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Caste, ‘Cleanliness’ and Cash: Effects of Caste-Based Political Reservations in Rajasthan on a Sanitation Prize

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ABSTRACT *Even compared with neighbouring countries, latrine use is especially uncommon in India. How might caste – historically associated with sanitation inequality – interact with government sanitation policy? Using data from Rajasthan state, we investigate the effect of caste-based reservations for village chairmen elected in 2005 on the likelihood of winning the government’s Clean Village Prize by mid 2012. This prize is a large cash award for villages in which open defecation has been eliminated; thus it is intended to be a prize for both latrine construction and use. Villages randomly assigned to a Scheduled (low-ranking) Caste chairman are less likely to win the prize.*

1. Introduction

Exceptionally high levels of open defecation and the continuing effects of the caste system may be two of the most important challenges to human welfare in India. On the one hand, according to joint UNICEF and World Health Organisation (WHO) estimates for 2010 (Joint Monitoring Programme for Water Supply and Sanitation, 2012), over half of the population of India defecates openly, accounting for 60 per cent of all people who do so worldwide.¹ This open defecation causes millions of infant deaths and reduced physical and cognitive growth among those who survive (Spears, 2013). On the other hand, people born into low-ranking castes in India continue to face profound economic, political, social, and health disadvantages and discrimination (Deshpande, 2011; Thorat & Newman, 2010).

This article studies the interaction of two government policies: reservations of local political positions for members of disadvantaged groups, and a large, *ex post* cash incentive to village leaders for eliminating open defecation. This incentive, part of India’s Total Sanitation Campaign (TSC), has contributed to important improvements in sanitation in rural India (Spears, 2012), but progress has been uneven and it is an urgent, open question why sanitation coverage remains so incomplete. Caste could be one limit to better sanitation (Bathran, 2011). Caste and so-called ‘untouchability’ have long been connected with poor sanitation: low-caste ‘sweepers’ are traditionally responsible for moving human excreta. Political reservations based on caste are also of independent importance: scholars have debated whether potential benefits of mandated representation are worth possible costs to governance capacity. For all of these reasons, it is important to understand the interaction of caste-based reservations with the functioning of the TSC’s prize incentive.

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Prior research in the literature has taken ample advantage of the fact that certain political reservations are randomly determined in India. We study the universe of *Gram Panchayats* (local councils) in rural Rajasthan, to see the effect of randomised caste-based reservation in 2005 elections on the probability of subsequently winning the TSC's Clean Village Prize.² We find that villages reserved for low-caste chairmen are about two percentage points less likely to win the prize, a reduction of more than one-third. Additionally our data allow certain conclusions about the mechanism: villages reserved for low-caste chairmen do not build fewer latrines than unreserved villages. Instead, they are half as likely to win this government prize for latrine use even when they have constructed at least one latrine per household.

This article makes five contributions to the literature. First, although several papers have studied local reservations for women in India (and interactions with reservations for women), to our knowledge fewer have documented an effect of randomised caste-based political reservations on a policy outcome. Second, given the importance of sanitation for health and human capital formation, this result indicates a potential social cost of political reservations, to be weighed against the benefits. Third, our findings highlight the interactions between caste and sanitation, and suggest that the caste system could be a barrier to improving sanitation. Fourth, despite national, state and district components of the TSC, our results demonstrate the importance of local governance for sanitation policy. Finally, the difference in the effects of reservations on latrine construction and on being recognised for eliminating open defecation serves as a reminder that latrine construction does not necessarily lead to latrine use. It is also important to recognise that the outcome that this article studies is winning a government sanitation prize – not sanitation itself – and error and corruption in awarding the prize are well-documented (Snehalatha, Anitha, Busenna, & Venkata Swamy, 2012) and could even be a mechanism disadvantaging low-caste village leaders.

1.1. Sanitation, the Clean Village Prize and Caste

1.1.1. The Nirmal Gram Puraskar. The Total Sanitation Campaign (TSC), first announced in 1999, is one of the 'flagship' programmes of the Indian government. In late 2003, the TSC announced the Nirmal Gram Puraskar, Hindi for 'Clean Village Prize', often called the NGP. The NGP is a large cash prize (about US\$2000 to US\$4000 at market exchange rates) given to the village chairman at a prestigious ceremony. Because government money is largely fungible, in many cases these prizes are effectively captured by local leaders; this apparent corruption could, however, increase the effectiveness of the programme by concentrating the incentive on locally powerful elites (see Spears, 2012).

