports the odds ratios for the gender dummy from Eq. (5.1). Three key patterns emerge. First, across all quartiles, females are consistently more likely than males to show upward movements - odds ratios for positive δ are significant and exceed 1. Second, from Grade 5 onward, these odds ratios approach 2, especially in Quartiles 2 and 3, indicating that females in these quartiles are nearly twice as likely as males to improve. Third, in Grades 9 and 10, the odds ratios for Quartiles 1–3 exceed 2, suggesting females in these groups are over 200% more likely than males to make gains.
Math: Table 19 shows similar odds ratios for math. From Grades 1–5, females are 25–30% less likely than males to experience declines, with the gap widening to nearly 50% in the Grade 5–6 transition. Accordingly, females are 65–80% more likely to improve than males during this phase. From Grades 6–10, the odds of improvement for females remain roughly 50% higher than for males, particularly in Quartiles 2 and 3.

4.3 Explaining the Gender Achievement Gap

We begin by sequentially controlling for a comprehensive set of potential confounders, including parental and household characteristics such as education, occupation, and landholding; teacher attributes such as age, gender, experience, and qualifications; and the prior academic performance of students through lagged test scores. This allows us to examine how the coefficient on the gender dummy β_1 changes as potential confounders are taken into account. Inclusion of lagged test scores serves captures both the cumulative effect of prior investments and individual-specific heterogeneity.

$$Y_{ics} = \alpha + \beta_1 female_i + \beta_2 T_i + \beta_3 P_i + \lambda_c + \omega_s + u_{ics} \tag{3}$$

Here Y_{ics} denotes the standardized score of the student i in the cohort c belonging to the school s. $female_i$ is the gender dummy, T_i and P_i are teacher and parental controls and λ_c ω_s denote cohort and school FE respectively.

Interestingly, the addition of parental and teacher controls widens the estimated gender gaps, particularly in higher grades (see Table 4). For example, in English, the gaps without controls in grades 6–10 are 0.585, 0.633, 0.646, 0.648, and 0.643 SD, respectively. With controls, they rise to 0.598, 0.659, 0.663, 0.651, and 0.703 SD. math shows a similar trend: from 0.363–0.447 SD without controls to 0.370–0.458 SD with them. This suggests that differences in parental and teacher background do not explain gender disparities and that omitting these controls may even understate them.

However, once we include lagged test scores, the gaps shrink substantially. In English, the adjusted gaps fall to 0.338, 0.296, 0.259, 0.270, and 0.326 SD; in math, they reduce to 0.278, 0.191, 0.202, 0.145, and 0.148 SD. These patterns align with Lai, 2010, who find that girls outperform boys in Chinese public schools and that prior scores strongly predict current achievement. Since lagged scores proxy for unobserved individual heterogeneity, this suggests that intrinsic traits may be key drivers of gender gaps.

Next, guided by insights from the literature, we investigate additional channels that may contribute to explaining the observed gender achievement gaps.

4.3.1 Do Peer Interactions Drive These Gaps?

Peer composition plays a critical role in shaping academic outcomes, with gender dynamics influencing how students respond to their peers. While high-achieving classmates can be a source of motivation, large skill disparities may lower self-confidence and hinder performance. Research shows that girls tend to benefit from being surrounded by other high-performing girls, whereas male-dominated environments—especially in STEM subjects—can reduce academic engagement and performance for both genders (Fischer, 2017). In addition, male underachievement is often tied to traditional masculine norms that portray academic effort as incompatible with masculinity, encapsulated in the notion that 'studying is for sissies'. As a result, boys may under-perform in order to conform to peer expectations that devalue academic success.

Leveraging the random assignment of students to classrooms, we identify the causal effects of peer composition in determining the gender achievement gap. This randomization ensures that the classroom gender composition or the proportion of high-performing females or males is free from systematic biases. We estimate the specification below to examine how the share of high-performing students, high-performing girls, and high-performing boys in a classroom influences individual academic outcomes.

$$Y_{igcsq} = \alpha + \beta_1 Female_{igcsq} + \beta_2 Prop_{HP_{igcsq}} + \beta_3 Female_i * Prop_{HP_{igcsq}} + \lambda_c + \delta_s + u_{igcsq} \quad (4)$$

$$Y_{igcsq} = \alpha + \beta_1 Female_{igcsq} + \beta_2 Prop_{HPf_{igcsq}} + \beta_3 Female_i * Prop_{HPf_{igcsq}} + \lambda_c + \delta_s + u_{igcsq} \quad (5)$$

$$Y_{igcsq} = \alpha + \beta_1 Female_i + \beta_2 Prop_{HPm_{igcsq}} + \beta_3 Female_i * Prop_{HPm_{igcsq}} + \lambda_c + \delta_s + u_{igcsq} \quad (6)$$

Here Y_{igcsq} is a dummy variable taking value 1 if the score of individual i lies in the top quartile in grade g, school s, cohort c and classroom q. $Female_i$ is a dummy variable indicating student $i's$ gender (F=1). λ_c denotes cohort fixed effects while δ_s denotes school fixed effects. $Prop_{HP_{igcsq}}$ indicates the proportion of high-performing individuals in grade g, school s, cohort c and classroom q, while $Prop_{HPm_{igcsq}}$ and $Prop_{HPf_{igcsq}}$ capture the proportions of high-performing males and females, respectively, within the same group. The proportion of high-performing students is calculated as

$$\frac{\text{Number of Students lying in top quartile}}{\text{Total number of students in classroom}},$$

while the proportion of high-performing females (or males) is calculated as

$$\frac{\text{Number of high performing females (males)}}{\text{Total number of females (males)}}.$$

If individual i is a high-performing student, we subtract 1 from the numerators in both expressions to exclude the individual's own contribution and isolate the peer effect. The coefficient of interest, β_3 identifies whether the effect of high-performing students (overall, male, or female) varies based on the gender of the student.

Interestingly, even after accounting for peer composition, gender gaps in achievement remain significant. For English, the estimated gaps range from 0.141 to 0.217 SD across models that control for the presence of high-performing peers. In math, the gaps lie between 0.154 and 0.198 standard deviations. These results suggest that peer composition alone does not explain the observed gender disparities in performance.

4.3.2 Does Teacher Gender Account for These Gaps?

Several studies have shown that teacher gender can influence student performance, with female students often performing better under female teachers (Muralidharan and Sheth, 2016, Rawal and Kingdon, 2010, Dee, 2007, Carrell et al., 2010). To test this in our context, we include a teacher gender dummy and an interaction term with student gender, allowing us to assess whether teacher-student gender matching affects outcomes (Table 8). We also estimate effects separately for primary and post-primary grades, as existing literature suggests teacher gender may matter more in lower grades, where younger students are more impressionable and more likely to form role model connections (Holmlund and Sund, 2008, Dee, 2007). In contrast, older students may rely more on subject mastery than on teacher characteristics (Doornkamp et al., 2024).

$$Y_{igcs} = \alpha + \gamma Y_{i(g-1)cs} + \beta_1(F_{igcs} * female_i) + \beta_2 female_i + \beta_3 F_{igcs} + \delta T_{igcs} + u_{igcs} \quad (7)$$

Here Y_{igcs} denotes the standardised score of student i in grade g, cohort c and school s. $Y_{i(g-1)cs}$ denotes lagged standardsied score. $female_i$ denotes whether the student is female, , F_{igcs} indicates if the student's current teacher is a female, and $T * f$ captures whether a female student is matched with a same-gender teacher in the current grade. T_{igcs} represents a vector of other teacher characteristics, while u_{igcs} is the random error term.

Our findings show that gender achievement gaps remain large and statistically significant even after accounting for teacher gender. In English, the estimated gaps for females are 0.587, 0.435, 0.641, and 0.661 SD for the full sample, grades 1–5, 6–8, and 9–10 respectively. In math, the corresponding gaps are 0.302, 0.126, 0.351, and 0.372 SD. We next examine the differential effect of teacher gender. For English, boys perform 0.0717 SD better when taught by a female teacher. However, the interaction term is –0.0816, implying that girls actually perform worse than boys when both are taught by female teachers. This suggests that the benefit of a female teacher accrues mainly to boys. A similar trend appears in grades 1–5, where girls perform 0.051 SD worse than boys under female teachers. In grades 6–10, the effect of teacher gender is no longer statistically significant.

For math, using the full sample, boys taught by female teachers score 0.0717 SD higher than those taught by male teachers. The interaction term is insignificant, indicating no gender differential overall. But when disaggregated by grade group, the picture changes. In grades 1–5, 6–10, and 9–10, female students outperform male students by 0.0436, 0.111, and 0.0753 SD, respectively, when taught by female teachers. This suggests that the positive effect of teacher-student gender alignment in math emerges more clearly in later grades. These results echo those of Muralidharan and Sheth, 2016, who found that female teachers in India significantly improved girls' math scores, likely by serving as role models and challenging gender stereotypes in male-dominated subjects.

4.3.3 Is Teacher Bias a Driver of the Observed Gender Differences?

Biased teachers can shape student outcomes through differential treatment of boys and girls, often reflected in grading disparities. A large body of research (for example, Lavy and Megalokonomou, 2019, Lavy and Sand, 2018, Terrier, 2020) identifies teacher bias by comparing gender differences in teacher-assigned grades with those in anonymized or standardized assessments for the same students. These studies consistently show that teachers with pro-girl or anti-boy biases tend to boost girls' academic outcomes both in the short and long term.

Our setting offers a unique opportunity to test the relevance of this mechanism. During the COVID-19 lockdown period (2020–2021), student assessments were conducted online and comprised only multiple choice questions (MCQs), eliminating the scope of teacher discretion. As shown in Tables 13 and 14, the gender achievement gaps during these years remained significant and continued to favor girls across all grades. These patterns suggest that teacher bias is unlikely to be a primary driver of the gender gaps observed in our context.

4.3.4 Do Parental Characteristics Have a Differential Impact on Male and Female Performance?

Prior research suggests socioeconomic factors can affect boys and girls differently—for instance, Tansel, 2002 finds stronger effects of parental education and occupation on girls in Turkey. To examine such heterogeneity, we add interactions between the female dummy and five characteristics: (i) highly educated mother, (ii) highly educated father, (iii) mother in a professional job, (iv) father in a professional job, and (v) landholding. Results for English and math are shown in Table 5 and Table 6, Columns 2–7.

Across all specifications, the gender coefficient remains positive and significant, indicating that girls outperform boys even after accounting for background characteristics. However, the interaction terms are consistently negative and significant, suggesting that the female advantage narrows in more advantaged households. For example, in English, students with highly educated fathers score 0.0163 SD higher, but girls benefit 0.077 SD less than boys. A highly educated mother is associated with a 0.24 SD gain, yet the benefit is 0.104 SD smaller for girls. Similar patterns hold for parental occupations: a professional father yields a 0.0975 SD gain (0.074 SD lower for girls), and a professional mother adds 0.0198 SD (0.125 SD lower for girls). math results follow the same trend. The advantage of a highly educated father is 0.0516 SD smaller for girls; for a highly educated mother, the gap is 0.074 SD. Professional fathers and mothers are linked to gains of 0.0877 SD and 0.191 SD, respectively, with the effects 0.0514 SD and 0.0474 SD smaller for girls.

These findings echo U.S.-based evidence showing girls often outperform boys in socioeconomically disadvantaged settings, including among marginalized groups like Black students (Delaney and Devereux, 2021).

4.3.5 Do New Entrants or Differential Attrition Drive these Gaps?

To ensure that the observed gender gaps are not driven by new entrants, we restrict our analysis to students tracked continuously from Grades 1 to 10. Our data span 2012–2023, allowing us to follow three cohorts: those entering Grade 1 in 2012, 2013, and 2014. Results presented in Table 16 confirm earlier findings - significant and widening gender gaps favoring females across grades. Notably, these gaps are even larger in the stable panel. For example, in English, the gap in the full sample grows from 0.218 SD in Grade 1 to 0.643 SD in Grade 10, while in the stable sample it starts at 0.795 SD and remains high at 0.705 SD by Grade 10. A similar pattern holds for math: the gap increases from 0.120 SD to 0.389 SD in the full sample, and from 0.065 SD to 0.515 SD in the stable sample.

We also address the concern that attrition may be driven by low-performing girls, thereby inflating gender gaps. To test this, we compare the average scores of boys and girls who attrit at each grade transition. As shown in Table 17, boys who drop out consistently have lower average scores than girls. Moreover, the academic profiles of attriting students diverge over time: average scores for attriting girls increase across grades, while those for boys decline. For example, among those exiting after Grade 1, the average English score is -0.169 for boys and 0.083 for girls. By Grade 9, the gap widens to -0.286 for boys versus 0.376 for girls. math shows a similar pattern. These trends clearly reject the hypothesis that attrition is primarily driven by lower-performing girls.

4.3.6 Are Certain Cohorts Responsible for the Observed Gaps?

One potential concern is that the observed gender gaps may be driven by a few specific cohorts. While our grade-specific regressions account for cohort fixed effects, in this section, we examine the gaps within each cohort. To do so, we run separate grade-specific regressions for each of the 18 cohorts in both English and math. The results, presented in Tables 13 and 14 show that the gender gaps remain consistently positive and statistically significant across all cohorts in the data set.

4.3.7 Are the Gaps More Evident in Particular Years?

There are concerns that these gaps could be driven by certain time periods during the 12 years pertaining to our study (2012-2023). For example, several authors find that gender gaps widened during the post-pandemic years (Bertoletti et al., 2023). To investigate such concerns, we analyze the gaps for each grade in different years (Table 13 for English, Table 14 for math). Interestingly, we find that the gender gaps remain statistically significant in all grades and throughout the study period. These gaps appear to persist over time, with no clear evidence of any substantial change in the years after COVID.

