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Research Paper Series
Thurgau Institute of Economics
and Department of Economics
at the University of Konstanz

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Caste and Unequal Access to Education: An Experimental Study ^{*}

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March 21, 2022

Abstract

We study caste-based discrimination in hiring practices of employers in a lab experiment in India. Students belonging to different castes are assigned the role of employees and employers. We test whether employers tend to discriminate in assessing the abilities of potential employees by varying employees access to education. Depending on the treatment, employers are presented information on actual performance, education and caste belonging of the employees. We find evidence for initial discrimination in favor of in-group by non-upper caste employers. However, this preference for in-group changes with time. Over time, as employers learn based on the experience gained in the experiment, they statistically discriminate in favor of upper caste employees.

Keywords: Caste, discrimination, labour market outcomes, experiments

JEL Codes: C91, D63, D91, J71

^{*}We are particularly grateful to Jaison Manjaly for his support in conducting the experiment. We thank the participants at UEA Discrimination and Diversity Workshop (2021), International Conference of the French Association of Experimental Economics (2021), Centre for Development Studies Seminar (2021) and the research group at the Thurgau Institute of Economics (TWI) for helpful comments and feedback.

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1 Introduction

Discrimination has been shown in different domains such as the labour or the housing market (Bartoš et al., 2016; Bertrand and Mullainathan, 2004; Lang and Manove, 2011; Neumark, 2018), and across different criteria such as gender, race, sexual orientation, or social class (Carlsson and Rooth, 2012; Lahey, 2008; Oreopoulos, 2011) - even though it violates norms of fairness and efficiency and, therefore, many societies fight discrimination using rules, affirmative action and awareness campaigns. These measures help in reducing blatant discrimination but people could shift discrimination to characteristics according to which discrimination is not considered as unfair. A particularly important characteristic in this respect is education. People of disadvantaged groups often get inferior education, and then, it is not considered inappropriate to discriminate based on this information or on the resulting skill level. In this study, we use an experiment to investigate discrimination in such a situation, in which people have different access to education. We use caste as the criterion people could discriminate on. Even though the different education levels would provide an excuse for discrimination, we find low levels of discrimination, and qualitatively correct response to education information and feedback.

The economic literature on labour market discrimination focuses on two main explanations of discriminatory behaviour, taste-based discrimination and statistical discrimination. Taste-based discrimination occurs when employers have an exogenous preference for a particular group, which is unjustified and results in differential hiring based on identity (Becker, 1957). In contrast, statistical discrimination assumes that discrimination arises due to imperfect information about individuals (Phelps, 1972; Arrow, 1973). Our research is related to three main aspects of discrimination discussed in the literature. The first aspect of discrimination focuses on status-based discrimination with respect to the perceived status-based on race (Bertrand and Mullainathan, 2004), gender (Riach and Rich, 1987, 2002) or other attributes (Eriksson and Rooth, 2014; Kroft et al., 2013). The second aspect is related to in-group favoritism such that employers give a higher preference to the employees belonging to their own group (Brewer, 1979; Turner et al., 1979; Messick and Mackie, 1989). The third aspect focuses on endogenous employer learning which points towards the belief updating of the employers over time as they learn the true productivity of the employees and the statistical discrimination based on their updated beliefs (Altonji and Pierret, 2001; Lange, 2007; Lepage, 2021).

In this paper, we investigate how the pre-existing inequality in the form of unequal access to education interacts with these three aspects of discrimination. We study how the presence of information about inequality of opportunity affects discrimination based on favoritism towards a high status group, towards own group and how the employers

update beliefs. We conduct a lab experiment in India, where we use the caste identity of the participants as a form of group identity. The Indian caste system divides the society into a hierarchical structure with persistent economic and social inequality between upper castes (high status) and non-upper castes (low status). This division leads to status-based discrimination, in-group favoritism as well as statistical discrimination in the labour market (Hanna and Linden, 2012; Siddique, 2011; Banerjee et al., 2009; Thorat and Attewell, 2007). This persistent inequality of opportunity between the two caste groups makes the division on caste identity apt for our study. In our experiment, participants are randomly assigned the role of employers and employees. First, the employees belonging to upper and non-upper castes learn and answer a set of questions on general knowledge (GK). Next, the participants assigned the role of employers repeatedly choose an employee from a randomly selected pair of employees. The employees are selected from a group, which comprises of half upper caste and half non-upper caste employees. The employers are shown the performance and caste belonging and depending on the treatment, education information of the employees. We introduce unequal access to education within the experiment by varying the questions selected from learned and not-learned questions.

We conduct two treatments to understand how information on inequality of education affects three aspects of discrimination. In the Caste treatment(C), employers receive information about the caste belonging and the performance of the two employees in randomly selected GK quiz questions. In the Caste and Education treatment(CE), the employers are also shown the education information, in addition to caste and performance information. With this experimental design we are able to test if the strength of discrimination towards the high status, in-group favoritism as well as belief updating differs between the two treatments. We find that employers do not discriminate in favor of the high status (upper caste) group in either the CE treatment or C treatment. In the initial rounds, we find evidence for in-group bias by non-upper caste employers in both of the treatments. Over time, the employers learn about the true productivity of different caste groups within the experiment, where on average the upper caste employees performed better than the non-upper caste employees. In both our treatments, we find statistical discrimination in favour of upper caste employees in the later rounds due to learning based on the experience gained in the previous rounds.

The remainder of the paper is organized as follows: Section 2 gives an overview of the related literature, Section 3 describes our experiment design, Section 4 presents our results and Section 5 concludes.

2 Related literature

A large number of studies have been conducted on the existence of caste-based discrimination in the labour market.¹ Previous correspondence studies point towards the existence of taste-based discrimination in hiring in the labour market based on caste belonging, particularly in the private sector. The upper caste applicants are favored and receive higher call-backs as compared to the non-upper caste applicants (Siddique, 2011). Also, significant differences in call-back exist in case of call centre jobs, where having good soft skills is the key criteria (Banerjee et al., 2009). Thorat and Attewell (2007) further explored the existence of caste-based and religious discrimination in the labour market and found that upper caste hindus received more invitations for job interviews as compared to lower caste hindus and muslims. The evidence supporting the existence of taste-based discrimination in the labour market necessitates measures which can eliminate or at least reduce the biased perceptions of the employers. Effective interventions to reduce biased evaluation about future performance of employees include joint assessment of employees rather than separately. When employees are presented at the same time, employers are more likely to focus on individual performance signals compared to separate evaluations. In separate evaluations, employers are more likely to decide based on group stereotypes (Bohnet et al., 2016). We focus on the former in this paper.

Our study is closest to Albrecht et al. (2013) and Reuben et al. (2014) who also study how updating interacts with discrimination. Reuben et al. (2014) find evidence for discrimination towards women in hiring decisions even when performance is known and is same across genders. Their results further suggest that this is due to employers having biased beliefs about women’s abilities. Albrecht et al. (2013) show that individuals incorporate irrelevant information while evaluating others. Individuals from low-performance groups receive low evaluations on average, even when it is known that the individual performs well. This implies that even in the presence of new information, the evaluators do not fully update their prior beliefs about certain groups. Their results indicate that the bias exists in both gendered and non-gendered setup.² Their study focuses on discrimination arising due to conservatism in updating, while we study caste-based discrimination due to lack of updating. In addition, we also study if (and how) the employers discount the unequal access to education of potential employees. In our design, if the employers will completely update their beliefs in the presence of caste and education information, their evaluations will not be biased in favor of a particular caste group based on taste.

¹See Banerjee and Knight (1985). For an overview of literature on hiring discrimination, see (Baert, 2018); (Quillian et al., 2017)

²The finding that gender differences exist in updating behaviour is consistent with the previous literature on updating (Charness and Levin, 2005); (Dohmen et al., 2009); (Mobius et al., 2011)

3 Experiment Design

The study consists of two parts. In the first part, participants are assigned the role of employees where they learn and answer a GK Quiz. In the second part, a different group of participants acts as employers and assesses the performance of the employees (from the first part) in order to select the better performer among a pair of employees. We use the evaluation of a better performer as a proxy for hiring, promotion and task allocation decisions, which are regularly undertaken in the labour market.

The nature of the task is crucial for our design. We choose the task to solve a GK quiz as it is caste-neutral and large differences in abilities due to caste cannot be assumed in such a task. Additionally, the learning phase provides an equal opportunity to learn to all the participants. Our task for the employees is similar to the task proposed by (Eisenkopf et al., 2013).

3.1 Caste information

The caste system of the Indian society divides the society into mutually exclusive groups based on occupational segregation.³ The upper caste, comprising of the “General category” have a higher status as compared to the non-upper castes which generally comprise of Scheduled Caste (SC), Scheduled Tribe (ST) and Other Backward Classes (OBCs). We use these four categories in our experiment and for our analyses, we use the upper caste and non-upper caste classification.

