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

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Abstract

We investigate whether teachers discriminate against students from marginalized groups, what attitudes and beliefs underlie this discrimination, and whether empathy can mitigate it. A correspondence study with 1,700 teachers from India shows teachers assign lower grades to answers with lower caste surname. Many teachers have pessimistic views over ability, perseverance, occupational prospects, and ritual cleanliness of people from lower castes. Teachers with more pessimistic views discriminate more. An intervention to activate empathy eliminates discrimination, especially among teachers with higher baseline empathy. These results offer a proof-of-concept on mental processes that can serve as inputs in designing programs to reduce discrimination.

JEL: C90, I24, J15, J16, Z13

Keywords: Discrimination, Correspondence study, Caste, Attitudes, Beliefs, Empathy, India

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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 are in part due to 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, we know little about the attributes of teachers who discriminate: How do they perceive individuals from marginalized groups? What attitudes and beliefs do they have about such individuals? How do these attitudes and beliefs affect educational outcomes?(Bertrand and Duflo, 2017; Neumark, 2018; Rose, 2023). Without this information, it is difficult to know what fraction of teachers discriminate, what are their motivations, and how to counteract discrimination. If only a handful of teachers discriminate, then children from marginalized groups might be able to avoid discrimination by sorting into schools with less discriminatory teachers (Becker, 1957). 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 conduct in-depth surveys, behavioral experiments, and vignettes to elicit attitudes and beliefs of teachers toward individuals from marginalized groups, and examine how these map onto discrimination in grading. This allows us to highlight the "invisible elements" that are critical to understanding the extent of discrimination and its drivers (see Stantcheva, 2023). Third, we conduct a proof-of-concept experiment to understand the role of empathy as a mental process that could 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" or "High Caste" (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, officially designated as "Scheduled

Castes" or "Low Caste"(SC) (see Munshi, 2019). Data from nationally representative surveys show that SC children have the worst educational outcomes of all caste groups. On average, they score 15-20 percentage points lower than GC children 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.

We recruited a large sample of 1733 teachers from three north Indian states with large disparities in education by caste (Ramachandran, 2023). Participation in our study was voluntary and teachers were compensated monetarily (see List et al., 2008). First, we conduct a correspondence study in which we ask teachers, who are primarily from the GC group, to grade exams in two languages (Hindi and English) by children in the fifth grade. We randomly assign one exam with an SC surname and the other with a GC surname to indicate caste. Following Heckman, Lochner and Todd (2003); Bertrand and Mullainathan (2004), we vary the quality of the answers within each caste to obtain four conditions: high-quality GC, low-quality GC, high-quality SC, and low-quality SC. We randomly assign teachers to one of these four conditions. This means that each teacher grades two exams of the same quality by the same student, one in Hindi and the other in English.

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 answer as a benchmark, we find that Low-Quality GC answer receives a significantly lower grade, thereby confirming that teachers pay attention to the quality of the answers. Although the High-Quality SC answer receives a slightly higher grade, the difference is economically small and mostly statistically insignificant. However, the Low-Quality SC answer receives a lower score by 0.29 standard deviations and this difference is statistically significant at the 1-percent level.[1] These findings imply that teachers engage in discrimination when quality is low, which is in line with the findings of Heckman, Lochner and Todd (2003); Sarsons (2017); Shi

[1]We benchmark these estimates against some prominent studies on teachers and attitude change in India. For example, Muralidharan and Sundararaman (2011) find that 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. Dhar, Jain and Jayachandran (2022) find that classroom discussions made gender attitudes more progressive by 0.18 standard deviations.

and Zhu (2023).

Second, to shed light on the drivers of discrimination, we elicit teachers' attitudes and beliefs toward the SC in a variety of domains. We find that a large fraction of teachers have strongly negative attitudes and beliefs about SC, suggesting that discrimination is systemic. Specifically, teachers consider SC ritually unclean and are willing to forego money in an experiment to prevent them from preparing mid-day meals in schools and believe that other teachers will do the same. Teachers also significantly underestimate SC students' ability to read a paragraph and believe that they are less likely to persevere in completing an extracurricular school program. Moreover, two-thirds of teachers assign SC graduates to a low-skill job despite having the same education and grade as GC graduates. Finally, 60 percent of the teachers perceive the use of caste slurs as either a reflection of reality or as playful banter. These findings highlight that bias against SC individuals is surprisingly widespread even among public service providers like teachers. They are also remarkable because many of the professed attitudes and beliefs are punishable by law.

We examine whether these negative attitudes and beliefs toward the SC matter for discrimination in grading. Our results reveal that teachers with more pessimistic attitudes and beliefs discriminate 2-5 times more than teachers with less pessimistic attitudes. These findings underscore the importance of studying attitudes and beliefs, as they help us to underpin the determinants of discrimination by caste and, more broadly, in correspondence studies.

Third, we investigate the scope of empathy in mitigating discrimination through a proof-of-concept experiment. The literature in economics, psychology, and neuroscience defines empathy as the ability to understand and share the experiences of others. However, empathy is often latent and needs to be activated to produce results Batson et al. (1991); Singer and Fehr (2005); Andreoni and Rao (2011). According to these studies, images and movies can invoke empathy even when the other person is a stranger if they have experienced a similar situation. Accordingly, we show teachers from the treatment group *two* animations to activate empathy for the SC. 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 of the doctor and the statement "What is my life worth if everyone judges me based on my origins and not my achievements?" Our treatment aims to

foster cognitive empathy among teachers by helping them understand the perspectives of SC individuals and affective empathy by making them vicariously experience it.[2] In the control group, teachers see a health-related animation without making any mention of race, caste, or discrimination.

We find that discrimination in grading disappears in the treatment group. While the coefficients on *Low-Quality* and *SC* remain unchanged, the coefficient on *SC*×*Low-Quality* declines significantly, from -0.29 standard deviations in the control group to -0.003 standard deviations in the treatment group. To pin down empathy as the mechanism driving this result, we measured the empathy of each teacher before assigning them to the treatment and control group using a survey designed by psychologists Reniers et al. (2011). Our results reveal that teachers with higher baseline cognitive and affective empathy witness the strongest decline in discrimination in the treatment group. One possibility behind these results could be that empathy fosters prosocial behavior (see for instance Batson et al., 1991; Singer and Fehr, 2005) Consistent with this, we find that teachers with higher baseline empathy donate much more to a charity that supports the education of SC children, are also much more willing to set aside the notion of ritual purity in cooking, and find the use of caste slurs much more derogatory.

There is a possibility that the treatment alleviated discrimination without invoking empathy, in part because it shows an SC doctor, which may have prompted teachers to update their beliefs about the abilities and occupational potential of SC individuals. However, we find noisy evidence in support of this argument. Although the likelihood of assigning SC to a low-skill occupation actually decreases in the treatment group, there is no corresponding change in beliefs about ability or perseverance by SC children. Another possibility is that the treatment induces social desirability, which results in a decrease in discrimination. Following Dhar, Jain and Jayachandran (2022), we measure social desirability through a survey designed by Crowne and Marlowe (1960) and find that it cannot explain our findings.

Together, these results suggest that empathy may be an important channel in mitigating discrimination. Our purpose is not to show the long-lasting effect of an intervention. Rather, our findings should be seen as a proof-of-concept to identify

[2]Cognitive empathy refers to the ability to recognize and understand the mental state of others, whereas affective empathy is the ability to share the feelings of others, without any direct emotional stimulation to oneself (Reniers et al., 2011).

empathy as a "mental process" that can serve as input in designing and testing programs to reduce discrimination in the long run.

Our paper makes several contributions to the literature. We complement the extensive literature on discrimination observed in correspondence studies in several ways. First, we combine a standard correspondence study on discrimination in grading with a rich survey and experimental data on teacher attitudes and beliefs. This allows us to go beyond previous studies and understand how teachers perceive individuals from marginalized groups, shed light on the otherwise invisible drivers of discrimination, and show that discrimination is systemic (see Bertrand and Duflo, 2017; Neumark, 2018; Rose, 2023; Stantcheva, 2023).

Second, there is limited evidence in the literature on mitigating discrimination (see Bertrand and Duflo, 2017; Neumark, 2018). In a recent study, Carlana, La Ferrara and Pinotti (2022) focus on mitigating discrimination against children of immigrant backgrounds in Italy through tutoring and career counseling. Dhar, Jain and Jayachandran (2022) use an intervention based on classroom discussions on gender equality to reduce gender bias in northern India. We highlight the role of empathy as a potential mechanism that policy makers could leverage to address caste-based discrimination in India. In doing so, our study also contributes to the emerging literature on the role of empathy. Alan et al. (2021) use an educational program to foster cognitive empathy among school children in Turkey to show that it reduces peer violence and increases prosocial behavior among students. Our focus is on activating cognitive and affective empathy among teachers to mitigate discrimination toward SC and validating the findings through the survey measures of empathy.