The NGP is intended to be a reward for villages that are 'open defecation free', that is, where everyone is using a toilet or latrine. Although the TSC offers villages small partial subsidies for latrine construction, the NGP is designed as an incentive for latrine use, not construction.³ Kumar, Singh and Prakash (2010) describe how the prize is to be awarded: after a *Gram Panchayat* (GP) decides to apply, its open defecation free status is verified by its block, then by its district. After this, an independently contracted agency verifies open defecation free status on behalf of the state, and a State-Level Scrutiny Committee reviews the verification report and decides whether to recommend the application to the central government. Finally, the application is approved by a committee of the central government which includes representatives of the World Bank Water and Sanitation Program. The central government randomly re-verifies 30 per cent of the applications that reach it using survey teams from other states, with triggers for further re-verification if discrepancies are too large. Kumar et al. (2010) report that from 2005 to 2009, 22,554 GPs won the prize out of 55,442 applicants, a success rate of about 40 per cent. Of course, like many government functions in rural India, the NGP is surely implemented imperfectly, and we cannot assume that all prize winners are indeed 'open defecation free'.

As a UNICEF official responsible for sanitation in a sub-national office in India explained to us, the NGP was, in his experience, a 'motivating force' in attracting the attention of village leaders to the TSC: 'Once the award was started, the [latrine construction] numbers increased like anything'. Spears (2012) found evidence of a motivating role of the NGP in discontinuities in the step function mapping village size into a monetary prize amount. However, it took several years for the NGP to produce

verified winners; the earliest winners in our Rajasthani data were in 2007, two years after the election we study.

Qualitative accounts of the TSC – a central government programme with state and district components – indicate that villages are a critical level of governance for implementing sanitation policy, suggesting that our focus on village leadership is plausible (Black & Fawcett, 2008). For example, the same UNICEF official explained that the heterogeneity in the success of the TSC is due to what he called ‘the P factor: the pradhan factor’, referring to the type of local officials we study here. In one case, a district magistrate with whom we met explained convincingly that he was quite committed to the success of the TSC in his district. He had been trained as a civil engineer before being accepted to administrative service, and personally wrote a booklet recommending sanitation practices for his village, which he distributed at a series of sanitation-themed parties for his district’s village chairmen. Yet he lamented that ultimately the village chairmen have the power to pursue the prize or not, and few of those in his district appeared to be trying.

1.1.2. Caste and sanitation. There is much debate about the origins and nature of the Indian caste system, most of which is beyond the scope of this quantitative article. What almost all analysts agree upon, however, is that historically some people have been assigned extremely low ranks in the caste system (Deshpande, 2011). These so-called ‘untouchables’ or ‘dalits’ (a word meaning ‘the oppressed’) are, and historically have been, assigned dirty, degrading and manual labour.⁴ Many dalits have been ‘sweepers’ (a common euphemism; also ‘scavengers’), whose job it is to physically collect and remove human faeces from places where higher-caste people have defecated without using a toilet or latrine (Prashad, 2001; Ramaswamy, 2005; UNICEF, 2011).

The Indian constitution mandates certain quotas for such low-caste people, and also for people belonging to certain ‘tribal communities’. Because the eligible groups are enumerated in a schedule, these are sometimes referred to as ‘Scheduled Castes’ and ‘Scheduled Tribes’, often ‘SC’ and ‘ST’, terminology this article will henceforth use to reflect the state’s role in deciding who is and is not eligible for reserved political positions.

Bathran (2011), reviewing official writing on the TSC, argues that caste is involved in this government programme, even if some official documents omit it. For example, when the TSC builds school latrines, ‘the reality, as seen in many villages, is that the dalit students are forced to clean the toilet’ (Bathran, 2011, p. 36). Hammer, Chaudhury, Moulik and Pokharel (2007) report that, as the TSC was implemented in a government experiment in Maharashtra, high-caste villagers were motivated to build latrines for the entire village with the observation that otherwise flies would carry particles of low-caste people’s faeces into high-caste people’s food, an especially polluting possibility. It stands to reason that an SC village chairman might be less likely to make this point persuasively to others in the village. Of course, fully characterising any relationship between caste and sanitation in India is beyond the scope of this narrow quantitative article.

1.2. Village Council Reservations in India

The 1992 73rd Amendment Act of the Indian constitution led to the emergence of a three-tiered local government functioning at the district (*Zila Parishad*), intermediate (*Panchayat Samiti*) and village levels (*Gram Panchayat*). These Panchayati Raj Institutions (PRIs) were entrusted with the responsibility to implement schemes of economic development and with the authority to function as effective institutions of self-government. In particular, this structure enumerated 29 functions whose powers and authorities were to be devolved by the states on the PRIs, including sanitation. By 2001, Rajasthan, the state we study, had indeed officially devolved all 29 listed functions to PRIs.

