Discrimination by Teachers:
Role of Attitudes, Beliefs, and Empathy[*]

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Abstract

We investigate whether discrimination by teachers explains the large gap in educational outcomes between students from marginalized and non-marginalized groups. Using the context of India, we start with a correspondence study to show that teachers assign 0.29 standard deviations lower grade to an exam of equal quality but with a lower caste surname. We then conduct incentivized surveys, behavioral experiments, and vignettes to highlight some of the invisible elements that are critical to understanding discrimination. We find that teachers hold biased attitudes and beliefs about lower caste individuals, which are associated with poor grading outcomes. We conduct a mechanism intervention based on invoking empathy among teachers to mitigate discrimination. We find that discrimination disappears in the treatment group, and the effect is largest for teachers with higher baseline empathy. These findings are not due to social desirability. Given the fundamental role that teachers play in shaping the future of students, our findings offer a proof-of-concept to understand mental processes that could be instrumental in designing policies to mitigate discrimination.

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I. Introduction

Understanding why students from marginalized groups persistently lag behind in educational outcomes is of fundamental importance. Recent evidence suggests that these disparities may stem in part from discrimination by teachers against students from marginalized groups (Hanna and Linden, 2012; Botelho, Madeira and Rangel, 2015; Lavy and Sand, 2018; Lavy and Megalokonomou, 2024). However, in these studies, researchers rarely have access to information on the characteristics of teachers, how they perceive individuals from marginalized groups, what attitudes and beliefs they hold about such individuals, and how they affect education outcomes. Without this information, it is difficult to know what fraction of teachers discriminate, what are their motivations, and what policies can we design to combat discrimination (Bertrand and Duflo, 2017; Neumark, 2018; Rose, 2023). If only a handful of teachers discriminate, then children from marginalized groups might be able to avoid this discrimination by sorting into schools with less discriminatory teachers (Becker, 1957).[1] However, if discrimination is systemic, then it is imperative to understand the mental processes underlying this behavior and design policies to mitigate discrimination accordingly.

In this paper, we contribute to this agenda in three steps. First, we conduct a correspondence study to examine whether teachers discriminate in grading exams of students from marginalized groups. Second, we complement the correspondence study with in-depth surveys, behavioral experiments, and vignettes to elicit perceptions, attitudes, and beliefs of teachers toward individuals from marginalized groups. This allows us to highlight "invisible elements" that are critical to understanding the extent and reasons behind discrimination (Stantcheva, 2023). Third, mitigating discrimination is likely to involve a long-term intervention to produce a meaningful change. We conduct a proof-of-concept mechanism experiment to understand the mental processes that could eventually be useful in designing policies to mitigate discrimination (see Ludwig, Kling and Mullainathan, 2011; Alesina, Miano and Stantcheva, 2023).

Our study takes place in the context of caste-based discrimination in India. The Indian caste system stratifies people hierarchically into four different groups: Brahmins, Kshatriya, Vaishyas, and Shudras. Of these, the first three groups form the top end of the hierarchy and are officially designated as "General Category" (GC), whereas the fourth group is designated as "Other Backward Castes" (OBC). Individuals who were excluded from this system are at the bottom of this hierarchy and formed the most disadvantaged group; they are officially designated as "Scheduled Castes" (SC). Data from nationally representative sources show that relative to children from the GC group, children from the OBC group lag behind slightly, but children from the SC group have the worst educational

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[1]See for example, Kline, Rose and Walters (2022) for similar concerns in the context of labor market discrimination.

outcomes. For example, they score on average 15-20 percentage points less on standardized math and language tests, have 2.5 fewer years of education, and are 15 percentage points less likely to enter tertiary education. Considering that SC children account for over 20 percent of India's 0-14 population (more than 100 million children), the importance of this issue cannot be emphasized enough (see Munshi, 2019, for a detailed review).

We employ a large sample of 1733 teachers from three states in northern India, where significant educational gaps exist between the different caste groups (Ramachandran, 2023). Following List et al. (2008), we made participation voluntary and also monetarily compensated the teachers for their time. Our paper proceeds in three steps. First, we conduct a correspondence study in which we ask teachers to grade exams by children in fifth grade. We randomly assign one exam with an SC surname and the other with a GC surname. Since, discrimination may depend on quality, we vary the quality of the exam to have a 2×2 matrix: high-quality GC exam, low-quality GC exam, high-quality SC exam, and low-quality SC exam. We randomly assign teachers to grade one of these exams. The exams comprise of short paragraphs in two languages: Hindi (native language in the three states) and English. Therefore, each teacher grades two exams, one in each language, by the same student and of the same quality. We ensure that concerns over discrimination at the margin and over unobserved productivity affecting the grades rather than the exams themselves are alleviated (Heckman and Siegelman, 1993).

We regress the grades awarded by teachers on an indicator for *SC*, an indicator for *Low-Quality*, and an interaction between these two variables, *SC×Low-Quality*. Using the High-Quality GC exam as a benchmark, we find that: a) Low-Quality GC exam receives a significantly lower grade, thereby confirming that teachers pay attention to exam quality; b) High-Quality SC exam receives a slightly higher grade, but the difference is economically small and mostly statistically insignificant; c) Low-Quality SC exam receives a lower score by 0.29 standard deviations, and this difference is statistically significant at the 1-percent level.[2] These findings imply that teachers engage in discrimination when exam quality is low. This finding is in line with those reported by Heckman, Lochner and Todd (2003); Sarsons (2017); Shi and Zhu (2023).

Second, we shed light on the characteristics, attitudes, and beliefs of teachers underlying the above results. When we restrict our sample to GC teachers, the coefficient on *SC×Low-Quality* doubles in magnitude from -0.29 to -0.57. This underscores the importance of caste characteristics of teachers in understanding the true extent of discrimination. Consistent with this result, we document strong biases in attitudes and beliefs against SC. Teachers are willing to forego money in an experiment to prevent SC

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[2]We benchmark these estimates against some prominent studies on teachers in India. For example, Muralidharan and Sundararaman (2011) find performance pay increases student test scores by 0.27 and 0.17 standard deviations in math and language, respectively. Duflo, Hanna and Ryan (2012) find that monitoring and incentives to reduce teacher absence increased student test scores by 0.17 standard deviations.

from preparing mid-day meals in schools, and believe that other teachers will do the same. Teachers also believe that despite having similar grades, SC children are 10 percentage points less likely to persevere in completing an extra curricular program than GC children. They also underestimate SC students' ability to read a paragraph by more than 10 percentage points. Moreover, 60 percent of the teachers perceive the use of caste slurs by GC children as either a reflection of reality or as playful banter. Finally, two-thirds of the teachers assign SC individuals of the same ability as individuals from other groups to a stigmatized job with the lowest skill requirement. These findings highlight surprising levels of bias against SC individuals by public service providers like teachers. We proceed by showing that these attitudes and beliefs relate to discrimination in grading by teachers. Teachers with more pessimistic attitudes and beliefs toward the SC discriminate significantly more. These results help us rationalize why teachers reward SC exams of high quality with a slightly higher grade, but penalize those of low quality with a lower grade. They validate the importance of studying attitudes and beliefs, and help us underpin the determinants of discrimination in correspondence studies on caste and education.

Third, we investigate the mental processes that could serve as a useful mechanism through which public policy could mitigate discrimination. The data on attitudes and beliefs imply that a non-trivial share of teachers lack empathy. The literature in economics, psychology, and neuroscience defines empathy as sharing others' feelings by placing yourself in their shoes Batson et al. (1991); Singer and Fehr (2005); Andreoni and Rao (2011). Empathy has a neurological foundation: the same affective brain circuits are activated when individuals themselves feel pain and when they observe others in pain. Crucially, empathy is often latent and needs to be activated to yield results. In view of these findings, we design an intervention to activate empathy among teachers towards the SC. In the treatment group, we show teachers *two* animations. In the first animation, a highly qualified GC surgeon in the western world faces racial discrimination from a white patient. In the second animation, a highly qualified SC surgeon in India faces caste-based discrimination from a GC patient. Both animations end with a sad face and the doctor saying "What is my life worth if everyone judges me based on my origins and not my achievements?" We expect the first animation to generate empathy by making teachers, who are mostly from the GC group, realize that discrimination is arbitrary and how it feels when someone from their own group experiences discrimination. The second animation shows that this feeling is similar to what the SC experience in India. In the control group, teachers see a health-related animation without any mention of race, caste, or discrimination.

Our results reveal that discrimination in grading disappears in the treatment group. The coefficient on $SC \times Low\text{-}Quality$ changes from -0.29 in the control group to -0.003 in the treatment group. When we restrict the sample to GC teachers, we find that the coefficient on $SC \times Low\text{-}Quality$ declines by half. To further confirm that empathy is indeed

driving this result, we use data from a survey module designed by psychologists to measure empathy Reniers et al. (2011). The survey was conducted at the start of the study, so it is not contaminated by mention of caste, discrimination, attitudes, and beliefs. We find that the effect of the treatment is strongest for teachers who have stronger baseline empathy. Following Dhar, Jain and Jayachandran (2022), we implemented a survey to measure susceptibility to social desirability and show that it does not have a differential effect for teachers in the treatment group over teachers in the control group. Together, these results suggest that empathy may be an important channel to mitigate discrimination. Our intervention should be seen as a proof-of-concept, which paves a way for identifying a crucial input - activation of latent empathy - to design and test programs to mitigate discrimination in the short and long-run.

Our paper makes several contributions to the literature. First, we complement the extensive literature on discrimination by linking discrimination observed in a correspondence study with rich survey data on teacher characteristics, attitudes, and beliefs. This allows us to understand how teachers perceive individuals from marginalized groups and shed light on the otherwise invisible drivers of discrimination (see Bertrand and Duflo, 2017; Neumark, 2018; Rose, 2023; Stantcheva, 2023).

Second, there is little evidence in the literature on how to undermine discrimination (see Bertrand and Duflo, 2017; Neumark, 2018). In a recent study, Carlana, Ferrara and Pinotti (2022) focus on mitigating discrimination against children of immigrant backgrounds in Italy by using tutoring and career counseling targeted at high-ability immigrant students. Dhar, Jain and Jayachandran (2022) use a two-year intervention based on classroom discussions on gender equality to mitigate gender bias in northern India. We highlight the role of empathy as a potential mechanism that policy makers could use to mitigate caste-based discrimination in India. In this way, our study also contributes to the literature on the importance of using empathy to mitigate discrimination, an area where empirical evidence has been largely missing Batson (2017).

