

Attitude towards caste-based reservation and study group formation: Evidence from a business school in India¹

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Abstract

Can social-desirability concerns cause measurement errors in anonymous surveys studying caste issues? We study this question in the context of caste considerations in endogenous study-group formation by students of an Indian business school. Study groups can affect grades, which can affect salaries. We find that more than 40 percent respondents believe that reservation is not justified and that reserved-caste category students have inferior academic ability. We focus on comparing anonymous survey responses with and without an additional ‘veil’ to reduce social desirability concerns in responses. We find that with the additional veil, the self-report of the tendency to exclude reserved-caste category students from one’s study group increases from 5 percent to 22 percent, and the tendency to exclude an inferior-academic-ability student increases from 21 percent to 64 percent. These findings raise fundamental questions of measuring and analysing attitudes related to caste-related issues using anonymous surveys.

Keywords: Social desirability bias; survey; caste; study-group formation.

JEL Codes: C83, C93, I23, J15

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1. Introduction

Caste-based reservation for admission into higher educational institutes is a sensitive topic in India (Ghosh 2006, Ilaiah 2006). Notably, admission into such institutes doesn't guarantee homogeneous post-admission experience across castes (Kumar 2016, Vijay and Nair 2021). In this paper, within the context of caste and endogenous study-group formation in an Indian business school, we investigate the broader question of robustness of the standard strictly-anonymous survey method in eliciting true responses regarding sensitive caste-related questions. In particular, even with anonymity, surveys regarding sensitive caste-related issues can be inaccurate due to responses being affected by social desirability bias (SDB henceforth; see Edwards (1953) and Krumpal (2013) for discussions on SDB). For example, Coffman et al. (2017) show that the size of LGBT population and the magnitude of antigay sentiment is underestimated by the anonymous-survey method. In this paper we attempt to investigate the possible existence of a similar measurement bias in an important novel area: caste and endogenous study-group formation in the second year of the MBA (Masters in Business Administration) program in an Indian business school.

This inquiry into caste and study-group formation is important because marks accruing to group projects contribute significantly towards the overall GPA (typically 20 to 50 percent of a second-year course grade), which has been shown to be a significant determinant of one's future earnings. Chakravarty and Somanathan (2008) analyse placement data on the 2006 class of MBA graduates from IIM Ahmedabad (a leading business school in India) and find that graduates belonging to Scheduled Castes (SC) or Scheduled Tribes (ST) get significantly lower wages (up to 35 per cent lower) than those in the general category. This difference disappears once their lower GPAs are taken into account, suggesting that the large wage difference is due to the lower grades of the SC/ST category students.

Caste or reservation category can be used as a factor in study-group formation since students at higher educational institutes can easily infer the reservation category of their peers based on indicators like admission test scores³, last name, and educational background (Rao 2013, Sharma and Subramanyam 2020, and Vijay and Nair 2021).

We follow the methodology of Coffman et al. (2017) to investigate the social desirability bias in anonymous survey responses related to caste and study-group formation. This method uses the item count technique (Miller 1984). To simplify, the method is to compare the survey responses from a control group where the survey questions are asked under anonymity with survey responses from a treatment group where questions are asked under anonymity but also with a 'veil'.

Specifically, the control group is asked 4 questions, each with a yes/no answer, in a block, followed by a sensitive yes/no question of our interest. E.g., a sensitive question we asked was: "In the 2nd year are/were you willing to include a reserved-caste category student in your study group?". The control-group respondent only reports the total number of yeses for the 4 block questions, and the individual yes/no answer to the sensitive question. The treatment-group respondent is only asked the number of yeses for 4+1 questions, where the 4 questions are exactly those asked to the control-group respondent, and the 5th question is the same sensitive

³ Students who are admitted under the reservation policy have lower admission test scores than general category students.

question as the control, except in the treatment, the sensitive question is also a part of the block. The sensitive question is not asked separately in the veiled treatment, as it is asked in the control. Note that the treatment provides a 'veil' to each respondent since the respondent knows that she never revealed her individual answer to the sensitive question; she only stated the total number of yeses, from which it is impossible to infer to which questions she said yes (unless she answers 0 or 5).

This design yields two measures of the proportion of the sample saying yes to the sensitive question. Direct measure: the proportion in the control who say yes to the sensitive question, (when it is asked separately from the block of 4 questions). Veiled measure: the average number of yeses out of 4+1 in the veiled treatment minus the average number of yeses out of 4 for the block questions in the control. The veiled measure assumes that, since participants are randomized across the treatment and control, the number of yeses will be the same for the 4 common questions across the two. Thus, an increase in the average yeses out of 4+1 questions relative to 4 questions, must be the proportion of the treatment sample saying yes to the 5th question of our interest.

Note that the veiled measure provides no inference for a particular individual's answer to the sensitive question. The veiled measure only yields an inference for the number of yeses to the sensitive question at the sample level. Thus, if there is a significant difference in the direct measure and the veiled measure, then it provides evidence that the direct measure, even with strict anonymity, is affected by social desirability bias, which is less of a concern in the veiled measure.

As an example, consider the 'include reserved-caste category student' question (for short) mentioned above. When the question is asked separately from the block of 4 questions in the control, about 95 percent of participants said yes (about 5 percent said no); this is the direct measure. To calculate the veiled measure, note that the number-of-yeses out of the block of 5 questions (including the sensitive question) in the veiled treatment was about 2.99 and the number-of-yeses out of the four-question block in the control was about 2.12, which yields a difference of about 0.87. Thus, the veiled measure yields the inference that about 87 percent of participants answered yes to the sensitive question, and about 13 percent said no, which is the sensitive answer for this question. Comparing the two measures yields that the sensitive answer to this question is underreported by about 8 percentage points in the anonymous survey used in the control, without the veil. Once we control for demographic observables, the underreporting is 17 percentage points.

Thus, we find evidence that the tendency to exclude reserved-caste category students from study groups is underreported in the strictly anonymous survey of the control. Similarly, we also find evidence of underreporting of what could have been a factor showing statistical channel for discrimination (see Guryan and Charles (2013) for a survey on discrimination). We find that the unwillingness to include an inferior academic-ability student in one's study group is underreported by 43 percentage points.