3.2 Employees

In part one, participants are assigned the role of employees. The task consists of two phases. In the learning phase, each employee gets an opportunity to learn answers to 60 randomly selected multiple choice questions from a GK Quiz consisting 120 questions.⁴ This phase lasts for 15 minutes.

In the second phase, employees answer a GK Quiz consisting 120 questions which includes 60 questions from the learning phase and 60 other questions. The questions are presented in random order. Each correct answer earned them one point. There was no penalty for incorrect answers. The duration for the second phase was 30 minutes. After the completion of both phases, participants filled an anonymous socio-economic

³The origin of the caste system dates back to the 2nd Century BCE, where the four Varnas – Brahmin, Kshatriya, Vaishya and Shudra were mentioned along with their duties (dharma), in the ancient manuscript “Manusmriti”. The caste system also has a presence in Bangladesh, Nepal, Pakistan and Sri Lanka. For a brief introduction to the caste system in India, please refer to section A.1 of the Appendix.

⁴The questions were from a variety of subject areas such as science and technology, economics, politics, sports, history, geography, current and world affairs.

questionnaire which comprised of questions about their caste, age, discipline of study, math grade in high school etc.

3.3 Employers

In the second part, we recruit different participants, who act as employers and have to evaluate the better performer among a pair of employees based on the information presented to them. Each employer is randomly assigned a group of 12 employees from the first part. The assigned group remains the same throughout the experiment. Out of the assigned 12 employees, 6 employees are from the General category, 3 from OBC category, 2 from SC category and 1 from ST category. That is, 6 employees belong to the upper caste and 6 employees belong to the non-upper caste.⁵ The proportion of employees assigned to each employer is in line with the reservation shares for different categories in higher educational institutions.⁶

We vary an employee's access to education such that out of the 6 employees from the General category, 3 employees were randomly chosen to be educated. Out of the 2 employees from OBC category, 1 employee is randomly chosen to be educated. Further, out of 1 OBC & 1 SC employee and 1 SC and 1 ST employee, 1 employee is educated from each pair. This procedure ensures that the upper caste employees and non-upper caste employees are educated with equal probability. Therefore, out of the 12 employees, 3 upper caste employees and 3 non-upper caste employees were educated. Being educated here means that to determine the performance of the chosen employee, out of 8 questions, 5 questions will be picked up randomly from the learnt questions and 3 questions will be picked up from the not-learned questions. For the employees who are not educated, 1 question is picked up randomly from the learnt questions and 7 questions are randomly chosen from the not-learned questions.⁷ An employee's access to education remains the same throughout the session.

The task of the employers is to bet on the better performing employee among a pair of randomly selected employees from their assigned group. The employers are shown the performance of the two employees on 8 randomly selected questions from the 120

⁵Due to a programming error, one of these 12 employees was never selected. This employee was always from the general category and his access to education was randomly determined. As we were not aware of the error, the instructions mention 12 employees. In our design section, we explain the situation as it was presented to the employers.

⁶In central government funded higher educational institutes, 27% of the available seats are reserved for OBC category, 15% are reserved for SC category and 7.5% for ST category. This sums the reservation share to 49.5% of the available seats. 50.5% of the available seats are open to all categories and selection is based solely on merit.

⁷It is important to note here that we replace the not-learned questions for which the performance has been shown once. In simple terms, the questions are picked randomly but with replacement.

questions answered in Part 1. The performance on the 8 selected questions is a mix of learnt questions (i.e. these questions were learnt during the learning phase) and the not-learned questions.

The employers get information about the performance of employees as well as - based on the assigned treatment - information about caste and education (number of learned questions) or only caste information. With respect to the caste information of the employees, the information displayed to the employers are from the four categories – General/SC/ST/OBC. The education information consists of information about the number of learnt questions, out of the total 8 questions for which performance is shown. In case of educated employee, the education information is equal to 5 and in case of not-educated employee it is equal to 1.

The experiment lasts for 30 rounds. In each round, the employer has to choose the employee who is more likely to perform better in the not-learned questions. The better performing employee is decided on the basis of performance in common not-learned questions where only one of the two employees had answered the question correctly. That is, the better performer is determined based on a randomly chosen not-learned question. The employer gains 1 point in each round for correctly predicting the better performing employee. In case the prediction is wrong, the employer does not receive any points. After each round, the employers receive feedback about whether their evaluation was correct or incorrect and if they received any points for the corresponding round.

Treatments - As mentioned above, we vary the availability of information provided to the employers. In *CE treatment*, information about the performance, caste and education (number of learnt questions) of an employee is presented to the employers. In *C treatment*, information about an employee’s performance and caste is provided.

3.3.1 Procedure

The participants were students from a premier government engineering college in India. The participants belonged to several disciplines including engineering, social science, natural science and humanities. The participants were recruited via email and the experiment was programmed and conducted using z-Tree (Fischbacher, 2007). All the sessions were conducted in the computer lab of the institute in November 2019. Participants were randomly assigned a seat number upon arrival in the lab. They received written instructions following which they had to answer some control questions in order to assess their understanding of the task. The participants were informed that the anonymous data will be used for the next part.⁸ They were allowed to begin the experiment once they

⁸The participants signed a consent form explaining them the nature of the study and anonymity of their data before the experiment began. They could withdraw from the study anytime without any

answered all the control questions correctly. After the experiment, participants answered a questionnaire about their demographic information including their caste information.

In part one, we had 103 participants who were assigned the role of employees. On average, the employee sessions lasted for 75 minutes. The mean age of participants was 19 years. On average, participants earned Rs. 333 (approx. 5 dollars at the time of the experiment).⁹ All the participants received their payments privately. The caste belonging of the employees was – Upper caste: 49 (General - 49), Non-upper caste: 54 (SC: 21, ST: 5 & OBC: 28).

It was ensured that none of the participants in the second part had participated in the previous part. In total, 145 participants acted as employers. Similar to the first part, the participants were randomly assigned a seat number upon arrival in the lab. In the written instructions, all the participants were informed about the first part of the study and were told how they can earn money. A quiz question from the first part is shown to the second part participants so that they can judge the difficulty of the task. On average, employer sessions lasted for 45 minutes and participants earned Rs. 140 (approx. 2 dollars) in CE treatment and Rs. 130 (approx. 1.9 dollars) in C treatment. The caste membership of the participants in the CE treatment was – Upper castes: 59 (General - 59), Non-upper caste: 45 (SC: 8, ST: 10 and OBC: 27) and in the C treatment was – Upper caste: 22 (General - 22), Non-upper caste: 19 (SC: 4, ST: 2 and OBC: 13).

3.4 Hypotheses

Our two treatments allow us to investigate the different sources of discrimination - namely, in-group bias, discrimination based on status, and discrimination due to conservatism in updating beliefs. In addition, we test whether employers discriminate in the presence (absence) of information about access to education and explore the sources of discrimination in this environment. We expect a higher in-group bias in C treatment as compared to CE due to absence of education information. Further, we explore the temporal dimension of discrimination by examining the decisions of the employers in the initial rounds. As employers receive feedback after every round, they learn about the performance distribution of employees over time. Learning can mitigate or exacerbate discrimination, based on an employer's prior beliefs and actual performance of the employees. We discuss these possibilities in detail below, starting with the hypothesis on overall discrimination (status-based, in-group) followed by discrimination in the initial round and employer

repercussions. As public revelation of caste can affect an individual's behaviour (Hoff and Pandey, 2006), it was a major concern for us. Anonymous caste and performance data was used for part two of the study, which ensured that this revelation does not impact the behaviour or performance of employees.

⁹The payments were equivalent to a day's minimum wage received by a skilled worker in India.

learning.

H1 (Status-based discrimination): Upper caste employees have a higher probability to be selected. This advantage is higher in the C treatment than in the CE treatment.

The perception that upper caste have higher academic ability as compared to non-upper caste has existed in the Indian society since a long time. A recent survey by Pandey and Pandey (2018) shows that majority of students from upper caste believe that upper caste students have higher academic ability than non-upper caste students. Similar view is shared by approximately half of the non-upper caste respondents of the survey. Due to these biased perceptions based on an individual's caste identity, we expect that, in general, upper caste employees will be preferred in both of the treatments. This would further lead to statistical discrimination in the favor of upper caste employees. As in the CE treatment employers are equipped with additional information (education) about an employee's productivity, this should lead to less statistical discrimination as compared to C treatment. Therefore, we expect that upper caste employees will be chosen more in C treatment as compared to CE treatment.

H2 (In-group bias): Employers are more likely to select employees belonging to their own caste than the other caste. In-group bias is higher in C treatment as compared to CE treatment.