Our paper also relates to the literature targeting teachers to improve educational outcomes in developing countries. In these studies, the emphasis is on designing interventions to make teachers more effective in teaching Muralidharan and Sundararaman (2011) or preventing teacher absence from school (missing in action) (Duflo, Hanna and Ryan, 2012). Our focus is on documenting caste-based discrimination by teachers. A related study is by Hanna and Linden (2012) who conduct a correspondence study with 120 teachers in India and document discrimination in the grading of art exams toward three caste groups relative to the highest caste (Brahmins). Our focus is on discrimination against the SC, who form the most marginalized group in India and lag behind in educational outcomes than all other caste groups. Furthermore, we go beyond by combining a correspondence study with detailed data on attitudes and beliefs, as well as a mechanism experiment to mitigate discrimination using a large sample of 1733 teachers.

II. Field Setting and Sample Construction

We begin with a brief overview of the caste system in India, followed by a description of the sample construction and data collection process.

II.A. Field setting

The Indian caste system stratifies individuals into four main groups known as *varnas*: Brahmins (priests and teachers), Kshatriyas (warriors and rulers), Vaishyas (traders and merchants), and Sudras (laborers). A fifth group comprises of individuals who were excluded from this system and were classified as *untouchables*. They often performed tasks that were considered ritually impure and polluting, such as handling waste, working with leather, and disposing of dead bodies. In 1950, the Indian government abolished the practice of untouchability and made it a criminal offense. It also established an affirmative action program under which historically untouchable groups, collectively designated as Scheduled Castes (SC), were offered reservation in institutions of higher education, jobs in central and state government, and local politics. Subsequently, the affirmative action program was extended to the Shudra under the designation "Other Backward Castes (OBC)". The first three *varnas*/groups are not beneficiaries of the affirmative action program and are designated as General Castes (GC).

Our focus is on discrimination towards the SC, which remains widely prevalent despite the abolition of caste-based discrimination. Anecdotal and case-study evidence suggests that these gaps may be in part due to discrimination against SC children by teachers who are primarily from GC groups. This discrimination could manifest in many forms, such as deliberate reduction of grades on exams by SC children, or segregation of GC and SC children at the time of serving mid-day meals, or seating arrangements in classrooms, such that SC children are made to sit on the floor but the GC children sit on chairs.[3] Figure 1 plots data from the Indian Human Development Survey (YEAR) to show significant gaps in reading an entire paragraph and ability to divide or subtract between SC and GC children. While 64 of the GC children can read a paragraph and and 59% can divide or subtract, the corresponding share for the SC children is much lower, at 48 and 42%. Figure 2 uses data from the National Family Health Survey (2019-21) to show large disparities in educational attainment, measured by average years of schooling and the share of students entering tertiary education. On average, SC individuals have 6.93 years of education compared to 9.78 years for GC individuals. The gaps are even wider for tertiary education, with only 11% of SC entering tertiary education compared to 26% percent of GC. Given that the SC comprise nearly 20 percent of India's population, addressing these inequities is of vital importance.

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[3]See, for example, newspaper reports in The Times of India (Times of India, 2019), Hindustan Times (Rajput, 2021), Deccan Chronicle (Deccan Chronicle, 2014), and Firstpost (Rajrah, 2020).
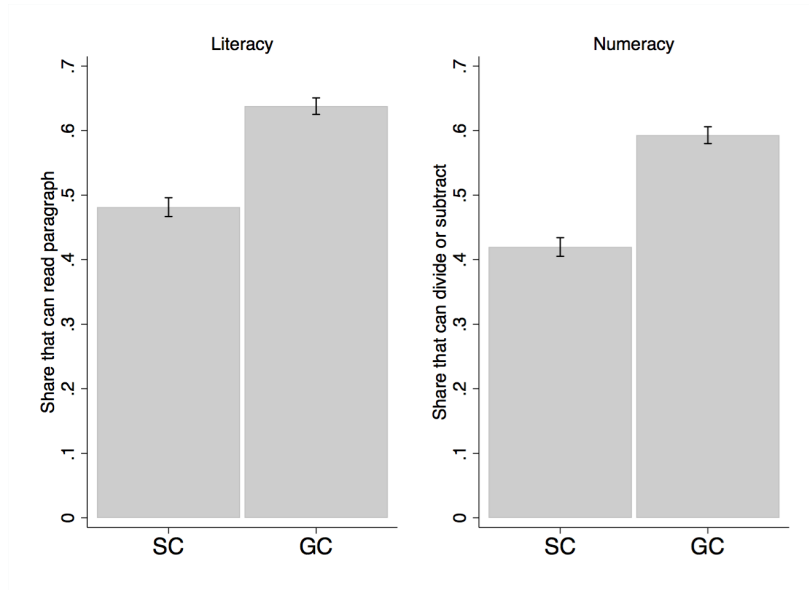
Figure 1: Numeracy and Literacy among SC and GC children

Notes: The bar graph shows the mean proportion of 8-11 years old children from SC and GC groups who can read an entire paragraph (left figure) and divide and subtract (right figure). The capped bars indicate 95% confidence intervals. The data are from the Indian Human Development Survey-I and II (Desai, Vanneman and National Council of Applied Economic Research, 2005; Desai, Vanneman and of Applied Economic Research, 2011).
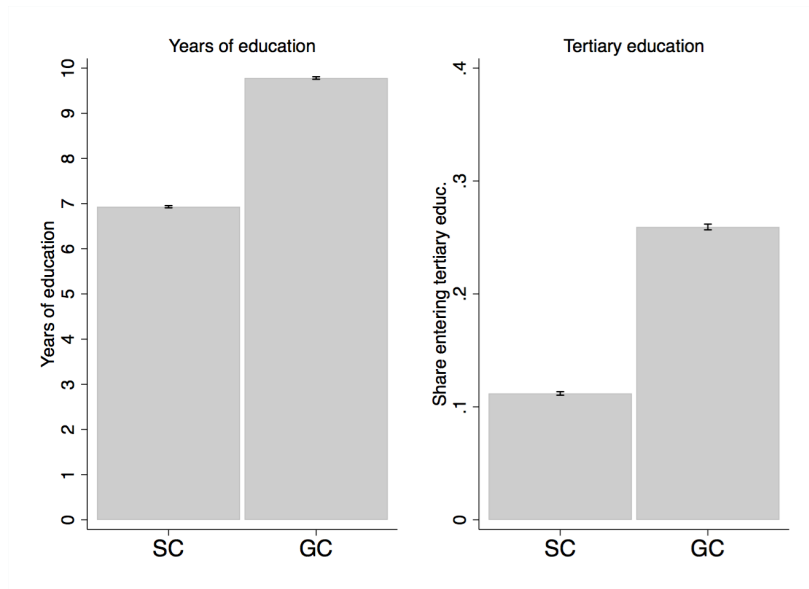
Figure 2: Years of Schooling and Share Entering Tertiary Education among SC and GC children - Men and Women aged 15-49

Notes: The bar graph shows the average years of education (left) and average share entering tertiary education (right) among SC and GC individuals in the age-group of 15-49. The capped bars indicate 95% confidence intervals. The data are from the National Family Health Survey (NFHS-V), 2019-21 (International Institute for Population Sciences , IIPS).

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II.B. Sample Construction

We recruited teachers from three northern states of India using a teacher consultancy agency involved in teacher recruitment and placement in schools in India. Based on a pilot study conducted in two other Hindi-speaking states, our target sample was more than 1,500 teachers. The agency invited all eligible teachers in their database from the states to participate in an online survey. The teachers were offered a baseline payment of INR 700 (approximately $9 USD) contingent on completing the survey, with the possibility of earning an additional amount of up to INR 2,200 (approximately $23 USD) based on their responses to incentivized questions and experiments. The payments were made on our behalf by the consultancy, ensuring that we had no direct interaction with the teachers. 1900 teachers participated in the study. We dropped 77 teachers who answered basic comprehension questions incorrectly, and an additional 90 teachers who completed the survey more than once. This leaves us with a final sample of 1733 teachers. We used stratified random assignment to assign teachers within each state to the control and treatment group. 47 percent of the teachers are in the control group and the remaining 53 percent in the treatment group. Table A.1 shows that the teachers in the control and treatment groups are comparable across several important characteristics, such as age, gender, education, caste, religion, school type, and urban residence.

Table 1 shows that in both the control and treatment group, teachers first participated in a survey module on empathy, followed by a survey module on social desirability. The survey modules on empathy and social desirability consisted of neutral questions used in psychology and did not mention caste, India, or discrimination. Teachers in the control group then viewed a placebo animation, whereas those in the treatment group saw an animation intended to mitigate discrimination. Afterward, both groups of teachers took part in a correspondence study on the grading of exams, followed by questions on attitudes towards the SC.

Table 1: Study Flow

Control	Empathy Questions	Social Desirability	Placebo Animation	Grading of Exams	Attitudes Toward SC
Treatment	Empathy Questions	Social Desirability	Treatment Animation	Grading of Exams	Attitudes Toward SC

Notes: The table shows study flow in both the control and treatment group.

III. Discrimination in Grading

III.A. Study Design

We conduct a correspondence study in which we ask teachers to grade exams. We keep the quality of the exams and the first name constant, and randomly vary only the surname of the student to indicate caste. Our approach mirrors the actual situation in primary schools, where exams are not graded anonymously; teachers can see the student's name on the exam, and classes are mixed, that is, SC and GC attend the same school.

Bartoš et al. (2016) find that discrimination could arise because attention is a scarce resource. We suspect that this is more likely if teachers have to grade many exams. To limit the influence of attention scarcity on our results, we ask each teacher to grades two five-line paragraphs, one in Hindi on "the tiger", and the other in English on "my family". Teachers are required to assign a grade between 0 and 10 to each paragraph, with 10 being the highest possible grade.

Discrimination may vary depending on quality. For instance, Bertrand and Mullainathan (2004) introduce high and low-quality resumes to test whether quality alleviate employers' concern over skills of Black applicants. However, they find that the gap in callback rates between Whites and Blacks widens with resume quality. Their evidence suggests that employers simply pay less attention to resumes with Black sounding names. This contrasts with the results of Heckman, Lochner and Todd (2003), who find that Blacks have higher returns to a high school degree than Whites. In a recent study, Shi and Zhu (2023) also found that relative to the white students, positive bias towards Asians was more pronounced among high-achieving students. Furthermore, Sarsons (2017) finds that relative to male doctors, referrals to female doctors decline more sharply when a patient dies, but not when the outcome is good.

Motivated by these findings, we created two sets of exams: a "low quality" set with a spelling or grammar mistake in each of the five sentences of the paragraph and a "high quality" set with no mistakes in any of the five sentences of the paragraph (see Figure A.1 and Figure A.2). This gives for each language exam a 2x2 matrix, which we present in Table 2. Conditional on state, we randomly assigned teachers to one of these four variants of the exam. Each teacher grades two exams of the same quality and by the same student, one in Hindi and another in English. The between-teacher design allows us to compare teachers who grade identical exams with the same first name but some have a GC surname and the others have a SC surname. We selected surnames that are highly common within the state and make it easy for teachers to recognize the caste to which an individual belongs.