4.3.8 Do Gaps Exist Between Siblings Sharing Common Parents?

The foregoing analysis only captures the role that a select few variables play on the gender achievement gaps. However, there exist many unobserved household characteristics such as home environment, parental care, etc. that could be driving the differential performance among males and females. For example Autor et al., 2019 find that boys in low-income families are more negatively affected by family instability and weaker parental investment than girls, which leads to lower academic performance among boys compared to girls. In order to further explore the role that observed and unobserved household and parental characteristics play in driving the gender achievement gap, we restrict our sample to siblings of different genders sharing common parents. We incorporate sibling fixed effects into our regression specification to identify gender gaps within households. This allows us to compare academic outcomes between brothers and sisters raised by the same parents. The results are based on a restricted sample of 2,67,860 individuals, each of whom has at least one sibling, either a brother or a sister, also included in the dataset. We find that the gender gap within sibling pairs remains both positive and statistically significant: girls outperform their brothers by 0.481 standard deviations in English and by 0.255 standard deviations in math. These findings suggest that household and parent factors are unlikely to fully explain the observed gender differences in achievement.

4.3.9 Do Individual Traits Account for These Gaps?

Recognizing that external factors such as parental, teacher, and peer characteristics account for only a fraction of the gender achievement gaps, while lagged scores (a proxy for individual heterogeneity, including student ability) explain a significant share, we shift our focus to the role of individual traits in driving these disparities. These factors encompass the child's level of effort, attentiveness in the classroom, punctuality in submitting assignments, and similar attributes.

Role of Behaviour: A large proportion of authors find a direct link between noncognitive skills such behavior on learning outcomes. Studies reveal that boys are prone to exhibit behavioral difficulties (Beamen et al., 2006; Entwisle et al., 2007; Gilliam, 2005; Ready et al., 2005). To explore whether individual behavior and conduct drives the difference in male-female disparities we include a term indicating scores obtained by students in the subject 'Behaviour and Scriptures' and interact that with the indicator for gender. (Every year, students take an exam gauging their efficiency in reading scriptures and their knowledge about hymns. Marks for behavior are awarded based on student conduct and demeanour.) Interestingly, even after controlling for marks in Behaviour and Scriptures, the gender achievement gaps remain positive and statistically significant for both English and math. Specifically, female students outperform their male peers by 0.734 standard deviations in English and by 0.309 standard deviations in math.

We now turn to the interpretation of the interaction terms between gender and behavior marks. As reported in the lower panels of Table 7 for English and math respectively, the interaction coefficients are negative and statistically significant. For English, a one-point increase in behavior marks is associated with a 0.0001 standard deviation smaller gain in test scores for girls relative to boys. Similarly, for math, the corresponding reduction is 0.0002 standard deviations. Although statistically significant, these interaction effects are quantitatively negligible, suggesting that the marginal association between behavior and achievement does not differ significantly by gender.

Role of Attentiveness and Diligence - A comparison Between Siblings: A large body of research suggests that boys tend to have shorter attention spans and are more likely to be diagnosed with [attention deficit hyperactivity disorder (ADHD)](w) (see Bertrand and Pan, 2013; Szatmari, 1989). They also spend less time on homework than girls (Jacob, 2002). To explore whether such behavioral differences contribute to the gender achievement gap, we use teacher-reported student records that capture information on three traits: hardworking nature, classroom attentiveness, and punctuality in submitting assignments. Teachers responded to the following questions, each with four response categories (Highly, Moderately, Somewhat, Not): (1) How hardworking is the child? (2) How attentive is the child in the classroom? and (3) How regular is the child in submitting assignments on time? This information is collected only for siblings who share the same parents, allowing us to control for unobserved household, parental, and school-level factors.

Our analysis centers on three key questions: Are sisters more hardworking, attentive, and punctual than their brothers? Do these differences become more pronounced as siblings progress through school? And can these behavioral traits help explain the widening gender achievement gap? We find that sisters consistently outperform their brothers across all three dimensions. Girls are reported to be more diligent, more attentive in class, and more consistent in meeting assignment deadlines (see Table 10, Fig. 7, Fig. 5, Fig. 17). For instance, 55% of girls are reported to be highly regular in submitting assignments, compared to 35% of boys. Similarly, 51% of girls are rated as highly attentive, compared to 32% of boys, and 49% of girls are reported as highly hardworking, compared to 31% of boys.

To quantify these differences, we regress each trait on a female dummy variable (equal to 1 if the student is female and 0 otherwise), controlling for sibling fixed effects.[7] We estimate three separate linear probability models where the dependent variable takes the value 1 if

[7]Siblings with the same parents are assigned a common family identifier.

the student is rated as either highly or moderately demonstrating the respective trait. Results reported in Table 10 show that girls are 23.3 percentage points more likely to be reported as hardworking, 21.8 percentage points more likely to be attentive, and 22.5 percentage points more likely to submit assignments on time. When we include an interaction between the gender dummy and grade level (columns 2, 4, and 6), we find that the gender gap in these traits widens as students progress through school. Specifically, the female advantage in the likelihood of being rated as hardworking, attentive, or punctual increases by 2.4 to 2.6 percentage points with each additional grade. These findings highlight the role of individual behavioral traits in contributing to the growing gender disparity in academic outcomes.

5 Robustness Checks

5.1 Are Gender Differences Robust to Distributional (CDF) Comparisons?

A key limitation of test score data is their ordinal nature - any monotonic transformation yields a theoretically valid representation of performance (Bond and Lang, 2013). This holds even with Item Response Theory (IRT) models or standardization. Such ordinality complicates the interpretation of intergroup differences, including gender gaps, as even their direction can shift under rank-preserving transformations when Cumulative Distribution Functions (CDFs) intersect. To address this, we move beyond mean comparisons and examine the full score distributions. If distributions are statistically similar, a null gap is less likely to be a scale artifact. More importantly, we plot CDFs for boys and girls separately. When one group's CDF first-order stochastically dominates the other's, the direction of the gap is robust to all rank-preserving transformations. Following Bond and Lang, 2013, this approach relies solely on ordinal information. As shown in Fig. 9 for grades 2, 6, and 10 in English and math, girls' CDFs consistently dominate boys', indicating robust gaps in favor of females.

5.2 Gender Gap with Classroom Fixed Effects

Gender gaps in academic achievement can, in part, reflect classroom-level factors such as differences in teaching practices, peer dynamics, or overall classroom environment. To account for such unobserved heterogeneity, we include classroom fixed effects in our grade-specific specifications, effectively comparing boys and girls within the same classroom. Interestingly, estimated gender gaps remain robust to this adjustment, indicating that these disparities persist even after excluding classroom-level influences (see Table 15). In the original sample for English, the gender gap starts at 0.215 standard deviations (SD) by the end of Grade 1 and widens to 0.643 SD by the end of Grade 10. When classroom fixed effects are included, the gap still begins at 0.215 SD in grade 1 and increases steadily to 0.630 SD by grade 10. For math, the gap in the full sample starts at 0.120 SD in grade 1 and expands to 0.389 SD by grade 10. After accounting for classroom fixed effects, the gap starts at 0.117 SD in grade 1 and rises to 0.379 SD by grade 10.

5.3 Examining Gender Gaps Using Metric-Free Approaches

Another consequence of ordinal test scores is that equal score changes may not represent equal gains across the distribution. For instance, an increase from 5 to 10 may not reflect the same learning as an increase from 45 to 50. This arises because test scores lack a common outcome scale where a given value corresponds to a fixed knowledge level across cohorts or years. To address this, many researchers adopt metric-free approaches—such as those in Robinson and Lubienski, 2011—which treat scores as ordinal and emphasize ranks over raw values. These methods shift attention from absolute scores to students' relative positions in the distribution. By examining where boys and girls fall at each percentile, such studies offer a distributional perspective on gender gaps. For example, Robinson and Lubienski, 2011 estimate the gender gap at each percentile θ of the score distribution using the following specification:

$$\lambda_\theta := \begin{cases} \frac{\phi_M(\theta)}{\phi_M(\theta)+\phi_F(\theta)} & \text{if } \theta < 50; \\ \frac{1-\phi_F(\theta)}{2-(\phi_M(\theta)+\phi_F(\theta))} & \text{if } \theta \geq 50 \end{cases}$$

Here, $\phi_F(\cdot)$ and $\phi_M(\cdot)$ denote the cumulative distribution functions (CDFs) for females and males at the θ^{th} percentile of the overall test score distribution. The statistic λ_θ captures gender disparities across the distribution. For $\theta < 50$, λ_θ reflects the share of males below the θ^{th} percentile (assuming equal group sizes); for $\theta \geq 50$, it captures the share of females above that percentile. Thus, $\lambda_\theta < 0.5$ indicates a female disadvantage at percentile θ.

For example, if $\phi_F(30) > \phi_M(30)$, more girls than boys fall below the 30th percentile, implying $\lambda_{30} < 0.5$. Similarly, if $\phi_F(70) < \phi_M(70)$, fewer girls score in the top 30%, again suggesting $\lambda_{70} < 0.5$. The further λ_θ deviates from 0.5, the larger the gender gap—especially favoring boys.

Our results show persistent gender gaps across the distribution, even under this rank-based, scale-invariant approach (see Fig. 11).

5.4 Are Gender-Based Disparities Evident in Mobility Patterns?

We further validate our findings by calculating directional rank mobilities, which estimate the proportion of students who move from one position in the achievement distribution to another across consecutive grades, conditional on their initial rank. For example, suppose that 10 girls and 5 boys lie in the bottom 25% of the Grade 1 score distribution. In grade 2, if 3 students from each group move to the top 75%, the upward mobility rates would be 30% for girls and 60% for boys, conditional on starting in the lowest quartile. Since distributional mobility remains stable when rank order is maintained, estimated mobility gaps remain unaffected by any transformation. Therefore, scaling issues that arise with achievement gaps at the performance level do not apply when analyzing gaps in distributional mobility.

To construct mobility matrices, we first compute the empirical cumulative distribution function (CDF) for each grade. Scores are then divided into four quartiles: Q1: bottom 25%, Q2: 25–50%, Q3: 50–75% and Q4: top 25%. A student is said to experience 'upward mobility' (downward mobility) if he changes his percentile rank $(F_{g_1}(y^{g_1}) - F_{g_0}(y^{g_0}))$ by certain $\gamma > 0$ ($\gamma < 0$). Since γ is the same for all, therefore, everyone is equally likely to be upwardly or downwardly mobile. Formally, the following expression is used to calculate the proportion of individuals who experience upward mobility relative to a given value of γ.

$$\theta_{k,\gamma}^{g_0,g_1} = \frac{\Pr(F_{g_0}(y^{g_0}) \in k, F_{g_1}(y^{g_1}) - F_{g_0}(y^{g_0}) \geq \gamma)}{\Pr(F_{g_0}(y^{g_0}) \in k)}$$

Similarly, the proportion of people who experience downward mobility is calculated as follows.

$$\theta_{k,\gamma}^{g_0,g_1} = \frac{\Pr(F_{g_0}(y^{g_0}) \in k, F_{g_1}(y^{g_1}) - F_{g_0}(y^{g_0}) \leq \gamma)}{\Pr(F_{g_0}(y^{g_0}) \in k)}$$

Note that $\gamma \in \{0, 0.1, 0.2, 0.3, -0.1, -0.2, -0.3\}$. For positive values of γ, we focus exclusively on upward mobility, while for negative values, we examine downward mobility. For $\gamma = 0$, we consider both upward $(F_{g_1}(y^{g_1}) - F_{g_0}(y^{g_0}) > 0)$ and downward mobility $(F_{g_1}(y^{g_1}) - F_{g_0}(y^{g_0}) < 0)$[8].

Gender Gaps in Upward Rank Mobility: Across all thresholds of upward mobility in both English and math, female students are consistently more likely than their male counterparts to experience upward shifts in percentile rank (Tables 20 and 21). This gender gap is particularly pronounced in the lower performance quartiles (Q1 and Q2). The advantage is greatest for moderate gains ($\gamma \geq 0.1$ and $\gamma \geq 0.2$), while even for extreme gains ($\gamma \geq 0.3$),

[8] For $\gamma = 0$ only the inequality signs $<$ and $>$ are considered.

girls are more likely to improve. In contrast, the best students (Q4) have limited opportunity for upward movement, but among them, girls still tend to outperform boys, although with smaller differences. This pattern of greater upward mobility for girls is consistent in all grade transitions from grade 1 to grade 10.

Gender Gaps in Downward Rank Mobility Our analysis (Tables 20 and 21) shows clear patterns of downward mobility by gender, quartile, and threshold ($\gamma \leq -0.3$, -0.2, -0.1, < 0). Across all thresholds of downward mobility in both English and math, and across each grade transition, male students are more likely than their female peers to experience declines in their percentile rank. This pattern is especially pronounced in the third and fourth quartiles, suggesting that among high-performing students, a larger share of males tend to exhibit downward mobility compared to females.