In general, we expect employers to prefer their own caste employees and show a bias towards in-group. In both CE treatment and C treatment, we expect employers to choose the employees belonging to their own caste, in particular when the performance (and education) of two employees is the same and one of them belongs to the other caste. In addition, the presence or absence of education information provides employers an opportunity to choose their own caste employees. For instance, if an employer prefers own caste employees and own caste employee performs better than the other caste employee but is also more educated, then estimating the true ability is difficult as the better performance could be due to higher education. Nonetheless, the employer can discriminate and choose based on his preference. Thus, we expect that ambiguity in education information will lead to discrimination. On the other hand, in C treatment, the lack of education information can exacerbate discrimination. For example, if an employer has a preference for own caste employees and the own caste employee performs worse than the other caste employee, the employer can still display in-group bias and choose an own caste employee by assuming that the own caste employee might not be educated. Due to lack of education information, we expect in-group bias to be higher in C treatment as compared to CE treatment.

H3 (Initial discrimination): In the initial rounds, employers discriminate in favor of

own-caste employees or upper caste employees.

The employer decisions in the initial rounds convey their prior beliefs about the abilities of individuals belonging to different castes. We expect employers to choose their own-caste employees or upper caste employees (high status group). Since in C treatment employers are not equipped with education information, it provides them an additional opportunity to discriminate among different caste employees based on their prior beliefs. Thus, we expect employers to discriminate more in C treatment as compared to CE treatment.

H4 (Employer Learning): Employers learn the performance distribution of employees over time and evaluate employees accordingly.

Since Altonji and Pierret (2001) point towards an updating of employer beliefs over time in the presence of additional information, we expect employers to initially discriminate and choose either the upper caste employees (H1) or their own caste employees (H2). Over time, we expect employers to learn the performance distribution of upper caste and non-upper caste groups and take their decisions based on the experience in the previous rounds. The empirical literature on employer learning also points out that employers learn about employees' productivity type quickly, as on average their initial expectation errors reduce by half within a short span of time (Lange, 2007). Hence, we expect that, over time, discrimination against non-upper caste employees will reduce when employers repeatedly encounter high performing non-upper caste employees, while controlling for education.

4 Results

In this section we discuss how information about unequal access to education affects in-group bias, status-based discrimination, and employer learning across our treatments. Our results are based on the classification of upper caste (General category) and non-upper caste (SC, ST, and OBC).¹⁰ We find evidence for in-group bias among non-upper caste employers in the initial rounds in both CE treatment and C treatment. However, the bias disappears as the employers learn the performance distribution of employees over time. In contrast to our expectation, we find no status-based discrimination in either of the treatments. Lastly, we find evidence for statistical discrimination in favor of upper caste employees in both treatments due to employer learning. In the following section, we get into the details of these results starting with the performance differences between the upper caste and non-upper caste employees.

¹⁰The category based summary tables are mentioned in the Appendix - Table A2 and A4.

4.1 Employees

Figure 1 shows that the upper caste employees perform slightly but significantly better than non-upper caste employees in both learned and not-learned questions as well as in total (learned and not-learned questions together) (Mann-Whitney U test, p -value < 0.001). This performance difference could lead to statistical discrimination in favor of the upper caste, since on average they perform better.¹¹

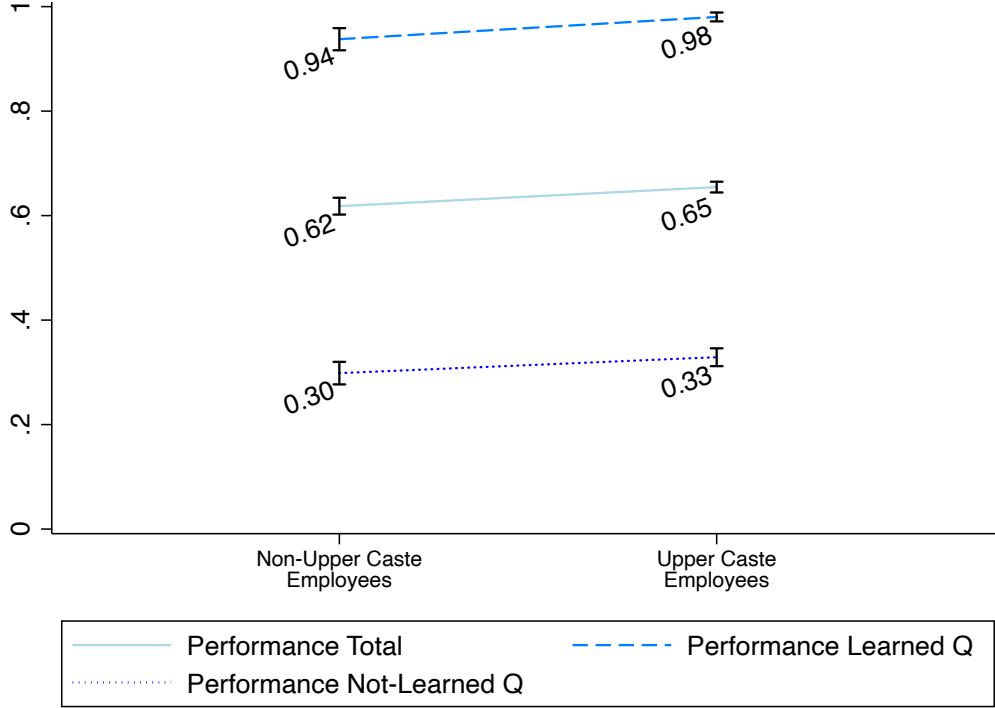


Figure 1: Average Performance of the Employees belonging to Different Caste

4.2 Employers

With respect to the employers, first we discuss all the possible situations for which they made a choice. The employers were either shown a pair of employees belonging to the same caste or different caste. In order to analyse the employer decisions, we conduct a linear probability regression in which the dependent variable is a dummy for choosing employee 1. The dependent variable *Employee 1 Selected* equals 1 if employee 1 is selected and 0 otherwise. In both the treatments, the decisions of the employers are significantly

¹¹The corresponding figure for the performance of the employees who were randomly assigned to the employers in the second part of the experiment is shown in the Appendix in Figure A1. The figure shows that the randomization did not lead to any changes in these performances.

affected by the performance (and education) information as shown in the Table 1. However, this is not the case for caste information. Overall, employers do not discriminate based on caste in both the treatments.¹²

Table 1: Probability of Employee 1 being selected

	CE Treatment	C Treatment
Performance Difference	0.153*** (0.007)	0.065*** (0.008)
Education Difference	-0.449*** (0.027)	
Employee 1 Upper Caste	0.011 (0.019)	0.033 (0.032)
Employee 2 Upper Caste	-0.018 (0.016)	0.018 (0.030)
Constant	0.515*** (0.013)	0.464*** (0.021)
Observations	3120	1230
R-squared	0.278	0.104

Note: OLS linear probability model regression where the dependent variable is *Employee 1 Selected*. The variable *Performance Difference* is calculated as Performance Employee 1 - Performance Employee 2 and ranges from -8 to +8. Similarly, *Education Difference* is computed as Education Emp 1 - Education Emp 2 and ranges between -1 to 1. Robust standard errors in parentheses clustered at employer level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The above result included all the possible scenarios for which employers made a choice. We now focus on the decisions in which the employers encountered a pair of employees belonging to different castes. First, we investigate whether status-based discrimination towards the upper caste employees exists. According to our hypotheses (H1), upper caste employees should be preferred in both treatments, however the extent of discrimination should be less in the CE treatment due to the presence of education information. Figure 2 shows the intercept from a linear probability model where the dependent variable is *Upper Caste Selected*, which is a dichotomous variable which equals 1 if upper caste employee is selected by the employer and equals 0 if the non-upper caste employee is

¹²We conducted the t-tests for the regressions to check if the intercept is significantly different from 0.50 and we find that the intercept is not significantly different from 0.50 (p-value = 0.09 in C treatment and p-value = 0.23 in CE treatment).

selected. The corresponding regressions are shown in the Appendix in Table A7. The regression controls for the difference in performance and education of a pair of employees. The main coefficient of interest is the intercept, which shows the probability of an upper caste employee being selected by an employer, given the performance and education level of the two employees is the same. Figure 2 shows that the probability of an upper caste employee getting selected is not significantly different from 0.50 (leftmost column) in both CE treatment and C treatment. In CE treatment, the probability is 0.52 and in the C treatment this probability is 0.50. Therefore, we reject our first hypothesis that upper caste employees have a higher probability to be selected and that the extent of status-based discrimination towards the upper caste is lower in CE treatment.¹³

Result 1: *Overall, there is no status-based discrimination towards the upper caste employees in either of the treatments.*