Table 2: Study Design

	Exam Quality	
General Caste (GC)	High	Low
Scheduled Caste (SC)	High	Low

Our design overcomes several concerns related to audit and correspondence studies raised by Heckman and Siegelman (1993); Bertrand and Duflo (2017); Neumark (2018). To begin with, we go beyond previous studies and collect rich data on the identity, characteristics, attitudes, and beliefs of school teachers. This helps us understand who discriminates and why. Second, our design mitigates concerns over failure to capture discrimination at the margin. Most students in India have little choice over which school to attend, as there is usually only one primary school in the village or its proximity. Even when there is a choice, say for instance between a private and a public school, both typically recruit teachers from the same local environment. It is unlikely that teachers who discriminate less select into private schools, and knowing this, SC students also select into such schools. A comparison of grades given by private and public school teachers yields no difference (p-value = 0.33), which further confirms this. Third, a teacher's time is scarce, so following List et al. (2008) we made sure that participation in our study was voluntary. We took each teacher's consent to take part in the study and also compensated them well above the market wage. Fourth, we believe that concerns over variance of unobserved productivity are unlikely to arise in our context, as teachers are expected to grade exams on the basis of the written material and not on the prospect of each student becoming successful in the future. We test this by comparing grades given on high and low quality GC exams.

III.B. Empirical Specification

We estimate discrimination in grading using the following specification:

$$Grade_{icq} = \alpha + \beta_1 Low\ Quality + \beta_2 SC + \beta_3 SC \times Low\ Quality + \delta FE + \mathbf{X}'_i \zeta + \epsilon_{icq} \quad (1)$$

where $Grade_{icq}$ is the grade assigned by teacher i to an exam by student from caste c $\in \{SC, GC\}$ and of quality $q \in \{Low, High\}$. *Low Quality* is an indicator for low quality exam, SC is an indicator for SC surname, $SC \times Low\ Quality$ is an interaction between indicators of SC surname and *Low Quality*. *FE* includes fixed effect for the language of the exam (Hindi or English) and the state in which the teacher resides. X_i is vector of teacher specific controls like age cohort, gender, education, caste, religion, years of

teaching experience, urban residence, state of birth, and self-reported proficiency in Hindi and English language. The omitted category is the GC exam of high quality. β_1 captures the marginal effect of the GC exam when the quality is low, β_2 captures the marginal effect of the SC exam when the quality is high, and β_3 captures the marginal effect of the SC exam when the quality is low.

If teachers care about exam quality and pay attention to it while grading exams, then we expect $\beta_1 < 0$. If teachers discriminate towards the SC regardless of exam quality, as in the results of Bertrand and Mullainathan (2004), we expect $\beta_2 < 0$ and $\beta_3 < 0$. However, if teachers rarely observe high performing SC students, then they may exhibit positive discrimination towards high quality exams, as found by Heckman, Lochner and Todd (2003); Sarsons (2017); Shi and Zhu (2023). In this case, we expect β_2 to be positive. This pattern could arise if teachers desire to support students defying stereotypes, or because high performance is seen as an indication of exceptional effort. Alternatively, it could reflect less desirable motivations, such as tokenism or perceived meritocracy (Wright and Boese, 2015) .

III.C.   Main Results

Descriptive results.–   Panel A of Figure 3 shows the cumulative distribution function (CDF) of the grades given to exams with SC and GC surnames, separately by exam quality. The left figure shows that when the exam quality is high, the pattern is noisy, and the distributions cross each other, especially after the exam score of 8. However, the right figure shows that when exam quality is low, the grade on exams with GC surname tends to first-order stochastically dominate the grade on exams with an SC surname. This pattern suggests that teachers discriminate against SC when exam quality is low, but not when exam quality is high.
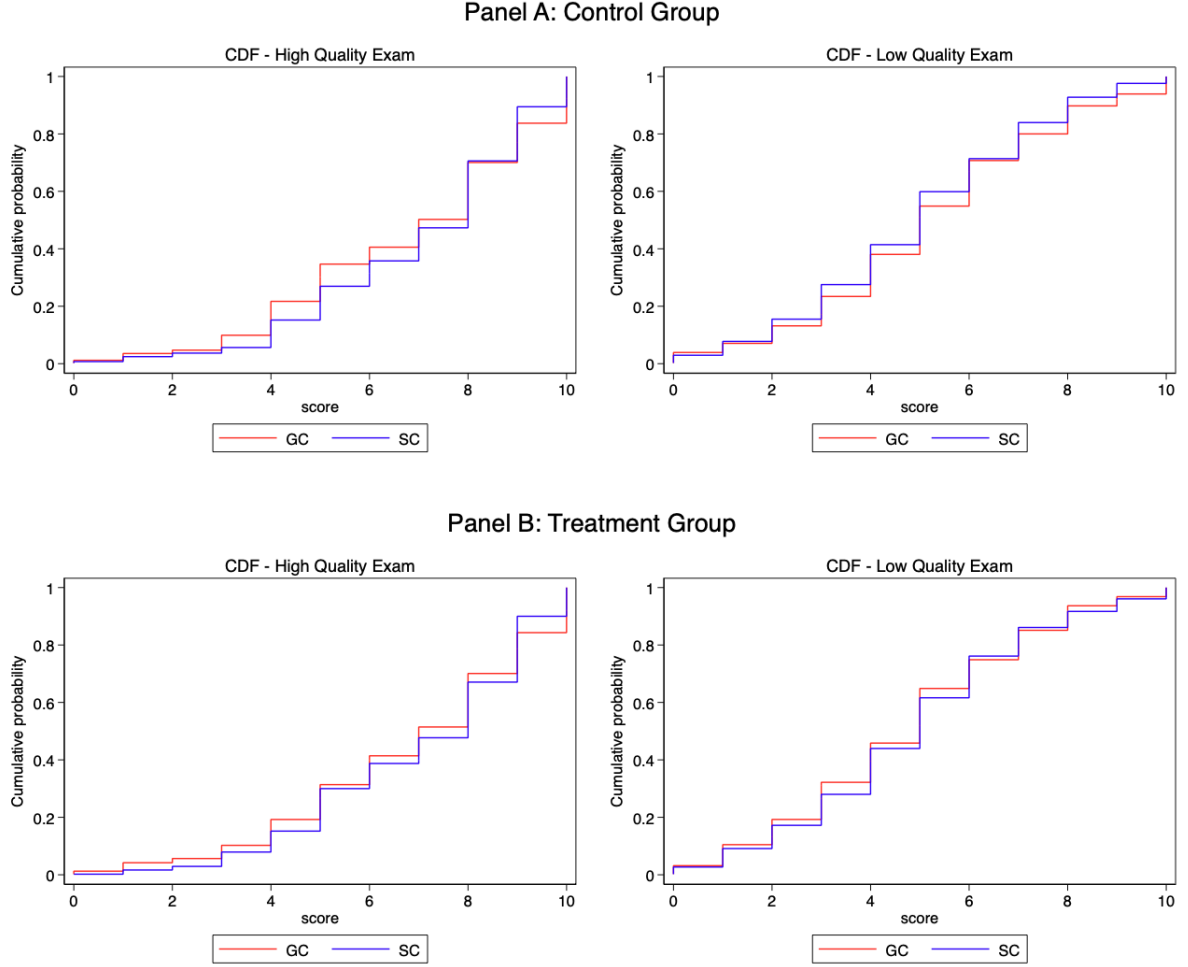
Figure 3: Cumulative Distribution Function (CDF) Plot of Grades Given by Teachers by Exam Quality.

Notes. The figure shows CDF of grades given to exams with SC and GC surname in the control group in Panel A and Treatment group in Panel B. The left hand side panels show the CDF when the exam quality is high and the right hand side panels when the exam quality is low.

Regression results.– We test whether these patterns are statistically significant and robust to the inclusion of control variables. Table 3 shows results from the estimation of equation 1 using an ordinary least squares (OLS) regression. For ease of interpretation, we standardize the grades awarded. The benchmark category is high quality exam with a GC surname. Column 1 includes only fixed effects for our stratification units: the language of the exam and the state of residence. Three interesting results emerge. First, *Low Quality* (with GC surname) receives a lower score of 0.58 standard deviations and the difference is statistically significant at the 1-percent level. This result confirms that the teachers paid attention to the quality of the exam while grading. Second, the exam with the *SC* surname (of high quality) receives a slightly higher score of 0.1 standard deviations, but the difference is not statistically significant. Third, the interaction term,

SC × Low Quality, receives a negative score of 0.22 standard deviations and the difference is statistically significant at the 5-percent level. This result provides the first indication that teachers discriminate against SC students and that this depends on the quality of the exam. These results are in line with those reported by Heckman, Lochner and Todd (2003); Sarsons (2017); Shi and Zhu (2023).

We test whether our results hold when we introduce control variables sequentially in columns 2-5. We start by controlling for the caste and religion of teachers in column 2. In column 3, we control for other teacher characteristics, namely, their age, gender, level of education, experience, whether they work in a private or government school, and whether they live in an urban or rural area. 25 percent of the teachers in our sample were born in a state which is different from their residence state, so we introduce fixed effects for state of birth in column 4. Finally, we control for teacher's self-reported proficiency in Hindi and English language in column 5.

Table 3: Discrimination in Grading by Caste: Control Group

	Dependent variable: Standardized score given by teachers				
	Exam & State FE	Caste & religion	Other characteristics	State of birth	Language fluency
	(1)	(2)	(3)	(4)	(5)
SC × Low Quality	-0.215	-0.235	-0.261	-0.279	-0.286
	(0.093)	(0.093)	(0.094)	(0.094)	(0.094)
SC	0.096	0.117	0.141	0.161	0.162
	(0.064)	(0.064)	(0.065)	(0.065)	(0.065)
Low Quality	-0.584	-0.576	-0.550	-0.540	-0.537
	(0.067)	(0.068)	(0.068)	(0.068)	(0.068)
Number of teachers	808	808	808	808	808
N	1616	1616	1614	1614	1614
R^2	0.14	0.15	0.16	0.17	0.17

Notes: OLS estimates are presented with robust standard errors in parentheses. The sample consists of 808 teachers assigned to the control condition. Controls are introduced sequentially and cumulatively across Columns 1–5. Column 1 controls for the language of the exam and the state of residence. Column 2 adds controls for the caste and religion of teachers. Column 3 further incorporates other teacher characteristics, including age, gender, level of education, experience, private school employment, and urban residence. Column 4 introduces an additional control for the teacher's state of birth, while Column 5 includes self-reported proficiency in Hindi and English.