Third, the paper relates to the studies that aim to improve educational outcomes in developing countries by targeting teachers. In these studies, the emphasis is on designing interventions to make teachers more effective in teaching Muralidharan and Sundararaman (2011) or to reduce teacher absenteeism (missing in action) (Duflo, Hanna and Ryan, 2012). Our focus is on mitigating caste-based discrimination by teachers, which can happen even when teachers are present in the school. In a related study with 120 teachers from India, Hanna and Linden (2012) document discrimination in the grading of art exams against students with GC (high caste) and OBC surnames, relative to students with a Brahmin surname (the highest caste). Our paper builds on this study by using a large sample of more than 1700 teachers to document discrimination in the grading of language exams against the SC, the most

marginalized group. Furthermore, we collect detailed data on the attitudes and beliefs of teachers to better understand the mechanisms underlying discrimination in grading. Finally, we conduct a mechanism experiment to explore potential strategies for mitigating caste-based discrimination.

The paper is organized as follows. Section II. provides a brief overview of the caste system in India and the construction of the sample. Section III. presents the design for the correspondence study and the results on discrimination in grading. Section IV. discusses the elicitation of attitudes and beliefs of teachers toward the SC, their prevalence in the sample, and association with discrimination in grading. Section V. presents the design of the empathy treatment to mitigate discrimination and the results, including potential channels. Section VI. offers concluding remarks.

II. Field Setting and Sample Construction

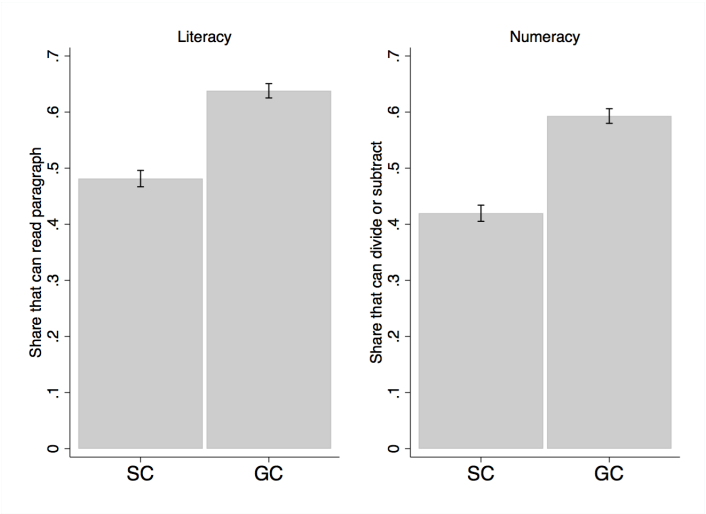
We begin with a brief overview of the caste system in India, followed by a description of the sample construction and data collection process.

II.A. Field setting

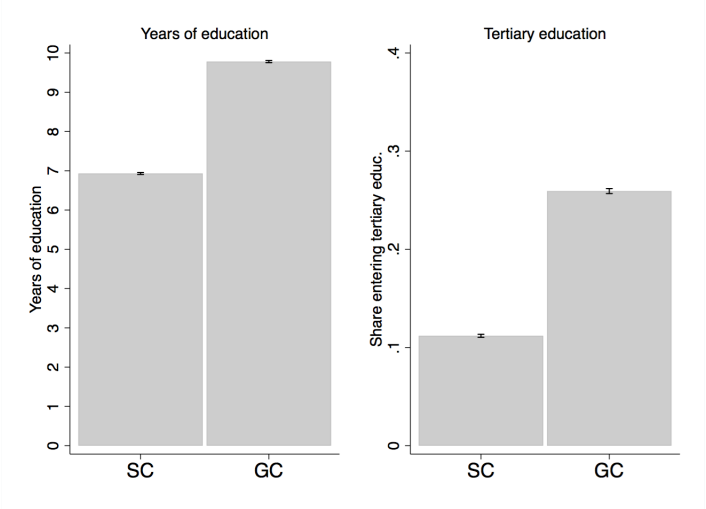
The Indian caste system stratifies people into four main *varnas* or groups: *Brahmins* (priests and teachers), *Kshatriyas* (warriors and rulers), *Vaishyas* (traders and merchants), and *Sudras* (laborers). A fifth group consists of people who were excluded from this system and classified as *untouchables*. 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 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 Sudras under the designation "Other Backward Castes (OBC)". The first three groups (Brahmins, Kshatriyas, Vaishyas) are not beneficiaries of the affirmative action program and are designated as General Category (GC).

Our focus is on discrimination against SC, who lag behind the GC in educational

attainment. Panel A of Figure 1a uses data from the Indian Human Development Survey (Desai, Vanneman and of Applied Economic Research, 2005; Desai, Vanneman and National Council of Applied Economic Research, 2011).



(a) Numeracy and Literacy



(b) Years of Schooling and Share Entering Tertiary Education

Figure 1: Educational Disparities Between SC and GC Children

Notes: (a) The bar graph in the top panel shows the mean proportion of 8-11-year-old children from SC and GC groups who can read an entire paragraph (left) and perform division and subtraction (right). (b) The bar graph in the bottom panel shows the average years of education (left) and the share entering tertiary education (right) among SC and GC individuals aged 15-49. The capped bars indicate 95% confidence intervals. Data in the top panel is from the Indian Human Development Survey I and II and in the bottom panel from the National Family Health Survey (NFHS-V, 2019-21).

It shows significant education gaps between SC and GC children. 64% of the GC children can read a paragraph and 59% can divide or subtract, but the corresponding share for the SC children is much lower, at 48% and 42%.

Figure 1b uses data from the National Family Health Survey (IIPS, 2021) to show large disparities in the 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% 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.

Anecdotal evidence suggests that these gaps are in part due to discrimination against SC children by teachers who are predominantly from GC groups. This discrimination could manifest itself in many forms, such as deliberate reduction in grades on exams answered by SC children, or segregation of GC and SC children at the time of serving midday meals, or seating arrangements in classrooms, such that SC children sit on the floor but GC children sit on chairs.[3] Our focus is on discrimination in grading.

II.B. Sample Construction

We recruited teachers from three northern states of India using a teacher consulting agency involved in teacher recruitment and placement in schools in India. Based on a pilot study conducted in two other northern states, we targeted a sample of more than 1,500 teachers. The agency invited all eligible teachers in their database from the three states to participate in an online survey. Teachers received 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 agency, ensuring that we had no direct interaction with the teachers. 1900 teachers participated in the study. We dropped 77 teachers who incorrectly answered the basic comprehension questions, and an additional 90 teachers

[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).

who completed the survey more than once.[4] This leaves us with a final sample of 1733 teachers. We used a stratified random assignment to assign teachers within each state to the control and treatment group. 47 percent of the teachers were assigned to the control group and the remaining 53 percent to the treatment group. Table A.1 shows that the teachers in the control and treatment groups are comparable in several important characteristics, such as age, gender, education, caste, religion, urban residence, experience, school type, and self-reported proficiency in Hindi and English.

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 on empathy and social desirability consisted of neutral questions used in psychology and did not mention caste, India, or discrimination. We discuss these in Section V. Teachers in the control group then viewed a placebo animation, while those in the treatment group saw two animations intended to mitigate discrimination. Afterward, both groups of teachers participated in a correspondence study on the grading of exams, followed by a survey on attitudes toward 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 of students from the 5th class. We keep the answer quality and the first name constant, and vary only the surname of the student to indicate caste. We selected surnames that are common within the state, making it easy for teachers to identify the student's

[4] Our results remain unchanged even if we include the teachers who answered basic comprehension questions incorrectly.

caste. Our approach mirrors the actual situation in primary schools, where exams are not graded anonymously, as teachers can see the student's name on the exam, and classes are mixed, with SC and GC children attending 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, 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 the quality. For instance, Bertrand and Mullainathan (2004) introduce high- and low-quality resumes to test whether quality alleviates employers' concern about the 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 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 answers to the exams: "low quality" set with a spelling or grammar mistake in each of the five sentences of the paragraph and "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 design, which we present in Table 2.

Table 2: Study Design

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

Notes: The table shows four conditions to which we randomly assigned teachers.

Conditional on state, we randomly assigned teachers to one of the four conditions. Each teacher grades two exams by the same student, one in Hindi and one in English, with answers of identical quality. The between-teacher design allows us to compare teachers who grade identical answers with the same first name, but some have a GC surname and the others have a SC surname.

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 about the failure to capture discrimination at the margin. Most students in India have little choice on which school to attend, as there is usually only one primary school in the village or its proximity. Even when there is a choice, 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 private schools, and knowing this, SC students also select such schools. We find no difference in grades awarded by private and public school teachers in our sample (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 further by comparing the grades given to high-quality and low-quality answers with a GC surname.

III.B. Empirical Specification

We estimate discrimination in grading using the following specification:

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

where $Grade_{icq}$ is the grade assigned by teacher i to an answer on the exam by student of caste $c \in \{SC, GC\}$ and of quality $q \in \{Low, High\}$. *Low Quality* is

an indicator for low quality answer, SC is an indicator for SC surname, $SC \times Low\ Quality$ is an interaction between indicators of SC surname and *Low Quality*. X_i is vector of controls that includes the language of the exam (Hindi or English), the state in which the teacher resides, and characteristics of the teacher such as age, gender, education, caste, religion, experience, urban residence, school type, state of birth, and self-reported proficiency in Hindi and English language. The omitted category is a high-quality answer with the GC surname. β_1 captures the difference in grade when the answer is of low quality and with a GC surname, β_2 captures the difference in grade when the answer is of high quality and with an SC surname, and β_3 captures the marginal effect when the answer is of low quality and with an SC surname.