The underreporting of the tendency to exclude inferior academic-ability students is especially important when considered with our finding that more than 40 percent of respondents believe that reserved-caste category students have inferior academic ability (we find no social desirability bias in the responses to this question). Given that we have found measurement issues in direct anonymous responses, regarding both the degree of caste-based discrimination

and its possible channel, we cannot contribute to the question of whether the discrimination we observed is taste based or statistical.

Thus, we find that surveys that are strictly anonymous may not suffice to elicit true responses regarding the existence or true magnitude of an important form of caste-based discrimination—the inclusion of reserved-caste category students in study groups. Furthermore, the channel through which such discrimination operates may also be underreported.

As such, our findings raise fundamental questions of accurately measuring caste-related attitudes and their underlying mechanisms using anonymous surveys. There are several studies that rely on traditional anonymous survey methods to measure caste attitudes and their effects (Lokniti (2017), Coffey et al. (2018), Pandey and Pandey (2018), Deshpande (2019), and Pew Research Centre (2021), among others). Our findings suggest that the robustness of such studies to social desirability bias is an open question.

Bertrand and Duflo (2017) and Lane (2016) provide two reviews of the different literatures on discrimination. Our findings suggest a great challenge in directly measuring beliefs and attitudes on caste-related issues, even though beliefs can be important determinants of discriminatory behavior (Bohren, Imas, and Rosenberg (2017), and Coffman et al. (2021)). Therefore, studies that identify discrimination in behavior seem a more promising direction for identifying and analyzing caste-based discrimination. E.g., Banerjee et al. (2009) and Siddique (2011) study the response to sending fictitious resumes to potential employers, and find significant differences in call-back rates between upper and lower caste applicants.

Our work is related to the literature studying peer effects (see Sacerdote (2014) for a review). Sacerdote (2001), Zimmerman (2003), Stinebrickner and Stinebrickner (2006), and Carrell et al. (2009) find that peers characteristics are important determinants of a student's academic outcomes. Studies that investigate peer effects at graduate business schools in India have yielded similar results (Sen et al. 2012 and Jain and Kapoor 2015). Administratively assigned connections like roommates and study group affect the level of social interaction and friendship between any two students (Jain and Langer (2019)). However, unlike in the current paper, these papers have not explored how endogenous peer groups are formed, and how that relates to caste. On that front, Marmaros and Sacerdote (2006) and Carrell et al. (2013) have found that race and geographic proximity, and academic ability can drive endogenous sorting into groups. We also find that caste and academic ability are drivers of endogenous sorting, but more importantly we find that students underreport the degree to which caste and academic ability drive endogenous sorting.

The rest of the paper is organized as follows. Section 2 details the experimental design. Section 3 specifies our methodology for empirical analysis. Section 4 provides the empirical results. Section 5 concludes.

2. Experimental Design

The survey was designed to elicit responses to five sensitive questions (reported in Table 2) using two methods: (a) anonymous survey (control group), and (b) anonymous survey combined with a veil (veiled treatment group). We closely follow the methodology of Coffman et al. (2017). Approximately half the participants in our main sample of 226 participants were

randomly allocated to the control group, and the other half to the veiled treatment group. The study was conducted offline. The survey forms were distributed to the students at their respective dormitories, who then deposited their anonymous response sheets in a common deposit box. The responses collected from the participants were completely anonymous in both treatments. No identifying information was collected and this was clearly communicated to the participants through the consent form at the start of the survey. As per IRB guidelines, after survey forms were collected, a debriefing statement was given to each participant, which included a request to not share any details about the survey with anyone. Almost 60 percent of the responses were collected on the same first day within a few hours, and furthermore there is no statistical difference between responses on other days (days 2 and 3) relative to the first day. The control and treatment survey documents are provided in Appendix B.

Consider one of the sensitive questions we asked: “In the 2nd year are/were you willing to include a reserved-caste category student in your study group?” The methodology for the control and the veiled treatment for this question is shown in Table 1.

In the control, each participant was presented with a block of 4 yes/no questions, where each question is different from the sensitive questions of our interest, and the sensitive question was presented separately. The participant was requested to only report the total number of yeses to these block questions, i.e., to report a number equal to 0, 1, 2, 3, or 4. In particular, she was not asked her yes/no answer to any of the 4 block questions individually. Next, she was separately asked her yes/no answer to the sensitive question. Thus, each participant in the control was asked the sensitive question “directly” but under anonymity.

In the veiled treatment, each participant was asked her/his number of yeses out of 5 on a block of five yes/no questions, 4 of which were exactly the same unrelated questions as asked to the control group participant in their block of 4 questions. The additional question in the block of five questions asked was the sensitive question of our interest. Note that in the veiled treatment, unlike in the control, the participant doesn’t report her yes/no answer to the sensitive question; instead, each participant only reports her score out of 5 on the block of five yes/no questions, and the sensitive question of our interest is included within this block. Thus, in the veiled treatment, the participant knows she has not provided her answer to the sensitive question, unless she reports 0 or 5. To avoid this, we tried to pick 4 non-sensitive questions such that they contain at-least one question to which most respondents would answer no and one question to which most respondents would answer yes.

This design yields two measures of the proportion of participants who say yes to the sensitive question. First, the *direct* measure from the control—the proportion of participants in the control group who say yes to the sensitive question. Second, the *veiled* measure, which is an inferred measure obtained by comparing the control and the veiled treatment as follows. The veiled measure is the mean number of yeses out of five (for the block of 5 yes/no questions) in the veiled treatment minus the mean number of yeses out of four (for the block of 4 yes/no questions that are common across the control and treatment). The key assumption in the veiled measure is that since the participants are randomized across the two groups, the mean number of yeses out of the 4 common questions in the respective blocks should be the same across the two groups, and therefore any difference in mean number of yeses (out of 4 vs out of 5) across the two groups is the proportion of participants in the veiled treatment who are saying yes to the additional question, which is the sensitive question of our interest.