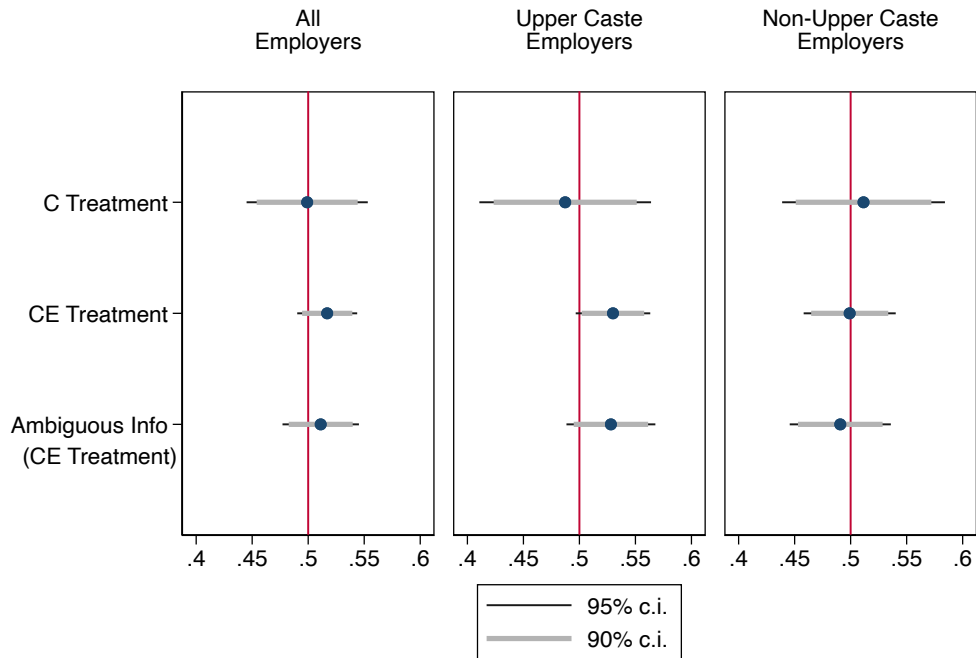


Figure 2: Probability of Upper Caste Employee being Selected

Result 1 shows that, on average, we do not find status-based discrimination in favor or against an employee based on her caste. However, this result could be driven by in-group bias of the employers towards own caste employees. The second and third panel of the

¹³We conducted the t-tests for the regressions in order to check if the intercept is significantly different from 0.50 and we find that the intercept is not significantly different from 0.50 as shown in Table A7 in the Appendix.

Figure 2 show the intercept from a similar linear probability model but also controlling for the caste of the employer. The corresponding regression table is shown in the Appendix in Table A8. Overall, we do not find an in-group bias based on the identity of the employer in either of the treatments. When the employer belongs to the upper caste, the probability of selecting an upper caste employee with the same performance and education level is 0.51 in CE treatment and 0.48 in C treatment. In both the treatments, the probability is not significantly different from 0.50 (p-value = 0.07 in CE treatment and p-value = 0.7 in C treatment). When the employer belongs to non-upper caste, the probability of selecting an upper caste employee with the same performance and education level is 0.49 in CE treatment and 0.51 in C treatment. In both the treatments the probability is not significantly different from 0.50 (p-value = 0.96 in CE treatment and p-value = 0.75 in C treatment).

Result 2: *Overall, employers do not show in-group bias towards the employees belonging to their own caste.*

Result 1 and Result 2 focused on the probability of selecting an upper caste employee when the performance and education levels of the two employees are the same. However, there can be situations where the information about the performance and education is ambiguous, that is, it is less informative about the true ability of the employees resulting in a higher likelihood of discrimination. For example, if an employee is a better performer, the information about the better performer being more educated makes it less informative to disentangle if the employee is of higher ability or if the better performance is merely due to more education. Therefore, our next result focuses on the selection probability when the performance of the two employees is different and the education information is ambiguous. The results are focused on a subset of cases where either the upper caste employee is a better performer but is also more educated, or the non-upper caste employee is a better performer but is also more educated. This result focuses only on CE treatment as the education information was not available to the employers in the C treatment.

The last row in Figure 2 shows if the coefficients described above are significantly different from 0.50.¹⁴ The probability of selecting an upper caste employee is 0.51 which is not significantly different from 0.50 (p-value = 0.51). This indicates that ambiguous information does not lead to a higher probability of an upper caste employee being selected. This effect does not change when we control for the caste of the employer. When the employer belongs to the upper caste, the probability of an upper caste employee being selected is 0.52 which is not significantly different from 0.50 (p-value = 0.16) and when

¹⁴The corresponding regression table is shown in the Appendix in Table A9.

the employer is non-upper caste the probability is 0.49 which is also not significantly different from 0.50 (p-value = 0.68).

Result 3: *Ambiguity in information about education does not lead to discrimination or in-group bias based on the caste of the employees.*

Table 2: Initial Discrimination

	CE Treatment			C Treatment		
	All Emp	UC Emp	N-UC Emp	All Emp	UC Emp	N-UC Emp
Performance Difference	0.147*** (0.009)	0.160*** (0.011)	0.127*** (0.013)	0.058*** (0.010)	0.057*** (0.012)	0.059*** (0.018)
Education Difference	-0.434*** (0.032)	-0.465*** (0.044)	-0.383*** (0.048)			
Upper Caste Employer	0.030 (0.026)			-0.024 (0.051)		
Period	0.001 (0.001)	-0.001 (0.002)	0.004*** (0.002)	0.004* (0.002)	0.001 (0.003)	0.008** (0.003)
Constant	0.479*** (0.028)	0.537*** (0.029)	0.440*** (0.031)	0.456*** (0.046)	0.481*** (0.052)	0.402*** (0.055)
Observations	1749	1009	740	673	345	328
R-squared	0.248	0.301	0.186	0.086	0.075	0.101
<i>P-value for t-test if probability = $\frac{1}{2}$</i>	0.442	0.208	0.064	0.344	0.712	0.089

Note: OLS linear probability model regression where the dependent variable is *Upper Caste Selected*. The titles All Emp, UC Emp and N-UC Emp refer to all employers, upper caste employers and non-upper caste employers respectively. The variable *Period* ranges from 1- 30. Robust standard errors in parentheses clustered at employer level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The above three results focused on determining whether overall, discrimination exists based on status, in-group, and ambiguity of information. In order to understand the temporal dimension of discrimination, we discuss the decisions made by employers in the initial rounds, in which they encountered a pair of employees belonging to different castes. For this, we conduct a regression analysis based on a linear probability model, where the dependent variable is *Upper Caste Selected*. The regression estimates in Table 2 show that in the initial rounds, the non-upper caste employers tend to favor their own caste employees in both CE treatment and C treatment. The intercept shows that in the first round in CE treatment, the probability of upper caste employee being selected by an upper caste employer and non-upper caste employer is 0.54 and 0.44 respectively. Also, in the C treatment, we find evidence pointing towards an in-group bias in the initial round. In this case, the probability of choosing an upper caste employee in the first round by

an upper caste and non-upper caste employer is 0.48 and 0.41 respectively. Thus, we find that in both CE treatment and C treatment, non-upper caste employers prefer their own-caste employees in the initial rounds.

Result 4: *Non-upper caste employers favor their own caste employees in the initial rounds in both CE treatment and C treatment.*

4.3 Employer Learning

As the employers receive feedback about their selection after every round, we investigate how they learn and adjust their choices in the subsequent rounds. To understand whether the employer decisions are motivated by the experience gained in the previous rounds, we use two approaches. First, we study how the aggregate history, that is, the share of wins by a caste in the previous rounds affects the decision in the current round. Second, we explore how the caste of the winner in the immediate previous round affects the decision in the current round, which can be seen as a *recency effect*.

To determine whether the employers learn about the performance distribution of employees over time, we analyse how the cumulative share of wins by upper castes and non-upper castes in the previous rounds impacts the decision in the current round. As shown in Table 3, the variable *Share of UC Winners in All Past Rounds* shows the experience of employers from all the previous rounds, while controlling for the performance and education differences for a pair of employees. This means that, over multiple rounds, if employers receive feedback that the upper caste employees performed better than non-upper caste employees, then the probability that upper caste employee is chosen will increase. The coefficient of the variable *Share of UC Winners in All Past Rounds* in Table 3 shows that, as the cumulative share of wins by upper castes increase, the probability that an upper caste will be chosen increases by 0.11 percentage points in CE treatment and by 0.35 percentage points in C treatment. In both the treatments, the cumulative share of wins by a caste significantly impacts the decision of the employers. Thus, the decision of the employer to choose an upper caste or non-upper caste employee (in addition to education and performance variables) can be significantly explained by the experience gained by the employers in the previous rounds.

For our second approach, we test if the probability of an upper caste employee getting selected is affected by the experience from immediate preceding round (depicted by the variable *Share of UC Winner in Previous Round* in Table 3). The variable equals 1 if an upper caste employee was a better performer in the previous round when the two employees were of different caste, 0 otherwise. In simple terms, we investigate that if an upper caste employee won in the previous round, are there higher chances that an

upper caste employee will be chosen in the current round? In the regression, we control for the performance difference and education difference. We do not find support for the recency effect in either of the treatments. The mean estimates of the variable *Share of UC Winner in Previous Round* in Table 3 show that in CE treatment, the probability to choose an upper caste employee increases when an upper caste employee was a better performer in the previous round although the effect is insignificant.¹⁵

From our two approaches, we can infer that employers select employees based on their aggregate experience in the previous rounds. In both the treatments, the employers learn the performance distribution of upper caste and non-upper caste employees over time. However, it is interesting to note that the effect is driven by the non-upper caste employers in the CE treatment and the upper caste employers in the C treatment (shown in column 3 and 5 of Table 3). As the upper caste employees performed better than the non-upper caste employees in the GK quiz, the employers tend to statistically discriminate in favor of the upper caste employees.