If teachers care about the quality of the answers and pay attention to it while grading, then we expect β_1 to be negative. If teachers discriminate toward SC regardless of answer quality, as in the results of Bertrand and Mullainathan (2004), we expect both β_2 and β_3 to be negative. However, if teachers rarely observe high-performing SC students, then they may exhibit positive discrimination towards high-quality answers, 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.– Figure 2 shows the cumulative distribution function (CDF) of the grades given to exams with the SC and GC surnames, separately by the quality of the answer. The figure on the left-hand side of Panel A shows that when the answer quality is high, the pattern is noisy because the distributions cross each other, especially after the score of 8. However, the figure on the right-hand side in Panel A shows that when the answer quality is low, the grade on exams with the 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 quality is low, but not when quality is high.

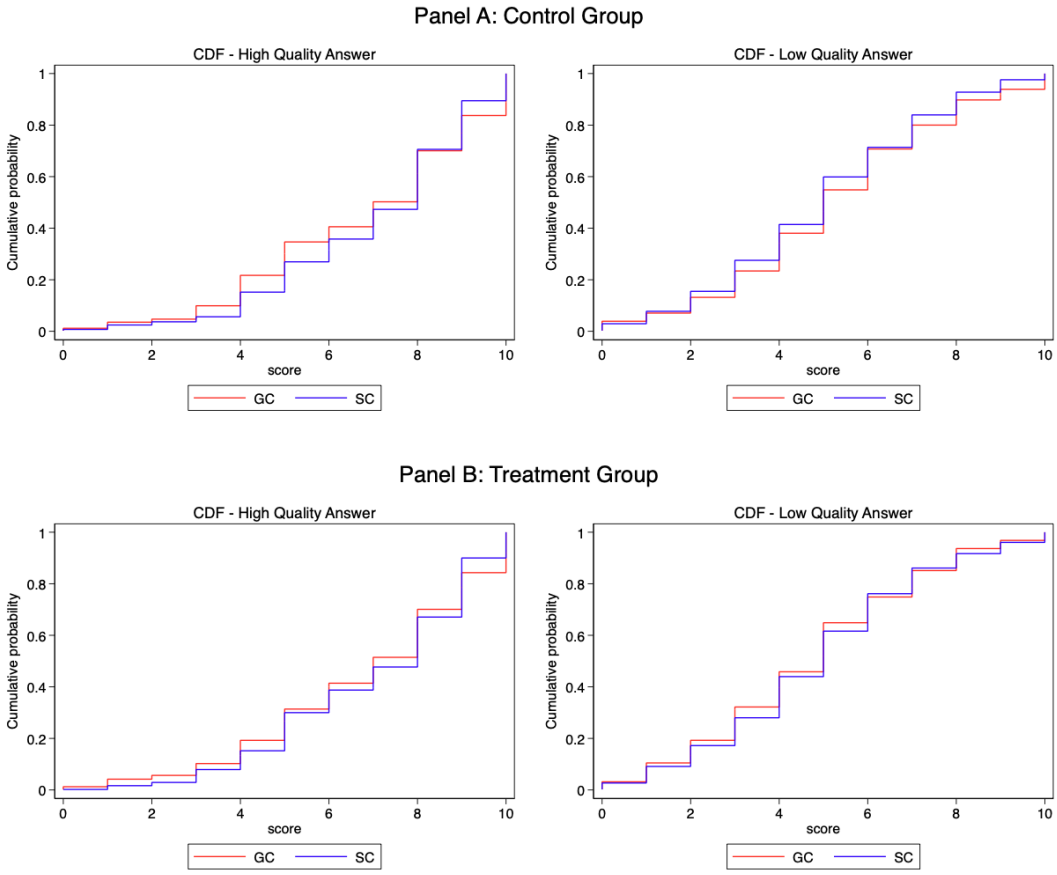


Figure 2: Cumulative Distribution Function (CDF) Plot of Grades Given by Teachers by Answer Quality.

Notes. The figure shows CDF of grades given on answers with SC (black) and GC (red) surname in the control group in Panel A and treatment group in Panel B. The panels on the left hand side show the CDF when the answer quality is high. The panels on the right hand side show the CDF when the answer quality is low.

Regression results.– We test whether these patterns are statistically significant and robust to the inclusion of control variables. Table 3 shows the results of the estimation of equation 1 using an ordinary least squares (OLS) regression. For ease of interpretation, we standardize the grades awarded to have a mean 0 and a standard deviation of 1. The omitted category is the high-quality answer with 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 by 0.58 standard deviations, a difference

that is statistically significant at the 1-percent level. This result confirms that the teachers paid attention to the quality of the answers while grading. Second, the *SC* surname (high quality answer) receives a slightly higher score by 0.1 standard deviations, but this difference is not statistically significant. Third, the interaction term, *SC* × *Low Quality*, receives a lower score by 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 answer. These results are in line with those reported by Heckman, Lochner and Todd (2003); Sarsons (2017); Shi and Zhu (2023).

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 with robust standard errors in parentheses. 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 includes other teacher characteristics like age, gender, education, experience, government school, and urban residence. Column 4 controls for the teacher's state of birth and Column 5 for self-reported proficiency in Hindi and English.

We test whether our results hold when we introduce control variables sequentially in columns 2-5. In column 2, we include controls for the caste and religion of teachers. In column 3, we control for other teacher characteristics: age, gender, education, experience, whether they work in a private or government school, and urban residence. 25 percent of the teachers in our sample were born in a state that is different from their residence state, so we control for the state of birth in column 4. Finally, we control for self-reported proficiency in Hindi and English language in column 5. The introduction of these controls leads to a small decline in the coefficient on *Low Quality*, but it remains negative and statistically significant. In contrast, the coefficient on

SC surname increases in magnitude to 0.16 and is now statistically significant at the 5-percent level. The coefficient on *SC* × *Low Quality* 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 the answer quality is low is close to twice the absolute magnitude of the reward they receive when the answer 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 answer 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).[5]

A key advantage of our study is that we know the caste of teachers.[6] 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* × *Low Quality* increases two times in absolute magnitude, from -0.286 in the full sample to -0.570 in the upper caste sample. These results suggest that the discrimination in grading is primarily driven by upper caste teachers.

IV. Attitudes and Beliefs of Teachers Toward SC

We go beyond the reduced-form evidence from correspondence studies and investigate whether teachers have biased attitudes and beliefs toward SC individuals and whether these biases drive discrimination in grading. Anecdotal evidence suggests that teachers discriminate across various 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.

[5]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 conduct a randomization inference test with 5000 replications.

[6]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. Most teachers provided their emails bearing first and last names, from which we could infer if the reported caste is the same as in the surname in the email. We find no evidence of misreporting.

IV.A. Incentivized Measures

Ritual Purity.– A key aspect of the caste system is its emphasis on ritual purity. This is enforced by preventing SC individuals from preparing food and by segregating SC children from GC children during mealtimes at school. To elicit attitudes in this domain, we asked teachers to evaluate the situation below:

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 INR for your indicated level of support. For example, if you choose 0 you will be paid INR 0; if you choose 10 you will be paid INR 10, etc.

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 answer the same question. The responses to these questions 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 3 presents the results. 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% expressing a willingness to give up more than half. Panel B presents results on teachers' beliefs about their colleagues' willingness to give up part of their endowment. The average reported amount is 32, which is slightly higher than the teacher's own willingness to forego the endowment. These results suggest that teachers are not only personally willing to forego money to prevent an SC 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 psychological disutility at the mere thought of an SC person preparing meals.