Following Coffman et al. (2017), we argue that the veiled measure yields the proportion of participants answering yes to the sensitive question with their social desirability concerns (if any) reduced relative to the anonymous but direct measure. So, comparing the veiled measure with the direct measure yields the effect of reducing social-desirability concerns, and the degree of underreporting of the sensitive answer in the direct measure due to the presence of social-desirability concerns, even in anonymous surveys.

For example, consider the sensitive question shown in Table 1: the ‘include reserved-caste category student’ question (for short). When the question is asked separately from the block of 4 questions in the control, about 95 percent of participants in the control said yes (5 percent said no); this is the direct measure. To calculate the veiled measure, note that the number-of-yeses out of the block of 5 questions (including the sensitive question) in the veiled treatment was about 2.99 and the number-of-yeses out of the four-question block in the control (all four questions identical to the unrelated questions in the veiled treatment) was about 2.12, which yields a difference of about 0.87. Thus, the veiled measure yields the inference that 87 percent of participants answered yes to the sensitive question (13 percent said no). For this question, “no” is the sensitive answer. Comparing the two measures yields that the sensitive answer to this question is underreported by 8 percentage points in the anonymous setting, without the veil.

Table 1: Veiled Methodology

Control Group	Treatment Group
1. Do you feel you get as much exercise as you need?	1. Do you feel you get as much exercise as you need?
2. Do you think that air pollution in India is a pressing issue that needs to be addressed immediately?	2. Do you think that air pollution in India is a pressing issue that needs to be addressed immediately?
3. Do you think that the Indian government should completely ban cryptocurrency in India?	3. In the 2nd year are/were you willing to include a reserved-caste category student in your study group?
4. Do you get most of your news from electronic media compared to print media?	4. Do you think that the Indian government should completely ban cryptocurrency in India?
Please circle the total number of questions from the list above for which your answer is yes.	5. Do you get most of your news from electronic media compared to print media?
0 1 2 3 4	Please circle the total number of questions from the list above for which your answer is yes.
(B)	
In the 2nd year are/were you willing to include a reserved-caste category student in your study group?	0 1 2 3 4 5
Yes No	(A)
(C)	

There are five sensitive questions for which we elicit both measures, veiled and direct. These questions are reported in Table 2. In the control, each participant answered a five-part survey form. Each part contained a different block of 4 unrelated questions followed by a particular sensitive question, exactly as described for the ‘include reserved-caste category student’ question above. Following the five parts, there was a short demographic survey with questions on age, gender, reservation category, hometown area (rural/urban), program year (first/second),

and religion. Note that none of these could help the experimenter identify the participant. In the veiled treatment, there were again five parts, where each part contained a block of 5 yes/no questions that had the four questions exactly the same as the corresponding part in the control, and the fifth question in each block was that block’s sensitive question being asked with a veil.

Table 2: Sensitive Questions

Questions	Sensitive Answer
1. Do you believe that caste-based reservation while allocating seats at your institute is justified?	No
2. Do you believe that within your institute, reserved caste category students have inferior academic ability relative to general category students?	Yes
3. In the 2nd year are/were you willing to include a student of inferior academic ability than yours in your study group?	No
4. In the 2nd year are/were you willing to include a reserved caste category student in your study group?	No
5. Do you believe that there is sufficient informal social interaction between general and reserved-caste category students within your institute?	No

Accounting for internal consistency bias

A concern we try to address by experimental design is to check if there was any internal consistency bias while answering sensitive questions 2, 3, and 4 (‘reserved-caste category have inferior academic ability’, ‘include inferior academic-ability student’, and ‘include reserved-caste category student’). These three questions are closely related. The respective answers yes-no-no would follow the typical statistical discrimination story. So, the answer to one question might affect the response to another question.

To perform a robustness-check against such internal-consistency bias we surveyed additional participants (over and above the main sample). Each of these additional participants was assigned to a particular sensitive question: Q2, Q3, or Q4. And within that question to either a robustness control or robustness veiled treatment. E.g., if a participant was assigned to the robustness control (respectively, veiled treatment) for question 3, she would be asked only part 3 of the main-sample control (veiled treatment) survey along with demographic questions. Thus, each of these additional participants was exposed to exactly one sensitive question, either in the control or in the veiled treatment. For each of questions 2, 3, and 4, we had more than 30 participants each in its robustness control and robustness treatment.

3. Empirical Analysis Methodology

To check whether the veiled treatment increased the proportion of participants who gave the sensitive answer to the sensitive question we specify the following regression model for each of the five sensitive questions. For sensitive question q whose sensitive answer is “yes” (e.g., the ‘reserved-caste category have inferior academic ability’ question) the dependent variable for individual i in the veiled treatment is the number of yeses out of 5. For each participant in

the control, the dependent variable is the sum of the following two components: (a) the number of yeses out of the 4 non-sensitive questions, plus (b) 1 if the participant answers yes to the directly asked sensitive question and 0 otherwise. We also control for all observable demographic variables. Hence, for a question which has “yes” as its sensitive answer, we estimate

$$(No. \text{ of yeses out of five})_{qi} = Constant + \beta X_i + \mu_q Treatment_Dummy_i + \varepsilon_i \quad (1)$$

In equation (1), $Treatment_Dummy_i$ is an indicator variable which equals 1 if the participant is in the veiled treatment group. μ_q is the key variable that estimates the increase in the proportion of sensitive answers in the veiled treatment relative to the control. That is, μ_q measures the under-reporting of the sensitive answer under the standard anonymous direct-report method. X_i is the vector of observable demographics: age, gender, reservation category, hometown area (rural/urban), program year (first/second), and religion.

For a question q whose sensitive answer is “no” the dependent variable for individual i in the veiled treatment group is the *number of noes* out of 5, which is 5 minus the number of yeses. For each participant in the control group, the dependent variable is the sum of the following two components: (a) the number of noes out of the 4 non-sensitive questions, plus (b) 1 if the participant answers no to the directly asked sensitive question and 0 otherwise. The rest of the analysis is similar. So, for a question which has “no” as its sensitive answer, we estimate

$$(No. \text{ of noes out of five})_{qi} = Constant + \beta X_i + \mu_q Treatment_Dummy_i + \varepsilon_i \quad (2)$$

Again, μ_q estimates the increase in the proportion of sensitive answers in the veiled treatment relative to the control, or the degree of underreporting of the sensitive answer in the anonymous direct-report method.