The introduction of these controls leads to a small decline in the coefficient on the *Low Quality* exam, which remains negative and statistically significant. In contrast, the coefficient on exam with SC surname increases in magnitude to 0.16 and is now statistically significant at the 5-percent level. The coefficient on *SC × Low Quality* exam also increases in magnitude to -0.29 and is now statistically significant at the 1-percent level. This estimate implies that the penalty the SC receive when exam quality is low is close to

twice the absolute magnitude of the reward they receive when quality is high; the two coefficients are also significantly different from each other (p-value = 0.000). In terms of points awarded, teachers reduce the grade on the low quality exam with the SC surname by close to 0.75 points, which is 11 percent of the average grade in the baseline category (6.79 points). These results hold when we cluster standard errors by teachers or by both teachers and state of residence in columns 1-2 of Table A.2. Our results also hold when we carry out a randomization inference test with 5000 replications.

A key advantage of our study is that we know the caste of teachers.[4] We further show in column 3 of Table A.2 that when we restrict the sample to teachers traditionally viewed as upper castes ($Brahmin$ and $Kshatriya$), the coefficient on $SC \times Low\ Quality$ rises in absolute magnitude from -0.286 in the full sample to -0.570 in the upper caste sample, which is twice as large. These results suggest that discrimination in grading stems primarily from the upper caste teachers.

IV.   Attitudes and Beliefs of Teachers Toward SC

We go beyond the reduced-form evidence from correspondence studies and investigate what attitudes and beliefs teachers have toward individuals from the SC group and whether these drive discrimination in grading. This step helps us highlight "invisible elements" that are critical to understanding the reasons behind discrimination Stantcheva (2023). Anecdotal evidence suggests that teachers discriminate across a variety of domains, so we elicit attitudes and beliefs related to preparation of mid-day meals, beliefs over cognitive skills, beliefs over non-cognitive skills, assignment to occupations, and tolerance of caste-based slurs. Of these, the first three measures are based on incentivized responses, whereas the last two are not. We describe the questions we used to measure these attitudes and beliefs together with our findings below. Our analysis is based on a sample of 808 teachers from the control group, which allows us to gauge the prevalence of these attitudes and beliefs in the absence of treatment.

IV.A.   Preparation of mid-day meals

A key aspect of the caste system is its emphasis on ritual purity. This is practiced by restricting individuals from the SC group from preparing food, and by segregating SC children from GC children in school at the time of eating. To elicit attitudes in this domain, we asked teachers to evaluate the situation below:

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[4]It is very likely that there was no misreporting because we asked teachers at the end of the study to voluntarily provide their email if they would like to be contacted in the future for another study. A large majority of teachers provided their emails bearing their first and last name from which we could infer if the reported caste is the same as in their surname in the email.

Imagine the government wants to roll out a mid-day meal scheme in which for 15 days a month an SC prepares meals for children. How strongly would you support this scheme in your school? Choose a number between 0-100, where 100 indicates full support and 0 indicates no support. You will be paid in Rupees for your indicated level of support. For example, if you choose 0 you will be paid Rs.0; if you choose 10 you will be paid Rs.10, etc.
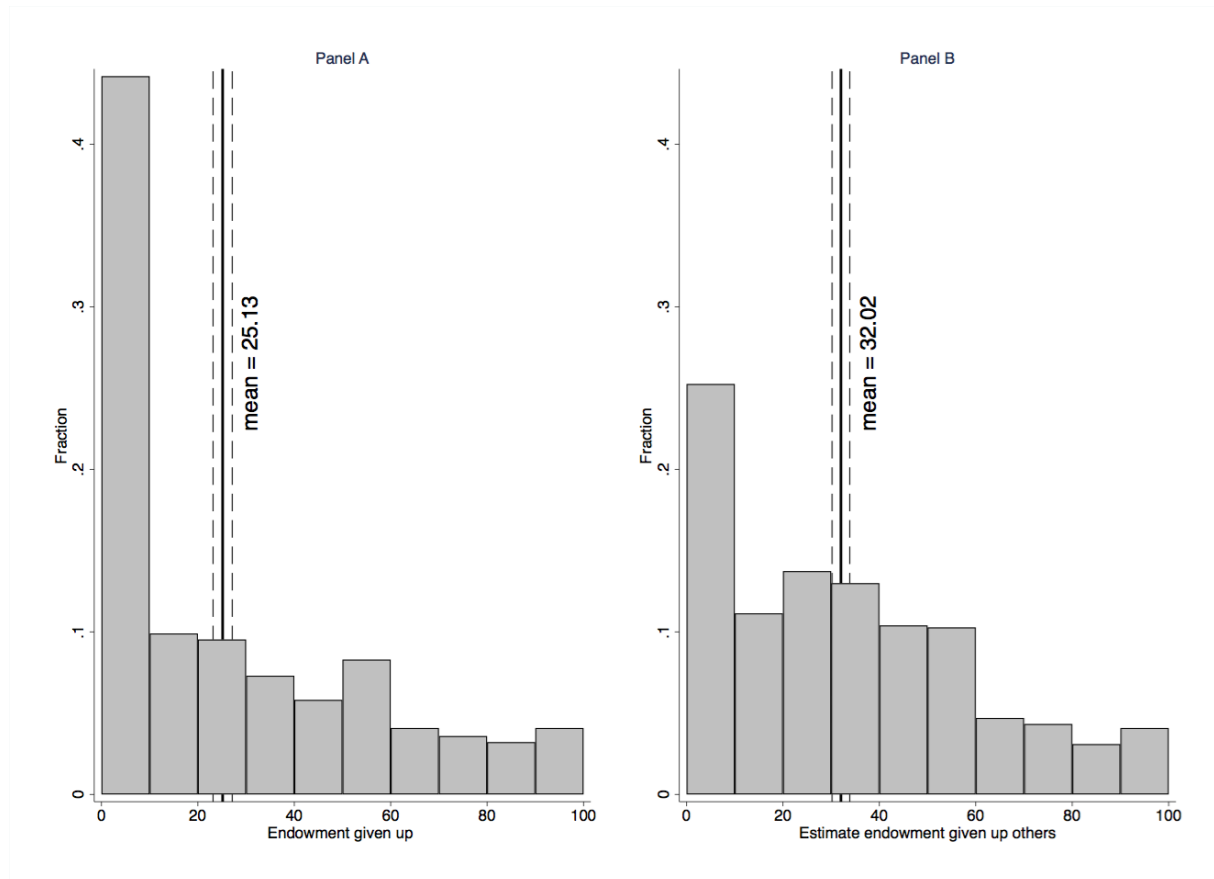

Figure 4: Teachers' Attitudes towards Caste and Food

Notes: Panel A and B present histograms of responses against preparation of mid-day meals by SC from 808 teachers assigned to the control condition. Panels A shows the amount teachers are willing to forego, whereas Panel B shows teachers' beliefs over other teachers doing the same. The vertical thick black line indicates the mean, whereas the dotted black lines indicate the 95 percent confidence interval of the mean.

In this question, any response below 100 indicates a willingness to forgo money to oppose this hypothetical policy. We also asked teachers to guess how other teachers in their state would have answered the same question. The responses to this question were incentivized. Five teachers whose answers were closest to the average response of all teachers from their state were paid an additional INR 500 (approximately $6 USD). This approach enables us to capture the prevailing norm in the state.

Figure 4 presents responses to the first two questions. Panel A shows the histogram of the INR 100 endowment that the teachers were willing to forego to avoid the hypothetical policy. On average, teachers are willing to forego a quarter of their endowment, with 20% of the teachers expressing a willingness to give up more than half. Panel B presents results on teachers' beliefs about their colleagues' willingness to give up their endowment. The average turns out to be 32, which is slightly larger than the teacher's own willingness to forego the endowment. These results suggest that teachers are not only themselves willing to forego money to prevent an SC cook from preparing mid-day meals, but also believe that other teachers are willing to do the same, even when the policy is hypothetical. This implies that teachers are likely to experience a psychological disutility at the mere thought of an SC person preparing meals.

Subsequently, in a non-incentivized question, we further asked teachers to state whether they agree with the following statement:

It is good for schools to have a social norm in which SC and upper-caste students sit separately during meal times.

We expected all teachers to disagree because it violates the law on caste-based discrimination. However, we find that 12% of the teachers agreed with the statement and another 10% were neutral. This means, almost a quarter of the teachers did not disagree with separating SC and GC children during meal times. These results suggest that caste-related notions of purity and pollution in preparation and serving of food remain prevalent among a significant fraction of teachers.

IV.B.   Cognitive skills

Teachers may perceive that SC children have lower cognitive skills than GC children. We assess this using incentivized questions covering both literacy and numeracy skills:

In an assessment of reading (mathematical) skills of 8-11-year-old in Madhya Pradesh conducted by the Indian Human Development Survey, 72 (46)% of the GENERAL CATE-GORY children could read (divide or subtract). What percentage of SCHEDULED CASTE children do you think could read (divide or subtract) on the same test?

The five teachers whose answers are closest to the correct answer were paid an extra INR 500 (approximately $6 USD).
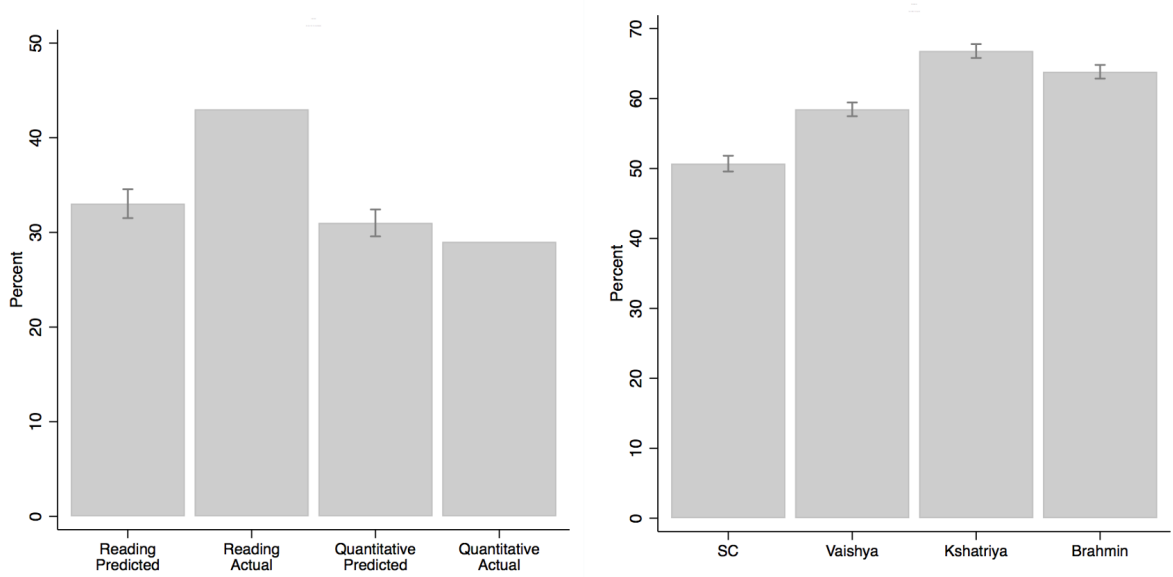
Figure 5: Teachers' Beliefs over Literacy and Numeracy Skills of SC Children.