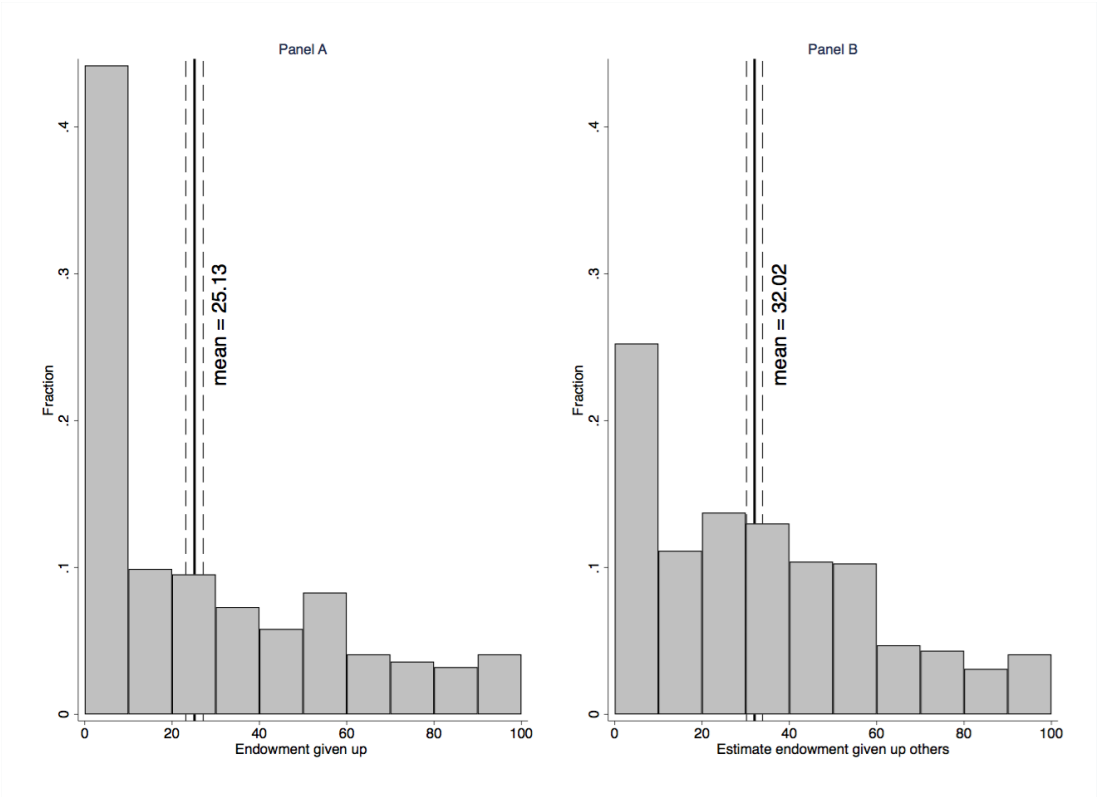


Figure 3: Teachers' Attitudes towards Caste and Food

Notes. The figure presents histograms of responses opposing preparation of midday meals by SC. Panel A (left) shows the amount teachers are willing to forego, whereas Panel B (right) 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.

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 GC students sit separately during meal times.

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

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 (math) skills of 8-11-year-old in Madhya Pradesh conducted by the Indian Human Development Survey, 72 (46)% of the GENERAL CATEGORY 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).

The left-hand side of Figure 4 shows the results. 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. Concerning math ability, teachers believe that 30% of SC children would be able to subtract or divide, which is closely aligned with the actual share of 29%. Thus, teachers believe that SC have poor cognitive abilities in language, a domain in which teachers grade exams in our correspondence study.

Non-cognitive skills.– Teachers may perceive SC children to have lower non-cognitive skills than GC children. We asked teachers to assess the 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 present 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%. The right-hand side of Figure 4 shows the results: Teachers believe that the likelihood of completing the program is 51% for the SC but 58-67% for the GC. These findings indicate that teachers believe that SC children are the least likely to complete the program, suggesting pessimistic priors over perseverance by SC children.

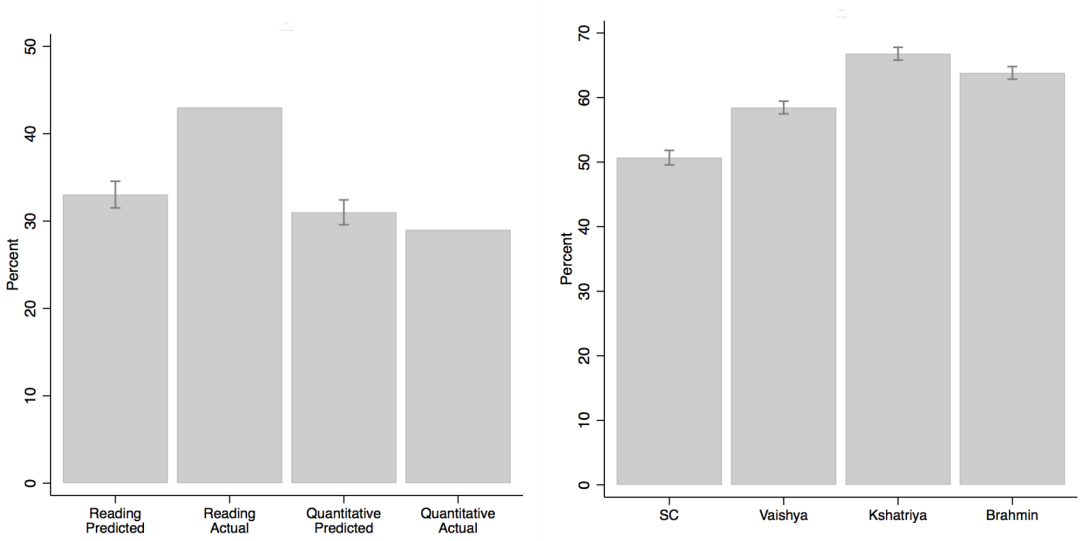


Figure 4: Teachers' Beliefs over Cognitive and Non-Cognitive Skills of SC Children

Notes. On the left-hand side figure, bars 1 (Reading-Predicted) and 3 (Quantitative-Predicted) show the average share of 8-11 years old SC students predicted by teachers to read an entire paragraph and divide or subtract, respectively. Bars 2 (Reading-Actual) and 4 (Quantitative-Actual) show the actual share from the IHDS data. On the right-hand side figure, the bars show teachers' estimates on the likelihood of completing an extracurricular program by students from different caste groups. The capped bars indicate 95% confidence intervals.

Assignment to Occupations.– The caste system historically assigned individuals to specific 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 continue to adhere to these traditional caste-based occupations by asking them to assign individuals to one of four jobs, where all individuals have identical qualification from the same university but differ in caste, as indicated 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.

Figure 5 reveals a striking pattern consistent with caste-based occupations. 67% of the teachers assign individuals with an SC surname to a cobbler, 73% assign those with a 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 highlights the extent to which attitudes shaped by the caste system are prevalent among teachers.

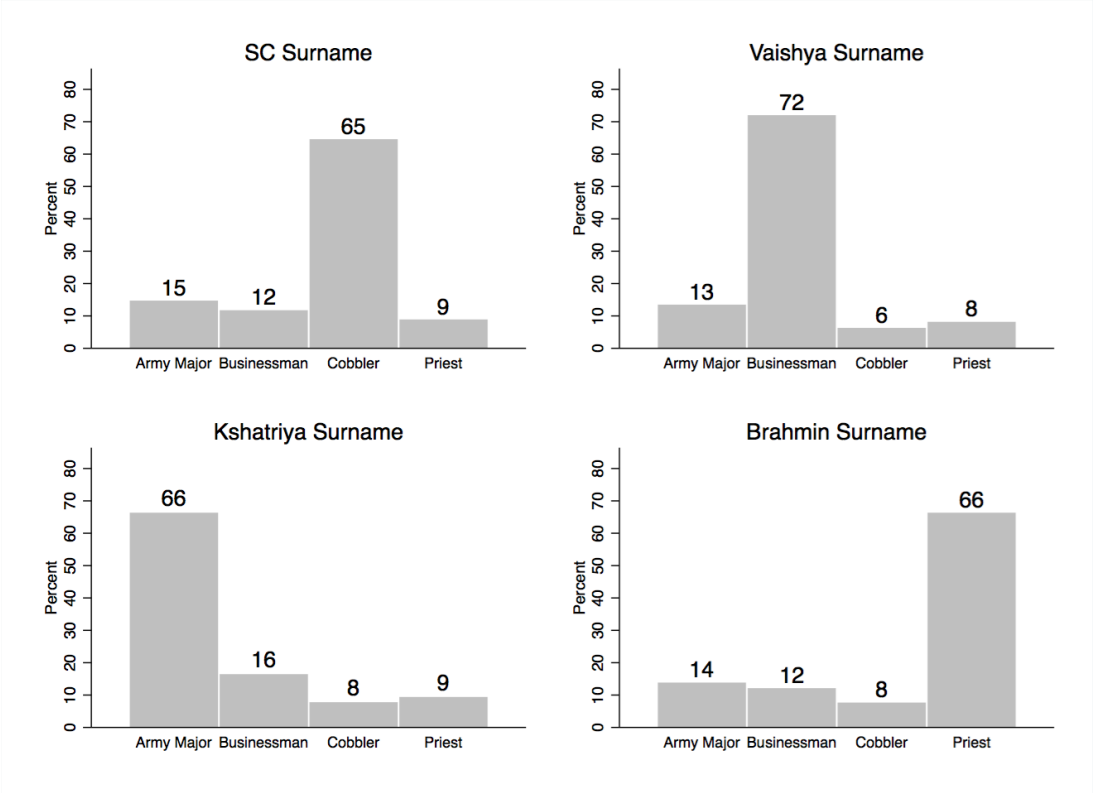


Figure 5: Caste and Occupational Assignment.

Notes. The bar graph indicates the proportion of jobs assigned to a particular caste name by teachers.

Use of Caste Slurs.– Since the SC surnames were traditionally associated with stigmatized 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. Although the use of caste slurs is illegal in India under the Scheduled Castes and Scheduled Tribes Prevention of Atrocities Act (1989), their use remains widely prevalent. 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 asked teachers to characterize 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 6 shows that 20% of the teachers perceive caste slurs as harmless, while another 40% view them as playful behavior by the children. This widespread tolerance among 60% teachers is astounding, given their authority and influence over student attitudes and the fact that the use of caste slurs is a punishable offense.