One important feature of political decentralisation in India is the reservation of seats in PRIs in favour of historically disadvantaged groups: Scheduled Castes, Scheduled Tribes and women. We study elections in 2005 to a position of village chairman known in Rajasthan as the ‘sarpanch’.⁵ The 2005 sarpanch election was for a five-year term. In Rajasthan, sarpanch positions are reserved for women and for SC, ST and ‘Other Backwards Caste’ or OBC people. In particular, *Gram Panchayats*

– which we will sometimes refer to as ‘GPs’ or loosely as ‘villages’⁶ – are eligible for randomisation for a group-based reservation (such as for an SC sarpanch) if they have a population at least 5 per cent of which belongs to that group. Among these eligible villages, some are assigned to reservations using a random rotation mechanism (Chattopadhyay & Duflo, 2004a; Rajaraman & Gupta, 2009).

Several papers in the literature have taken advantage of this randomisation to explore causal effects of sarpanch reservations. Using survey data on villages from Birbhum district in West Bengal and Udaipur district in Rajasthan, Chattopadhyay and Duflo (2004b) find that a woman sarpanch invests more in goods that are relevant to the needs of local women (water and roads in the case of Bengal and water in the case of Rajasthan). Beaman, Duflo, Pande and Topalova (2011) review subsequent studies on reservations for women and analyse transcripts of village meetings to document mechanisms. Note that reservations for women are orthogonal to caste-based reservations; controlling for reservation for a woman does not change any of our results.

Pande (2003) examines reservations of state legislature jurisdictions for SC or ST officeholders, using 16 Indian states at the units of observation. She concludes that states with more intensive reservations for SC or ST group members experience greater levels of redistribution towards these groups.

In Birbhum district of West Bengal, Chattopadhyay and Duflo (2004a) find that SC sarpanchs invest a larger share of public goods in hamlets with many SC people than do non-SC sarpanchs. Besley, Pande, Rahman and Rao (2004) study reservations in south India for SC and ST village chairmanships, although they collapse these two groups into one ‘SC/ST’ category, despite important social and political differences between them. They find that ‘high spillover’ public goods are allocated to be near village leaders, while ‘low spillover’ household goods from government sources are allocated to people socially similar to leaders.

Bardhan, Mukherjee and Parra Torrado (2010) further study local reservations in West Bengal. They show that SC reservations improved public service delivery to SC groups and reduced delivery to ST groups. Overall, reservations for SC and ST leaders increased the average number of benefits received by village households. They explain their findings using a model of elite capture with clientelism.

Our article differs from these prior papers in three ways. First, unlike much of the prior literature, our article is not about the selection or distribution of public resources within villages. We do not ask who within a village receives latrines; we ask how a village, as a whole, performs. This is a relevant focus given negative externalities of open defecation.

Second, we study caste-based reservations in a particular policy context where caste has historical and contemporary social significance: sanitation. We are not merely investigating generalised democratic performance, or the political influence of disadvantaged social groups.

Finally, we are not only studying publicly funded resources and goods, such as constructed latrines; we are further studying a prize that, in principle, rewards villages where people *use* latrines. This plausibly requires village leaders to motivate the rest of the village into action, rather than to simply make binding decisions among themselves. It is possible that socially excluded sarpanchs are less able to fulfil this public leadership role.

Given the random assignment of reservations to villages, the outline of our article is straightforward. Section 2 details the data sources and our empirical strategy. Section 3 presents results, separating effects of reservations on winning the prize, on latrine construction and on winning conditional on latrine construction. Section 4 concludes.

2. Empirical Strategy

The observations in our analysis are the full universe of villages in Rajasthan, a state in northern India. Rajasthan was chosen partially because it was studied in Chattopadhyay and Duflo’s (2004b) earlier study of the effects of reservation of sarpanch positions for women. We combine two forms of administrative, government data – data on sarpanch reservations and actual election outcomes – and TSC administrative data on pre-programme sanitation coverage, latrine construction and the Clean

Village Prize. Our empirical strategy partially relies on the randomisation of sarpanch reservations, but also makes use of demographic data.

Villages in Rajasthan are randomly assigned to reservation for a Scheduled Caste sarpanch. However, only villages with a population at least 5 per cent SC are eligible for randomisation into reservation. Therefore, our main results focus on this subset of Rajasthani villages, but for robustness results are also shown for all villages. For more information on the randomisation and for the text of the relevant law, please see the Appendix.