Notes. In the left figure, bars 1 and 3 show the average share of 8-11 years old SC students teachers predict can read an entire paragraph, and divide or subtract, respectively. This is based on a sample of 808 teachers assigned to the control condition. Bars 2 and 4 show the actual share from the IHDS data. In the right figure, the bars show teachers' estimates on the likelihood of completing the program by students from different caste groups. The capped bars indicate 95% confidence intervals.

Figure 5 shows the results. The first two bars show the share of SC children who the teachers believe can read and the actual share, respectively. On average, teachers believe that 33% of SC students can read an entire paragraph, but the actual share is 46%. This means that teachers substantially underestimate the reading ability of SC children by 13% percentage points. The last two bars show the same for math ability: teachers believe that 30% of SC children would be able to subtract or divide, which aligns closely with the actual share of 29%, as indicated by the rightmost bar. Thus, teachers believe SC have poor cognitive abilities in language, a domain in which teachers grade exams in our correspondence study.

IV.C.   Non-cognitive skills

Teachers may perceive SC children to have lower non-cognitive skills than GC children. To assess this, we asked teachers to evaluate the following situation:

There is a new school program for students. This program requires students to engage in creative writing and analytical thinking tasks for 1 hour after school for one year. In your opinion, how likely are the following students to complete the program fully?

We presented teachers with four students whose names are easily identifiable with different castes: Manjhi (SC), Aggarwal (Vaishya), Jadeja (Kshatriya), and Trivedi (Brahmin).

The teachers were asked to assess each student's likelihood of completing the program: 0-20%, 20-40%, 40-60%, 60-80%, and 80-100%. Figure 6 shows the results: teachers believe that the likelihood of completing the program is 51% for the SC but 58-67% for the GC. This means that, among all caste groups, teachers believe that SC children are the least likely to complete the program. These findings imply that teachers hold negative priors on perseverance by SC children.
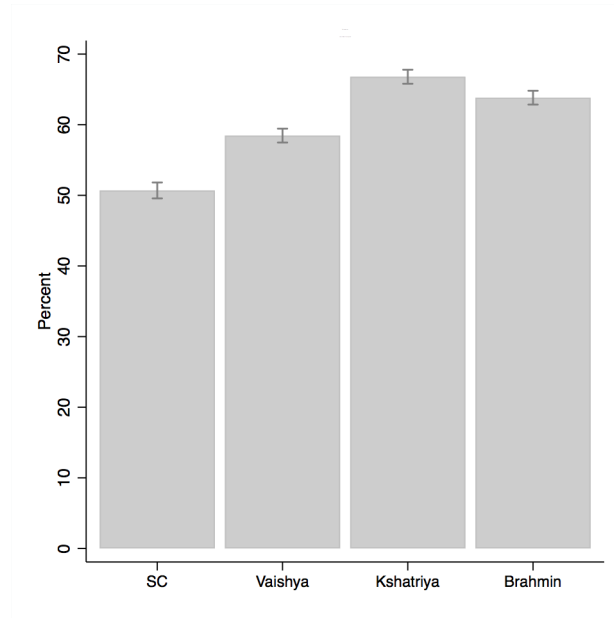

Figure 6: Teachers' Beliefs over Perseverance of SC Children.

Notes. The figure shows the mean and 95% confidence intervals on the teachers' estimates of the likelihood of completing the program by students from different caste groups. This is based on a sample of 808 teachers assigned to the control condition.

IV.D.   Assignment to Occupations

As discussed in Section II, the caste system assigned individuals to occupations. Of these, SC were often confined to occupations considered stigmatizing, polluting, and requiring the lowest skill. While the GC can sort into any occupation except priesthood (which is still largely the prerogative of Brahmins), the SC are usually expected to engage in occupations requiring menial work. We investigate whether teachers still adhere to these traditional caste-based occupations by asking them to assign individuals to one of four jobs, where all individuals hold the same qualification from the same university but vary in their caste, which is identifiable by their surname. The exact statement reads as follows:

There are four persons who are hardworking and have a first division in B.Com (Hons) from the University of Delhi. They are applying for 4 jobs: Businessman, Army Major, Priest, and Cobbler. Assign one person to each job.
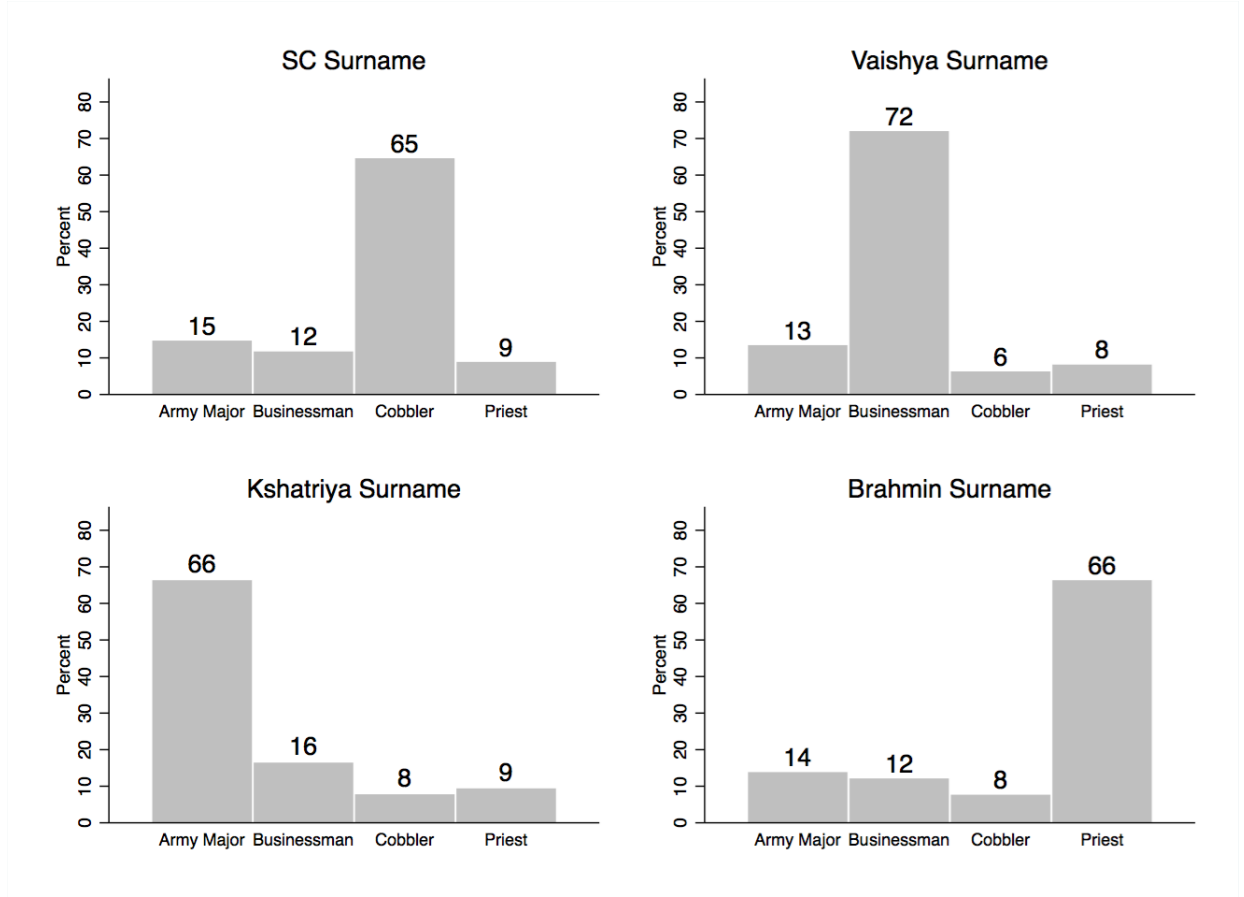
18

Figure 7: Caste and Occupational Assignment.

Notes. The bar graph indicates the proportion of jobs assigned to a particular caste name by teachers. This is based on a sample of 808 teachers assigned to the control condition.

Figure 7 shows the assignment of persons to different jobs by teachers. The results reveal a striking pattern consistent with traditional caste-based occupations. 67% of the teachers assign individuals with an SC surname to the occupation of a cobbler, 73% assign the Vaishya surname to a businessman, 65% assign the Kshatriya surname to an army major, and 66% assign the Brahmin surname to a priest. This adherence to caste-based occupations shows the extent to which attitudes shaped by the caste system are still prevalent, even among teachers, who are expected to be agents of change.

IV.E. Use of Caste Slurs

Since the SC surnames were traditionally associated with menial occupations, the GC began to use them in the form of slurs. The use of such caste slurs is deeply offensive and demeaning to individuals from the respective groups. Though using caste slurs is illegal in India under the Scheduled Castes and Scheduled Tribes Prevention of Atrocities Act (1989), their use is still prevalent. Teachers' tolerance for the use of caste slurs can normalize discriminatory language and behavior in schools, creating a hostile environment

for SC children. We assess teachers' tolerance for the use of caste-based slurs using a vignette study, in which we presented them with the following scenario:

A person was walking down the street after finishing work. A car drove by and splashed muddy water all over the person's clothes. A group of children who were playing nearby saw this and started calling the person Bhangi.

We then asked teachers to judge the behavior of children by choosing from the following options: (i) a harmless statement describing the appearance of a person; (ii) playful and joking behavior; and (iii) statements being derogatory to individuals and groups. Figure 8 shows the results from the vignette study.
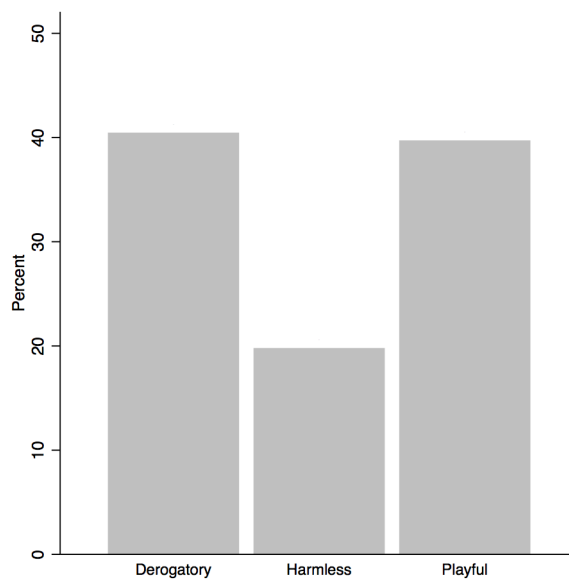

Figure 8: Teacher's Tolerance for the Use of Caste Slurs.

Notes. The bar graph indicates the percent of responses in each of the categories by teachers. This is based on a sample of 808 teachers assigned to the control condition.