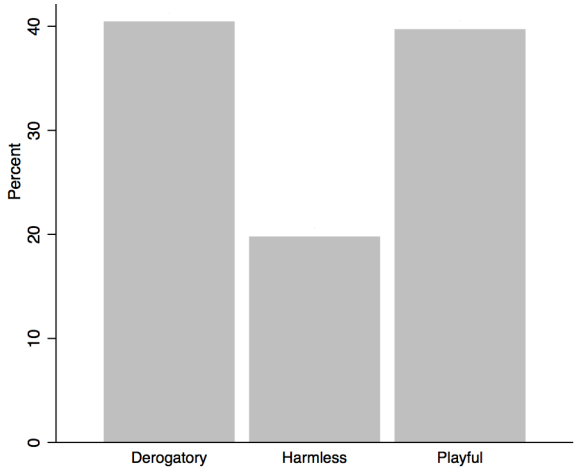


Figure 6: Teacher's Tolerance for the Use of Caste Slurs.

Notes. The bar graph indicates the percent of responses on the use of caste slurs by teachers. Teachers could choose from "derogatory" to the concerned individuals, or as a "harmless" statement, or as children being "playful".

In summary, our results reveal that a significant fraction of teachers have negative attitudes and beliefs about SC individuals, suggesting that discrimination may be systemic.

IV.B. Discrimination in Grading and Attitudes

We investigate whether teachers with more negative attitudes and beliefs toward SC individuals also exhibit stronger discrimination in the grading of exams with the SC surname. Table 4 presents the results separately by incentivized and non-incentivized measures of attitudes and beliefs. Since the coefficients on *Low Quality* and *SC* do

not change much, our focus is on the coefficient on *SC* × *Low Quality*.

Table 4: Discrimination in Grading by Attitudes and Beliefs

	Dependent variable: Standardized score given by teachers					
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A - Incentivized Attitudes and Beliefs					
	Ritual Purity		Reading Ability		Math Ability	
	Below median	Above median	Below median	Above median	Below median	Above median
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)
R^2	0.21	0.20	0.14	0.28	0.22	0.19
N	794	820	948	666	816	798
	Panel B - Non-Incentivized Attitudes and Beliefs					
	Non-Cognitive		Occupation		Caste Slur	
	Below median	Above median	SC - Cobbler		Acceptable	
			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)
R^2	0.21	0.19	0.19	0.24	0.19	0.22
N	798	816	1044	570	962	652
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes: OLS estimates with robust standard errors in parenthesis. Panel A reports results by the median of incentivized measures of attitudes and beliefs. In columns 1-2, Ritual purity is the attitude of teachers toward SC preparing midday meal at school measured as amount forgone. 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. Columns 1-2 present results using the median split of Non-Cognitive skills, which is the difference in the belief of teachers about perseverance by GC and SC children. Columns 2-3 report results by whether teachers assign SC to cobbler job or not. Columns 5-6 report results by teachers acceptance for the use of caste slurs. All columns include the following control variables and fixed effects: language of the exam, state of residence, caste, religion, age, gender, education, experience, government school, urban residence, state of birth, and proficiency in Hindi and English language.

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 of teacher attitude toward ritual purity, where above the median implies a more negative attitude. We find that teachers with stronger negative attitudes give a low-quality answer with the SC surname 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 answers a slightly lower grade by 0.11 standard

deviations, but it is not statistically significant. These findings suggest that teachers with a more negative attitude toward ritual purity penalize low-quality answers with the SC surname five times more than teachers with a less negative attitude.

We perform a similar exercise using the median split of beliefs about the reading ability of SC children in columns 3-4 and math ability in columns 5-6. Note that now below the median implies more pessimistic beliefs. We find that teachers with more pessimistic beliefs about reading ability give a low-quality answer with the SC surname a lower grade by 0.37 standard deviations, which is statistically significant at the 5-percent level. Although teachers with less pessimistic beliefs also give a lower grade to these exams by 0.11 standard deviations, it is not statistically significant.[7] The corresponding estimates for teachers with more pessimistic beliefs about math ability are -0.26 standard deviations which is statistically significant at the 5-percent level, while 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 answers with SC surname 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 of beliefs about non-cognitive abilities of SC children, specifically perseverance. Teachers with more pessimistic beliefs give a low-quality answer with SC surname 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 beliefs is close to one-third in magnitude at -0.19 standard deviations and is also statistically insignificant.

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

Finally, in columns 5-6, we conduct a similar analysis using attitude toward the

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

use of caste slurs. Teachers who find the use of caste slurs acceptable give a low-quality answer with the SC surname a lower score by 0.08 standard deviations, but it is not statistically significant. In contrast, teachers who find the use of caste slurs derogatory give a low-quality answer with the SC surname a much lower score by 0.66 standard deviations, which is statistically significant at the 1-percent level. This result is counterintuitive and is not in line with the results obtained using other attitudes and beliefs.

Overall, for four out of six measures of attitudes and beliefs we find a negative association with grading, for one attitude there is no association, and for another a counterintuitive positive association. As such, the results using incentivized measures of attitudes and beliefs in Panel A present a clear pattern: teachers with more negative attitudes and beliefs penalize low-quality answers with the SC surname 2-5 times more than teachers with less negative attitudes and beliefs. However, results from non-incentivized measures of attitudes and beliefs present mixed evidence. One possible explanation is that non-incentivized measures may be prone to social desirability. To the extent that teachers with more negative attitudes and beliefs are also the ones who respond 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: "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." Overall, these results suggest that teachers with more negative attitudes and beliefs discriminate the most.

V. Empathy and Discrimination

Mitigating caste-based discrimination by teachers is likely to require a costly long-term intervention to produce a meaningful change.[8] Therefore, it is imperative to explore what mental processes could be instrumental in driving such a change. We conduct a proof-of-concept experiment to examine the role of empathy as a mental process in mitigating caste-based discrimination. Our purpose is not to show a long-term effect of empathy in mitigating discrimination, but to explore whether it can be a

[8]For example, the intervention by Dhar, Jain and Jayachandran (2022) to change attitudes toward gender in India lasted two years.

crucial input in designing policies, such as teacher training, to mitigate discrimination in the long run.

The literature in economics, psychology, and neuroscience defines empathy as the ability to understand and share the experiences of others, but empathy is often latent and must be activated to produce meaningful results (Batson et al., 1991; Singer and Fehr, 2005; Andreoni and Rao, 2011). Crucially, individuals vary widely in their empathy (Singer et al., 2004), shaping the potential to mitigate discrimination. In view of these findings, empathy may serve as a plausible mental process, but we know little about its scope in alleviating discrimination (Batson, 2017). Testing the scope of empathy in an experiment presents challenges in determining how to activate and measure empathy.

We design a treatment that encourages teachers to understand the perspective of SC and recognize the harm and pain that discrimination inflicts on them. Our treatment invokes cognitive empathy by making teachers understand the experience of discrimination against the SC, and affective empathy by making them experience vicariously what it feels like to be discriminated Reniers et al. (2011).

V.A. Treatment Design

Research suggests that images, movies, and documentaries can invoke empathy and enable individuals to look at a situation from the other's perspective, even when the other person is a stranger, particularly if they 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 saw *two* short animated stories. Figure A.3 presents screenshots of both 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 emphasizes that this is not an isolated case, but that such discrimination is rather systemic. It cites evidence from publicly available information on the webpage of the Association of Physicians of Indian Origin, which documents widespread discrimination against Indian doctors in the UK.[9] 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 emphasizes 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.[10] As before, teachers were asked control questions to ensure that 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 SC individuals.

Control Group.– The control group teachers read an animated story depicting a normal hospital scenario without any mention of caste or discrimination (see Figure A.4).

Survey Measures.– We measure the cognitive and affective empathy of all teachers at baseline, before randomly assigning them to the control or treatment group

[9] `https://www.bapio.co.uk`.

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

(see Table 1) using six questions from the Questionnaire of Cognitive and Affective Empathy (QCAE) survey by Reniers et al. (2011) (see Appendix III).

V.B. Results

Does treatment reduce discrimination? To test whether our intervention alleviated discrimination in grading, we first look at the descriptive results in Panel B of Figure 2. In the left panel, the distributions of grades for high-quality answers between SC and GC appear similar in the treatment group. Crucially, in the right panel, the distributions of grades for low-quality answers between SC and GC are also similar in the treatment group. When we compare these findings with those in the control group (see Panel A), a clear pattern emerges: the large gap in the control group in grades between low-quality SC and GC answers disappears in the treatment group. These results suggest that empathy might be a useful mental process to reduce discrimination in our context.

We test this formally by estimating the equation 1 for the teachers assigned to the treatment group. Table 5 reports the results and shows that discrimination in grading disappears in the treatment group. The coefficient on the interaction term, $SC \times Low\ Quality$ ranges from -0.002 to -0.008, which is close to zero in magnitude and is always statistically insignificant. The result remains robust to the inclusion of controls in columns 2-5. In contrast, the coefficient on SC (high quality answer) ranges from 0.06 to 0.07, but is never statistically significant.

Using the specification in column 5, which includes the full set of controls and fixed effects, we compare these coefficients between the treatment and control groups. We find that there is no difference in the coefficient on SC (high quality answer) (p-value = 0.27). However, as Figure 7 shows, the coefficient on the interaction term, $SC \times Low\ Quality$ declines significantly in magnitude from -0.29 in the control group to -0.003 in the treatment group (p-value = 0.026). These results suggest that our treatment was effective in mitigating the large discrimination in grading observed in the control group.

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 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 includes other teacher characteristics like age, gender, level of education, experience, government school employment, and urban residence. Column 4 controls for the teacher's state of birth and Column 5 for self-reported proficiency in Hindi and English.