2.1. Data

Our dependent variables come from publicly available administrative data collected by the TSC.⁷ These data include a ‘baseline survey’ – collected, it should be emphasised, by the Indian government as part of the TSC at the beginning of the programme⁸ – including sanitation infrastructure coverage and village-level demographic characteristics: population, population of certain groups, and count below the official poverty line.

The main dependent variable of the survey is an indicator for a village having won the Clean Village Prize by the time of our compilation of the data in June 2012. Only 3.8 per cent – or 305 of the 8022 villages in our data – had won the prize. The same administrative data report how many latrines have been constructed in each village, from which we can compute the count of latrines per household and an indicator of having at least one latrine per household.

Our key independent variables are the official reservation assigned to a village, if any, and the category of the sarpanch actually elected. Reservation for an SC, ST or OBC sarpanch has a correlation with actually electing such a sarpanch of 0.96, 0.91 and 0.51, respectively. We matched reservation and TSC data by hand based on district, block and village names, blind to reservation status.

2.2. Identification Strategy

The identification strategy of this article is simple, given the ostensible randomisation of villages to reservations. Although Freedman (2008) suggests that regression controls can cause bias in finite samples for randomised trials, for robustness we will replicate basic results by adding a large set of controls in stages in order to account for any association between assignment to caste reservation and heterogeneity across villages; the purpose will be to show that this has no effect on results. Additionally we will show all results for the full sample and for the 82 per cent subsample of the full population of villages eligible for randomisation, that is, those with populations at least 5 per cent Scheduled Caste.

We estimate a linear probability regression of the probability of winning the NGP:

$$NGP_{vbd} = \beta_1 SC\ sarpanch_{vbd} + \beta_2 ST\ sarpanch_{vbd} + \beta_3 OBC\ sarpanch_{vbd} + X_{vbd}\theta + \alpha_{bd} + \varepsilon_{vbd} \quad (1)$$

where v indexes villages, b indexes blocks, d indexes states and X_{vbd} is a vector of controls. Fixed effects α – first by district, then by block – are included; blocks are partitions of districts, which partition the state of Rajasthan.

Coefficients β are the parameters of interest. Villages assigned to no sarpanch reservation are the omitted category. We present reduced form results of the effects of reservation on winning the NGP, ordinary least squares (OLS) estimates of the effect of the actual caste group of the elected sarpanch, and instrumental variables estimates of the effect of the actual caste group elected, instrumented with the reservation assignment.

Fixed effects and controls are added in stages to demonstrate that they have little effect on the conclusion. In particular, covariate controls are added in three sets:

- *Reporting controls.* An indicator for never having updated latrine construction data, and a set of five indicators for the years 2008 to 2012 in which the village's latrine construction data were last updated.
- *Demographic controls.* Household count as a quadratic polynomial; fraction of the village households that are SC as a fourth-order polynomial; fraction of the village households that are ST as a fourth-order polynomial; four indicators for the village having any and only SC and ST households; and the fraction of the village households that are below the official poverty line.
- *Baseline sanitation controls.* Number of latrines per household in the baseline survey as a quadratic polynomial and an indicator for having at least one latrine per household in the baseline survey.

After this main analysis, we study the mechanism by which villages reserved for SC sarpanchs are less likely to win the prize. Do SC-reserved villages build fewer latrines per household, or are they less likely to win even conditional on latrine construction? We approach this question with the same specification as in Equation (1), but substituting these further dependent variables.

2.3. Randomisation Balance

Table 1 presents summary statistics describing the villages in Rajasthan. Panel A reports results from the main sample of the article, villages eligible for randomisation. The top row presents preliminary evidence from a Fisher's exact test – assuming exogeneity and that villages are independent observations – that rejects that villages assigned to an SC sarpanch are equally likely to win the prize.

Villages assigned to SC sarpanchs are very similar to unreserved villages on the means of every observed dimension. The last column presents the *t*-statistic from a test that means for unreserved villages and those reserved for SC sarpanchs are the same. There are no statistically significant differences in the main sample used in the analysis, that is, villages that were eligible for randomisation because their population was at least 5 per cent SC.