20% of the teachers perceive caste slurs as harmless, while another 40% view them as playful behavior among children. This widespread tolerance among 60% of the teachers is astounding, given their authority and influence over student attitudes and the fact that the use of caste slurs are punishable offenses.

In summary, our results reveal that a significant fraction of teachers have negative attitudes toward SC children. We subsequently study whether these attitudes matter for discrimination in grading.

IV.F. Discrimination in Grading and Attitudes

We investigate whether teachers who hold stronger biased attitudes and beliefs toward SC individuals also exhibit higher discrimination in the grading of exams with the SC

surname. Table 4 presents the results, wherein our focus is on the coefficient on $SC \times$ *Low Quality.*

Incentivized measures of attitudes and beliefs.– We start with incentivized measures of attitudes and beliefs in Panel A. Columns 1-2 present results by the median split of teacher attitude toward SC preparing a mid-day meal at school. We find a strong difference by median split. Teachers with stronger negative attitudes give low-quality SC exams a lower grade by 0.50 standard deviations, which is statistically significant at the 1-percent level. In contrast, teachers with less negative attitudes give these exams a slightly lower grade by 0.11 standard deviations, which is not statistically significant. These findings suggest that teachers with more regressive attitudes toward meal preparation by SC penalize low-quality SC exams five times more than teachers with less regressive attitudes.

We perform a similar exercise using the median split of beliefs about the ability of SC children to read in columns 3-4 and in math in columns 5-6. Note that now being below the median implies more pessimistic beliefs. We find that teachers with more pessimistic beliefs about reading ability give low-quality SC exams a lower grade by 0.37 standard deviations, which is statistically significant at the 5-percent level. Though teachers with less pessimistic beliefs also give a lower grade to these exams by 0.11 standard deviations, the magnitude is three times smaller and statistically insignificant.[5] The corresponding estimates for teachers with more pessimistic beliefs about math ability turn out to be -0.26 standard deviations which is statistically significant at the 5-percent level, whereas for teachers with less pessimistic beliefs it is -0.16 standard deviations, which is statistically insignificant. These findings suggest that teachers with more pessimistic beliefs about the ability of SC students penalize low-quality SC exams 2-3 times more than teachers with less pessimistic beliefs.

Non-incentivized measures of attitudes and beliefs.– Panel B uses non-incentivized measures of attitudes and beliefs. Columns 1 and 2 present results by the median split of beliefs about non-cognitive abilities of SC children, specifically perseverance. Teachers with stronger pessimistic beliefs give low-quality SC exams a lower grade by 0.53 standard deviations, which is large in magnitude and statistically significant at the 1-percent level. The corresponding estimate for teachers with less pessimistic attitudes is less than half in magnitude at -0.19 standard deviations and is also statistically insignificant.

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[5]Approximately 16% of the sample falls exactly at the median value. Excluding these observations does not lead to any changes in the results.

Table 4: Discrimination in Grading and Attitudes

	Dependent variable: Standardized score given by teachers					
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A - Incentivized Attitudes and Beliefs					
	Midday Meal		Reading Ability		Math Ability	
	Median split		Median split		Median split	
	Below	Above	Below	Above	Below	Above
SC × Low Quality	-0.107	-0.498	-0.368	-0.109	-0.262	-0.163
	(0.130)	(0.143)	(0.134)	(0.140)	(0.137)	(0.131)
N	794	820	948	666	816	798
R^2	0.21	0.20	0.14	0.28	0.22	0.19
	Panel B - Non-Incentivized Attitudes and Beliefs					
	Non-Cognitive		Occupation		Caste Slur	
	Median split		SC - Cobbler		Acceptable	
	Below	Above	Yes	No	Yes	No
SC × Low Quality	-0.531	-0.189	-0.241	-0.314	-0.078	-0.657
	(0.139)	(0.130)	(0.118)	(0.156)	(0.126)	(0.143)
N	798	816	1044	570	962	652
R^2	0.21	0.19	0.19	0.24	0.19	0.22

Notes: OLS estimates with robust standard errors in parenthesis. This is based on a sample of 808 teachers assigned to the control condition. Panel A reports results by the median of incentivized measures of attitudes and beliefs. In columns 1-2, Mid-day meal is the attitude of teachers towards SC preparing midday meal at school. In columns 3-4 and in 5-6, Reading Ability and Math Ability is the belief of teachers about the ability of SC children to read a paragraph and divide or subtract, respectively. Panel B reports results using non-incentivized measures of attitudes and beliefs. In columns 1-2, Non-Cognitive refers to the difference in the belief of teachers about perseverance by GC and SC children. We present results using the median split of this variable. Columns 2-3 report results by whether teachers assign SC to cobbler job or not. Columns 5-6 report results by the use of caste slurs by acceptable or not by teachers. All columns include the following control variables and fixed effects: language of the exam, state of residence, caste, religion, age categories, gender, education, experience, urban, government sector, state of birth, and proficiency in Hindi and English language.

Columns 3-4 uses attitudes related to caste specific occupations. It shows that teachers who assign SC individuals to cobbler vs other occupations give low-quality SC exam a lower grade by 0.24 and 0.31 standard deviations. These coefficients are comparable in magnitude and are also statistically significant at the 5 percent level. This result, however, suggests that there is no discrimination in grading by attitudes towards caste-based occupation.

Finally, in columns 5-6, we perform a similar exercise using teacher attitude toward the use of caste slur in the vignette. Teachers who find the use of caste slurs acceptable give low-quality SC exams a lower score by 0.08 standard deviations, but it is not statistically significant. In contrast, teachers who are find the use of caste slurs derogatory give a low-quality SC exam a much lower score by 0.66 standard deviations, which is statistically

significant at the 1-percent level. These results are counterintuitive and not in line with results obtained using other attitudes and beliefs.

Overall, we find that four out of six measures of attitudes and beliefs have negative association with grading exams, for one attitude there is no association, and for one attitude a counterintuitive positive association. As such, results from incentivized measures present a clear pattern: teachers with more pessimistic attitudes and beliefs penalize low-quality SC exams 2-5 times more than teachers with less pessimistic attitudes and beliefs. However, results from non-incentivized attitudes and beliefs present a mixed evidence. One possible explanation is that unlike incentivized measures, non-incentivized measures may be prone to social desirability. To the extent teachers with more regressive attitudes and beliefs are the ones who yield more to desirability the association will become counterintuitive. This is a concern also raised by Guiso, Sapienza and Zingales (2011) with respect to the survey measures of cultural attitudes, who note that "One issue with these specific measures is that people may have poor incentives to reveal their true values...Furthermore, it is plausible that those who lie to the interviewer are precisely the ones with lower civic values." Despite this, the overall pattern suggests that teachers with more pessimistic attitudes and beliefs are also the ones who discriminate the most.

V. Empathy and Discrimination

Mitigating caste-based discrimination is challenging given the attitudes and beliefs we find. Changing these is likely to involve a long-term costly intervention to bring about a meaningful change.[6] Therefore, it is crucial to understand what other mental processes could underlie such a change. One possibility discussed in the literature involves invoking latent empathy. We examine the role of empathy in mitigating caste-based discrimination through a proof-of-concept experiment. Our purpose here is to shed light on a crucial ingredient that could be used as an input in designing policies to mitigate discrimination.

The literature in psychology, neuroscience, and economics defines empathy as sharing others' feelings by putting oneself in their shoes (Batson et al., 1991; Singer and Fehr, 2005; Andreoni and Rao, 2011). Empathy has neurological foundations: the same affective brain circuits are activated both when individuals themselves feel pain and when they observe others in pain (Preston and De Waal, 2002). Crucially, the levels of empathy vary between individuals (Singer et al., 2004), influencing the prospect of mitigating discrimination. In view of these findings, empathy might be a plausible mental process, but we know little about its scope in alleviating discrimination (Batson, 2017). Testing the scope of empathy in an experiment poses two main challenges: (a) how to build empathy?, and (b) how to measure empathy?

We design a treatment that encourages teachers to understand the perspective of a

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[6]For example, the intervention by Dhar, Jain and Jayachandran (2022) lasted two years.

stigmatized group and recognize the harm and pain inflicted on them by members of their group. To achieve this, we aim to *activate* latent empathy among teachers, which in turn is expected to mitigate discrimination in grading. We measure the empathy of all teachers at baseline, before randomly assigning them to either the control or treatment group (see Table 1) using the Questionnaire of Cognitive and Affective Empathy (QCAE) survey by Reniers et al. (2011).

V.A.   Treatment Design

Research suggests that images, movies, and documentaries can invoke empathy even when the other person is a stranger, particularly when individuals have experienced a similar situation (see for instance, Batson et al., 1997; Andreoni and Rao, 2011; Singer and Fehr, 2005). Accordingly, we employ animated stories as a tool to evoke empathy. We presented animations with distinct narratives to the treatment group and a placebo to the control group. These narratives were embedded in a hospital setting rather than in education to reduce the scope of demand effect on teachers.

Treatment Group.–   The teachers in the treatment group read two short animated stories. Figure A.3 presents screenshots of these animations, which we summarize in the order in which they were presented:

- The first animation depicts an Indian doctor with a GC (Brahmin) surname who faces discrimination at a hospital in a western country due to his origin. The GC doctor laments that despite being the best surgeon in the hospital, he is still judged based on his origins rather than his achievements. The animation then highlights that this is not an isolated case, citing evidence from the Association of Physicians of Indian Origin, which notes widespread discrimination against Indian doctors in the UK. This scenario is based on publicly available information from the website of the association. [7] Teachers were required to answer control questions to confirm that they had read and understood the animation.

- The second animation depicts a doctor with an SC surname facing discrimination in a hospital in India due to his caste. The SC doctor laments that despite being the best surgeon in the hospital, he is still judged based on his caste rather than his achievements. The animation then highlights that this is not an isolated case, citing evidence from the Democratic Association of Doctors, which documents widespread discrimination against SC doctors in India. This scenario is based on publicly available information from the website of the association.[8] As before, teachers were

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[7](https://www.bapio.co.uk).

[8]`(https://www.thebetterindia.com/171813/tamil-nadu-doctors-collective-neet-exam-student-rights/)`.

asked control questions to ensure they had read and understood the animation.

By juxtaposing the two scenarios, the treatment aims to operationalize Batson's three-step empathy framework. First, it encourages GC teachers to adopt the perspective of individuals who experience arbitrary discrimination, such as the GC doctor in the first animation, thereby fostering an empathetic response. Second, the empathy evoked for the GC doctor is extended to the SC doctor in the second animation, as teachers are prompted to recognize the harm and pain inflicted by caste-based discrimination in India. Third, this recognition is intended to generalize into greater concern for the welfare of SC individuals and more objective evaluations of individuals' abilities and capabilities.

Control Group.– The control group teachers read an animated story depicting a normal hospital scenario without any mention of caste identities or discrimination (see Figure A.3).