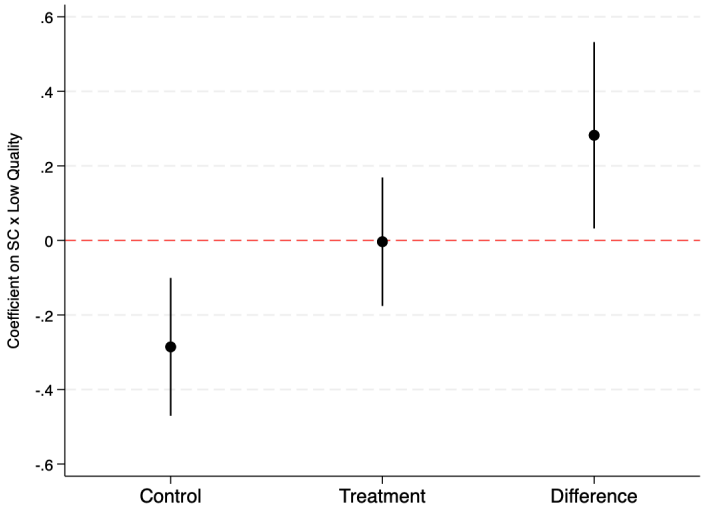


Figure 7: Coefficient on *SC* × *Low Quality* in Treatment and Control Group

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 difference indicates the difference in the coefficient on the interaction term between the treatment and control group. The capped bars indicate 95 percent confidence bands.

Since our treatment primarily targets upper caste teachers and they are also the

ones who discriminate the most, we examine whether they responded favorably to the treatment. The left-hand side of Figure A.5 shows that the coefficient on the interaction term in the sample of Brahmin and Kshatriya teachers is -0.24, which is half the magnitude of -0.57 in the control group; the difference is also marginally statistically significant (p-value = 0.09). The right-hand side of Figure A.5 shows the results for the sample of teachers from the remaining caste groups. We find a qualitatively similar picture: the coefficient on $SC \times$ *Low Quality* is 0.18 in the treatment group but -0.15 in the control group; this difference is also statistically significant (p-value = 0.055).

V.C. Channels

Our preferred explanation behind the decrease in discrimination in the treatment group is that it activates latent empathy among teachers toward the SC. Alternative explanations include the direct effect of treatment on discrimination without invoking empathy, and social desirability. We discuss these below.

Empathy.– We provide evidence on the role of empathy in reducing discrimination in the treatment group. Since empathy was measured before treatment assignment, we test whether more empathetic teachers respond more strongly to the treatment. Figure 8 presents the results separately for teachers whose scores fall above and below the median of cognitive empathy in Panel A and affective empathy in Panel B. Our focus is on the coefficient on the interaction term, $SC \times$ *Low Quality*. Three patterns are noteworthy.

- In the control group, the coefficient on $SC \times$ *Low Quality* (see diamonds) is generally comparable in magnitude for teachers with empathy scores above and below the median. This result suggests that in the absence of activation, baseline differences in empathy do not lead to differences in discrimination.[11]
- For teachers with above the median cognitive empathy (left figure, panel A), the coefficient on $SC \times$ *Low Quality* declines significantly in magnitude from -0.31 in the control group (diamond) to 0.04 in the treatment group (circle); the difference is large in magnitude (0.35) and statistically significant (p-value =

[11] Even for affective empathy, the results are not significantly different.

0.016) (square). The corresponding decline for teachers with above the median affective empathy (left figure, panel B) is from -0.22 in the control group (diamond) to 0.09 in the treatment group (circle); as before, the difference (0.32) is large in magnitude and also statistically significant (p-value = 0.025) (square). This result indicates that our treatment is effective in mitigating discrimination by teachers with higher baseline empathy.

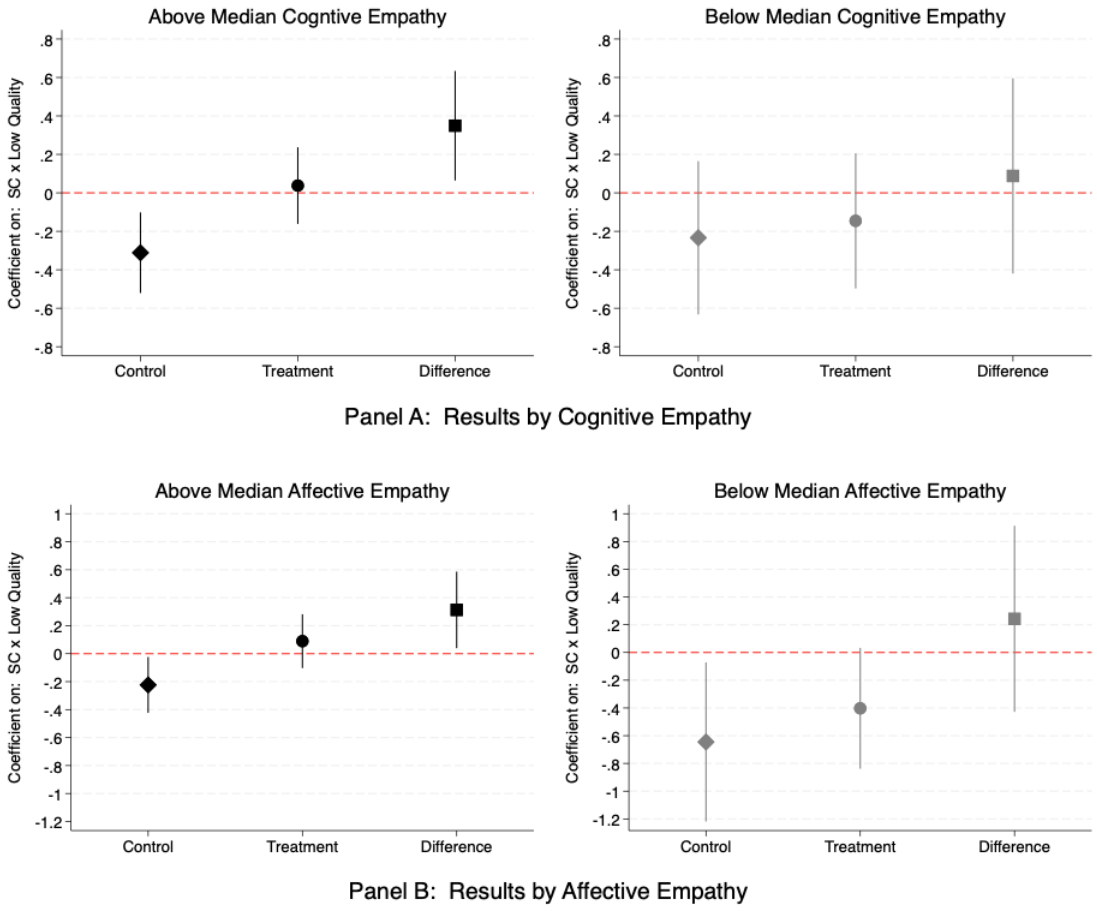


Figure 8: Coefficient on $SC \times$ *Low Quality* Exam by Baseline Measure of Empathy in Treatment and Control Group

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. Panel A shows results using cognitive empathy, whereas Panel B shows results using affective empathy. 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.

- For teachers with below the median cognitive empathy (right figure, panel A), the coefficient on $SC \times$ *Low Quality* also declines in magnitude from -0.23 in the control group (diamond) to -0.15 in the treatment group (circle); however, the difference is much smaller in magnitude (0.09) and statistically insignificant (p-value = 0.734) (square). The corresponding decline for teachers with below the median affective empathy (right figure, panel B) is from -0.64 in the control group (diamond) to -0.40 in the treatment group (circle); as before, the difference (0.24) is smaller in magnitude and statistically insignificant (p-value = 0.478) (square). This finding suggests that our treatment has less success in reducing discrimination by teachers with lower baseline empathy.

One possibility behind these results could be that empathy reduces discrimination by fostering prosocial behavior (see for instance Batson et al., 1991; Singer and Fehr, 2005). We test this using data on donations to charities. Half of the randomly selected teachers were asked if they would like to donate up to INR 100 from their endowment of INR 700 to a charity that supports the education of SC children. Table A.3 presents the results. We find that teachers with higher baseline cognitive and affective empathy are much more likely to donate by 4 percentage points and also a higher amount by 0.20 standard deviations, but these results are not statistically significant at conventional levels (p-value = 0.16). Another possibility is that the treatment caused teachers to change some of their attitudes and beliefs. We examine this in Figure A.6, which shows mixed results. Although more empathetic teachers indeed put less emphasis on ritual purity (mid-day meals) and less tolerant toward the use of caste slurs, we do not see change in beliefs about ability in reading and math, as well as perseverance and assignment to occupations.

Other Channels.– We test the plausibility that by showing an SC doctor our treatment directly causes teachers to update their beliefs about the ability of SC children, which then reduces discrimination in grading. Figure A.7 reveals mixed evidence on this channel. Although we observe a significant decline in the likelihood of assigning an SC individual to the cobbler occupation, beliefs about reading and math ability, as well as perseverance, remain unchanged. Moreover, we do not find any changes in attitudes related to ritual purity or the use of caste slurs.