Result 5 – *In both CE treatment and C treatment employers learn the performance distribution of upper caste and non-upper caste employees over time. Employers tend to statistically discriminate in favor of upper caste employees.*

¹⁵For a robustness check, we also estimate the learning model including the education difference variable for C treatment, as shown in Table A10 of the Appendix.

Table 3: Learning Model

	CE Treatment			C Treatment		
	All Emp	UC Emp	N-UC Emp	All Emp	UC Emp	N-UC Emp
Performance Difference	0.145*** (0.009)	0.159*** (0.012)	0.125*** (0.013)	0.053*** (0.011)	0.050*** (0.012)	0.055*** (0.019)
Education Difference	-0.429*** (0.033)	-0.467*** (0.045)	-0.369*** (0.048)			
Upper Caste Employer	0.033 (0.027)			-0.028 (0.048)		
<i>Share of Upper Caste Winners:</i>						
All Past Rounds	0.113* (0.057)	0.022 (0.065)	0.225** (0.087)	0.349*** (0.129)	0.462** (0.172)	0.229 (0.194)
Previous Round	0.007 (0.026)	0.009 (0.034)	0.004 (0.041)	-0.013 (0.044)	-0.012 (0.058)	-0.013 (0.068)
Constant	0.422*** (0.041)	0.505*** (0.035)	0.360*** (0.059)	0.309*** (0.080)	0.214* (0.108)	0.390*** (0.120)
Observations	1645	949	696	632	323	309
R-squared	0.245	0.296	0.188	0.097	0.111	0.081

Note: OLS linear probability model regression where the dependent variable is *Upper Caste Selected*. The titles All Emp, UC Emp and N-UC Emp refer to all employers, upper caste employers and non-upper caste employers respectively. The variable *Share of Upper Caste Winners: All Past Rounds* refers to the cumulative share of times when upper caste employee was a better performer compared to non-upper caste employee. *Share of Upper Caste Winners: Previous Round* is a dummy variable which represents the caste of employee who was the better performer in the last round. The variable takes the value 1 when the upper caste employee was a better performer and equals 0 when the non upper caste employee was a better performer. Robust standard errors in parentheses clustered at employer level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

5 Conclusion

This paper examines caste-based discrimination in the presence of unequal access to education. We focus on how the inequality of opportunity interacts with status-based discrimination, in-group bias and employer learning. We employ an experimental setting where employees are given an opportunity to learn answers to questions from a GK quiz. We vary their access to education in a manner in which the number of learned questions relevant for calculating their performance vary. The employers evaluate an assigned pair of employees and choose an employee who is a better performer in a not-learned question. Based on the treatment assigned to the employers, in addition to the performance information, they either receive information about caste belonging and education (CE treatment) or only caste information (C treatment). The two treatments allow us to test if the employers discount for the education information (when available) during evaluation, such that they fully update their beliefs and do not discriminate based on their taste or preference for a particular caste group. We find that, on average, upper caste employees perform better than non-upper caste employees in the GK Quiz. Overall, we do not find significant evidence for caste-based discrimination across both the treatments. Also, employers do not discriminate based on caste in decision situations where the employees belonging to different castes had the same performance and education. Although non-upper employers exhibit in-group bias in the initial rounds in both the treatments, this bias disappears with time due to the feedback. Our findings point towards statistical discrimination in favour of upper caste employees. The employers choose upper caste employees more often in later rounds as they learn that the upper caste employees are better performers. This leads us to an important result, that is, employers learn about the performance distribution of employees over time and update their beliefs based on the available information. The employer evaluations can partly be explained by the cumulative experience gained in the previous rounds as it significantly impacts their evaluation decision in both the treatments. Our result is in line with the previous literature on employer learning (Altonji and Pierret, 2001; Lange, 2007).

Although many previous correspondence studies point towards the existence of caste-based discrimination in the labour market, we do not find significant evidence of caste-based discrimination in our setting. There can be several possible reasons behind this result as different features of our design could affect discrimination. A probable reason can be that the employers found the task too difficult such that they could not assess the better performer correctly. However, we intentionally made the task difficult such that the employers have an environment where it is easy to discriminate implicitly. Also, the employers answer a set of control questions before the experiment which ensures their

understanding of the task. The absence of in-group bias can also be due to the nature of our subject pool. The employers were students from a premier engineering institute who studied and resided with students from different caste groups. These interactions can play a role in mitigating the caste bias an individual might have in early stages of life. It would be interesting to check the existence of caste-based discrimination by hiring a different subject pool at a different location in India. The absence of caste-based discrimination can also be due to our experiment design, which mitigates the confirmation bias that the employers in our experiment might have with respect to caste and ability, as we provide them with feedback on their employee evaluation after every round. Due to the feedback the employers learn how both the employees fared. For instance, if their prior belief was that upper caste have higher ability than non-upper caste then after every round of their employee assessment, they received feedback on whether their assessment was correct or not and this information might not confirm with their prior belief about abilities of upper caste and non-upper caste employees. The feedback provided an opportunity to the employers to update their beliefs and learn the true performance distribution of the caste groups. In contrast, in the real world, usually employers do not learn about the performance of employees whom they do not hire.

As caste continues to play a crucial role in determining an individual's occupation, it is crucial to address discrimination based on caste through additional measures. In order to mitigate caste-based discrimination by the employers, it would be beneficial if the information about inequality of opportunity is made salient to the employers. This will help them to discount for the inequality and hire accordingly. Also, in line with the results of the CE treatment, the presence of education information is expected to abate an employer's initial discriminatory beliefs about different caste groups.

A Appendix

A.1 Caste System in India

The caste system essentially divided the Hindus in a hierarchical manner based on their occupational structure and their purity. The four categories were – “Brahmins” (priests and educators), “Kshatriyas” (rulers and warriors), “Vaishyas” (farmers, merchants and artisans) and “Shudras” (manual labourers). The Brahmins were at the top in the hierarchical structure followed by Kshatriyas, Vaishyas, and Shudras were at the bottom. The caste at the top of the hierarchy had the highest social status in the society and were entitled to a lot of privileges. Both the social status and the privileges reduced gradually as we move down the caste hierarchy (Simon and Thorat, 2020). People working as street cleaners, manual scavengers or doing menial tasks were classified as untouchables. These people, commonly referred as Dalits now, were considered out of the caste system and were regarded as impure and polluting. Traditionally, dalits were denied the basic civil rights including right to education, property and right to use public facilities. For instance, they were denied entry into schools and temples where upper castes used to participate. Social interaction was also limited among them as they were not allowed to communicate with upper castes. The occupational based division of the society consequently led to social, political and economic disparities among castes.

After independence, the caste system was formally abolished and the government introduced affirmative action policies in the form of reservations for the historically disadvantaged castes.¹⁶ Reservations in higher educational institutes, national and state legislatures and government jobs were introduced for the Dalits or the untouchables, who are now known as Scheduled Castes (SCs) and for the tribal communities belonging to geographically isolated areas, who are referred as Scheduled Tribes (STs). The reservations were later extended to the Other Backward Classes (OBCs) comprising of people who were identified as socially and educationally backward on the basis of caste.¹⁷ The General category comprises of the upper castes who were historically privileged and continue to be in a strong socioeconomic position. They are not a beneficiary of the reservation policy and enjoy the highest social status in the society. Although over the years, caste inequalities have narrowed with certain improvement in the condition of SCs, inequalities still persist with respect to income, education and asset ownership (Desai and Dubey, 2012).

The historical practice of division of the society based on the occupational structure

¹⁶Article 15 of the Indian Constitution prohibits discrimination against any citizen on the basis of caste, religion, race, sex or place of birth.

¹⁷Based on the Mandal Commission report, reservations for OBC’s in central government jobs were introduced in 1992.

has had long lasting consequences. Over the years, considerable segmentation based on caste, gender, religion and tribe has continued to exist in the Indian labour market. According to 2011 census data, caste continues to be one of the biggest factor in determining one's occupation. The labour market participation of the non-upper caste has largely been limited to unskilled, low-paying jobs, whereas the upper caste have a higher share in the high paid occupations. 38.4% of the Indian workers derive a major part of their income by engaging as casual labourers as compared to 54.7% of the SC workers (Department of Rural Development, 2011) ¹⁸. A large section of OBCs are concentrated in low productivity employment sectors such as agriculture and construction. Also, the non-upper castes are least likely to run an enterprise (Labour Employment Report, 2014). On the other hand, as a result of affirmative policies, the proportion of SCs and STs having a central government job increased to 17.41% and 7.42% respectively (GoI, 2020). In professions such as health care, teaching and police, which have a substantial government presence, the non-upper castes are now being represented in proportion to their population. However, in the private sector they continue to have miniscule presence. In contrast, the upper castes have significant presence in the private sector. Over 90% of the top jobs in the private sector such as business professionals and corporate managers are held by individuals who do not belong to the SC/ST category (ToI, 2018). A major limitation of the affirmative action policy is its applicability to only the government jobs, which constitutes a very small share of the total jobs in the economy.