Panel B reports results from the full sample, including villages with populations less than 5 per cent SC. Mechanically and unsurprisingly, in this set the SC fraction is greater, on average, in households

Table 1. Summary statistics, by reservation assignment

	sarpanch reservation assignment:				<i>t</i> -statistic:
	unreserved	SC	ST	OBC	SC = unreserved
Panel A: Eligible villages (> 5% Scheduled Caste households)					
win NGP	0.051	0.039	0.010	0.042	
Fisher's exact <i>p</i> -value		0.050	0.000	0.144	
SC sarpanch elected	0.025	0.999	0.000	0.000	288
households	858	855	834	862	−0.27
fraction SC	0.233	0.235	0.228	0.242	0.43
fraction ST	0.096	0.100	0.321	0.075	0.78
reserved for female	0.339	0.338	0.317	0.320	−0.18
never reported data	0.030	0.027	0.060	0.030	−0.76
year data last updated	2010.45	2010.35	2010.60	2010.43	0.75
baseline latrines	0.187	0.192	0.074	0.192	0.58
endline latrines	0.310	0.304	0.276	0.316	−0.71
<i>n</i> (villages)	3328	1286	926	1002	
Panel B: Full sample					
win NGP	0.049	0.036	0.010	0.030	
Fisher's exact <i>p</i> -value		0.027	0.000	0.196	
households	858	860	849	869	0.14
fraction SC	0.201	0.214	0.142	0.209	2.57
<i>n</i> (villages)	3881	1417	1559	1165	

reserved for an SC sarpanch. For more discussion of this eligibility criterion and the relevance of the fraction of the village that is Scheduled Caste, please see the Appendix.

3. Results

Are villages that were assigned to an SC sarpanch in 2005 less likely to win the Clean Village Prize by mid 2012? Our first answer is suggested by a set of local polynomial regressions.

Figure 1 plots the probability of winning the NGP as a function of baseline sanitation infrastructure coverage, separately for villages that were assigned to an SC sarpanch and for unreserved villages. As a reassuring check of the data and prize monitoring process, villages that had more latrines at the beginning of the TSC were more likely to win the prize. However, at all levels of initial coverage, unreserved villages are more likely to win than villages reserved for an SC sarpanch.⁹

Could this result be driven by an omitted variable, correlated with SC reservation? Figures 2 and 3 explore two candidate confounds: the fraction of the village that is Scheduled Caste, and the size of the village. In both cases, the conditional probabilities of winning never intersect: SC-reserved villages are always less likely to win. These figures suggest that any association between SC reservation and winning the NGP is not merely a spurious reflection of heterogeneity in these otherwise ‘omitted’ variables.

3.1. Villages Reserved for SC Leaders Are Less Likely to Win

Table 2 presents estimates of Equation (1) testing the robustness and statistical significance of the differences seen in the local polynomial regressions. In all regressions, villages with or assigned to a Scheduled Caste sarpanch are about two percentage points less likely to have won the NGP. This result is strikingly robust to controls, accounting for any heterogeneity in SC population or other factors that may be correlated with reservation assignment. The long vector of demographic controls changes the point estimate of the effect of an SC sarpanch by less than 3 per cent. Note also that there is no consistent direction of change in the estimate of the effect of an SC sarpanch when the full sample is used instead of only villages eligible for randomisation: in three of six cases the point estimate increases slightly in absolute value; in three it slightly decreases.

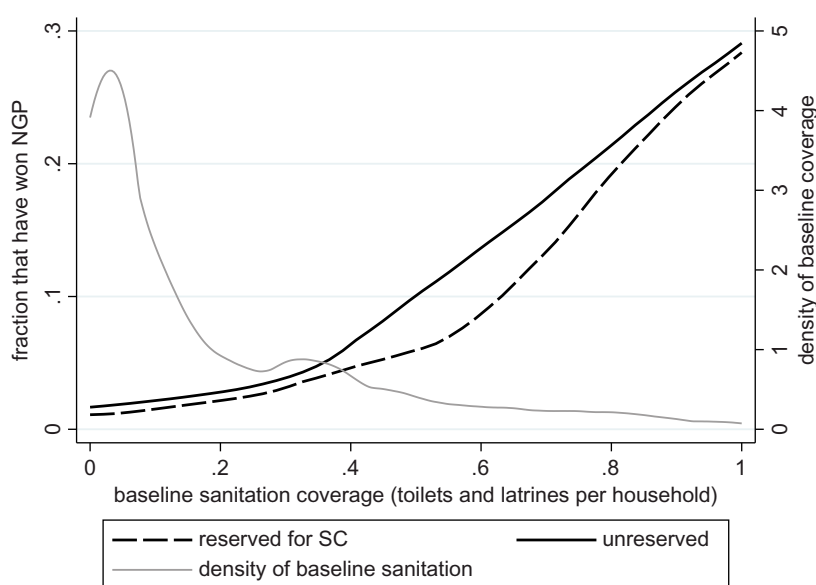


Figure 1. Effects of reservation on NGP, by baseline sanitation: local polynomial regressions.