6 Concluding Remarks

We track math and English scores of 1,16,026 students as they progress from grade 1 till grade 12. Contrary to prior studies[9], we find that girls consistently outperform boys across all grades and throughout the performance distribution. In both English and mathematics, girls demonstrate higher achievement as early as Grade 1, with the gap widening over time. Specifically, the female advantage in English rises from 0.2 standard deviations (SD) in Grade 1 to 0.65 SD by Grade 10, while in math it grows from 0.1 SD to 0.4 SD. These patterns persist across cohorts, grades, and quartiles. To rule out compositional bias from attrition or selective entry, we conduct robustness checks on students observed across all ten grades. The persistence of gaps within this balanced panel suggests that they are not driven by nonrandom sample selection. We further control for classroom-level confounders, such as peer composition and teacher characteristics, by incorporating classroom-fixed effects into grade-specific regressions. Gender gaps remain statistically and substantively significant, indicating that they arise from within-classroom differences. Recognizing that standardized test scores can distort comparisons under monotonic transformations, we also perform distributional analyses using cumulative distribution functions and rank-based methods. Girls' scores stochastically dominate boys' across nearly the entire performance range, especially in English. Together, these analyses confirm the robustness of gender gaps across model specifications and measurement scales.

Turning to potential drivers, we incorporate controls for family background (e.g., parental education, occupation, landholding) and teacher characteristics (e.g., age, gender, experience). Interestingly, accounting for these factors increases the estimated gender gaps,

[9] Das and Singhal, 2021; Singh and Krutikova, 2017

particularly in higher grades. For example, in English, the gap between grades 6 and 10 increases from approximately 0.59 to 0.65 SD without controls to 0.60 to 0.70 SD with controls; similar patterns are observed in mathematics. In addition, significant gaps persist even between siblings of opposite genders raised by the same parents, suggesting that family and teacher factors alone cannot explain the disparities. When we also control for student prior achievement using lagged test scores, a proxy for individual-level heterogeneity, the gender gaps decrease substantially. In English, the gaps shrink from around 0.60–0.70 SD to 0.26–0.34 SD; in math, from 0.37–0.46 SD to 0.15–0.28 SD. These results echo findings from Lai, 2010 in China, underscoring the importance of early individual differences in shaping gender disparities.

Finally, examining individual traits among sibling pairs reveals that girls consistently outperform their brothers in attentiveness, diligence, and timely submission of assignments. For instance, 55% of girls, compared to 35% of boys, are highly regular in submitting assignments; 51% of girls versus 32% of boys are highly attentive; and 49% of girls versus 31% of boys are characterized as highly hardworking. These gaps widen as students progress to higher grades, suggesting that intrinsic traits such as diligence and attentiveness play a growing role in the gender achievement gap over time. In sum, while family, teacher, and peer factors partially account for gender gaps, our results emphasize the increasing importance of individual traits—particularly attentiveness and diligence—as students advance through school.

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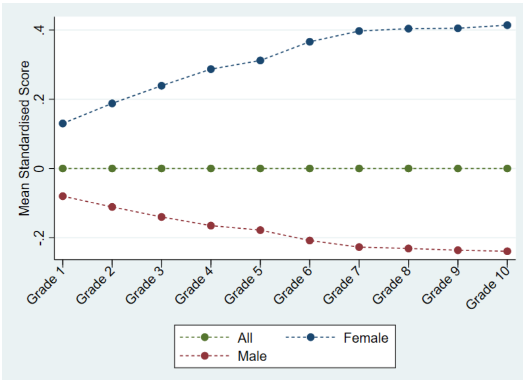
Table 1: *Parental, School and Teacher Characteristics*

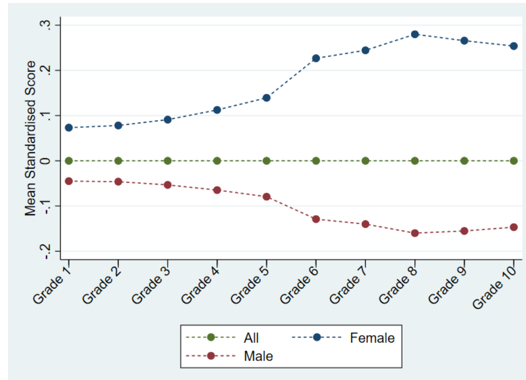
Variable	**Description**
Parental characteristics	Annual Income, mother's highest qualification, father's highest qualification, mother's occupation, father's occupation, landholding, total siblings and their composition.
Student characteristics	Gender, Age, behavior, total number of siblings, each sibling's age and gender.
Class and school characteristics	Class size, school's year of opening, etc.
Teacher characteristics	Gender, highest qualification, years of experience, whether completed Bachelors in Education (B.Ed.), whether completed Masters in Education (M.Ed.), etc.

Figure 1: *Mean Scores and Gender Gap*

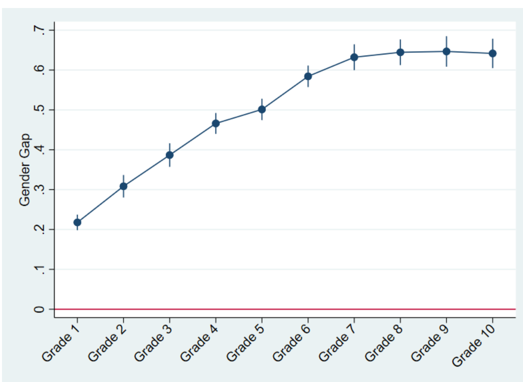
(a) *Mean Standardised Scores (English)*



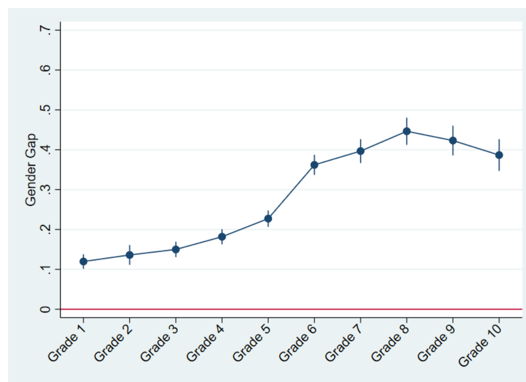
(b) *Mean Standardised Scores (math)*



(c) *Gender Gap (English)*

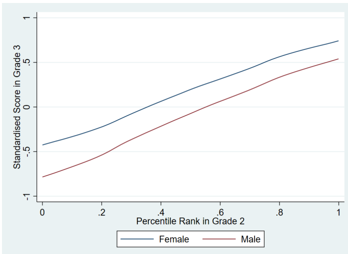


(d) *Gender Gap (math)*

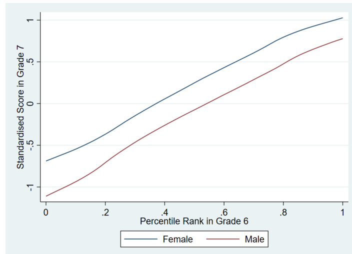


Notes: The top two graphs display the mean standardized scores for males, females, and the overall sample. The bottom two graphs illustrate the gender gap, represented by the coefficient of the gender dummy.

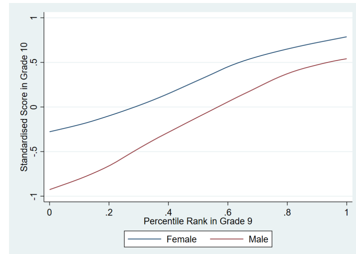
Figure 3: *Divergence in Male-Female scores*



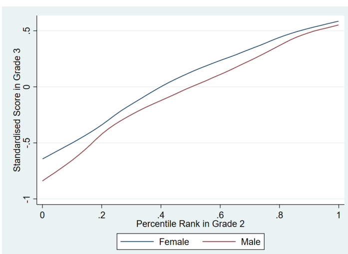
Grade 2 to 3 (English)



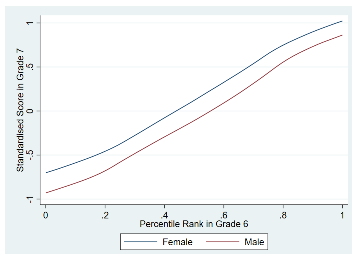
Grade 6 to 7 (English)



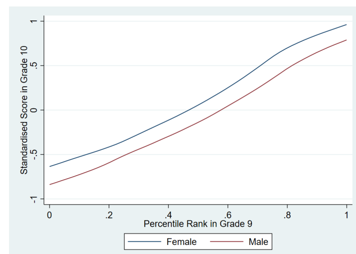
Grade 9 to 10 (English)



Grade 2 to 3 (Math)



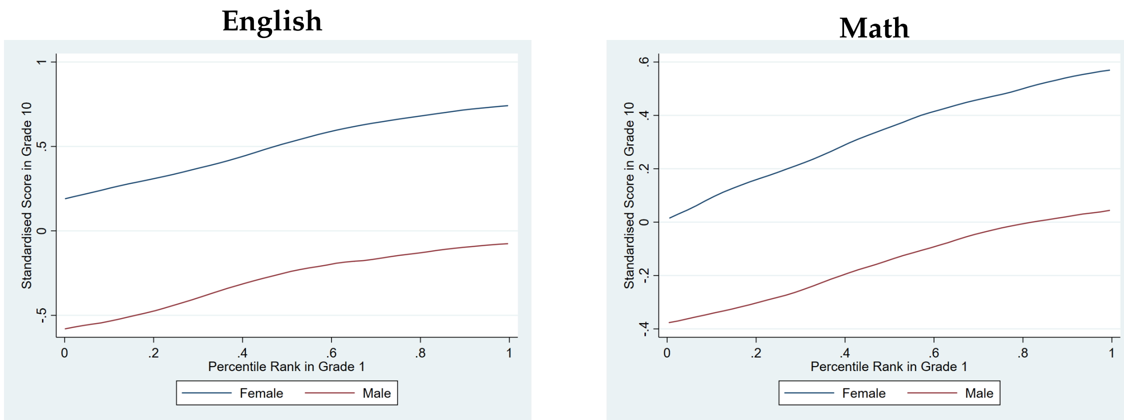
Grade 6 to 7 (Math)



Grade 9 to 10 (Math)

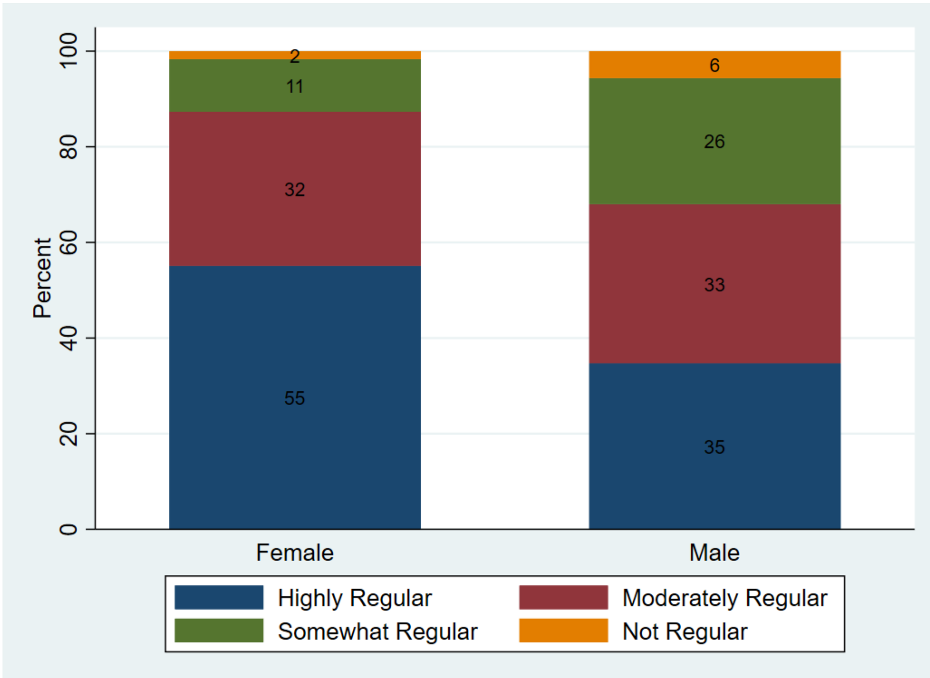
Notes: The X-axis represents students' percentile rank in grade g while the Y-axis displays their standardized test scores in grade g+1.

Figure 4: *Divergence in Male-Female Scores from Grade 1 to Grade 10 (English and Math)*



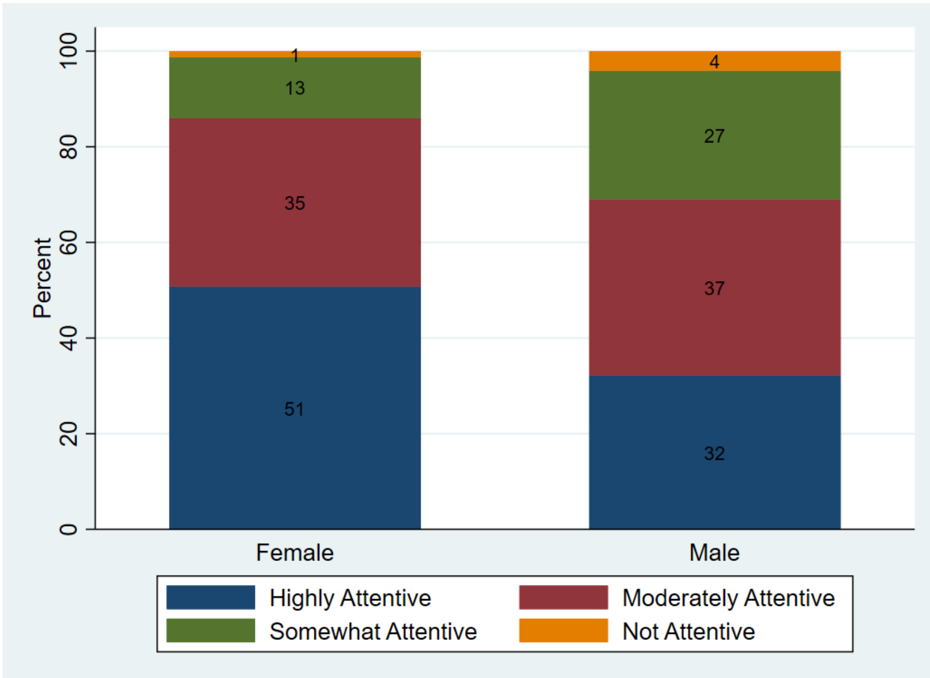
Notes: The X-axis represents students' percentile rank in Grade 1, while the Y-axis displays their standardized test scores in Grade 10.