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 align with researchers' expectations. To account for this potential confounding, we measure a teacher's susceptibility to social desirability using the Crowne-Marlowe Desirability Scale (Crowne and Marlowe, 1960), which has been 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.

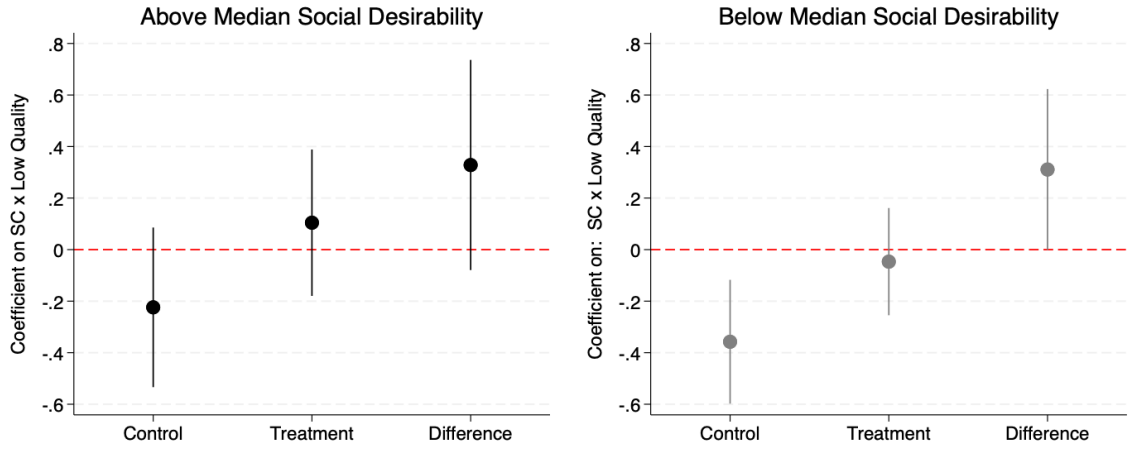


Figure 9: Coefficient on *SC* × *Low Quality* by Social Desirability in Treatment and Control Group

Notes. The figure plots the coefficient on *SC* × *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.

Figure 9 presents the results separately for teachers above and below the median social desirability. 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* × *Low Quality* is -0.224 (s.e. 0.158), while 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.

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.

- 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.

- Importantly, 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 practiced by public service providers like teachers. 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 of equal quality but with the SC surname significantly lower grade.

Second, we complemented the correspondence study with carefully designed behavioral experiments, surveys, and vignettes to identify and understand attitudes and

beliefs that drive discrimination and to assess whether discrimination is systemic. Our findings indicate that many teachers display pessimistic attitudes and beliefs toward SC individuals in multiple domains: preparation of midday meals, reading ability, perseverance, occupational assignment, and use of caste slurs. These attitudes and beliefs have economic implications: teachers with more pessimistic attitudes and beliefs also discriminate more in grading of exams. These findings underscore the importance of examining the underlying factors driving behavior in correspondence studies.

Third, we explore the role of empathy as a mental process to mitigate discrimination. We implement a mechanism experiment designed to activate 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 potential of activating latent empathy as a mechanism to help design programs aimed at combating discrimination.

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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

	(1)	(2)	(3)
Variable	Control group	Treatment group	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)
Education	0.589	0.572	-0.016
	(0.493)	(0.495)	(0.024)
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)
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. Education is an indicator variable which is 1 for teachers with a masters degree, 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. 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.

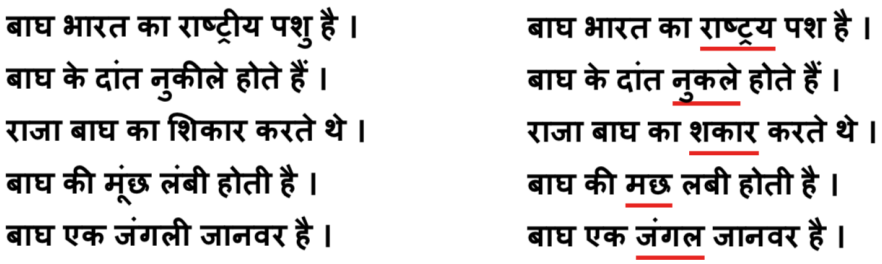

Figure A.1: Paragraphs in Hindi of High (left) and Low (right) Quality

English Exams.– Figure A.2 shows English exams of high (top) and low quality (below).

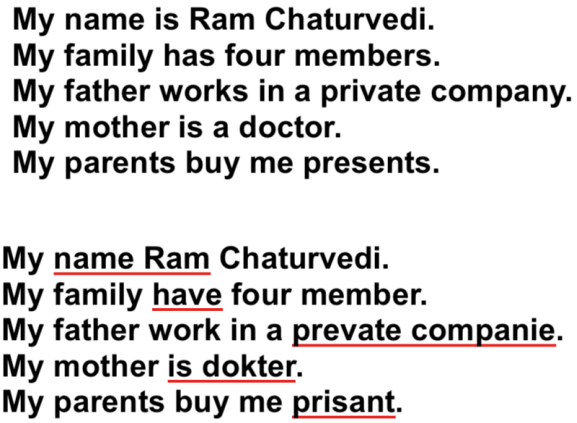

Figure A.2: Paragraphs in English of High (top) and Low (below) Quality

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.

FigureA.4 shows the animation that we showed to the teachers in the control group. The animation was originally in Hindi and was 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

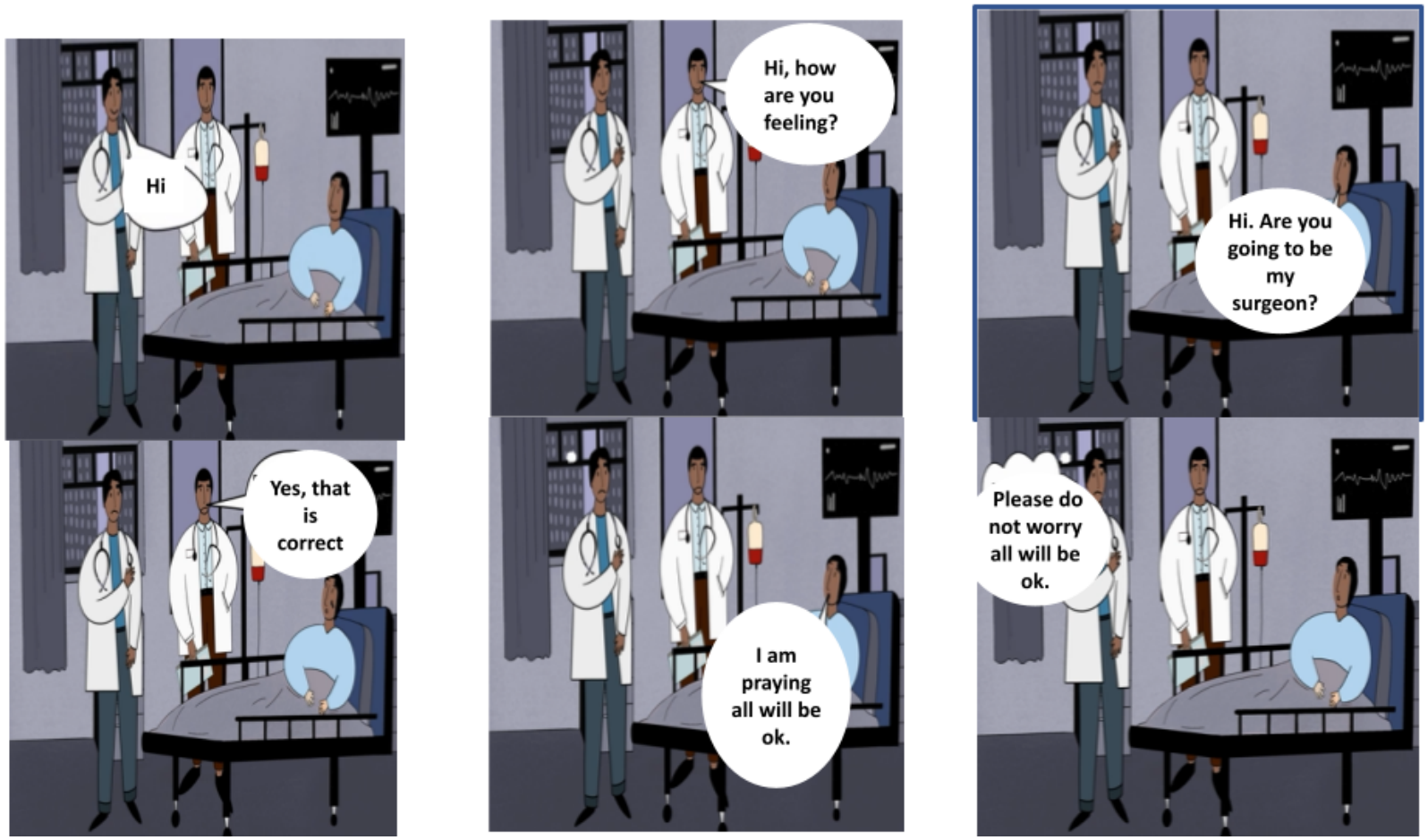

Figure A.4: Screenshot of Control Group Animation

Treatment Effect by Caste.– Figure A.5 shows the effect of treatment in the sample of teachers from the traditional upper caste (Brahmins and Kshatriyas) on the left hand side and teachers from the remaining caste groups on the right hand side.