3.1 Correlation between direct responses and observable demographics

For the questions where we find the direct responses in the control robust to the social desirability bias, i.e., we find that the treatment effect μ_q is not significantly different from zero, we check for any correlation between observable demographics and the direct reports of the sensitive answer. We do this by fitting a linear probability model as follows:

$$(Direct \text{ sensitive answer to the sensitive question})_{qi} = Constant + \gamma X_i + \varepsilon_i \quad (3)$$

The dependent variable is 1 if the respondent reports the sensitive answer and X_i is the vector of observable demographics.

We skip this analysis for the questions where we find significant under-reporting of the sensitive answer in the direct measure. This is because in such questions there is evidence of social desirability bias in the direct responses. So, an analysis of these biased direct reports could lead to incorrect inferences, which is the key point we are trying to make in this paper.

3.2 Internal consistency robustness check

To empirically test for the presence of any internal consistency bias, for each of questions 2, 3, and 4, we specify the following regression model:

$$(No. \text{ of yeses or noes out of five})_{qi} = Constant + \beta X_i + \mu_q Treatment_Dummy + \alpha_1 Robustness_Dummy + \alpha_2 Treatment_Dummy * Robustness_Dummy + \varepsilon_i \quad (4)$$

Here α_1 captures if the main-sample control is different from the robustness control, while α_2 captures if the veiled treatment in the robustness sample had a differential impact relative to the impact of the veiled treatment in the main sample.

4. Results

In total, 431 students participated in our survey, which is about 50 percent of the entire relevant student body in the business school we studied. These 431 students were allocated to the main sample or the samples for the three individual robustness checks, each with a separate between-subject control and treatment. The split of the sample into the various groups is detailed in Table A1 in the Appendix. About 60 percent of the students in our survey (main and individual robustness samples) belong to the general category (non-reserved), and 29 percent belong to the reserved-caste category (Other Backward Classes (OBC), Scheduled Castes (SC), and Scheduled Tribes (ST)). The remaining 11 percent chose not to answer this question. See Table A1 for these details.

Table 3: Chi-Square Test of Independence between treatment and control group (two tailed p-values)

Demographic Variables	Main Study	Robustness Check 1	Robustness Check 2	Robustness Check 3
Gender (Male/Female)	0.19	0.95	0.88	0.70
Reservation Category (General/Reserved)	0.62	0.14	0.91	0.99
Area (Urban/Rural)	0.86	0.24	0.76	0.33
Year (First/Second)	0.77	0.68	0.71	0.80
Religion (Hindu/Non-Hindu)	0.27	0.31	0.63	0.99

A chi-square test of independence was used to determine if all the demographic variables are distributed randomly between the treatment and control groups. We find no significant difference in the proportion of these characteristics across the two groups. These findings are consistent across the main sample and the three individual robustness checks (see Table 3).

Table 4 presents the direct measure, that is, the percentage of respondents in the control who report the sensitive answer when asked directly under anonymity. Table 5 shows the level of under-reporting in the control group relative to the veiled treatment after controlling for observable demographics. Table 6 reports the correlation between the demographic variables and direct responses for the questions where we do not find significant under-reporting.

Our analysis shows that our results are robust to the internal consistency bias between questions 2-4. Columns (2), (3), and (4) in Table 5 report the results of regression equation 4 for the three

questions (questions 2, 3, and 4) that could have been considered linked. There is no significant difference between the responses of robustness sample control and the responses of main sample control; see the coefficients of the robustness dummy. Also, for each of these 3 questions, the impact of the veiled treatment in the robustness sample is not significantly different from the impact of veiled treatment in the main sample; see the coefficients of the interaction between the robustness and treatment dummies. This suggests that the average respondent's answer to one question did not affect their response to other questions.

Table 4: Proportion of sensitive answer in the control group

Question	Percent Reporting Sensitive Answer
1. Do you believe that caste-based reservation while allocating seats at your institute is justified?	41
2. Do you believe that within your institute, reserved caste category students have inferior academic ability relative to general category students?	46
3. In the 2nd year are/were you willing to include a student of inferior academic ability than yours in your study group?	21
4. In the 2nd year are/were you willing to include a reserved caste category student in your study group?	5
5. Do you believe that there is sufficient informal social interaction between general and reserved-caste category students within your institute?	13

In the control group, where the participants were asked the sensitive question directly, but under anonymity, the proportion of sensitive answer is sizable, as shown in Table 4. This yields our first result.

Result 1: *A significant proportion (p -value of difference from zero < 0.01) of students give sensitive answers to each of the five caste-based reservation questions in the direct-report measure. The results from questions 1 through 5 using the direct-report measure are as below.*

1. *41 percent of the participants report that caste-based reservation while allocating seats at their institute is not justified.*
2. *46 percent of the participants believe that reserved-caste category students have inferior academic ability relative to general category students.*
3. *21 percent of the participants are/were unwilling to include an inferior academic ability student in their study-group.*
4. *5 percent of the participants are/were unwilling to include a reserved-caste category student in their study group.*
5. *13 percent of the participants report a lack of informal interaction between the general and reserved-caste category students.*

The central aim of our paper is to ascertain whether the standard anonymous surveys are effective in eliciting truthful responses on issues related to caste-based reservation. We find significant under-reporting of the sensitive answer in the control group relative to the veiled treatment for two of the five questions in our survey; see the coefficients of the veiled treatment

in Table 5. In Question 3, the proportion of students who report that they are unwilling to include an inferior-academic-ability student in their study group increases from 21 percent in the control group to 64 percent in the veiled treatment. Thus, there is under-reporting of about 43 percentage points ($p < 0.01$) in the direct measure. In Question 4, we find that 5 percent of the control group participants state that they are unwilling to include a reserved-caste category student in their study group. This increases to 22 percent in the veiled treatment. Thus, there is under-reporting of about 17 percentage points ($p < 0.1$).