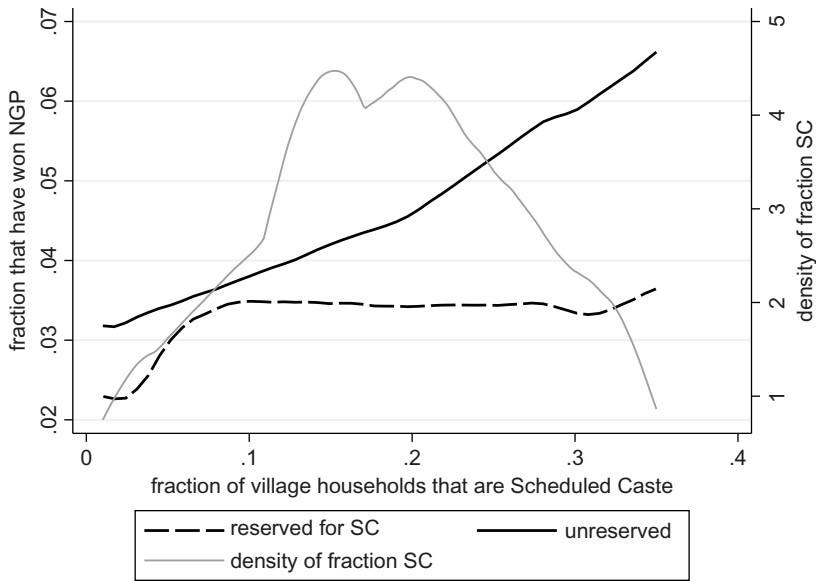


Figure 2. Effects of reservation on NGP, by SC fraction: local polynomial regressions.

Especially for SC and ST reservations, the reservation is highly correlated with the actual group membership of the sarpanch actually elected, so it is unsurprising that reduced form results in panel A are very similar to OLS results in panel B. However, this compliance with assigned reservation is not perfect, so local average treatment effects (LATE) estimated with instrumental variables in panel C are even greater in absolute value. For the IV regression in column 1 of panel C, the first stage t -statistics on reservations for SC, ST and OBC are 267, 136 and 37 respectively, indicating no threat from weak instruments.

Further evidence suggests that the fraction of the village that is SC is not an omitted variable driving these results. When this fraction alone is added to the simple regression of column 1 of panel A of

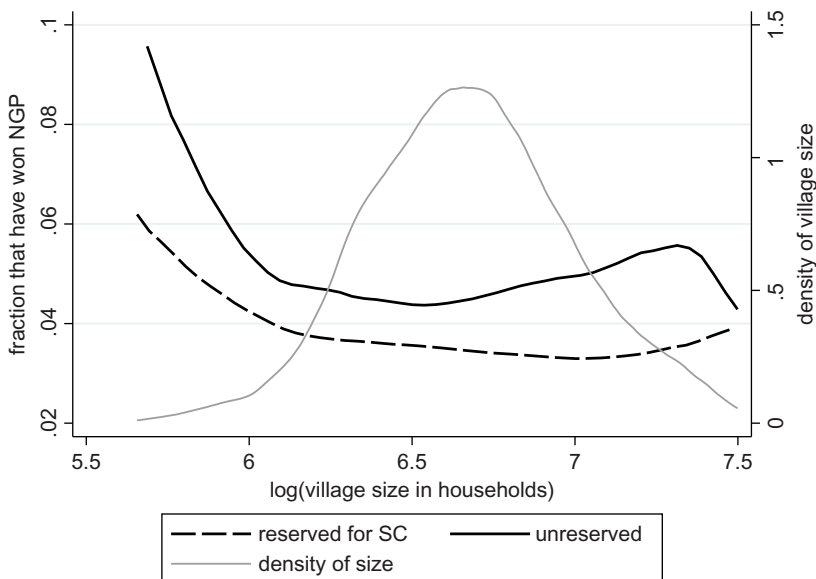


Figure 3. Effects of reservation on NGP, by village population: local polynomial regressions.