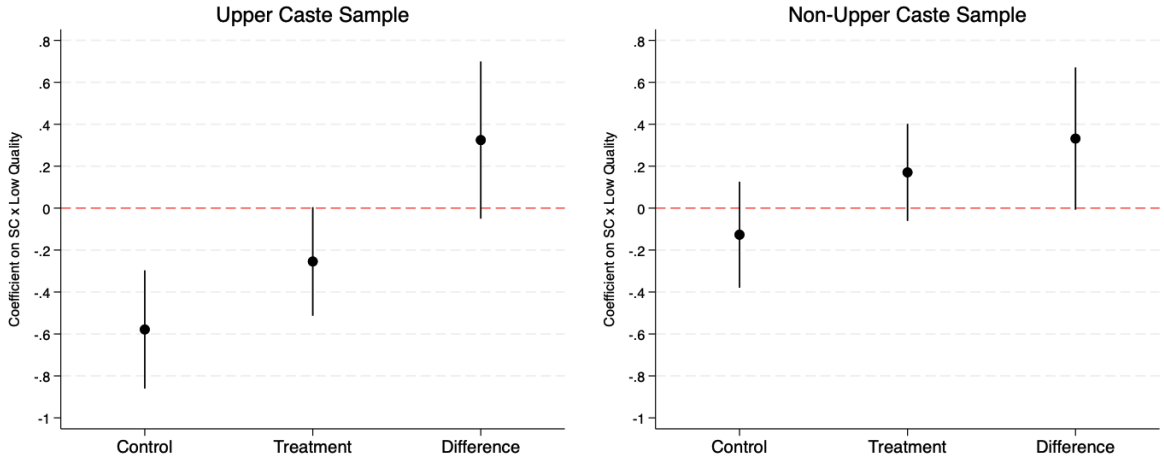

Figure A.5: Coefficient on $SC \times Low\ Quality$ in Treatment and Control Group

Notes. The figure plots the coefficient on the interaction term, $SC \times Low\ Quality$, 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 sample of upper caste teachers (Brahmins and Kshatriyas), whereas the figure on the right hand side is based on the sample of other teachers from the remaining caste groups. 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.

Measuring Cognitive and Affective Empathy.– We use six questions from a survey designed by Reniers et al. (2011). The questions are listed below. Teachers could choose between the following options: strongly agree, slightly agree, slightly disagree, and strongly disagree. We used the first four questions to measure cognitive empathy and the remaining two to measure affective empathy.

Cognitive Empathy

1. I sometimes find it difficult to see things from other people's point of view.
2. I always try to consider the other person's feelings before I do something.
3. I sometimes try to understand my friends better by imagining how things look from their perspective.
4. I am quick to spot when someone in a group is feeling awkward or uncomfortable.

Affective Empathy

1. It is hard for me to see why some things upset people so much.
2. Friends talk to me about their problems as they say that I am very understanding.

Donations to Charities.– TableA.3 reports the heterogeneous treatment effect on donations to charities by cognitive empathy in Panel A and affective empathy in Panel B.

Table A.3: Donations to NGOs Supporting SC Children

	Standardized Donations	
	Extensive Margin	Intensive Margin
	(1)	(2)
	Cognitive Empathy	
Cognitive Empathy × Treatment	0.043	0.204
	(0.030)	(0.159)
	Affective Empathy	
Affective Empathy × Treatment	0.043	0.198
	(0.030)	(0.188)
Control variables	Yes	Yes
Fixed effects	Yes	Yes
Observations	833	833

Notes: OLS with robust standard errors in parentheses. The dependent variable in both columns is standardized donation to an NGO supporting SC children. All columns include the following control variables and fixed effects: gender, education, urban, experience, government sector, state of residence, age categories, state of birth, caste, religion, and proficiency in Hindi and English language.

Heterogeneous Effect of Treatment on Attitudes and Beliefs by Empathy.– FigureA.6 plots the heterogeneous effect of the treatment on attitudes and beliefs by cognitive and affective empathy.

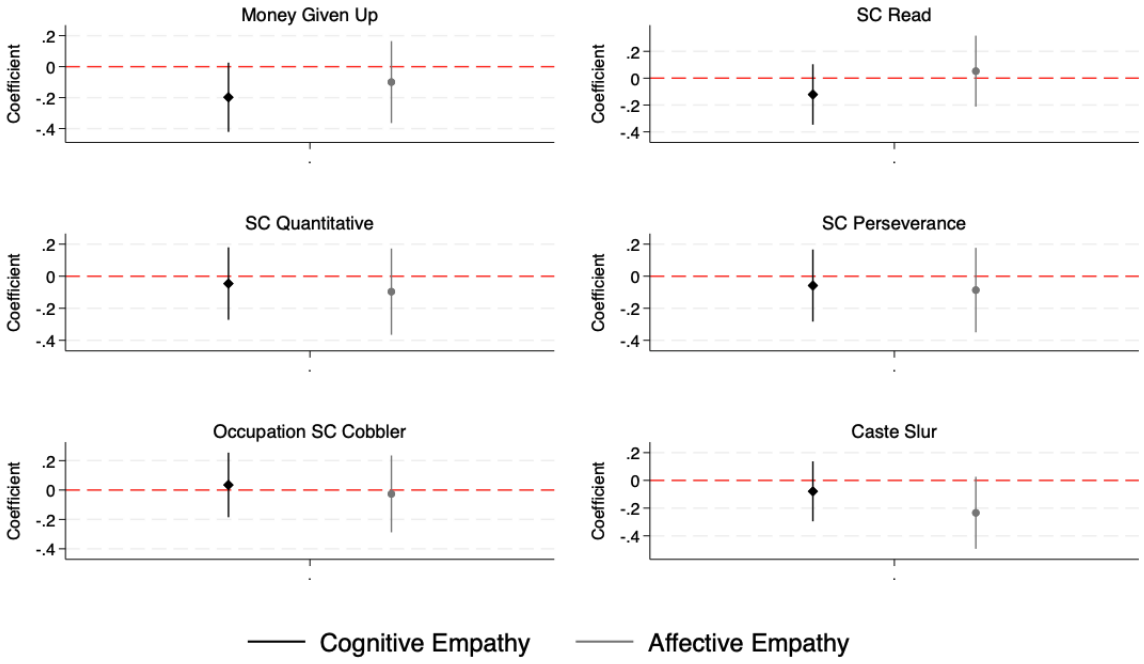

Figure A.6: Coefficient on the interaction of Empathy with Treatment

Notes. The figure plots the coefficient from a regression of each of the six main attitudes and beliefs separately on an interaction term between empathy measure and treatment indicator, after controlling for covariates and fixed effects. The black circles plot the effect of cognitive empathy × treatment, whereas the gray circles plot the effect of affective empathy × treatment. The capped bars indicate 95 percent confidence bands.

Direct Effect of Treatment on Attitudes.– FigureA.7 plots the direct effect of the treatment on attitudes and beliefs.

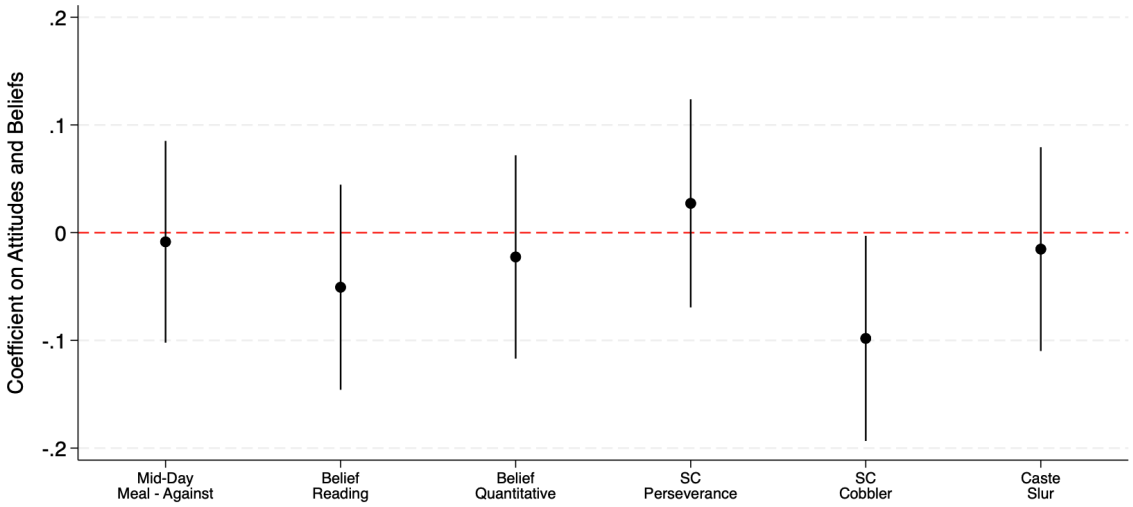

Figure A.7: Coefficient on the Treatment Indicator

Notes. The figure plots the coefficient from a regression of each of the six main attitudes and beliefs separately on an indicator variable for the treatment. The capped bars indicate 95 percent confidence bands.