Figure 5: *How regular is the child in submitting assignments on time?*



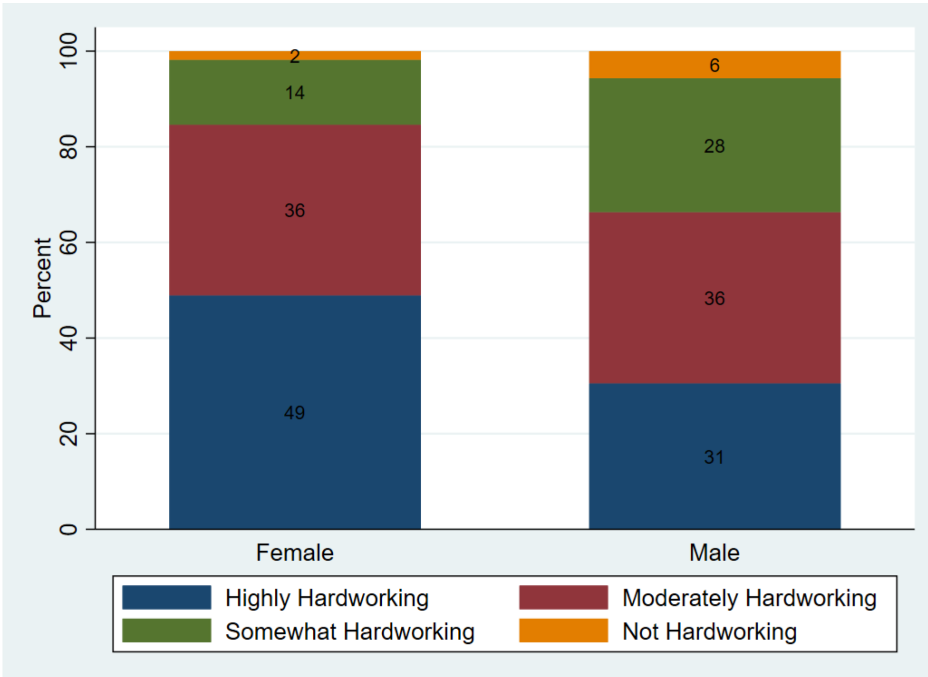
Notes: The data is collected from teachers' reports on the child's adherence to timely assignment submissions.

Figure 6: *How attentive is the child in classroom?*



Notes: The data is collected from teachers' reports on the child's attentiveness in the classroom.

Figure 7: *How hardworking is the child?*



Notes: The data is collected from teachers' reports on the child's work ethic.

Table 2: *Gender Gap at Mean*

Panel A: Gender Differentials in Scores by Grade								
Dependent Variable - Standardised Scores								
	English				Math			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female (Grade 1)	0.209***	0.211***	0.218***		0.118***	0.119***	0.120***	
	(0.012)	(0.011)	(0.010)		(0.011)	(0.010)	(0.009)	
Observations	54,978	54,978	54,978		54,909	54,909	54,909	
Female (Grade 2)	0.299***	0.301***	0.309***	0.234***	0.124***	0.125***	0.136***	0.096***
	(0.015)	(0.015)	(0.014)	(0.012)	(0.015)	(0.014)	(0.013)	(0.012)
Observations	54,942	54,942	54,942	42,753	54,923	54,923	54,923	42,708
Female (Grade 3)	0.378***	0.381***	0.387***	0.275***	0.144***	0.145***	0.150***	0.103***
	(0.018)	(0.015)	(0.015)	(0.012)	(0.012)	(0.011)	(0.010)	(0.009)
Observations	54,004	54,004	54,004	43,591	53,968	53,968	53,968	43,551
Female (Grade 4)	0.452***	0.456***	0.467***	0.273***	0.177***	0.179***	0.182***	0.119***
	(0.017)	(0.015)	(0.013)	(0.010)	(0.011)	(0.011)	(0.010)	(0.011)
Observations	52,199	52,199	52,199	42,548	52,178	52,178	52,178	42,516
Female (Grade 5)	0.490***	0.493***	0.502***	0.247***	0.219***	0.220***	0.228***	0.145***
	(0.016)	(0.015)	(0.014)	(0.011)	(0.013)	(0.012)	(0.010)	(0.0103)
Observations	51,170	51,170	51,170	41,562	51,095	51,095	51,095	41,497
Female (Grade 6)	0.573***	0.578***	0.585***	0.316***	0.356***	0.359***	0.363***	0.257***
	(0.015)	(0.014)	(0.014)	(0.011)	(0.015)	(0.014)	(0.013)	(0.011)
Observations	47,325	47,325	47,324	39,618	47,246	47,246	47,245	39,500
Female (Grade 7)	0.625***	0.630***	0.633***	0.300***	0.384***	0.387***	0.398***	0.197***
	(0.018)	(0.017)	(0.016)	(0.014)	(0.018)	(0.017)	(0.015)	(0.014)
Observations	42,733	42,733	42,733	36,993	42,704	42,704	42,704	36,933
Female (Grade 8)	0.635***	0.640***	0.646***	0.275***	0.440***	0.443***	0.447***	0.208***
	(0.018)	(0.017)	(0.016)	(0.015)	(0.019)	(0.017)	(0.017)	(0.013)
Observations	37,782	37,782	37,782	32,874	37,749	37,749	37,749	32,838
Female (Grade 9)	0.641***	0.646***	0.648***	0.317***	0.421***	0.424***	0.425***	0.185***
	(0.019)	(0.019)	(0.019)	(0.029)	(0.022)	(0.019)	(0.019)	(0.018)
Observations	31,851	31,851	31,851	26,273	31,818	31,818	31,818	26,233
Female (Grade 10)	0.653***	0.657***	0.643***	0.352***	0.401***	0.403***	0.389***	0.180***
	(0.023)	(0.020)	(0.019)	(0.029)	(0.023)	(0.022)	(0.020)	(0.020)
Observations	29,482	29,482	29,482	23,734	29,400	29,400	29,400	23,646
Panel B: Trends in Gender Differentials in Scores from Lower to Higher Grades								

Continued on next page

Table 2 – continued from previous page

	Dependent Variable - Standardised Scores							
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Female	0.220***	0.223***	0.233***	0.182***	0.050***	0.051***	0.056***	0.038***
	(0.018)	(0.016)	(0.015)	(0.013)	(0.013)	(0.012)	(0.011)	(0.010)
Female*Grade	0.050***	0.050***	0.049***	0.021***	0.041***	0.041***	0.041***	0.024***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Observations	465,373	465,373	465,373	336,239	458,233	458,233	458,233	330,902
Cohort FE	No	Yes	Yes	Yes	No	Yes	Yes	Yes
School FE	No	No	Yes	Yes	No	No	Yes	Yes
Lagged Score	No	No	No	Yes	No	No	No	Yes

Notes: Column (2) controls for cohort fixed effects, column (3) additionally incorporates school fixed effects, and column (4) further accounts for lagged scores, all for English. Columns (6), (7), and (8) present the corresponding results for math. Standard errors clustered at the school level in parentheses. ***p$<$ 0.01, **$p < 0.05$, * $p < 0.1$.

Table 3: *Quantile Gender Gap*

	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10
					English					
Q=10	0.306***	0.494***	0.444***	0.488***	0.524***	0.592***	0.603***	0.692***	0.595***	0.812***
	(0.021)	(0.022)	(0.014)	(0.015)	(0.015)	(0.017)	(0.018)	(0.020)	(0.019)	(0.028)
Q=25	0.294***	0.451***	0.463***	0.540***	0.615***	0.698***	0.772***	0.841***	0.771***	0.833***
	(0.015)	(0.016)	(0.013)	(0.013)	(0.014)	(0.014)	(0.015)	(0.017)	(0.017)	(0.018)
Q=50	0.241***	0.329***	0.451***	0.536***	0.583***	0.697***	0.757***	0.787***	0.799***	0.720***
	(0.011)	(0.011)	(0.012)	(0.013)	(0.013)	(0.012)	(0.013)	(0.014)	(0.015)	(0.013)
Q=75	0.099***	0.168***	0.342***	0.427***	0.456***	0.549***	0.601***	0.493***	0.623***	0.550***
	(0.009)	(0.007)	(0.012)	(0.012)	(0.011)	(0.012)	(0.013)	(0.012)	(0.014)	(0.011)
Q=90	0.082***	0.102***	0.209***	0.278***	0.311***	0.376***	0.403***	0.381***	0.417***	0.371***
	(0.007)	(0.007)	(0.012)	(0.013)	(0.012)	(0.011)	(0.013)	(0.011)	(0.015)	(0.011)
Obs	54,978	54,942	54,004	52,199	51,170	47,325	42,733	37,782	31,851	29,482
					Math					
Q=10	0.208***	0.255***	0.224***	0.246***	0.271***	0.315***	0.334***	0.395***	0.345***	0.288***
	(0.026)	(0.023)	(0.021)	(0.017)	(0.017)	(0.015)	(0.014)	(0.016)	(0.017)	(0.015)
Q=25	0.173***	0.194***	0.213***	0.254***	0.270***	0.377***	0.428***	0.469***	0.401***	0.404***
	(0.016)	(0.016)	(0.015)	(0.015)	(0.015)	(0.013)	(0.013)	(0.016)	(0.014)	(0.012)
Q=50	0.115***	0.139***	0.168***	0.195***	0.261***	0.471***	0.505***	0.579***	0.545***	0.492***
	(0.010)	(0.011)	(0.012)	(0.013)	(0.014)	(0.015)	(0.015)	(0.016)	(0.017)	(0.014)
Q=75	0.009	0.037***	0.082***	0.132***	0.201***	0.380***	0.420***	0.462***	0.509***	0.485***
	(0.006)	(0.007)	(0.009)	(0.011)	(0.012)	(0.014)	(0.015)	(0.015)	(0.018)	(0.022)
Q=90	0.042***	0.024***	0.049***	0.064***	0.095***	0.214***	0.249***	0.241***	0.278***	0.282***
	(0.006)	(0.007)	(0.010)	(0.011)	(0.009)	(0.011)	(0.012)	(0.011)	(0.016)	(0.017)
Obs	54,909	54,923	53,968	52,178	51,095	47,246	42,704	37,749	31,818	29,400

Notes: Each element represents the estimated gender gap from the quantile regression in the corresponding grade and quantile. Standard errors, clustered at the school level,are presented in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 4: *Gender Gap with Parental & Teacher-Level Controls*

Dependent Variable: Standardised Scores				
Variable	**English**		**Math**	
	(1)	**(2)**	**(3)**	**(4)**
Female (Grade 1)	0.221***		0.124***	
	(0.011)		(0.013)	
Observations	22,837		22,603	
Female (Grade 2)	0.311***	0.244***	0.117***	0.056***
	(0.017)	(0.015)	(0.016)	(0.016)
observations	23,174	19,924	22,751	19,541
Female (Grade 3)	0.388***	0.284***	0.139***	0.099***
	(0.015)	(0.015)	(0.013)	(0.015)
observations	25,060	22,132	24,782	21,868
Female (Grade 4)	0.464***	0.292***	0.175***	0.119***
	(0.013)	(0.013)	(0.013)	(0.017)
observations	26,229	23,115	26,145	23,061
Female (Grade 5)	0.492***	0.249***	0.206***	0.133***
	(0.013)	(0.015)	(0.012)	(0.014)
observations	25,616	23,053	26,081	23,470
Female (Grade 6)	0.598***	0.338***	0.370***	0.278***
	(0.014)	(0.016)	(0.015)	(0.014)
observations	24,373	21,675	24,683	21,916
Female (Grade 7)	0.659***	0.296***	0.416***	0.191***
	(0.0147)	(0.0170)	(0.0175)	(0.0165)
observations	22,505	20,567	23,045	21,146
Female (Grade 8)	0.663***	0.259***	0.458***	0.202***
	(0.018)	(0.017)	(0.018)	(0.016)
observations	19,061	17,495	20,138	18,484
Female (Grade 9)	0.651***	0.270***	0.415***	0.145***
	(0.022)	(0.029)	(0.027)	(0.023)
observations	15,707	13,528	15,953	13,801
Female (Grade 10)	0.703***	0.326***	0.377***	0.148***
	(0.019)	(0.030)	(0.023)	(0.019)

Continued on the next page

Table 4

Continued from the previous page

Variable	**English**		**math**	
	(1)	**(2)**	**(3)**	**(4)**
observations	12,965	11,569	12,856	11,486
School FE	yes	yes	yes	yes
Cohort FE	yes	yes	yes	yes
Parental Characteristics	yes	yes	yes	yes
Teacher Characteristics	yes	yes	yes	yes
Lagged Score	no	yes	no	yes

Notes: Parental characteristics include occupational status of both parents, educational qualification of both parents and landholding. Teacher characteristics include their gender, age, experience, and years of schooling. Standard errors clustered at the school level in parentheses. ****p< 0.01, ** p< 0.05, * p< 0.1