Table 5: Effect of Veiled Treatment on the report of sensitive answer

	(Q1)	(Q2)	(Q3)	(Q4)	(Q5)
	Is caste based reservation justified	Do RC students have inferior academic ability	Will you include an inferior academic ability student	Will you include a reserved category student	Is there sufficient informal interaction
Veiled Treatment	-0.01 (0.13)	-0.3 (0.14)	0.43*** (0.15)	0.17* (0.10)	-0.12 (0.14)
Robustness Dummy		-0.12 (0.21)	0.04 (0.23)	0.24 (0.15)	
Treatment*Robustness		-0.41 (0.28)	0.17 (0.31)	-0.32 (0.21)	
Demographic Controls	Yes	Yes	Yes	Yes	Yes
Observation	168	225	217	219	168
R ²	0.03	0.07	0.06	0.02	0.03

Note: Positive value of the veiled treatment reflects the increase in reporting of the sensitive answer under the veiled treatment compared to the control group. Standard errors are in parenthesis. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Result 2: *There is significant underreporting about both, the tendency to exclude a reserved-caste category student as well as the tendency to exclude an academically-inferior student from one's study group. The measure of the tendency to exclude a reserved-caste category student increases from 5 percent in the direct measure to 22 percent in the veiled measure. The measure of the tendency to exclude an academically-inferior student increases from 21 percent in the direct measure to 64 percent in the veiled measure.*

The underreporting that we observe here has implications for studies that want to accurately measure and analyse the attitudes of students towards caste-based reservation and its beneficiaries. Elicitations under standard anonymous surveys may not reflect the true beliefs of students. We have shown evidence for the presence of stigma associated with reporting of the sensitive answer, even under strict anonymity, regarding the existence and magnitude of discrimination in inclusion of reserved-caste category students in study groups. We have also shown under-reporting of an important possible channel for this discrimination: participants under-report the fact that they don't want to include academically-inferior students. And as shown in Result 1, more than 40 percent participants report that they consider reserved-caste category students academically inferior.

Table 6: Correlation between direct responses and demographics

	(Q1)	(Q2)	(Q5)
	Is reservation justified (No=1)	Do RC students have inferior academic ability (Yes=1)	Is there sufficient informal interaction (No=1)
Reserved Category	-0.27** (0.13)	-0.33*** (0.11)	0.01 (0.10)
Male	-0.05 (0.15)	0.19 (0.13)	-0.01 (0.11)
Age	0.03 (0.03)	0.02 (0.03)	0.04 (0.03)
Area-Urban	-0.05 (0.16)	0.14 (0.13)	-0.17 (0.12)
Second Year	0.05 (0.12)	0.11 (0.10)	-0.07 (0.09)
Non-Hindu	-0.33 (0.24)	0.02 (0.17)	-0.22 (0.18)
Robustness Dummy		-0.05 (0.11)	
Observation	70	96	70
R ₂	0.09	0.13	0.08

Note: Standard errors are in parenthesis. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Finally, in questions where there is no significant under-reporting of the sensitive answer, we check for any correlation between the demographic variables and the reporting of the sensitive answer in the control group. Using the linear probability model⁴, we find that reporting of the sensitive answer is significantly correlated with the reservation category of the respondent (see the coefficients of Reserved Category in Table 6) while other demographics are uncorrelated. Result 3 describes our findings on such correlations.

Result 3: *In the questions where we find no measurement bias in the direct measure, the following correlations are notable. Students belonging to the reserved-caste category are 27 percentage points more likely (p -value < 0.05) to report that caste-based reservation is justified (question 1) compared to the general category students. General category students are 33 percentage points more likely ($p < 0.01$) to report that reserved-caste category students have inferior academic ability relative to reserved-caste category students (question 2).*

5. Conclusion

The results show that around 41 percent of MBA students at a business school in India believe that reservation based on caste is not justified. 46 percent believe that reserved-caste category students have inferior academic ability. We also find that general category students are more likely to report such beliefs compared to reserved-caste category students.

More importantly, we show the presence of measurement biases due to social desirability concerns in answering sensitive questions related to caste and study-group formation, even under strict anonymity. In particular, when participants are asked under anonymity *and* a veil,

⁴ We get similar results under logit and probit specifications.

we find that the inferred tendency to exclude a reserved-caste category student from one's study group increases from 5 percent in the direct report (under only anonymity) to 22 percent in the veiled treatment (under both anonymity and veil). One of the possible drivers of this tendency is also underreported in the direct report. We find that the tendency to exclude a student with inferior academic ability from one's study group increases from 21 percent in the direct report to 64 percent in the veiled measure.

Thus, we find that social desirability concerns can bias measurements using anonymous surveys to investigate caste-related issues. In this paper, we find these measurement issues while investigating possible caste-based discrimination in study-group formation. Certainly, using our data, we cannot say why there is a tendency to exclude reserved-caste category students from study groups. The data only *suggests* a statistical discrimination channel: 46 percent of participants believe reserved-caste category students have inferior academic ability, and (using the veiled measure) 64 percent are unwilling to include students with inferior academic ability. But the anonymous direct reporting of the latter is found affected by social desirability bias. As such, it seems imprudent to conclude that it is this statistical channel that is causing the discrimination towards reserved-caste category students in endogenous study-group formation. Furthermore, our finding shows that it may not be possible to study this discrimination using direct anonymous reporting.

Finally, our findings have certain policy implications. The fact that 41 percent students believe that caste-based reservation is not justified seems to indicate a need for sensitization of general category students (where the "not justified" belief is more prevalent) about the need for such a policy. The fact that endogenous study-group formation may exclude reserved-caste category students from certain study groups they may want to join, to improve their grades or to improve their learning, indicates that caste-based reservation in admission may need to be supported by nurturing policies post admission. More specifically, many business schools in India sort student exogenously in the first year of their MBA, but allow for endogenous sorting in the second year. Our finding on caste-based discrimination in endogenous sorting suggests that exogenous sorting even in the second year is worth considering.