Survey on Social Desirability.– Given the sensitive nature of caste-based discrimination, it is plausible that a part of the treatment effect is due to social desirability, that is, teachers act in ways they believe aligns with researchers' expectations. To account for this potential confounding factor, we measure a teacher's susceptibility to social desirability using the Crowne-Marlowe Desirability Scale (Crowne and Marlowe, 1960), which has been widely used and validated in previous studies (see Dhar, Jain and Jayachandran, 2022). The survey to measure social desirability was implemented at baseline, before teachers were randomly assigned to the control or treatment group.

V.B. Results

Does treatment reduce discrimination? To test whether our intervention alleviated discrimination in grading, we first look at the descriptive results in Figure 3. In the left panel, the distributions of grades on high-quality exams between SC and GC appear similar in the treatment group. Crucially, in the right panel, now the distributions of grades on low-quality exams between SC and GC are also similar in the treatment group. When we compare these findings with those from the control group, a clear pattern emerges: the large gap in the control group in grades between low-quality SC and GC exams disappeared in the treatment group. These results suggest that empathy might be a useful mental process to explore in reducing discrimination in our context.

We test this formally by estimating the equation 1 for teachers assigned to the treatment group. Table 5 reports the results. The coefficient on the SC exam (with high quality) ranges from 0.057 - 0.07, but is never statistically significant. There is no difference in this coefficient between the treatment and control groups (p-value = 0.27).

In contrast, the coefficient on the interaction term, *SC × Low Quality* ranges from -0.002 to -0.008. These estimates are close to zero in magnitude and are always statistically insignificant. The result remains robust to the inclusion of controls in columns 2-5.

Table 5: Discrimination in Grading by Caste: Treatment Group

	Dependent variable: Standardized score given by teachers				
	Exam & State FE	Caste & religion	Other characteristics	State of birth	Language fluency
	(1)	(2)	(3)	(4)	(5)
SC × Low Quality	-0.008	-0.002	-0.006	-0.003	-0.003
	(0.087)	(0.087)	(0.088)	(0.088)	(0.088)
SC	0.065	0.057	0.070	0.067	0.068
	(0.060)	(0.060)	(0.060)	(0.060)	(0.060)
Low Quality	-0.811	-0.809	-0.804	-0.807	-0.806
	(0.065)	(0.065)	(0.066)	(0.066)	(0.066)
R^2	0.16	0.17	0.18	0.18	0.18
Number of teachers	925	925	925	923	923
Observations	1850	1850	1850	1846	1846

Notes: OLS estimates with robust standard errors in parentheses. Controls are introduced sequentially across Columns 1–5. Column 1 controls for the language of the exam and the state of residence. Column 2 adds controls for the caste and religion of teachers. Column 3 further incorporates teacher characteristics such as age, gender, level of education, experience, private school employment, and urban residence. Column 4 introduces teacher's state of birth, while Column 5 includes self-reported proficiency in Hindi and English.

Using the specification in column 5, which includes the full set of controls and fixed effects, we compare the coefficient on the interaction term, *SC × Low Quality*, in treatment and control group in Figure 9. The left-hand side of the figure shows that in the full sample of teachers, the coefficient on the interaction term in the treatment group (-0.003) is significantly different from its counterpart (-0.29) in the control group (p-value = 0.026). These results suggest that our treatment effectively mitigated the large discrimination in grading observed in the control group.

Since our treatment primarily targets GC teachers and they are also the ones who discriminate the most, we examine whether they responded favorably to the treatment. The right-hand side of Figure 9 shows that the coefficient on the interaction term in this sub-sample is -0.24, which is half the magnitude of -0.57 in the control group; the difference is also statistically significant (p-value = 0.08).
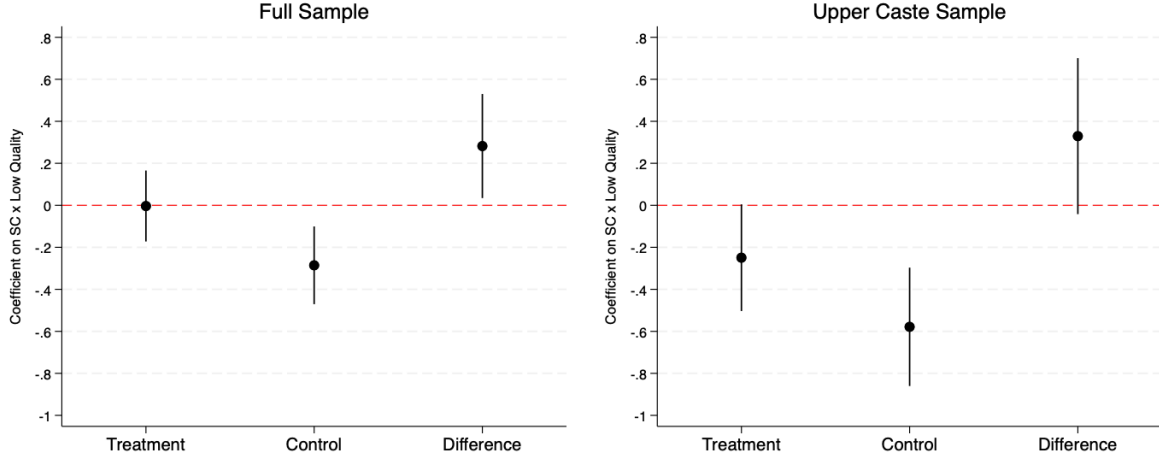
Figure 9: Coefficient on *SC × Low Quality* in Treatment and Control Group

Notes. The figure plots the coefficient on the interaction term, *SC × Low Quality*, after controlling for our full set of controls and fixed effects outlined in the notes of Table 3. The figure on the left hand side is based on the full sample of 1733 teachers, whereas the figure on the right hand side is based on the sample of 745 upper caste teachers (Brahmins and Kshatriyas). The difference indicates the difference in coefficient on the interaction term between the treatment and control group. The capped bars indicate 95 percent confidence bands.

We also explore the possibility that our treatment shifted attitudes and beliefs. As mentioned before, these attitudes and beliefs appear to be deep-seated, so we believe that shifting these would require a long-term intervention. Indeed, we find that there is no effect of treatment on most attitudes and beliefs of teachers; the only exception is occupational assignment of SC to cobbler, which declines in the treatment group (see Figure A.5).

Results by Baseline Empathy.– We provide further evidence on the importance of empathy in driving the positive effect of treatment in alleviating discrimination in grading. To do so, we present the results separately for teachers whose empathy scores fall above and below the median. Since empathy was measured before the treatment was assigned, we expect the treatment to interact with pre-existing differences in empathy, such that teachers with empathy scores above the median react more favorably to the treatment. Figure 10 presents the results, wherein we focus on the coefficient on the interaction term. Three patterns are noteworthy.

- First, in the control group, the coefficients on *SC × Low Quality* are similar for teachers with empathy scores above the median (-0.29, s.e. 0.12) and below the median (-0.27, s.e. 0.15). Both coefficients are negative and individually statistically significant, but are not significantly different from each other. This result suggests

that in the absence of activation, pre-existing differences in empathy do not lead to differences in discrimination.

- Second, in the treatment group, for teachers with empathy scores above the median, the coefficient on $SC \times Low\ Quality$ declines significantly in magnitude from -0.29 in the control group to 0.02 in the treatment group (see left figure). The difference between these two coefficients is 0.30, which is both large in magnitude and statistically significant (p-value = 0.049). This result indicates that our treatment is effective in mitigating discrimination by teachers with higher baseline empathy.

- Third, in the treatment group, for teachers with empathy scores below the median, the coefficient on $SC \times Low\ Quality$ also declines, but by a smaller magnitude, from -0.27 in the control group to -0.12 in the treatment group (see right figure). The difference of 0.14 is statistically insignificant (p-value = 0.52) and half the magnitude of the effect observed for teachers with empathy scores above the median. This finding suggests that our treatment is less successful in mitigating discrimination for teachers with lower levels of baseline empathy.

Figure 10: Coefficient on $SC \times Low\ Quality$ Exam by Baseline Measure of Empathy in Treatment and Control Group

Notes. The figure plots the coefficient on $SC \times Low\ Quality$ after controlling for covariates and fixed effects outlined in the notes of Table 3. The left hand side shows results for teachers with above the median empathy, whereas the right hand side shows results for teachers with below the median empathy. The difference indicates the difference in coefficient on the interaction term between the treatment and control group. The capped bars indicate 95 percent confidence bands.

Overall, these results suggest that our treatment activates latent empathy among teachers with higher baseline empathy, who then respond more favorably to treatment, resulting in a reduction of discriminatory grading practices toward SC.

Our results show that the GC teachers discriminated more in the control group and our treatment was successful in reducing this discrimination. We now test whether empathy plays a critical role in reducing discrimination by this subgroup of teachers. Figure A.6 shows that the treatment effect is stronger for GC teachers with empathy scores above the median, whereas there is no significant effect for GC teachers with empathy scores below the median. This finding underscores the pivotal role of activating empathy in addressing caste-based discrimination in education.

Scope of Social Desirability.– It is plausible that our results are influenced in part by social desirability. To test this possibility, we split teachers into two groups using the median of social desirability score in the baseline survey. Figure 11 presents the results. In the control group, there is a small positive effect of social desirability on discrimination in grading. For teachers with social desirability above the median, the coefficient on $SC \times Low\ Quality$ is -0.224 (s.e. 0.158), whereas for teachers with social desirability below the median, the coefficient is -0.358 (0.122). The difference between these coefficients is 0.134 (s.e. 0.195), but it is not statistically significant (p-value=0.49). This pattern suggests that teachers with above the median social desirability discriminate slightly less in the control group.
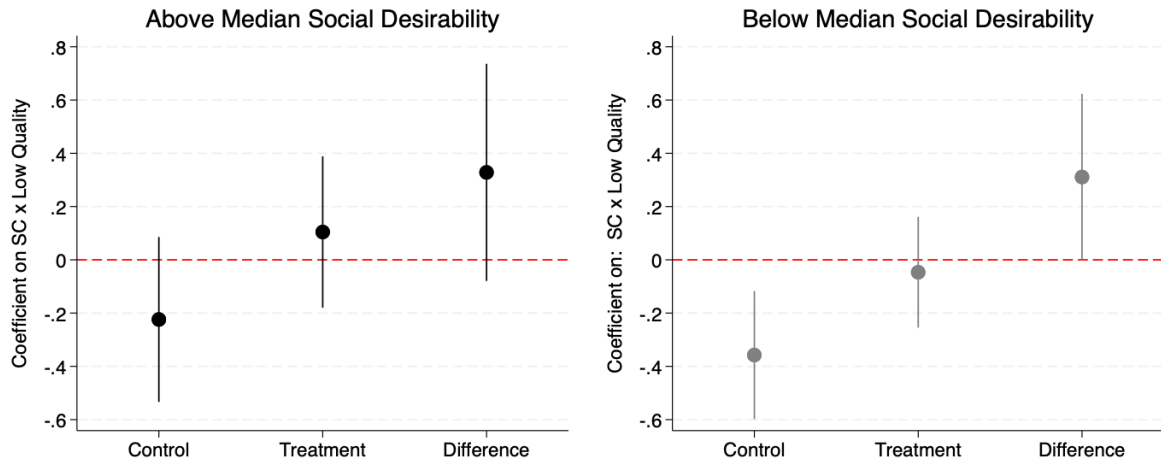

Figure 11: Coefficient on $SC \times Low\ Quality$ by Social Desirability in Treatment and Control Group

Notes. The figure plots the coefficient on $SC \times Low\ Quality$ after controlling for covariates and fixed effects outlined in the notes of Table 3. The left hand side shows results for teachers with above the median social desirability, whereas the right hand side shows results for teachers with below the median social desirability. The difference indicates the difference in coefficient on the interaction term between the treatment and control group. The capped bars indicate 95 percent confidence bands.