Table 5: *Parental Characteristics and Gender Gap: English*

Dependent Variable: Standardised Scores in English						
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Female	0.461***	0.472***	0.480***	0.475***	0.467***	0.446***
	(0.009)	(0.010)	(0.011)	(0.011)	(0.010)	(0.009)
Father Highly Educated		0.163***				
		(0.013)				
Female*Father Highly Educated		-0.078***				
		(0.016)				
Mother Highly Educated			0.240***			
			(0.015)			
Female*Mother Highly Educated			-0.104***			
			(0.017)			
Father Professional				0.098***		
				(0.012)		
Female*Father Professional				-0.075***		
				(0.016)		
Mother Professional					0.198***	
					(0.020)	
Female*Mother Professional					-0.125***	
					(0.021)	
High Landholding						-0.036**
						(0.016)
Female*High Landholding						0.081***
						(0.017)
Parental Controls	yes	yes	yes	yes	yes	yes
School*Grade FE	yes	yes	yes	yes	yes	yes
Cohort FE	yes	yes	yes	yes	yes	yes
Observations	285,610	285,613	285,613	285,613	285,613	285,613

Notes: Parental controls include occupational status of both parents, educational qualification of both parents, annual income, landholding, family category (general/OBC/SC and ST). Standard errors clustered at the school level in parentheses. ***p< 0.01, ** p< 0.05, * p< 0.1

Table 6: *Parental Characteristics and Gender Gap: Math*

Dependent Variable: Standardised Scores in Math						
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	0.238***	0.246***	0.252***	0.248***	0.243***	0.229***
	(0.008)	(0.009)	(0.010)	(0.009)	(0.009)	(0.009)
Father Highly Educated		0.152***				
		(0.016)				
Female*Father Highly Educated		-0.052***				
		(0.018)				
Mother Highly Educated			0.204***			
			(0.015)			
Female*Mother Highly Educated			-0.074***			
			(0.016)			
Father Professional				0.088***		
				(0.012)		
Female*Father Professional				-0.051***		
				(0.016)		
Mother Professional					0.191***	
					(0.023)	
Female*Mother Professional					-0.047**	
					(0.022)	
High Landholding						-0.004
						(0.015)
Female*Landholding						0.049***
						(0.018)
Parental Controls	yes	yes	yes	yes	yes	yes
School*Grade FE	yes	yes	yes	yes	yes	yes
Cohort FE	yes	yes	yes	yes	yes	yes
Observations	283,982	283,982	283,982	283,982	283,982	283,982

Notes: Parental controls include occupational status of both parents, educational qualification of both parents, annual income, landholding, family category (general/OBC/SC and ST). Standard errors clustered at the school level in parentheses. ***$p< 0.01$, ** $p< 0.05$, * $p< 0.1$

Table 7: *Individual Behaviour and Gender Gap*

Dependent Variable: Standardised Scores		
Variable	**English**	**Maths**
Female	0.734***	0.309***
	(0.035)	(0.044)
Behaviour and Reading Scriptures	0.018***	0.025***
	(0.001)	(0.001)
Female*Behaviour and Reading Scriptures	-0.0001***	-0.0002***
	(0.0004)	(0.001)
Parental Controls	yes	yes
School*Grade FE	yes	yes
Cohort FE	yes	yes
Observations	54,372	54,279

Notes: Parental controls include occupational status of both parents, educational qualification of both parents, annual income, landholding, family category (general/ OBC/SC and ST). Standard errors clustered at the school level in parentheses.
***p< 0.01, ** p< 0.05, * p< 0.1

Table 8: *Teacher Gender and Gender Gap*

Variable	Dependent Variable: Standardised Scores							
	English				math			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Female Student	0.587***	0.435***	0.641***	0.661***	0.302***	0.126***	0.351***	0.372***
	(0.020)	(0.024)	(0.026)	(0.026)	(0.016)	(0.019)	(0.019)	(0.023)
Female Teacher	0.072***	0.042	-0.005	-0.034	0.080***	0.074*	0.032	-0.018
	(0.025)	(0.029)	(0.035)	(0.039)	(0.026)	(0.043)	(0.030)	(0.039)
Female Student * **Female** Teacher	-0.082***	-0.051**	0.011	0.025	-0.022	0.044**	0.111***	0.075***
	(0.021)	(0.023)	(0.027)	(0.029)	(0.015)	(0.020)	(0.022)	(0.028)
School FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Teacher Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	247,173	129,928	75,871	39,944	250,326	129,687	79,034	40,422

Notes: Columns 1, 2, 3 and 4 (columns 5, 6, 7 and 8) present the findings pertaining to English (math) for the whole sample, for grades grades 1 to 5, 6 to 8 and grades 9 and 10 respectively. For English, while the overall effect of a female teacher is positive when considering the entire sample, the interaction term reveals that a female teacher negatively impacts a female student's performance,especially grades in 1 to 5. For math, female teachers are found to positively affect female students' outcomes for outcomes for post-primary grades (grades 6 to 10). Standard errors clustered at the school in parentheses. ***p< 0.01, ** p< 0.05, * p< 0.1.

Table 9: *Peer Effects and Gender Gap*

Dependent Variable: Dummy Variable Indicating High Performance						
	English			Math		
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Female	0.141***	0.163***	0.217***	0.168***	0.154***	0.198***
	(0.005)	(0.003)		(0.003)	(0.003)	(0.003)
Proportion of High Performers	-0.001**			0.003***		
	(0.001)			(0.0001)		
Female * Proportion of High Performers	0.008***			0.001***		
	(0.001)			(0.0002)		
Proportion of High Performing Females		-0.162***			0.019***	
		(0.005)			(0.003)	
Female * Proportion of High Performing Females		0.052***			0.073***	
		(0.010)			(0.006)	
Proportion of High Performing Males			0.003***			0.009***
			(0.001)			(0.001)
Female * Proportion of High Performing Males			-0.021***			-0.009***
			(0.002)			(0.001)
School FE	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	330,609	328,587	330,413	330,609	328,587	330,413

Notes: The dependent variable is a binary variable, taking the value of 1 if the student falls within the top quartile of the performance distribution. Standard errors clustered at the school in parentheses.***p< 0.01, ** p< 0.05, * p< 0.1.

Table 10: *Individual Traits and Gender Gap*

Variable	Hardworking		Attentive		Assignments	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Female	0.233***	0.060*	0.218***	0.038	0.225***	0.043
	(0.012)	(0.034)	(0.012)	(0.033)	(0.012)	(0.033)
Grade		-0.009*		-0.009*		-0.003
		(0.005)		(0.005)		(0.005)
Female*Grade		0.025***		0.026***		0.026***
		(0.005)		(0.005)		(0.005)
Sibling FE	yes	yes	yes	yes	yes	yes
Observations	5,148	5,148	5,148	5,148	5,148	5,148

Notes: Across all specifications, the dependent variable is a binary variable. In columns (1) and (2), it indicates whether the child is reported as highly or moderately hardworking (1), or not (0). In columns (3) and (4), the dependent variable reflects whether the child is reported as highly or moderately attentive. In columns (5) and (6), it indicates whether the child is reported as highly or moderately regular in submitting assignments on time. Standard errors clustered at the school level in parentheses. ***p$<$ 0.01, **$p < 0.05$, * $p < 0.1$.

Table 11: *Gender Gap within Siblings*

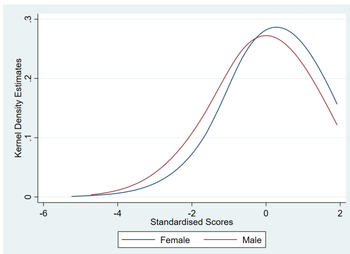
Variable	English			Math		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Female	0.481***	0.449***	0.321***	0.255***	0.243***	0.135***
	(0.005)	(0.005)	(0.017)	(0.005)	(0.006)	(0.018)
Lagged Score		0.177***	0.084***		0.168***	0.091***
		(0.002)	(0.007)		(0.003)	(0.007)
Hardworking			0.267***			0.217***
			(0.033)			(0.035)
Attentive			0.248***			0.199***
			(0.033)			(0.035)
Assignments			0.106***			0.098***
			(0.033)			(0.036)
Sibling FE	yes	yes	yes	yes	yes	yes
Observations	267,860	131,258	25,679	267,566	131,150	25,679

Notes: This table presents the gender gap observed within the sibling sample, with each specification controlling for sibling fixed effects. Standard errors clustered at the school level in parentheses.***p$<$ 0.01, **$p < 0.05$, * $p < 0.1$.

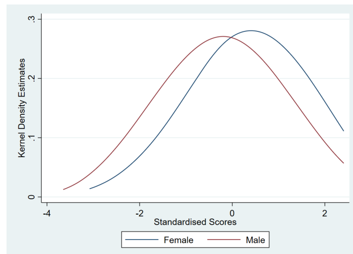
7 Appendix

Figure 8: *Kernel Density Plots: English and math*

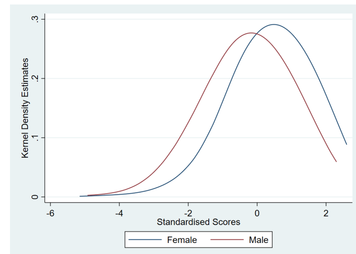
(a) *Grade 2 (English)*



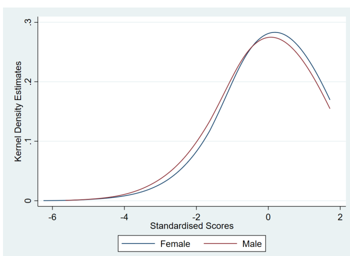
(b) *Grade 6 (English)*



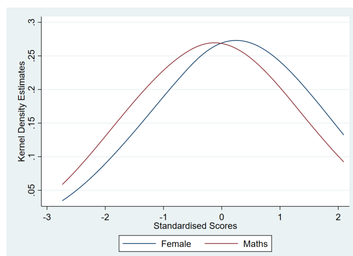
(c) *Grade 10 (English)*



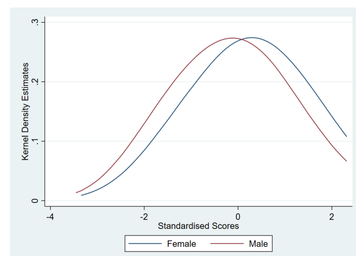
(d) *Grade 2 (math)*



(e) *Grade 6 (math)*



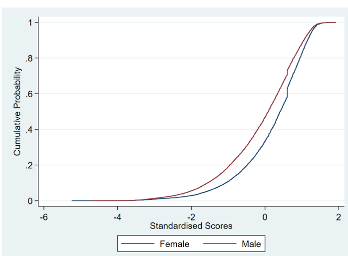
(f) *Grade 10 (math)*



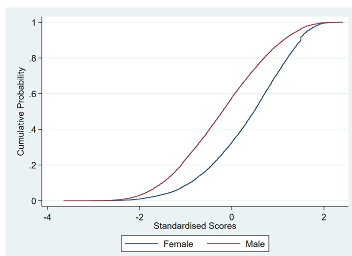
Notes: The figures present kernel density plots comparing the distributions of scores for both genders.

Figure 9: *Cumulative Distribution Plots: English and math*

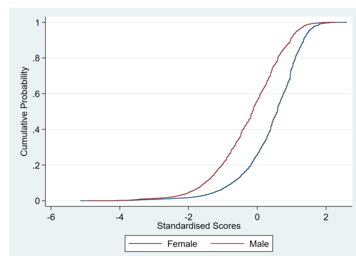
(a) *Grade 2 (English)*



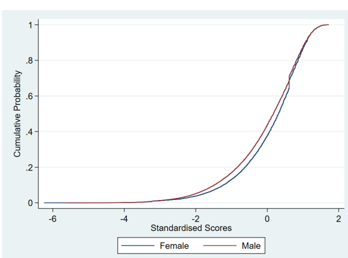
(b) *Grade 6 (English)*



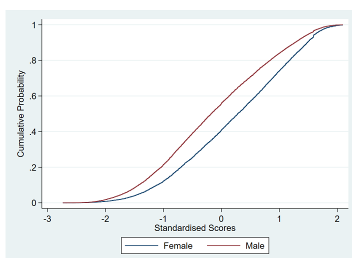
(c) *Grade 10 (English)*



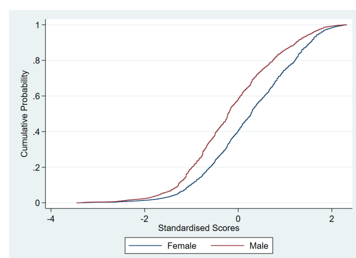
(d) *Grade 2 (math)*



(e) *Grade 6 (math)*

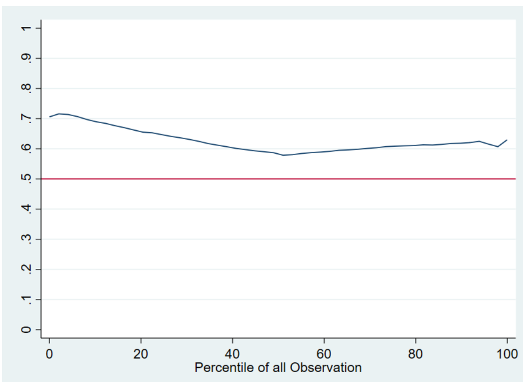


(f) *Grade 10 (math)*

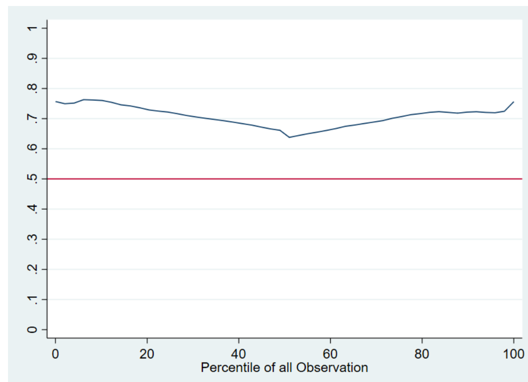


Note: The figures display cumulative distribution plots for both genders.