References

- Banerjee, A., Bertrand, M., Datta, S., and Mullainathan, S. (2009). Labor market discrimination in Delhi: Evidence from a field experiment. *Journal of Comparative Economics*, 37(1):14–27.
- Bertrand, M., and Duflo, E. (2017). Field experiments on discrimination. *Handbook of economic field experiments*, 1: 309-393.
- Bohren, J. A., Imas, A., and Rosenberg, M. (2019). The dynamics of discrimination: Theory and evidence. *American economic review*, 109(10): 3395-3436.
- Carrell, S. E., Fullerton, R. L., and West, J. E. (2009). Does your cohort matter? Measuring peer effects in college achievement. *Journal of Labor Economics*, 27(3): 439–464.
- Carrell, S. E., Sacerdote, B. I., and West, J. E. (2013). From natural variation to optimal policy? The importance of endogenous peer group formation. *Econometrica*, 81(3): 855–882.

Chakravarty, S. and Somanathan, E. (2008). Discrimination in an elite labour market? Job placements at IIM-Ahmedabad. *Economic and Political Weekly*, 43(44): 45–50.

Coffey, D., Hathi, P., Khurana, N., & Thorat, A. (2018). Explicit prejudice. *Economic & Political Weekly*, 53(1): 46-54.

Coffman, K. B., Coffman, L. C., and Ericson, K. M. M. (2017). The size of the LGBT population and the magnitude of antigay sentiment are substantially underestimated. *Management Science*, 63(10): 3168–3186.

Coffman, K. B., Exley, C. L., & Niederle, M. (2021). The role of beliefs in driving gender discrimination. *Management Science*, 67(6): 3551-3569.

Deshpande, A. (2019). Double jeopardy? Stigma of identity and affirmative action. *The Review of Black Political Economy*, 46(1): 38–64.

Edwards, A. L. (1953). The relationship between the judged desirability of a trait and the probability that the trait will be endorsed. *Journal of Applied Psychology*, 37(2): 90–93.

Ghosh, J. (2006). Case for caste-based quotas in higher education. *Economic and Political Weekly*, 41(24): 2428–2432.

Guryan, J., & Charles, K. K. (2013). Taste-based or statistical discrimination: The economics of discrimination returns to its roots. *The Economic Journal*, 123(572), F417-F432.

Ilaiah, K. (2006). Merit of reservations. *Economic and Political Weekly*, 41(24): 2447–2449.

Jain, T. and Kapoor, M. (2015). The impact of study groups and roommates on academic performance. *Review of Economics and Statistics*, 97(1): 44–54.

Jain, T. and Langer, N. (2019). Does whom you know matter? Unraveling the influence of peers' network attributes on academic performance. *Economic Inquiry*, 57(1): 141–161.

Krumpal, I. (2013). Determinants of social desirability bias in sensitive surveys: a literature review. *Quality & Quantity*, 47(4): 2025–2047.

Kumar, V. (2016). Discrimination on campuses of higher learning: A perspective from below. *Economic and Political Weekly*, 51(6): 12–15.

Lane, T. (2016). Discrimination in the laboratory: A meta-analysis of economics experiments. *European Economic Review*, 90: 375–402.

Lokniti (2017). Attitudes, anxieties and aspirations of India's youth: changing patterns. *Lokniti: Centre for the study of developing societies and Konrad Adenauer Stiftung*. https://lokniti.org/media/upload_files/Lokniti-CSDS%20Youth%20Report%202017.pdf

Marmaros, D. and Sacerdote, B. (2006). How do friendships form? *Quarterly Journal of Economics*, 121(1): 79–119.

Miller, J. D. (1984). *A new survey technique for studying deviant behavior*. PhD thesis, The George Washington University.

Pandey, P. and Pandey, S. (2018). Survey at an IIT campus shows how caste affects students' perceptions. *Economic and Political Weekly*, 53(9).

Pew Research Centre (2021). Religion in India: Tolerance and segregation. <https://www.pewresearch.org/religion/2021/06/29/religion-in-india-tolerance-and-segregation/>

Rao, S. (2013). Structural exclusion in everyday institutional life: Labelling of stigmatized groups in an IIT. In G. B. Nambissan & S. Rao (Eds.), *Sociology of education in India: Changing contours and emerging concerns* (pp. 199–223). New Delhi, India: Oxford University Press

Sacerdote, B. (2001). Peer effects with random assignment: Results for dartmouth roommates. *Quarterly journal of economics*, 116(2): 681–704.

Sacerdote, B. (2014). Experimental and quasi-experimental analysis of peer effects: two steps forward? *Annu. Rev. Econ.*, 6(1): 253–272.

Sen, A., Goutam, P., and Chatterjee, C. (2012). Peer effects in graduate education: Evidence from india. Technical report, Working paper.

Sharma, A. J., and Subramanyam, M. A. (2020). Psychological responses to reservation-based discrimination: A qualitative study of socially marginalized youth at a premier Indian university. *International Journal of Educational Development*, 79, 102298.

Siddique, Z. (2011). Evidence on caste based discrimination. *Labour Economics*, 18: S146–S159.

Stinebrickner, R. and Stinebrickner, T. R. (2006). What can be learned about peer effects using college roommates? Evidence from new survey data and students from disadvantaged backgrounds. *Journal of Public Economics*, 90(8-9): 1435–1454.

Vijay, D. and Nair, V. G. (2021). In the name of merit: Ethical violence and inequality at a business school. *Journal of Business Ethics*, 1–23.

Zimmerman, D. J. (2003). Peer effects in academic outcomes: Evidence from a natural experiment. *Review of Economics and statistics*, 85(1): 9–23.