If social desirability were the primary driver of the observed reduction in discrimination, we would expect a larger marginal effect in the treatment group for teachers

with above-median social desirability. However, our findings indicate a similar effect for teachers above and below the median.

- First, for teachers with social desirability *above* the median, the coefficient on $SC \times$ *Low Quality* changes from -0.224 in the control group to 0.104 in the treatment group (see the left figure). The difference between these two coefficients is 0.328, which is large in magnitude and is marginally statistically significant (p-value = 0.114). This indicates that teachers with above the median social desirability discriminate less in the treatment group.

- Second, for teachers with social desirability scores *below* the median, a similar pattern emerges. The coefficient on $SC \times$ *Low Quality* changes from -0.358 in the control group to -0.047 in the treatment group (see the right figure). The difference of 0.311 is comparable to that observed for teachers with above the median social desirability and is statistically significant (p-value = 0.051). This suggests that teachers with below the median social desirability also discriminate less in the treatment group.

Together, these results suggest that social desirability does not play an important role in explaining the observed reduction in discrimination in the treatment group in our context. These findings align with the results reported by Dhar, Jain and Jayachandran (2022).

VI. Conclusion

Discrimination remains a major barrier to individual well-being, particularly when public service providers like teachers engage in such practice. In this study, we used a large sample of teachers to make three contributions. First, we conducted a correspondence study that revealed that teachers discriminate against SC by giving exams with the SC surname a significantly lower grade.

Second, we complemented the correspondence study with carefully elicited surveys, behavioral experiments, and vignettes to understand what attitudes and beliefs drive this discrimination and whether discrimination is systemic. Our findings indicate that many teachers exhibit pessimistic attitudes and beliefs towards SC individuals in many domains: preparation of midday meals, language ability, perseverance, occupation, and use of caste slurs. This has economic implications: teachers with more pessimistic attitudes and beliefs also discriminate more in grading of exams. These findings suggest that discrimination is systemic and underscore the importance of examining factors underlying behavior in correspondence studies.

Given the extent of negative attitudes and their association with discrimination grading, we explore the scope of empathy as a mental process to mitigate discrimination. We

implement a mechanism experiment designed to activate latent empathy among teachers. We find that discrimination in grading disappears in the treatment group and the effect is primarily driven by teachers with higher levels of baseline empathy. Our results should be seen as offering a proof-of-concept on the scope of activating latent empathy as a mechanism that could be used as an input in designing programs to test their role in combating discrimination in the long-run.

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ONLINE APPENDIX:

Discrimination by Teachers: Role of Attitudes, Beliefs, and Empathy

Rajesh Ramachandran   Devesh Rustagi   Emilia Soldani

Appendix A

I.   Study Design

Balance check.–   Table A.1 shows that control variables are balanced across teachers in the treatment and control group. All differences turn out to be very small in magnitude and are always statistically insignificant.

Table A.1: Balance check on Covariates by Treatment and Control Group

Variable	(1) Control group	(2) Treatment group	(3) Difference
Age	33.230	33.032	-0.198
	(8.193)	(8.440)	(0.401)
Female	0.380	0.357	-0.023
	(0.486)	(0.479)	(0.023)
Schedule Caste (SC)	0.061	0.062	0.001
	(0.239)	(0.241)	(0.012)
General Category (GC)	0.516	0.508	-0.008
	(0.500)	(0.500)	(0.024)
Hindu religion	0.824	0.809	-0.016
	(0.381)	(0.394)	(0.019)
Urban	0.418	0.443	0.025
	(0.494)	(0.497)	(0.024)
Experience	0.574	0.578	0.004
	(0.495)	(0.494)	(0.024)
Government school	0.082	0.089	0.007
	(0.274)	(0.284)	(0.013)
Hindi Proficiency	1.876	1.865	-0.010
	(0.388)	(0.399)	(0.019)
English Proficiency	1.844	1.838	-0.006
	(0.432)	(0.434)	(0.021)
Observations	808	925	1,733

Notes: Columns 1-2 show the means of key variables for teachers assigned to the control and treatment groups. In columns 1-2, the numbers in parentheses are standard deviations. Column 3 reports the difference in means between columns 2 and 1, whereby the numbers in parentheses are standard errors. Age is reported in 5-year age brackets and we take the midpoint to conduct the test. Female is an indicator variable, which is 1 for females, otherwise 0. Scheduled Caste (SC) is an indicator variable, which is 1 for Scheduled Caste, otherwise 0. General Category (GC) is an indicator variable, which is 1 for General Caste, otherwise 0. Hindu religion is an indicator variable, which is 1 if a person is Hindu, otherwise 0. Urban is an indicator variable, which is 1 if a teacher resides in a city, otherwise 0. Experience is an indicator variable, which is 1 if experience is more than 5 years, otherwise 0. Government school is an indicator variable, which is 1 if a teacher is working at a government school, otherwise 0. Hindi and English proficiency are measured on a scale of self-reported 0-2 points, where 0 is poor, 1 refers to neutral, and 2 refers to good.

Hindi Exams.– Figure A.1 shows Hindi exams of high and low quality.

Figure A.1: Paragraphs in Hindi of High (left) and Low (right) Quality

English Exams.– Figure A.2 shows English exams of high and low quality.

My name is Ram Chaturvedi.
My family has four members.
My father works in a private company.
My mother is a doctor.
My parents buy me presents.

My <u>name Ram</u> Chaturvedi.
My family <u>have</u> four member.
My father work in a <u>prevate companie</u>.
My mother <u>is dokter</u>.
My parents buy me <u>prisant</u>.

Figure A.2: Paragraphs in English of High (left) and Low (right) Quality

II. Results

Robustness.– Columns 1-2 of Table A.2 show that our results are robust to alternative standard errors. Column3 shows results for the sub-sample of GC teachers.

Table A.2: Discrimination in Grading in the Control Group:
Robustness Checks

	Dependent variable:		
	Standardized score given by teachers		
	Clustered on teachers	Clustered on teachers & state	GC sample
	(1)	(2)	
SC × Low Quality	-0.286	-0.286	-0.570
	(0.122)	(0.126)	(0.144)
SC	0.162	0.162	0.304
	(0.085)	(0.027)	(0.096)
Low Quality	-0.537	-0.537	-0.514
	(0.089)	(0.061)	(0.105)
Control variables	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes
Observations	1614	1614	696

Notes: OLS estimates with standard errors clustered on teachers in parentheses in column 1, on teachers and state of residence in column 2, and robust standard errors in column 3. Control variables and fixed effects include language of the exam, state of residence, caste, religion, age categories, gender, education, experience, urban, government, state of birth, and proficiency in Hindi and English language. In column 3, we restrict the sample to teachers from the highest general caste – Brahmins and Kshatriyas.

III. Treatment

FigureA.3 shows the animation that we showed to the teachers in the treatment group. Please note that teachers saw both animations. The animations were originally in Hindi and have been translated into English for the paper.

Figure A.3: Screenshots of Treatment Animation. Part 1: Discrimination of GC in the West

Figure A.3: Screenshots of Treatment Group Animation, Part 2: Discrimination of SC in India

FigureA.4 shows the animation that we showed to the teachers in the treatment group. The animation was originally in Hindi and was translated into English for the paper.

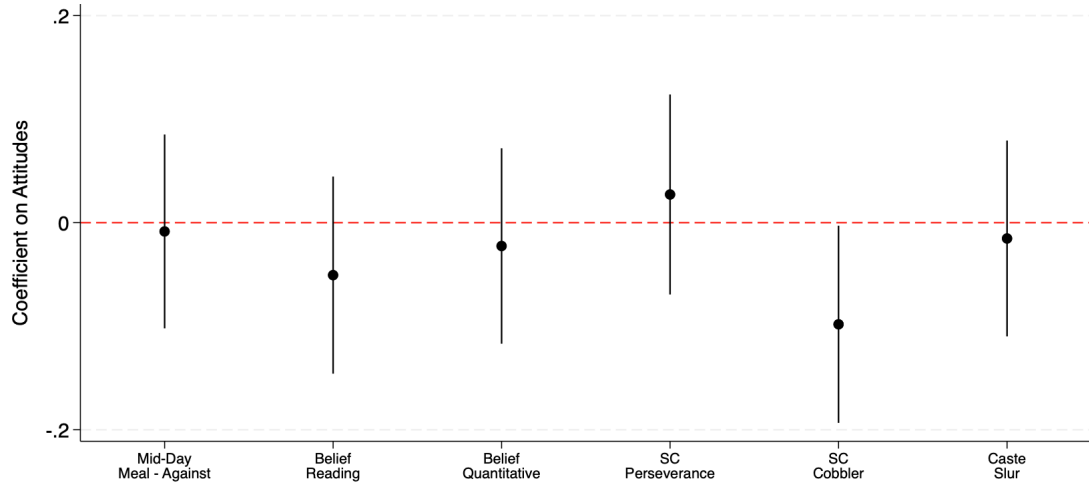Figure A.4: Screenshot of Control Group Animation

Figure A.5: Attitudes, Beliefs, and Treatment

Notes. The figure plots the coefficient from the regression of each attitude separately on an indicator for treatment, after controlling for our full set of controls and fixed effects outlined in the notes of Table 3. The capped bars indicate 95 percent confidence bands.

Heterogeneous Effect of Empathy by Caste.– FigureA.6 shows the effect of empathy by caste.

Figure A.6: Coefficient on *SC x Low Quality* Exam by Empathy in Treatment and Control Group: Upper Caste Sample

Notes. The figure plots the coefficient on *SC x Low Quality* after controlling for covariates and fixed effects. The capped bars indicate 95 percent confidence bands. The left hand side shows results for teachers with above the median empathy. The right hand side shows results for teachers with below the median empathy.