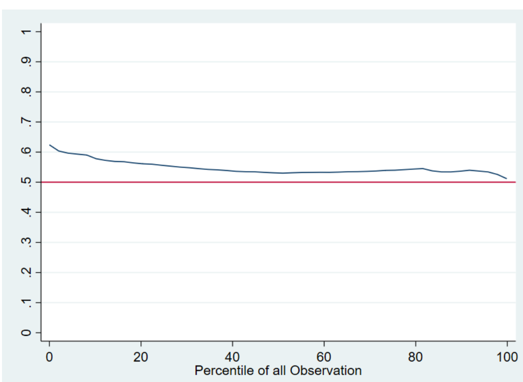
Figure 11: *Gender Gap Using Metric Free Approach*



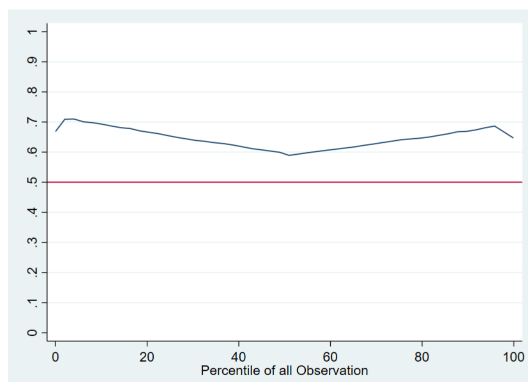
(a) *Grade 3 (English)*



(b) *Grade 8 (English)*



(a) *Grade 3 (math)*



(b) *Grade 8 (math)*

Table 12: *Distribution of Students by Grade and Year*

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Grade 1	3,705	4,198	5,074	5,505	5,402	6,050	5,005	5,137	4,299	3,392	3,050	4,244	55,061
Grade 2	3,442	3,877	4,409	5,446	5,645	5,532	5,839	4,920	5,190	3,647	3,816	3,255	55,018
Grade 3	3,003	3,488	4,180	4,584	5,373	5,794	5,125	5,446	5,090	4,219	3,899	3,857	54,058
Grade 4	2,632	2,899	3,576	4,222	4,694	5,539	5,302	4,912	5,622	4,390	4,523	3,960	52,271
Grade 5	3,422	2,642	3,067	3,759	4,323	4,808	5,142	5,176	5,073	4,819	4,557	4,468	51,256
Grade 6	1,819	3,157	2,649	2,961	3,870	4,334	4,454	4,936	5,381	4,313	4,997	4,528	47,399
Grade 7	1,464	1,607	3,141	2,642	2,910	3,839	4,033	4,174	5,069	4,718	4,454	4,781	42,832
Grade 8	1,308	1,429	1,685	2,852	2,490	2,915	3,520	3,859	4,345	4,303	4,848	4,285	37,839
Grade 9	1,159	1,128	1,284	1,654	2,667	2,477	2,616	3,552	3,707	3,624	4,014	4,043	31,925
Grade 10	1,141	1,274	1,246	1,289	1,681	2,937	2,304	2,741	3,649	3,699	3,642	3,957	29,560
All Grades	23,095	25,699	30,311	34,914	39,055	44,225	43,340	44,853	47,425	41,124	41,800	41,378	457,219

Notes: The table presents the total number of data points, disaggregated by grade and year. Diagonal entries, running from the top-left to the bottom-right, represent individual cohorts as they progress through successive grades.

Table 13: *Gender Gap by Grade and Year - English*

Year	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10
F(2012)	0.209***	0.290***	0.354***	0.466***	0.431***	0.371***	0.577***	0.488***	0.485***	0.538***
	(0.043)	(0.033)	(0.054)	(0.059)	(0.049)	(0.090)	(0.082)	(0.101)	(0.095)	(0.065)
Obs	3,703	3,441	3,003	2,632	3,422	1,819	1,464	1,308	1,159	1,141
F(2013)	0.250***	0.349***	0.378***	0.381***	0.444***	0.459***	0.479***	0.573***	0.480***	0.721***
	(0.037)	(0.048)	(0.049)	(0.046)	(0.071)	(0.072)	(0.067)	(0.080)	(0.075)	(0.083)
Obs	4,196	3,876	3,485	2,898	2,641	3,156	1,606	1,428	1,128	1,274
F(2014)	0.191***	0.320***	0.339***	0.400***	0.442***	0.493***	0.561***	0.454***	0.640***	0.404***
	(0.025)	(0.032)	(0.043)	(0.041)	(0.047)	(0.058)	(0.073)	(0.076)	(0.089)	(0.054)
Obs	5,074	4,406	4,179	3,575	3,066	2,648	3,141	1,684	1,282	1,246
F(2015)	0.167***	0.261***	0.366***	0.430***	0.442***	0.478***	0.442***	0.484***	0.412***	0.452***
	(0.024)	(0.028)	(0.040)	(0.053)	(0.042)	(0.058)	(0.057)	(0.068)	(0.077)	(0.063)
Obs	5,505	5,445	4,581	4,220	3,758	2,961	2,641	2,851	1,654	1,289
F(2016)	0.227***	0.281***	0.402***	0.494***	0.491***	0.568***	0.520***	0.625***	0.540***	0.461***
	(0.026)	(0.027)	(0.031)	(0.039)	(0.045)	(0.047)	(0.060)	(0.067)	(0.076)	(0.062)
Obs	5,401	5,644	5,371	4,691	4,321	3,870	2,910	2,490	2,667	1,681
F(2017)	0.208***	0.317***	0.392***	0.516***	0.628***	0.718***	0.722***	0.685***	0.778***	0.604***
	(0.022)	(0.029)	(0.028)	(0.031)	(0.032)	(0.037)	(0.035)	(0.049)	(0.047)	(0.052)
Obs	6,050	5,532	5,794	5,539	4,808	4,333	3,838	2,915	2,476	2,937
F(2018)	0.303***	0.370***	0.547***	0.541***	0.649***	0.689***	0.741***	0.755***	0.738***	0.599***
	(0.025)	(0.028)	(0.029)	(0.031)	(0.027)	(0.035)	(0.036)	(0.035)	(0.048)	(0.044)
Obs	5,004	5,839	5,124	5,301	5,140	4,452	4,033	3,518	2,615	2,304
F(2019)	0.289***	0.391***	0.440***	0.570***	0.511***	0.595***	0.725***	0.734***	0.742***	0.660***
	(0.025)	(0.033)	(0.030)	(0.034)	(0.035)	(0.030)	(0.042)	(0.042)	(0.042)	(0.043)
Obs	5,135	4,919	5,446	4,910	5,175	4,935	4,174	3,858	3,550	2,741
F(2020)	0.162***	0.243***	0.311***	0.414***	0.518***	0.513***	0.632***	0.652***	0.595***	0.587***
	(0.029)	(0.031)	(0.029)	(0.029)	(0.029)	(0.035)	(0.031)	(0.032)	(0.030)	(0.025)
Obs	4,275	5,166	5,081	5,617	5,039	5,375	5,044	4,340	3,700	3,649
F(2021)	0.190***	0.296***	0.258***	0.314***	0.255***	0.618***	0.607***	0.707***	0.665***	0.636***
	(0.033)	(0.031)	(0.040)	(0.044)	(0.042)	(0.035)	(0.031)	(0.032)	(0.038)	(0.029)
Obs	3,391	3,646	4,218	4,390	4,818	4,311	4,718	4,302	3,622	3,698
F(2022)	0.235***	0.316***	0.456***	0.522***	0.570***	0.589***	0.697***	0.602***	0.699***	0.782***
	(0.028)	(0.024)	(0.032)	(0.032)	(0.030)	(0.029)	(0.026)	(0.032)	(0.038)	(0.033)
Obs	3,022	3,786	3,877	4,489	4,522	4,966	4,418	4,824	3,993	3,601
F(2023)	0.137***	0.276***	0.351***	0.482***	0.530***	0.657***	0.658***	0.702***	0.659***	0.785***
	(0.027)	(0.036)	(0.032)	(0.031)	(0.030)	(0.034)	(0.029)	(0.034)	(0.039)	(0.035)
Obs	4,216	3,235	3,836	3,930	4,452	4,492	4,742	4,257	3,997	3,920

Notes: Each element represents the estimated gender gap for the given grade and year. Standard errors clustered at the school level, are reported in parentheses. .***p$<$ 0.01, **$p < 0.05$, * $p < 0.1$.

Table 14: *Gender Gap by Grade and Year - Math*

Year	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10
F(2012)	0.101***	0.119***	0.139***	0.154***	0.158***	0.214***	0.274***	0.255***	0.289***	0.415***
	(0.037)	(0.028)	(0.044)	(0.047)	(0.029)	(0.045)	(0.073)	(0.074)	(0.102)	(0.070)
Obs	3,702	3,442	3,003	2,632	3,422	1,819	1,464	1,308	1,159	1,141
F(2013)	0.100***	0.111***	0.0851***	0.165***	0.122***	0.275***	0.255***	0.335***	0.233***	0.551***
	(0.028)	(0.036)	(0.034)	(0.032)	(0.043)	(0.050)	(0.069)	(0.072)	(0.060)	(0.087)
Obs	4,186	3,875	3,486	2,896	2,641	3,157	1,606	1,428	1,128	1,266
F(2014)	0.105***	0.137***	0.104***	0.13***	0.228***	0.265***	0.268***	0.23***	0.309***	0.4***
	(0.026)	(0.032)	(0.026)	(0.034)	(0.035)	(0.047)	(0.054)	(0.052)	(0.066)	(0.066)
Obs	5,072	4,401	4,179	3,574	3,066	2,647	3,141	1,684	1,282	1,240
F(2015)	0.080***	0.132***	0.167***	0.175***	0.229***	0.329***	0.350***	0.347***	0.274***	0.411***
	(0.022)	(0.025)	(0.027)	(0.039)	(0.036)	(0.050)	(0.052)	(0.073)	(0.065)	(0.051)
Obs	5,502	5,446	4,581	4,221	3,758	2,961	2,641	2,851	1,654	1,285
F(2016)	0.158***	0.157***	0.193***	0.215***	0.285***	0.304***	0.366***	0.434***	0.325***	0.486***
	(0.023)	(0.022)	(0.024)	(0.030)	(0.032)	(0.040)	(0.060)	(0.067)	(0.068)	(0.055)
Obs	5,402	5,644	5,371	4,691	4,321	3,870	2,910	2,489	2,659	1,679
F(2017)	0.096***	0.162***	0.148***	0.209***	0.325***	0.459***	0.414***	0.491***	0.561***	0.355***
	(0.023)	(0.026)	(0.023)	(0.025)	(0.031)	(0.038)	(0.037)	(0.044)	(0.046)	(0.052)
Obs	6,048	5,532	5,788	5,533	4,747	4,300	3,838	2,915	2,476	2,937
F(2018)	0.172***	0.114***	0.229***	0.205***	0.259***	0.416***	0.432***	0.532***	0.57***	0.309***
	(0.025)	(0.026)	(0.025)	(0.028)	(0.030)	(0.026)	(0.034)	(0.037)	(0.059)	(0.046)
Obs	5,003	5,839	5,124	5,300	5,139	4,451	4,033	3,518	2,613	2,304
F(2019)	0.149***	0.190***	0.123***	0.225***	0.181***	0.333***	0.513***	0.498***	0.505***	0.310***
	(0.024)	(0.027)	(0.028)	(0.031)	(0.030)	(0.033)	(0.036)	(0.035)	(0.043)	(0.048)
Obs	5,136	4,919	5,445	4,912	5,174	4,934	4,174	3,858	3,551	2,740
F(2020)	0.091***	0.124***	0.146***	0.158***	0.228***	0.318***	0.430***	0.493***	0.412***	0.393***
	(0.025)	(0.027)	(0.024)	(0.026)	(0.029)	(0.033)	(0.036)	(0.031)	(0.037)	(0.030)
Obs	4,256	5,172	5,076	5,610	5,052	5,351	5,047	4,340	3,693	3,643
F(2021)	0.103***	0.123***	0.041***	0.073***	0.045***	0.463***	0.419***	0.496***	0.469***	0.315***
	(0.027)	(0.025)	(0.022)	(0.024)	(0.020)	(0.036)	(0.031)	(0.035)	(0.035)	(0.038)
Obs	3,382	3,638	4,219	4,390	4,809	4,304	4,711	4,300	3,621	3,658
F(2022)	0.147***	0.152***	0.187***	0.17***	0.32***	0.365***	0.498***	0.402***	0.405***	0.412***
	(0.032)	(0.028)	(0.027)	(0.034)	(0.032)	(0.033)	(0.032)	(0.037)	(0.041)	(0.04)
Obs	3,013	3,776	3,864	4,487	4,519	4,963	4,409	4,805	3,973	3,590
F(2023)	0.086***	0.111***	0.143***	0.235***	0.264***	0.398***	0.307***	0.479***	0.383***	0.437***
	(0.029)	(0.032)	(0.030)	(0.029)	(0.031)	(0.030)	(0.036)	(0.031)	(0.040)	(0.039)
Obs	4,201	3,232	3,823	3,925	4,439	4,482	4,726	4,246	4,001	3,916

Notes: Each element represents the estimated gender gap for the given grade and year. Standard errors, clustered at the school level, are reported in parentheses. .***p< 0.01, ** $p < 0.05$, * $p < 0.1$.