Table 2. Effect of reservation on linear probability of winning NGP prize

sample	(1) SC < 5%	(2) full	(3) SC < 5%	(4) SC < 5%	(5) SC < 5%	(6) SC < 5%	(7) SC < 5%	(8) full
district FEs			✓					
block FEs				✓	✓	✓	✓	✓
data quality controls					✓	✓	✓	✓
demographic controls								
<i>n</i> (villages)	6542	8022	6542	6542	6542	6464	6464	7944
Panel A: Reduced form: effect of random assignment								
SC sarpanch	-0.0119 [†] (0.00695)	-0.0127 [†] (0.00655)	-0.0219** (0.00601)	-0.0203** (0.00600)	-0.0226** (0.00590)	-0.0221** (0.00592)	-0.0195** (0.00564)	-0.0191** (0.00511)
ST sarpanch	-0.0411** (0.00816)	-0.0384** (0.00732)	-0.00971 [†] (0.00499)	-0.00983 [†] (0.00524)	-0.00825 (0.00545)	-0.00806 (0.00591)	-0.00701 (0.00582)	-0.00591 (0.00520)
OBC sarpanch	-0.00887 (0.00719)	-0.00664 (0.00666)	-0.0120 [†] (0.00727)	-0.0118 [†] (0.00701)	-0.00997 (0.00687)	-0.00957 (0.00689)	-0.00378 (0.00646)	-0.00290 (0.00590)
Panel B: OLS: effect of category actually elected								
SC sarpanch	-0.0162 (0.0100)	-0.0171 [†] (0.00910)	-0.0263** (0.00830)	-0.0229** (0.00822)	-0.0225** (0.00783)	-0.0227** (0.00792)	-0.0189* (0.00739)	-0.0196** (0.00667)
ST sarpanch	-0.0465** (0.00919)	-0.0434** (0.00819)	-0.0170* (0.00672)	-0.0159* (0.00683)	-0.0120 [†] (0.00668)	-0.0115 (0.00706)	-0.00885 (0.00681)	-0.00903 (0.00613)
OBC sarpanch	-0.00329 (0.00910)	-0.00317 (0.00821)	-0.00685 (0.00739)	-0.00526 (0.00701)	-0.00160 (0.00691)	-0.00283 (0.00694)	0.00141 (0.00675)	0.000363 (0.00626)
Panel C: IV: LATE effect of category elected, instrumented with reservation								
SC sarpanch	-0.0320* (0.0145)	-0.0288* (0.0133)	-0.0411** (0.0130)	-0.0402** (0.0123)	-0.0398** (0.0120)	-0.0381** (0.0120)	-0.0276* (0.0118)	-0.0254* (0.0104)
ST sarpanch	-0.0613** (0.0158)	-0.0546** (0.0144)	-0.0295* (0.0146)	-0.0316* (0.0142)	-0.0266 [†] (0.0139)	-0.0239 [†] (0.0141)	-0.0155 (0.0137)	-0.0125 (0.0120)
OBC sarpanch	-0.0290 (0.0176)	-0.0227 (0.0163)	-0.0309 [†] (0.0164)	-0.0315* (0.0156)	-0.0271 [†] (0.0152)	-0.0255 [†] (0.0152)	-0.0119 (0.0149)	-0.00911 (0.0132)

Notes: Standard errors in parentheses, clustered by 223 blocks. Two-sided *p*-values: [†]*p* < 0.10, **p* < 0.05, ***p* < 0.01.

Table 1, the coefficient on SC *increases* slightly in absolute value from -0.0119 to -0.012024, with a standard error of 0.0069. In this regression, the fraction of households that are SC has a statistically significant *positive* slope. This fraction does not statistically significantly interact with reservation to an SC sarpanch (interaction $t = 0.32$).

Notice that there is no similarly stable and statistically robust effect found of reservation for ST or OBC sarpanchs. This is consistent with a special interaction between low caste and sanitation.

3.2. Latrine Construction is not the Mechanism

Why are SC-reserved villages less likely to win the NGP? Do SC-reserved villages build fewer latrines per household, or are they less likely to win even conditional on latrine construction? As before, local polynomial regressions suggest an answer. Figure 4 shows that the curves for predicted latrine construction conditional on baseline latrine coverage cross several times for unreserved and SC-reserved villages: neither group of villages uniformly constructed more latrines than the other. As minimal evidence of data quality, note villages that started out with nearly complete latrine coverage built fewer latrines.

The fact that SC-reserved sarpanchs constructed as many latrines as non-reserved sarpanchs suggests that overall lower competence or experience of politicians in reserved seats is not likely to explain our finding. Additionally, it suggests that the result may not be driven by a lower preference for sanitation among SC village chairmen. Note that this result *is* consistent with latrine construction (rather than use) being driven by profit motives of contractors who might have an economic incentive to ignore the caste of the sarpanch.

In contrast, Figure 5 plots the probability of winning as a function of latrine construction. Above the lowest levels of latrine construction – where no villages should win the prize and the curves meet near zero – unreserved villages are everywhere more likely to win the NGP. This is especially clear at the highest levels of latrine coverage, where the prize is more likely to be legitimately won.