A.2 Summary Statistics - Employees

Table A1 shows the summary statistics of the employees based on the caste categories in the reservation system (General, SC, ST and OBC) and Table A2 combines all the non-upper castes into one category (General category is the upper caste and the rest of the categories are non-upper caste).

¹⁸Socio Economic and Caste Census 2011, Rural households

Table A1: Summary Statistics for Employees belonging to Different Castes

	Non-Upper Castes mean	Upper Castes mean	Total mean
Male	0.98	0.88	0.93
Age	18.79	20.04	19.39
High school grade	88.18	88.75	88.45
Political orientation	4.38	4.27	4.33
Interested in politics	2.57	2.56	2.56
Performance	0.62	0.65	0.64
Performance learned questions	0.94	0.98	0.96
Performance not-learned questions	0.30	0.33	0.31
Proportions	0.52	0.48	0.50

Table A2: Summary Statistics for Employees belonging to Different Categories

	General mean	SC mean	ST mean	OBC mean	Total mean
Male	0.88	0.95	1.00	1.00	0.93
Age	20.04	18.70	17.60	19.07	19.39
High school grade	88.75	86.70	85.08	89.79	88.45
Political orientation	4.27	4.45	4.40	4.32	4.33
Interested in politics	2.56	2.55	2.20	2.64	2.56
Performance	0.65	0.63	0.58	0.62	0.64
Performance learned questions	0.98	0.94	0.90	0.94	0.96
Performance not-learned questions	0.33	0.32	0.26	0.29	0.31
Proportions	0.48	0.20	0.05	0.27	0.34

Majority of the subjects in our sample were males, apart from some females belonging to the General category (upper caste). The average age of the subjects was 20 years old for the General category (upper caste) and 18 years for rest of the categories (non-upper caste). The high school grade was similar across different categories, so was the political orientation and the degree of interest in politics. The last three rows of Table A1 and Table A2 show the performance of the employees in the quiz. The General category employees performed better than all the other categories for both learned and not-learned questions (significant at 5 %).

A.3 Summary Statistics - Employers

Table A3 and Table A4 show the summary statistics for the employers. The employer proportions seem to be similar in both the treatments (approximately 54% are upper caste and 46% are non-upper caste). This proportion is also quite similar to the em-

ployees (52% are upper caste and 48% are non-upper caste). There were relatively more non-upper caste males in CE treatment (82%) as compared to 68% in the C treatment. Average age of the participants is similar across treatments and groups at 20 years old. The upper caste employers have relatively higher high school grades in both treatments as compared to non-upper caste employers. The political orientation is similar averaging around 4 (on a scale from 0 to 10) in both treatments, as well interest in politics.

Table A3: Summary Statistics for Employers belonging to Different Castes

	CE Treatment			C Treatment		
	Non-Upper mean	Upper mean	Total mean	Non-upper mean	Upper mean	Total mean
Male	0.82	0.70	0.75	0.68	0.86	0.78
Age	19.93	20.45	20.23	20.16	20.68	20.44
High school grade	81.61	88.80	85.75	84.22	87.30	85.87
Political orientation	4.32	4.28	4.30	4.00	3.73	3.85
Interested in politics	2.48	2.50	2.49	2.47	2.77	2.63
Proportions	0.42	0.58	0.51	0.46	0.54	0.50

Table A4: Summary Statistics for Employers belongong to Different Categories

	CE Treatment					C Treatment				
	General mean	SC mean	ST mean	OBC mean	Total mean	General mean	SC mean	ST mean	OBC mean	Total mean
Male	0.70	0.88	0.90	0.77	0.75	0.86	0.50	0.50	0.77	0.78
Age	20.45	18.75	19.50	20.46	20.23	20.68	22.00	21.50	19.38	20.44
High school grade	88.80	81.80	74.67	84.22	85.75	87.30	86.38	44.20	89.71	85.87
Political orientation	4.28	5.00	4.40	4.08	4.30	3.73	3.25	3.00	4.38	3.85
Interested in politics	2.50	2.13	2.60	2.54	2.49	2.77	2.25	2.50	2.54	2.63
Proportions	0.58	0.08	0.10	0.25	0.41	0.54	0.10	0.05	0.32	0.40

Table A5: Summary Performance for Different Caste Employees

	CE-Educated mean	CE-Uneducated mean	C-Educated mean	C-Uneducated mean
Non-upper	5.57	2.97	5.52	3.07
Upper	5.90	3.35	5.81	3.35
Total	5.70	3.16	5.63	3.21

Table A5 and Table A6 show the average performance of educated and uneducated employees in different treatments for different castes and categories. On an average,

Table A6: Summary Performance for Different Category Employees

	CE-Educated mean	CE-Uneducated mean	C-Educated mean	C-Uneducated mean
General	5.90	3.35	5.81	3.35
SC	5.66	3.14	5.56	3.07
ST	5.22	2.67	5.29	2.70
OBC	5.63	2.96	5.59	3.15
Total	5.70	3.16	5.63	3.21

the General category or the upper caste employees perform better than the employees belonging to non-upper caste or OBC, SC and ST categories, both in the case when they are educated or uneducated. This result is in line with the our main result on employee performance as shown in Figure 1.

A.4 Additional Results

Figure A1 shows the average performance of the upper and non-upper caste employees who were assigned to the employers in CE treatment and C treatment. The average performance of upper caste employees with or without education is slightly higher than the non-upper caste employees. This is in line with our previous result as shown in Figure 1.

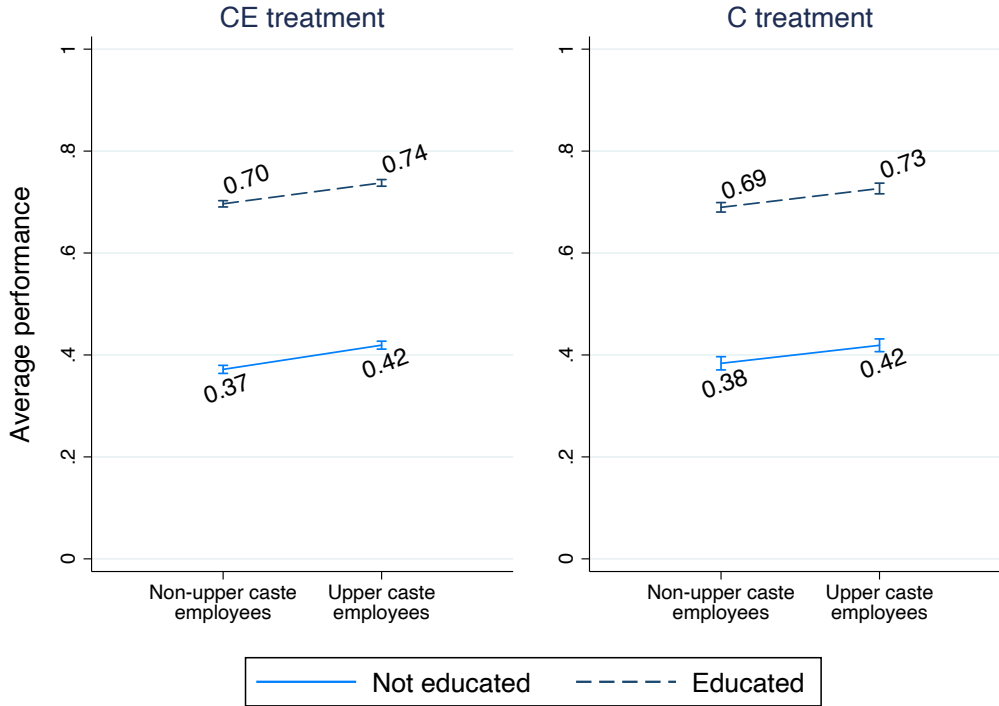


Figure A1: Average performance of the employees assigned to employers

Table A7: Status-based Discrimination

	CE treatment	C treatment
Performance Difference	0.147*** (0.008)	0.073*** (0.013)
Education Difference	-0.434*** (0.032)	-0.070* (0.040)
Constant	0.517*** (0.013)	0.499*** (0.027)
Observations	1749	673
R-squared	0.247	0.084
<i>P-value for t-test if probability = $\frac{1}{2}$</i>	0.212	0.973

Note: OLS linear probability model regression where the dependent variable is *Upper Caste Selected*. The variable is a dichotomous variable which equals 1 if the upper caste employee is selected and equals 0 if the non-upper caste employee is selected. Robust standard errors in parentheses clustered at the employer level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A8: In-group favouritism