Table 15: *Gender Gap with Classroom Fixed Effects*

	English	**Math**
Female (Grade 1)	0.215***	0.117***
	(0.010)	(0.008)
Observations	55,001	55,001
Female (Grade 2)	0.308***	0.138***
	(0.014)	(0.011)
Observations	54,890	54,890
Female (Grade 3)	0.381***	0.140***
	(0.015)	(0.009)
Observations	53,971	53,971
Female (Grade 4)	0.460***	0.171***
	(0.015)	(0.009)
Observations	52,164	52,164
Female (Grade 5)	0.488***	0.215***
	(0.014)	(0.010)
Observations	51,140	51,140
Female (Grade 6)	0.567***	0.348***
	(0.014)	(0.011)
Observations	47,340	47,340
Female (Grade 7)	0.623***	0.387***
	(0.017)	(0.015)
Observations	42,793	42,793
Female (Grade 8)	0.632***	0.429***
	(0.018)	(0.017)
Observations	37,787	37,787
Female (Grade 9)	0.632***	0.410***
	(0.018)	(0.017)
Observations	31,753	31,753
Female (Grade 10)	0.630***	0.379***
	(0.019)	(0.020)
Observations	29,411	29,411
Classroom FE	yes	yes

Notes: The table reports gender gaps for each grade after controlling for classroom fixed effects in the specification (Eq. 4.1). Standard errors clustered at school level are shown in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 16: *Gender Gap Excluding New Entrants and Dropouts*

	English	**Math**
Female(Grade 1)	0.795***	0.065*
	(0.032)	(0.033)
Observations	4,348	4,348
Female(Grade 2)	0.177***	0.080**
	(0.046)	(0.035)
Observations	4,348	4,348
Female(Grade 3)	0.236***	0.099***
	(0.037)	(0.029)
Observations	4,348	4,348
Female(Grade 4)	0.269***	0.145***
	(0.049)	(0.038)
Observations	4,348	4,348
Female(Grade 5)	0.373***	0.228***
	(0.051)	(0.037)
Observations	4,348	4,348
Female(Grade 6)	0.524***	0.394***
	(0.029)	(0.031)
Observations	4,348	4,348
Female(Grade 7)	0.614***	0.472***
	(0.031)	(0.037)
Observations	4,348	4,348
Female(Grade 8)	0.718***	0.520***
	(0.029)	(0.034)
Observations	4,348	4,348
Female(Grade 9)	0.703***	0.483***
	(0.030)	(0.038)
Observations	4,348	4,348
Female(Grade 10)	0.705***	0.515***
	(0.035)	(0.038)
Observations	4,348	4,348
School FE	yes	yes
Cohort FE	yes	yes

Notes: The Table reports gender gaps observed within the set of students that we have been able to track for all 10 grades starting from grade 1 till grade 10. This excludes new entrants and dropouts. Standard errors clustered at school level are shown in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 17: *Gender Gaps in Attrition*

Attrition Grade	Male	Female	Diff	Male	Female	Diff
	English			Math		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Grade 1	-0.169	0.083	0.251***	-0.098	0.021	0.119***
Grade 2	-0.200	0.138	0.338***	-0.127	0.024	0.150***
Grade 3	-0.247	0.156	0.403***	-0.143	0.030	0.173***
Grade 4	-0.260	0.230	0.490***	-0.155	0.074	0.230***
Grade 5	-0.258	0.239	0.497***	-0.172	0.097	0.270***
Grade 6	-0.327	0.272	0.599***	-0.234	0.107	0.341***
Grade 7	-0.310	0.295	0.604***	-0.213	0.153	0.366***
Grade 8	-0.278	0.374	0.652***	-0.220	0.227	0.446***
Grade 9	-0.286	0.367	0.653***	-0.197	0.217	0.414***

Notes: Columns 1 and 2 report the mean scores of male and female students, respectively in the previous grade among those who attrit from the school in the following grade. The rows correspond to the mean scores for the previous grade. Column 3 presents the difference in these mean scores. ***$p < 0.01$, **$p < 0.05$, $p < 0.1$.

Table 18: *Estimates from the Logit Regression (Odds Ratio): English*

	$\delta \leq -0.3$	$\delta \leq -0.2$	$\delta \leq -0.1$	$\delta \leq 0$	$\delta \geq 0$	$\delta \geq 0.1$	$\delta \geq 0.2$	$\delta \geq 0.3$
Grade 1 to 2								
Q1	0.562***	0.588***	0.586***	0.590***	1.695***	1.692***	1.692***	1.683***
Q2	0.583***	0.607***	0.608***	0.627***	1.596***	1.542***	1.511***	1.527***
Q3	0.614***	0.604***	0.621***	0.624***	1.604***	1.597***	1.607***	1.574***
Q4	0.658***	0.668***	0.655***	0.649***	1.540***	1.650***	1.677***	1.567***
Grade 2 to 3								
Q1	0.496***	0.529***	0.528***	4.993***	1.872***	1.820***	1.821***	1.817***
Q2	0.565***	0.579***	0.597***	2.151***	1.692***	1.667***	1.630***	1.650***
Q3	0.569***	0.556***	0.569***	1.892***	1.737***	1.728***	1.732***	1.714***
Q4	0.636***	0.659***	0.642***	1.476***	1.526***	1.501***	1.491***	1.479***
Grade 3 to 4								
Q1	0.505***	0.476***	0.516***	0.530***	1.887***	1.818***	1.845***	1.878***
Q2	0.479***	0.507***	0.513***	0.524***	1.909***	1.879***	1.890***	1.879***
Q3	0.608***	0.616***	0.605***	0.595***	1.682***	1.734***	1.800***	1.797***
Q4	0.568***	0.573***	0.584***	0.573***	1.746***	1.720***	1.753***	1.662***
Grade 4 to 5								
Q1	0.517***	0.518***	0.513***	0.515***	0.664***	1.901***	1.901***	1.887***
Q2	0.607***	0.613***	0.592***	0.583***	0.539***	1.738***	1.663***	1.680***
Q3	0.601***	0.609***	0.603***	0.609***	0.496***	1.572***	1.630***	1.703***
Q4	0.611***	0.618***	0.606***	0.597***	0.516***	1.684***	1.648***	1.651***
Grade 5 to 6								
Q1	0.482***	0.460***	0.484***	0.502***	1.993***	1.916***	1.826***	1.818***
Q2	0.475***	0.493***	0.496***	0.489***	2.046***	2.042***	2.010***	2.004***
Q3	0.522***	0.504***	0.510***	0.519***	1.925***	1.901***	1.855***	1.854***
Q4	0.532***	0.522***	0.523***	0.546***	1.830***	1.818***	1.908***	1.947***
Grade 6 to 7								
Q1	0.554***	0.590***	0.559***	0.579***	1.727***	1.757***	1.730***	1.699***
Q2	0.475***	0.486***	0.477***	0.472***	2.117***	2.123***	2.154***	2.219***
Q3	0.482***	0.490***	0.482***	0.504***	1.985***	1.926***	1.967***	1.990***
Q4	0.532***	0.557***	0.567***	0.568***	1.761***	1.911***	1.983***	2.107***
Grade 7 to 8								
Q1	0.586***	0.609***	0.601***	0.581***	1.721***	1.691***	1.674***	1.725***
Q2	0.528***	0.519***	0.519***	0.514***	1.944***	1.941***	2.020***	2.022***
Q3	0.482***	0.489***	0.500***	0.491***	2.036***	2.009***	2.085***	1.979***
Q4	0.565***	0.563***	0.588***	0.613***	1.631***	1.622***	1.709***	1.725***
Grade 8 to 9								
Q1	0.664***	0.593***	0.595***	0.605***	1.653***	1.559***	1.654***	1.765***
Q2	0.469***	0.484***	0.467***	0.468***	2.138***	2.262***	2.227***	2.212***
Q3	0.529***	0.517***	0.533***	0.513***	1.948***	1.962***	1.957***	1.932***
Q4	0.577***	0.576***	0.571***	0.586***	1.708***	1.746***	1.726***	1.789***
Grade 9 to 10								
Q1	0.436***	0.432***	0.416***	0.418***	2.390***	2.298***	2.485***	2.353***
Q2	0.476***	0.475***	0.464***	0.471***	2.122***	2.025***	2.148***	2.347***
Q3	0.455***	0.450***	0.453***	0.439***	2.279***	2.356***	2.366***	2.313***
Q4	0.530***	0.547***	0.564***	0.550***	1.817***	1.987***	1.977***	1.996***

Table 19: *Estimates from the Logit Regression (Odds Ratio): Math*

	$\delta \leq -0.3$	$\delta \leq -0.2$	$\delta \leq -0.1$	$\delta \leq 0$	$\delta \geq 0$	$\delta \geq 0.1$	$\delta \geq 0.2$	$\delta \geq 0.3$
Grade 1 to 2								
Q1	0.705***	0.740***	0.752***	0.765***	0.452***	0.451***	1.284***	1.291***
Q2	0.829***	0.836***	0.817***	0.848***	0.336***	0.322***	1.185***	1.196***
Q3	0.804***	0.804***	0.820***	0.862***	0.172***	0.117***	1.167***	1.163***
Q4	0.897**	0.915**	0.890**	0.899**	0.038***	0.014***	1.106	1.056
Grade 2 to 3								
Q1	0.800***	0.802***	0.810***	0.788***	1.269***	1.255***	1.198***	1.155***
Q2	0.816***	0.821***	0.821***	0.849***	1.178***	1.202***	1.217***	1.231***
Q3	0.747***	0.764***	0.758***	0.795***	1.257***	1.264***	1.242***	1.203***
Q4	0.887***	0.862***	0.891***	0.878***	1.138***	1.148***	1.107*	1.019
Grade 3 to 4								
Q1	0.710***	0.666***	0.694***	0.705***	1.419***	1.364***	1.389***	1.389***
Q2	0.772***	0.758***	0.755***	0.770***	1.299***	1.290***	1.230***	1.213***
Q3	0.807***	0.819***	0.839***	0.826***	1.211***	1.177***	1.154***	1.138***
Q4	0.879***	0.855***	0.868***	0.859***	1.164***	1.171***	1.129**	1.125*
Grade 4 to 5								
Q1	0.710***	0.666***	0.694***	0.705***	1.419***	1.364***	1.389***	1.389***
Q2	0.772***	0.758***	0.755***	0.770***	1.299***	1.290***	1.230***	1.213***
Q3	0.807***	0.819***	0.839***	0.826***	1.211***	1.177***	1.154***	1.138***
Q4	0.879***	0.855***	0.868***	0.859***	1.164***	1.171***	1.129**	1.125*
Grade 5 to 6								
Q1	0.538***	0.524***	0.533***	0.544***	1.837***	1.629***	1.603***	1.543***
Q2	0.560***	0.545***	0.533***	0.539***	1.855***	1.845***	1.882***	1.866***
Q3	0.562***	0.562***	0.562***	0.566***	1.768***	1.782***	1.877***	1.836***
Q4	0.617***	0.618***	0.615***	0.595***	1.681***	1.733***	1.794***	1.818***
Grade 6 to 7								
Q1	0.681***	0.713***	0.740***	0.746***	1.340***	1.395***	1.392***	1.389***
Q2	0.641***	0.644***	0.650***	0.647***	1.545***	1.540***	1.571***	1.589***
Q3	0.637***	0.636***	0.649***	0.632***	1.582***	1.561***	1.550***	1.500***
Q4	0.721***	0.719***	0.741***	0.764***	1.309***	1.329***	1.365***	1.349***
Grade 7 to 8								
Q1	0.622***	0.562***	0.594***	0.629***	1.590***	1.652***	1.618***	1.533***
Q2	0.593***	0.589***	0.594***	0.608***	1.644***	1.670***	1.650***	1.609***
Q3	0.570***	0.582***	0.593***	0.589***	1.698***	1.680***	1.739***	1.728***
Q4	0.704***	0.725***	0.693***	0.727***	1.375***	1.412***	1.426***	1.513***
Grade 8 to 9								
Q1	0.717***	0.775***	0.799***	0.875*	1.142*	1.188**	1.195***	1.223***
Q2	0.686***	0.720***	0.722***	0.758***	1.320***	1.338***	1.393***	1.385***
Q3	0.626***	0.639***	0.658***	0.660***	1.515***	1.537***	1.614***	1.593***
Q4	0.720***	0.735***	0.737***	0.701***	1.426***	1.425***	1.378***	1.422***
Grade 9 to 10								
Q1	0.650***	0.682***	0.719***	0.738***	1.356***	1.410***	1.380***	1.402***
Q2	0.686***	0.659***	0.682***	0.657***	1.522***	1.527***	1.518***	1.431***
Q3	0.646***	0.649***	0.644***	0.646***	1.547***	1.485***	1.467***	1.482***
Q4	0.836***	0.858***	0.877**	0.881**	1.136**	1.107	1.112	1.120