Appendix A

Table A1: Descriptive Statistics - Sample Size

	Control Group	Treatment Group	Overall
Sub-Sample			
Main Study	105	121	226
Robustness Check 1	37	36	73
Robustness Check 2	32	32	64
Robustness Check 3	34	34	68
Gender			
Male	150	178	328
Female	44	40	84
Did not report	14	5	19
Reservation Category			
General	124	132	256
Reserved Category (OBC, SC, ST)	51	73	124
Did not report	33	18	51
Religion			
Hindu	138	164	302
Non-Hindu	16	25	41
Did not report	54	34	88
Area			
Urban	155	172	327
Rural	32	42	74
Did not report	21	9	30
Year			
First Year Student	91	115	206
Second Year Student	103	104	207
Did not report	14	4	18

Appendix B: Survey documents

Introduction to the survey: This was identical for each control and treatment group participant.

This survey intends to study certain attitudes and behaviour of students currently enrolled in business/management schools in India. This is being conducted by Prof. Jeevant Rampal (faculty, Economics area, IIM Ahmedabad) and Saif Ali Khan (Research Assistant at IIM Ahmedabad) for their research. We would like you to fill out a short survey which will not take more than 10 minutes. The data collected will be completely anonymous and will only be used for research purposes. You will not be asked to report your name, email id or any other information which can be used to identify the individual from their responses. The institute's name will also be kept anonymous in any disclosure of results.

Participation in this survey is voluntary. You can skip any question you do not wish to answer. At any time during the survey, if you wish to discontinue, you can do so. Some of the questions might cause discomfort to some of the participants and we advise the participants to use their discretion. We encourage the participants to not answer questions and/or discontinue the survey if they think that the questions or survey may cause them any discomfort. We also encourage the participants to contact any one of the principal investigators (Prof. Jeevant Rampal, Mr. Saif Ali Khan) in case of any issues faced while answering the survey.

If you agree with this, please proceed further and complete the survey. Otherwise, you can end the survey at this point. Proceeding further will be considered as consent provided for the study.

This study has been cleared by the IRB Committee, IIM Ahmedabad. The approval number is IIMA IRB 2022-20.

Survey document for a participant in the control group

General instructions: You will be presented with five sets of yes/no questions. Each set will have two components: (i) 4-questions marked (a)-(d), and (ii) two individual questions marked by bullet points. Within each set, for the questions marked (a)-(d) *don't provide individual answers*, instead *only provide the total number of the questions in (a)-(d) for which your answer is yes*. This number (0, 1, 2, 3, or 4) will be asked after questions (a)-(d). For the two subsequent individual questions marked by bullet points, please provide individual yes or no answers where indicated. Please note that anonymity will be maintained as specified in the preceding page.

Set 1

(Please don't provide yes/no answers for individual (a)-(d) questions; please only note the number of yeses.)

- (a) Do you spend more than 6 hours in a day in front of a screen (mobile/computer) on an average?
- (b) Have you ever received any type of phishing email (fraudulent message designed to trick victims into revealing sensitive information)?
- (c) Have you ever taken any paid professional advice on financial matters?
- (d) Have you had a traffic accident in the last 3 months?

Please circle the total number of questions from the list above for which your answer is yes.

0 1 2 3 4

(Please provide yes/no answers for individual questions in bullet points.)

- Do you believe that caste-based reservation while allocating student seats at your institute is justified?
Yes No
- Have you ever lied or overstated your academic/professional achievements on any professional networking site (LinkedIn, etc.)?
Yes No

Set 2

(Please don't provide yes/no answers for individual (a)-(d) questions; please only note the number of yeses.)

- (a) Have you bought any type of health insurance plan for yourself?
- (b) Have you used UPI as the payment option in the past 5 days?
- (c) Have you been to a movie theatre at least once since the lockdown was lifted after the third COVID-19 wave?
- (d) Do you take any vitamin or protein supplements regularly?

Please circle the total number of questions from the list above for which your answer is yes.

0 1 2 3 4

(Please provide yes/no answers for individual questions in bullet points.)

- Have you ever felt envious after seeing a friend's post on any social media platform (Instagram, Facebook, etc.)?
Yes No
- Do you believe that within your institute, reserved-caste category students have inferior academic ability relative to general category students?
Yes No

Set 3

(Please don't provide yes/no answers for individual (a)-(d) questions; please only note the number of yeses.)

- (a) Have you ordered food online at least once in the past 5 days?
- (b) Do you know the political party of the member of parliament from your hometown constituency?
- (c) Will you stop buying products/services from a company if it is found guilty of unethical practices?
- (d) Do you think that Gujarat should remain a dry state?

Please circle the total number of questions from the list above for which your answer is yes.

0 1 2 3 4

(Please provide yes/no answers for individual questions in bullet points.)

- In the 2nd year are/were you willing to include a student of inferior academic ability than yours in your study group?
Yes No

- Have you ever lied about your personal information (e.g., age) or physical appearance in your online dating profile?

Yes No

Set 4

(Please don't provide yes/no answers for individual (a)-(d) questions; please only note the number of yeses.)

- (a) Do you feel you get as much exercise as you need?
- (b) Do you get most of your news from electronic media compared to print media?
- (c) Do you think that air pollution in India is a pressing issue that needs to be addressed immediately?
- (d) Do you think that the Indian government should completely ban cryptocurrency in India?

Please circle the total number of questions from the list above for which your answer is yes.

0 1 2 3 4

(Please provide yes/no answers for individual questions in bullet points.)

- Are you more likely to share positive emotions and events than negative ones on social media platforms (Facebook, Twitter, etc.)?

Yes No

- In the 2nd year are/were you willing to include a reserved-caste category student in your study group?

Yes No

Set 5

(Please don't provide yes/no answers for individual (a)-(d) questions; please only note the number of yeses.)

- (a) Do you think that climate change is something that is affecting you or is going to affect you, personally?
- (b) Do you think that moving from 5-day to a 4-day workweek will reduce the weekly productivity of corporate employees?
- (c) Were you aware of any type of cryptocurrency before 2017?
- (d) Do you believe there is a lack of unbiased news reporting in India?

Please circle the total number of questions from the list above for which your answer is yes.

0 1 2 3 4

(Please provide yes/no answers for individual questions in bullet points.)

- Do you believe that there is sufficient informal social interaction between general category students and reserved-caste category students within your institute?

Yes No

- Have you ever lied about the quality or the condition of a product while selling it online (OLX, Quikr.com etc.)?