	CE treatment	C treatment
Performance Difference	0.147*** (0.008)	0.073*** (0.014)
Education Difference	-0.434*** (0.032)	-0.070* (0.040)
Upper Caste Employer	0.031 (0.026)	-0.024 (0.051)
Constant	0.499*** (0.021)	0.512*** (0.036)
Observations	1749	673
R-squared	0.248	0.085
<i>P-value for t-test if probability = $\frac{1}{2}$</i>		
When employer is upper caste	0.077	0.739
When employer is non-upper caste	0.968	0.751

Note: OLS linear probability model regression where the dependent variable is *Upper Caste Selected*. Robust standard errors in parentheses clustered at the employer level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A9: Ambiguous Information - CE Treatment

	(1)	(2)
Performance Difference	0.149*** (0.008)	0.149*** (0.008)
Education Difference	-0.440*** (0.032)	-0.440*** (0.031)
Ambiguous Information	0.010 (0.021)	0.012 (0.021)
Upper Caste Employer		0.037 (0.026)
Constant	0.501*** (0.016)	0.478*** (0.024)
Observations	1523	1523
R-squared	0.286	0.288
<i>P-value for t-test if probability = $\frac{1}{2}$</i>		
All employers	0.517	
When employer is upper caste		0.163
When employer is non-upper caste		0.685

Note: OLS linear probability model regression where the dependent variable is *Upper Caste Selected*. Robust standard errors in parentheses clustered at the employer level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A10: Learning Model with Education Variable in C treatment

	CE Treatment			C Treatment		
	All Emp	UC Emp	N-UC Emp	All Emp	UC Emp	N-UC Emp
Performance Difference	0.145*** (0.009)	0.159*** (0.012)	0.125*** (0.013)	0.066*** (0.014)	0.074*** (0.020)	0.057** (0.021)
Education Difference	-0.429*** (0.033)	-0.467*** (0.045)	-0.369*** (0.048)	-0.062 (0.042)	-0.110* (0.059)	-0.012 (0.062)
Upper Caste Employer	0.033 (0.027)			-0.029 (0.048)		
<i>Share of Upper Caste Winners:</i>						
All Past Rounds	0.113* (0.057)	0.022 (0.065)	0.225** (0.087)	0.339** (0.129)	0.428** (0.175)	0.229 (0.195)
Previous Round	0.007 (0.026)	0.009 (0.034)	0.004 (0.041)	-0.008 (0.044)	0.005 (0.059)	-0.013 (0.069)
Constant	0.422*** (0.041)	0.505*** (0.035)	0.360*** (0.059)	0.305*** (0.080)	0.210* (0.104)	0.388*** (0.120)
Observations	1645	949	696	632	323	309
R-squared	0.245	0.296	0.188	0.101	0.122	0.082

Note: OLS Linear Probability Model regression where the dependent variable is *Upper Caste Selected*. The titles All Emp, UC Emp and N-UC Emp refer to all employers, upper caste employers and non-upper caste employers respectively. The variable *Share of Upper Caste Winners: All Past Rounds* refers to the cumulative share of times when upper caste employee was a better performer compared to non-upper caste employee. *Share of Upper Caste Winners: Previous Round* is a dummy variable which represents the caste of employee who was the better performer in the last round. The variable takes the value 1 when the upper caste employee was a better performer and equals 0 when the non upper caste employee was a better performer. Robust standard errors in parentheses clustered at employer level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

B Instructions

Instructions - Employees

Welcome! You are now taking part in an experiment.

If you read the explanations below carefully, you will be able to earn money in addition to 100 rupees which you receive as entry fee for your participation, depending on your answers.

In this experiment, you have to answer a general knowledge (GK) quiz consisting of 120 multiple-choice questions. For each question, you receive four options out of which only one is correct. For every correct answer you receive one point. There is no penalty for incorrect answers. Your pay-out depends on how many points you receive at the end. You will be paid in cash at the end of the experiment, where the points are exchanged with the following exchange rate:

$$1 \text{ Point} = 3 \text{ rupees}$$

All the participants are paid out privately so that other participants cannot see how much you have earned. Neither your name nor the names of others will be disclosed. We also only use anonymous data for the analyses. During the experiment, you are not allowed to speak with the other participants. If you have any questions, please raise your hand and a member from the experimenter team will come to you.

General Procedure

About the GK Quiz

All the questions are multiple-choice questions with four options. The questions are randomly selected from different subject areas. The more questions you answer correctly, the higher your payout in this experiment. The experiment consists of two phases.

First Phase - Learning Phase

The first phase is a learning phase in which you have an opportunity to prepare for the second phase. During the learning phase, you will get an opportunity to learn the correct answer of 60 randomly selected questions from the 120 questions of the GK quiz. You are not allowed to take notes. The experimenter present in the room will check compliance with this rule. An infringement will be punished with exclusion from the experiment. This phase will last for 15 minutes. You will not be allowed to leave this phase before

this duration. The remaining time for this phase will be shown at the top of your screen (in seconds). After 15 minutes you will automatically switch to the second phase.

The figure below shows the display of the screen. The question along with four answer options will be displayed. The correct answer is displayed below the answer options.

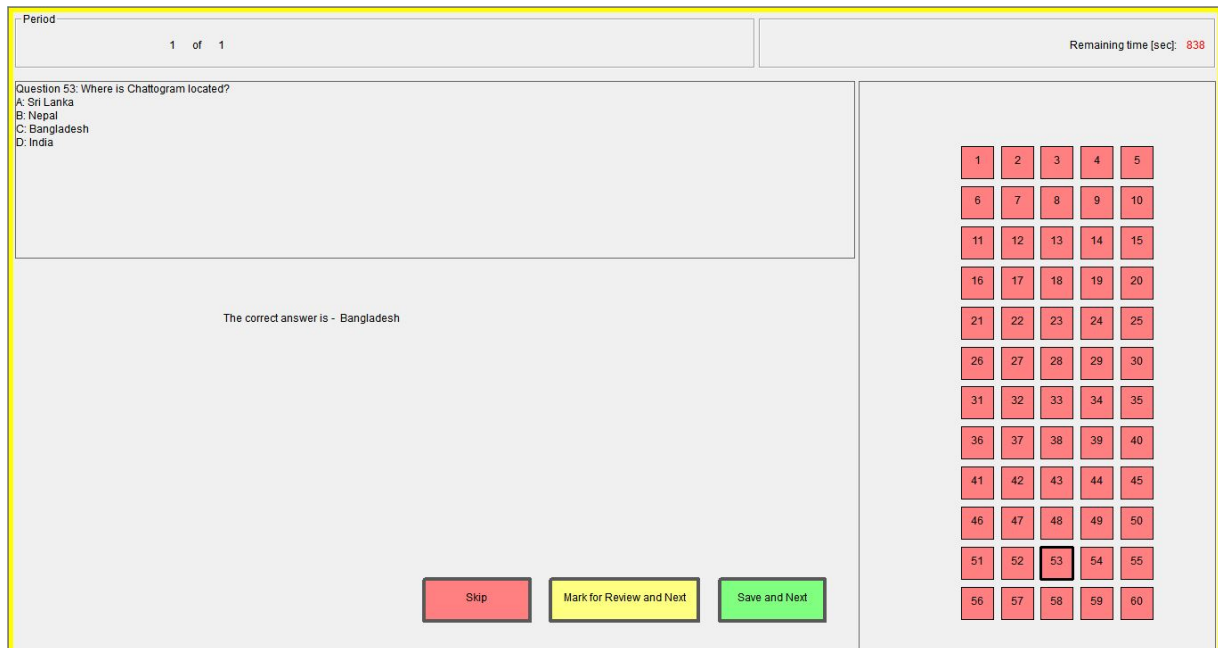


Figure A2: Screenshot of the Learning Phase

To move to the next question, click on the Save and Next button. In case you want to revisit a question, click on Mark for Review and Next button. You can skip a question by pressing the Skip button. You can navigate to a question of your choice by clicking the question numbers on the right. The color of the box shows whether you have learnt the question, marked for review or have not learnt it. The box is marked green when you learn a question and click “Save and Next” button. In case you want to revisit a question and learn the answer again, you may click on the “Mark for Review and next” button. The box is marked yellow when you click this button. The box is marked red when you skip a question and do not learn it.

Second Phase – Answering Phase

In the second phase, you have to answer a GK quiz consisting of 120 questions. The quiz

consists of 60 questions from the learning phase and 60 other questions. All the questions will be presented in a random order. For each correct answer you get one point. No points will be deducted for an incorrect answer. The second phase will last for 30 minutes. The figure below shows the display of the screen.