Table 20: *Directional Rank Mobility: English*

	$\gamma \leq -0.3$		$\gamma \leq -0.2$		$\gamma \leq -0.1$		$\gamma < 0$		$\gamma > 0$		$\gamma \geq 0.1$		$\gamma \geq 0.2$		$\gamma \geq 0.3$	
	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M
Grade 1 to 2																
Q1	0.00	0.00	0.00	0.00	0.05	0.08	0.17	0.25	0.82	0.75	0.66	0.56	0.53	0.42	0.42	0.31
Q2	0.05	0.08	0.12	0.19	0.24	0.32	0.35	0.45	0.65	0.55	0.53	0.43	0.42	0.32	0.32	0.23
Q3	0.19	0.27	0.28	0.37	0.37	0.48	0.49	0.60	0.51	0.40	0.39	0.29	0.26	0.19	0.12	0.09
Q4	0.30	0.39	0.39	0.49	0.52	0.61	0.69	0.77	0.31	0.23	0.11	0.08	0.02	0.01	0.00	0.00
Grade 2 to 3																
Q1	0.00	0.00	0.00	0.01	0.05	0.08	0.19	0.28	0.81	0.72	0.65	0.51	0.53	0.37	0.41	0.28
Q2	0.04	0.08	0.11	0.20	0.22	0.33	0.35	0.47	0.65	0.53	0.52	0.41	0.38	0.29	0.26	0.19
Q3	0.17	0.26	0.27	0.37	0.38	0.49	0.50	0.62	0.50	0.38	0.36	0.27	0.20	0.14	0.08	0.05
Q4	0.27	0.37	0.39	0.49	0.54	0.63	0.75	0.80	0.25	0.20	0.08	0.05	0.01	0.00	0.00	0.00
Grade 3 to 4																
Q1	0.00	0.00	0.00	0.01	0.05	0.08	0.21	0.32	0.79	0.68	0.60	0.44	0.45	0.30	0.32	0.20
Q2	0.04	0.05	0.10	0.16	0.19	0.31	0.34	0.47	0.66	0.53	0.51	0.38	0.37	0.25	0.23	0.16
Q3	0.13	0.19	0.22	0.30	0.33	0.44	0.48	0.59	0.52	0.41	0.36	0.26	0.20	0.14	0.06	0.05
Q4	0.21	0.31	0.30	0.43	0.44	0.57	0.67	0.77	0.33	0.23	0.09	0.07	0.01	0.01	0.00	0.00
Grade 4 to 5																
Q1	0.00	0.00	0.00	0.01	0.05	0.08	0.21	0.31	0.79	0.69	0.57	0.43	0.42	0.27	0.31	0.18
Q2	0.03	0.05	0.10	0.15	0.22	0.30	0.35	0.47	0.65	0.53	0.49	0.38	0.33	0.25	0.21	0.15
Q3	0.12	0.18	0.19	0.29	0.32	0.43	0.48	0.59	0.52	0.41	0.35	0.25	0.18	0.13	0.06	0.04
Q4	0.18	0.28	0.27	0.39	0.42	0.54	0.66	0.75	0.34	0.25	0.09	0.07	0.01	0.01	0.00	0.00
Grade 5 to 6																
Q1	0.00	0.00	0.00	0.01	0.04	0.08	0.20	0.31	0.80	0.69	0.58	0.42	0.44	0.29	0.32	0.17
Q2	0.03	0.05	0.08	0.16	0.18	0.30	0.32	0.47	0.68	0.53	0.53	0.37	0.38	0.28	0.24	0.14
Q3	0.11	0.19	0.19	0.30	0.31	0.44	0.46	0.60	0.54	0.40	0.37	0.25	0.19	0.15	0.06	0.04
Q4	0.14	0.28	0.23	0.39	0.38	0.53	0.63	1.00	0.37	0.26	0.09	0.07	0.01	0.00	0.00	0.00
Grade 6 to 7																
Q1	0.00	0.00	0.00	0.01	0.06	0.08	0.24	0.33	0.76	0.67	0.54	0.40	0.39	0.24	0.28	0.15
Q2	0.03	0.05	0.09	0.15	0.19	0.31	0.33	0.49	0.67	0.51	0.51	0.34	0.35	0.21	0.20	0.12
Q3	0.09	0.18	0.17	0.30	0.28	0.44	0.45	0.61	0.55	0.39	0.36	0.24	0.18	0.11	0.06	0.03
Q4	0.13	0.25	0.21	0.36	0.36	0.51	0.65	0.74	0.35	0.26	0.08	0.06	0.01	0.01	0.00	0.00
Grade 7 to 8																
Q1	0.00	0.00	0.00	0.01	0.06	0.09	0.27	0.35	0.73	0.65	0.51	0.39	0.36	0.24	0.25	0.14
Q2	0.03	0.05	0.10	0.14	0.21	0.31	0.36	0.49	0.64	0.51	0.48	0.34	0.33	0.20	0.20	0.11
Q3	0.09	0.17	0.17	0.28	0.28	0.44	0.45	0.60	0.55	0.40	0.36	0.24	0.20	0.12	0.08	0.05
Q4	0.12	0.24	0.21	0.35	0.34	0.49	0.59	0.69	0.41	0.31	0.12	0.09	0.02	0.02	0.00	0.00
Grade 8 to 9																
Q1	0.00	0.00	0.01	0.00	0.06	0.07	0.23	0.30	0.77	0.70	0.57	0.44	0.42	0.28	0.30	0.16
Q2	0.03	0.06	0.10	0.17	0.20	0.32	0.33	0.49	0.67	0.51	0.51	0.34	0.36	0.22	0.21	0.12
Q3	0.10	0.19	0.19	0.30	0.31	0.44	0.45	0.59	0.55	0.41	0.36	0.24	0.17	0.12	0.05	0.04
Q4	0.15	0.32	0.23	0.41	0.39	0.54	0.66	0.75	0.34	0.25	0.09	0.05	0.00	0.00	0.00	0.00
Grade 9 to 10																
Q1	0.00	0.00	0.01	0.01	0.06	0.10	0.17	0.30	0.83	0.70	0.67	0.47	0.53	0.31	0.39	0.19
Q2	0.04	0.06	0.11	0.18	0.22	0.34	0.35	0.50	0.65	0.50	0.51	0.34	0.38	0.23	0.26	0.13
Q3	0.10	0.20	0.18	0.32	0.30	0.45	0.43	0.59	0.57	0.41	0.41	0.26	0.21	0.13	0.08	0.04
Q4	0.14	0.28	0.24	0.39	0.39	0.54	0.63	0.73	0.37	0.27	0.11	0.09	0.01	0.01	0.00	0.00
Grade 1 to 10																
Q1	0.00	0.00	0.00	0.01	0.02	0.09	0.08	0.21	0.92	0.79	0.86	0.64	0.77	0.50	0.68	0.37
Q2	0.02	0.10	0.07	0.24	0.13	0.37	0.21	0.47	0.79	0.53	0.72	0.42	0.63	0.30	0.50	0.21
Q3	0.10	0.35	0.15	0.46	0.24	0.58	0.33	0.70	0.67	0.30	0.52	0.19	0.36	0.10	0.14	0.04
Q4	0.23	0.59	0.34	0.70	0.47	0.80	0.64	0.90	0.36	0.10	0.14	0.03	0.02	0.00	0.00	0.00

Table 21: *Directional Rank Mobility: Math*

	$\gamma \leq -0.3$		$\gamma \leq -0.2$		$\gamma \leq -0.1$		$\gamma < 0$		$\gamma > 0$		$\gamma \geq 0.1$		$\gamma \geq 0.2$		$\gamma \geq 0.3$	
	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M
Grade 1 to 2																
Q1	0.00	0.00	0.01	0.01	0.07	0.07	0.21	0.24	0.79	0.76	0.61	0.57	0.48	0.45	0.38	0.34
Q2	0.07	0.08	0.17	0.18	0.28	0.30	0.40	0.43	0.61	0.57	0.48	0.45	0.37	0.34	0.27	0.25
Q3	0.23	0.27	0.33	0.37	0.43	0.48	0.54	0.58	0.46	0.42	0.34	0.30	0.21	0.18	0.10	0.08
Q4	0.36	0.39	0.46	0.49	0.59	0.62	0.74	0.77	0.25	0.22	0.09	0.08	0.01	0.01	0.00	0.00
Grade 2 to 3																
Q1	0.00	0.00	0.01	0.01	0.06	0.07	0.23	0.25	0.77	0.75	0.57	0.55	0.44	0.41	0.33	0.30
Q2	0.06	0.08	0.15	0.19	0.26	0.31	0.39	0.43	0.61	0.57	0.49	0.45	0.37	0.33	0.25	0.22
Q3	0.21	0.26	0.30	0.37	0.41	0.48	0.53	0.59	0.47	0.41	0.33	0.28	0.21	0.18	0.10	0.08
Q4	0.34	0.36	0.44	0.47	0.56	0.59	0.72	0.75	0.28	0.25	0.09	0.08	0.01	0.01	0.00	0.00
Grade 3 to 4																
Q1	0.00	0.00	0.01	0.01	0.06	0.07	0.23	0.27	0.78	0.73	0.57	0.49	0.44	0.36	0.33	0.27
Q2	0.05	0.07	0.13	0.17	0.26	0.31	0.40	0.46	0.60	0.54	0.45	0.40	0.33	0.28	0.21	0.18
Q3	0.18	0.22	0.28	0.33	0.40	0.45	0.55	0.58	0.45	0.42	0.30	0.27	0.19	0.15	0.08	0.06
Q4	0.27	0.29	0.37	0.39	0.51	0.54	0.71	0.73	0.29	0.27	0.09	0.08	0.01	0.01	0.00	0.00
Grade 4 to 5																
Q1	0.00	0.00	0.01	0.01	0.07	0.08	0.24	0.28	0.77	0.72	0.56	0.50	0.41	0.36	0.30	0.25
Q2	0.05	0.07	0.14	0.18	0.26	0.32	0.40	0.46	0.60	0.54	0.45	0.39	0.32	0.27	0.21	0.17
Q3	0.17	0.21	0.26	0.33	0.38	0.45	0.52	0.60	0.48	0.40	0.32	0.25	0.17	0.14	0.06	0.05
Q4	0.22	0.28	0.32	0.38	0.45	0.52	0.68	0.73	0.32	0.27	0.09	0.07	0.01	0.01	0.00	0.00
Grade 5 to 6																
Q1	0.00	0.00	0.00	0.01	0.05	0.08	0.21	0.29	0.79	0.71	0.57	0.47	0.43	0.32	0.31	0.22
Q2	0.03	0.07	0.11	0.18	0.23	0.33	0.35	0.49	0.65	0.51	0.51	0.37	0.36	0.24	0.24	0.15
Q3	0.14	0.21	0.22	0.32	0.32	0.45	0.47	0.60	0.53	0.40	0.36	0.25	0.19	0.13	0.07	0.04
Q4	0.17	0.26	0.27	0.37	0.42	0.53	0.65	0.75	0.35	0.25	0.09	0.05	0.01	0.00	0.00	0.00
Grade 6 to 7																
Q1	0.00	0.00	0.00	0.01	0.07	0.09	0.26	0.31	0.74	0.69	0.52	0.45	0.36	0.29	0.26	0.19
Q2	0.03	0.06	0.11	0.18	0.25	0.33	0.40	0.50	0.60	0.50	0.44	0.35	0.30	0.22	0.18	0.13
Q3	0.11	0.19	0.21	0.30	0.34	0.43	0.51	0.60	0.49	0.40	0.32	0.25	0.16	0.12	0.05	0.03
Q4	0.14	0.22	0.23	0.31	0.38	0.46	0.66	0.72	0.33	0.28	0.09	0.06	0.01	0.01	0.00	0.00
Grade 7 to 8																
Q1	0.00	0.00	0.01	0.01	0.08	0.10	0.25	0.33	0.75	0.67	0.54	0.44	0.37	0.29	0.24	0.18
Q2	0.04	0.06	0.12	0.18	0.24	0.33	0.38	0.49	0.62	0.51	0.46	0.36	0.32	0.22	0.18	0.12
Q3	0.11	0.19	0.20	0.30	0.33	0.44	0.49	0.61	0.51	0.39	0.33	0.23	0.16	0.11	0.05	0.03
Q4	0.13	0.21	0.20	0.30	0.35	0.46	0.64	0.72	0.36	0.28	0.09	0.06	0.01	0.00	0.00	0.00
Grade 8 to 9																
Q1	0.00	0.00	0.01	0.01	0.07	0.09	0.26	0.28	0.74	0.72	0.51	0.48	0.36	0.32	0.25	0.21
Q2	0.04	0.07	0.14	0.19	0.27	0.33	0.43	0.49	0.57	0.51	0.42	0.37	0.28	0.24	0.17	0.13
Q3	0.13	0.21	0.22	0.32	0.35	0.45	0.51	0.60	0.49	0.40	0.32	0.25	0.15	0.11	0.04	0.03
Q4	0.16	0.26	0.25	0.35	0.40	0.50	0.67	0.73	0.32	0.26	0.08	0.06	0.00	0.00	0.00	0.00
Grade 9 to 10																
Q1	0.00	0.00	0.01	0.01	0.06	0.08	0.23	0.27	0.77	0.73	0.58	0.51	0.41	0.36	0.31	0.24
Q2	0.05	0.07	0.14	0.18	0.26	0.32	0.39	0.47	0.61	0.53	0.46	0.39	0.31	0.26	0.19	0.15
Q3	0.13	0.20	0.22	0.31	0.34	0.44	0.49	0.59	0.52	0.41	0.33	0.27	0.15	0.12	0.05	0.04
Q4	0.16	0.24	0.25	0.31	0.40	0.44	0.67	0.69	0.33	0.31	0.08	0.08	0.01	0.01	0.00	0.00
Grade 1to 10																
Q1	0.00	0.00	0.01	0.01	0.03	0.06	0.09	0.17	0.91	0.83	0.82	0.70	0.73	0.59	0.61	0.47
Q2	0.04	0.09	0.10	0.21	0.17	0.32	0.25	0.44	0.75	0.56	0.64	0.45	0.58	0.35	0.44	0.26
Q3	0.16	0.34	0.25	0.45	0.33	0.55	0.43	0.65	0.57	0.35	0.41	0.25	0.27	0.16	0.12	0.07
Q4	0.33	0.54	0.46	0.65	0.57	0.77	0.72	0.88	0.28	0.12	0.09	0.04	0.00	0.00	0.00	0.00