Yes No

Kindly fill in the following information. You are not being asked to report your name, email-id, etc., and you can skip any question that you do not wish to answer.

1. Age:
2. Gender:
3. Reservation Category (General, OBC, SC, ST):
4. Religion:
5. Hometown Area (Rural or Urban):
6. First-year student or second-year student:

Survey document for a participant in the treatment group

General instructions: You will be presented with five sets of yes/no questions. Each set will have 5-questions marked (a)-(e). Within each set, for the questions marked (a)-(e) *don't provide individual answers, instead only provide the total number of the questions in (a)-(e) for which your answer is yes.* This number (0, 1, 2, 3, 4 or 5) will be asked after questions (a)-(e). Please note that anonymity will be maintained as specified in the preceding page.

Set 1

(Please don't provide yes/no answers for individual (a)-(e) questions; please only note the number of yeses.)

- (a) Do you spend more than 6 hours in a day in front of a screen (mobile/computer) on an average?
- (b) Have you ever received any type of phishing email (fraudulent message designed to trick victims into revealing sensitive information)?
- (c) Have you ever taken any paid professional advice on financial matters?
- (d) Have you had a traffic accident in the last 3 months?
- (e) Do you believe that caste-based reservation while allocating student seats at your institute is justified?

Please circle the total number of questions from the list above for which your answer is yes.

0 1 2 3 4 5

Set 2

(Please don't provide yes/no answers for individual (a)-(e) questions; please only note the number of yeses.)

- (a) Have you bought any type of health insurance plan for yourself?
- (b) Have you used UPI as the payment option in the past 5 days?
- (c) Have you been to a movie theatre at least once since the lockdown was lifted after the third COVID-19 wave?
- (d) Do you believe that within your institute, reserved-caste category students have inferior academic ability relative to general category students?

(e) Do you take any vitamin or protein supplements regularly?

Please circle the total number of questions from the list above for which your answer is yes.

0 1 2 3 4 5

Set 3

(Please don't provide yes/no answers for individual (a)-(e) questions; please only note the number of yeses.)

- (a) Have you ordered food online at least once in the past 5 days?
- (b) In the 2nd year are/were you willing to include a student of inferior academic ability than yours in your study group?
- (c) Do you know the political party of the member of parliament from your hometown constituency?
- (d) Will you stop buying products or services from a company if it is found guilty of unethical practices?
- (e) Do you think that Gujarat should remain a dry state?

Please circle the total number of questions from the list above for which your answer is yes.

0 1 2 3 4 5

Set 4

(Please don't provide yes/no answers for individual (a)-(e) questions; please only note the number of yeses.)

- (a) In the 2nd year are/were you willing to include a reserved-caste category student in your study group?
- (b) Do you feel you get as much exercise as you need?
- (c) Do you get most of your news from electronic media compared to print media?
- (d) Do you think that air pollution in India is a pressing issue that need to be addressed immediately?
- (e) Do you think that the Indian government should completely ban cryptocurrency in India?

Please circle the total number of questions from the list above for which your answer is yes.

0 1 2 3 4 5

Set 5

(Please don't provide yes/no answers for individual (a)-(e) questions; please only note the number of yeses.)

- (a) Do you think that climate change is something that is affecting you or is going to affect you, personally?
- (b) Do you believe that there is sufficient informal social interaction between general category students and reserved-caste category students within your institute?
- (c) Do you think that moving from 5-day to a 4-day workweek will reduce the weekly productivity of corporate employees?
- (d) Were you aware of any type of cryptocurrency before 2017?
- (e) Do you believe there is a lack of unbiased news reporting in India?

Please circle the total number of questions from the list above for which your answer is yes.

0 1 2 3 4 5

Kindly fill in the following information. You are not being asked to report your name, email-id, etc., and you can skip any question that you do not wish to answer.

1. Age:
2. Gender:
3. Reservation Category (General, OBC, SC, ST):
4. Religion:
5. Hometown Area (Rural or Urban):
6. First-year student or second-year student:

Debriefing Statement: This was identical for each control and treatment group participant.

We would like to thank you for participating in our survey. Your participation is greatly appreciated.

In the consent form we informed you that the purpose of the survey is to study certain attitudes and behaviour of students currently enrolled in business schools. Specifically, the purpose of our study is to assess the students' attitude towards caste-based reservation, in particular how this attitude relates to study-group formation. We would like to reassure the participants that the data collected is completely anonymous and will be used for research purposes only. Not even the principal investigators can identify any individual from their responses. Your institute's name will also be kept anonymous in any disclosure of results. If you have any further questions or you feel any discomfort after completing the survey, please contact any one of the principal investigators (Prof. Jeevant Rampal, Mr. Saif Ali Khan).

*We would like to apologize for not providing you with all the details prior to your participation. It was necessary in order to get an accurate measure of the respondents' attitude. Questions related to caste-based reservation are sensitive in nature and when asked directly, respondents can potentially alter their responses. To minimize this effect and get an accurate measure, we used the **Item Count Technique (ICT)** or the veiled methodology.*

This methodology requires that we do not reveal the true purpose of the study at the start of the survey and divide the participants into two groups. Depending on whether you were in the control group or treatment group, each set of questions included a sensitive question (the focus of our study) which you were asked directly or grouped with other non-sensitive questions respectively. A comparison of the answers between the two groups will give us an accurate measure of the students' attitude. If you would like to learn more about the Item Count Technique, please see Coffman et al. (2017).

Please note that although the purpose of this study was not explicitly specified in the consent form, everything else has been clearly stated. This includes the ways in which we will keep your data confidential and anonymous. No personal information has been collected which can be used to identify any of the participant.

We request you to not disclose the true purpose of our study and the methodology used to anyone as this could affect the results of the future rounds of this study.

Thank you again for your participation.

Reference in the debriefing statement

Coffman, K.B., Coffman, L.C. & Ericson, K.M.M. (2017). The size of the LGBT population and the magnitude of anti-gay sentiment are substantially underestimated. Management Science, 63(10), 3168–3186.