Period

1 of 1

Remaining time [sec]: 16:10

Question 26: Where is Chattogram located?
A: Sri Lanka
B: Nepal
C: Bangladesh
D: India

Your Answer is:

A
B
C
D

Skip Mark for Review and Next Save and Next

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64
65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88
89	90	91	92	93	94	95	96
97	98	99	100	101	102	103	104
105	106	107	108	109	110	111	112
113	114	115	116	117	118	119	120

Figure A3: Screenshot of the Answering Phase

The question along with four answer options will be displayed. You can choose the correct answer by clicking the buttons displayed below the answer options. To move to the next question, click on the Save and Next button. In case you want to revisit a question later, click on Review and Next button. You can also skip a question by pressing the Skip button. You can navigate to a question of your choice by clicking the question numbers on the right. The colour of the box shows whether you have answered the question, marked for review or have not answered. The box is marked green when you answer a question and click “Save and Next” button. If you are not sure about the answer and want to revisit a question, you may click on the “Mark for Review and next” button. The box is marked yellow when you click this button. The box is marked red when you skip a question and leave it unanswered.

At the end of this phase, the questions saved as well as the questions marked for review

will be counted as answered. For each correct answer you will receive 1 point. The questions which are skipped will receive 0 points.

Instructions - Employers (CE Treatment)

Welcome! You are now taking part in an experiment.

If you read the explanations below carefully, you will be able to earn money in addition to 50 rupees which you receive as entry fee for your participation, depending on your decisions.

This experiment lasts 30 rounds. In each round you have to take one decision. For each decision you will receive points. Your pay-out depends on how many points you receive at the end. You will be paid in cash at the end of the experiment, where the points are exchange with the following exchange rate:

$$1 \text{ Point} = 5 \text{ rupees}$$

All participants are paid out privately so that other participants cannot see how much you have earned. Neither your name nor the names of others will be disclosed. We also only use anonymous data for the analyses. During the experiment, you are not allowed to speak with the other participants. If you have any questions, please raise your hand and a member from the experimenter team will come to you.

The experiment consists of two parts. You participate in the second part. It is important for you to understand the first part as your decisions relate to this first part.

First Part

In the first part, there were 103 participants each of whom answered 120 general knowledge questions. At the beginning of the experiment, the participants had a learning phase, where they had an opportunity to learn answers to 60 of the 120 questions. After the learning phase, they answered the quiz consisting of the 60 questions from the learning phase and 60 unlearned questions. All the participants answered the same questions. The questions were multiple choice questions with four options. The questions were randomly chosen and came from all subject areas. For example, a question from the quiz was:

Question: Which one of the following is the biggest island of Japan archipelago?

- A. Honshu
- B. Hokkaido
- C. Shikoku
- D. Kyushu

The correct answer is Honshu. If this question could be learned, this answer was provided in the learning phase. The first part has already been conducted.

Second Part

You are a second part participant. In this part, you will be assigned a group of 12 randomly selected participants from the first part. The group assigned to you stays the same throughout the session. Neither your identity nor the identity of the 12 participants assigned to you will be revealed to anyone.

In each round, you will be shown the performance of two randomly selected participants from your group. The performance shown will be based on eight randomly selected questions from the 60 questions that these participants answered. Out of these 8 questions, some of the questions were from the learning phase and some of the questions were not from the learning phase and hence the participants did not learn answers to these questions.

Half of the 12 participants that are assigned to you get one question from learned questions and 7 from the unlearned questions. The other half gets 5 questions from learned questions and 3 from the unlearned questions. In addition, you will be shown how many of the 8 randomly selected questions were from the learned questions, for the two randomly selected participants.

For example, consider a participant who had 5 questions from the learning phase and 3 questions which were not a part of the learning phase and hence the participant could not learn the answers to these questions. You will be informed that this participant had 5 questions from the learning phase. Similarly, another participant can have 1 question selected from the learning phase and 7 questions which were not a part of the learning phase. You will be informed that this participant had one question from the learning phase.

In addition to the information about performance and the number of learned questions, you will also be shown the category of the two randomly selected participants, whether they belong to a General/SC/ST/OBC category.

Your Task

Your task is to choose the participant who is more likely to perform better in the unlearned questions. That is, the questions for which the participants did not learn the answers.

You gain 1 point in each round in which you correctly predict the participant who is a better performer in an unlearned question. If your prediction is wrong, you receive 0 points. After each round, you will receive feedback about whether your prediction was correct or wrong.

The probability to win depends on the number of unknown questions that one participant answered correctly and the other participant did not. You can think that one of these questions is randomly drawn in order to determine whether you win. If both the participants answer exactly the same questions correctly, both have the same probability to win. In this case, the winner will be randomly chosen by the computer.

For example, assume participant 1 and participant 2 had 10 common unlearned questions. Since the learned and the unlearned questions were randomly selected for each participant, the number of questions which were unlearned for both the participants could be lower than 60. Participant 1 correctly answered question 1 to 4 and participant 2 correctly answered question 3 to 7. Thus, the questions that participant 1 knew but participant 2 did not know are questions 1 and 2. The questions that participant 2 knew but participant 1 did not know are questions 5, 6, and 7. So, if your prediction is participant 1, you win with probability $2/5$ and if your prediction is participant 2, you win with probability $3/5$. Note that we do not take into consideration the questions that both know (in the example questions 3 and 4), or both do not know (in the example questions 8, 9, and 10).

Decision Screen

All 30 rounds in the experiment will look like the following on your screen. You see in the first row the category of the participant, whether they belong to General/SC/ST/OBC category. In the second row you will be shown how many out of the eight selected questions were from the learned questions. In the third row you will be shown how many of the eight selected question were correctly answered.

In the example below, the participant on the left side belongs to General category and the participant on the right belongs to Scheduled Caste category. The participant on the left side could learn 5 questions in the learning phase and the participant on the right side could learn 1 question in the learning phase. This means that participant on the left side had 3 unlearned questions and participant on the right side had 7 unlearned questions. Out of 8 questions, the participant on the left side answered 7 questions correctly and the participant on the right side answered 5 questions correctly.

Category	General	Scheduled Caste	Confirm
Learned Questions	5	1	
Correctly Answered	7	5	

Figure A4: Screenshot of the Employer Task in CE Treatment

On this screen you have to choose the participant who according to you is a better performer in the unlearned questions. To enter your choice, highlight the rectangle that belongs to the participant by clicking anywhere in the rectangle. If you click, the rectangle will be highlighted. You can change your choice before clicking the "Confirm" button. If you are satisfied with your choice, please click on "Confirm". You gain 1 point in each round in which you make a correct prediction. After each round, you will receive feedback about whether your prediction was correct or wrong as shown on the results screen below.

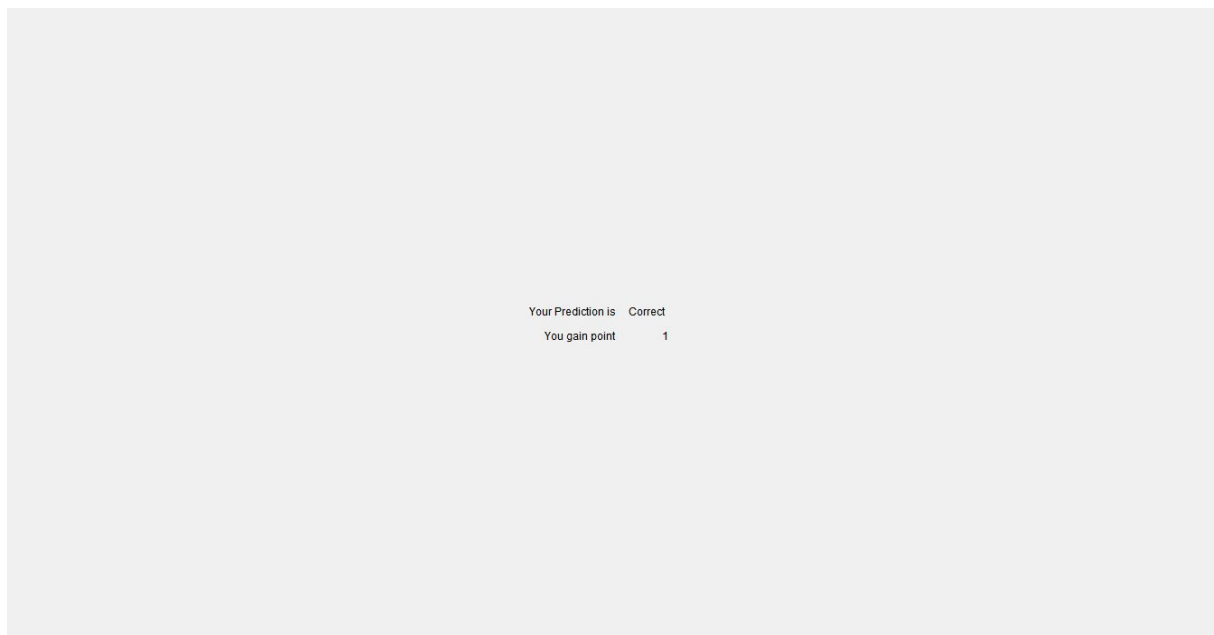


Figure A5: Screenshot of the Feedback Screen

If you have any questions after reading the instructions carefully, please raise your hand and remain seated. The experimenter will come to you. When you have understood everything, you can start the experiment by answering some questions on your screen. These questions are asked to make sure you have understood the instructions.

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