Table 3 confirms these graphical conclusions with regression estimations. Villages reserved for an SC sarpanch do not build fewer latrines, nor are they less likely to build at least one per household, and neither of these results is changed by the full set of controls.

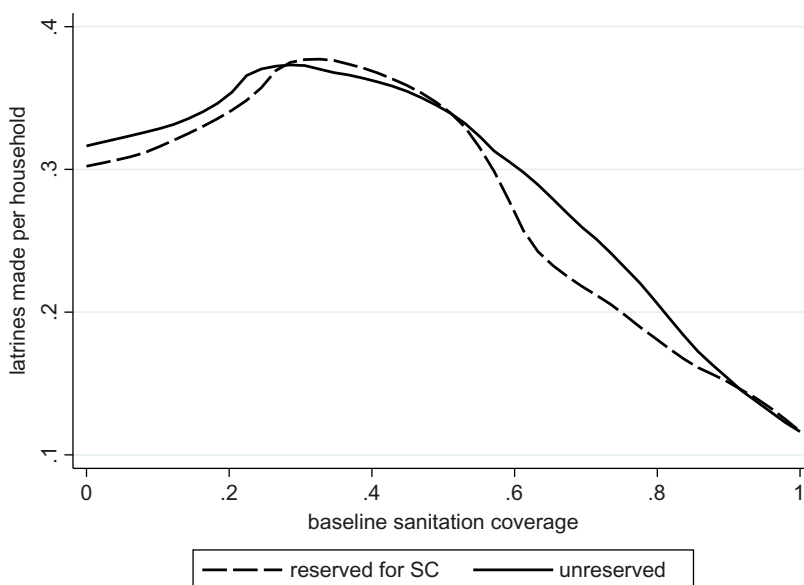


Figure 4. No effect of reservation on latrine construction: local polynomial regressions.

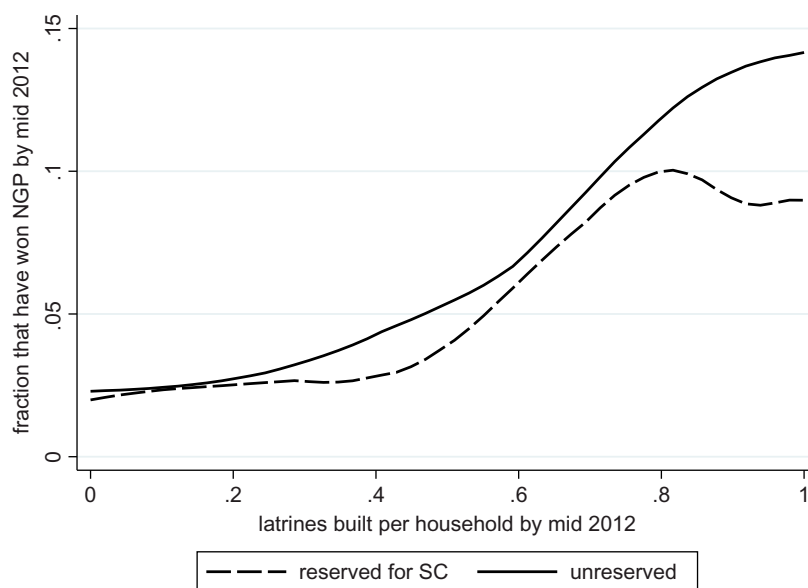


Figure 5. An SC sarpanch is less likely to win, even with high construction: local polynomial regressions.

However, columns 5–8 show that SC reserved villages are less than half as likely to win the prize, conditional on having built at least one latrine per household. In this tiny sample all of the regression controls cannot be used, however columns 6 and 8 – which controls for SC per cent as a fourth-order polynomial along an indicator for all SC and, in column 8, an indicator for no SC – show that this result is not driven by heterogeneity in caste composition of the village. Indeed, with these controls added the coefficient slightly increases in absolute value from column 7 to 8.

There are at least two processes by which SC sarpanchs could be less likely to win despite building as many latrines. First is that the Clean Village Prize is intended to reward being open defecation free. Therefore, it is a reward for latrine *use*, not latrine *construction*. Perhaps SC sarpanchs – with membership that may be made explicit by the reservation in a group associated with ritual uncleanness – are less socially able to motivate their villages to stop defecating openly. This would not necessarily reflect a lack of overall governance skills: higher caste people may simply be unwilling to take advice about sanitation from a low-caste officeholder.

A second possibility is that villages with an SC sarpanch are just as likely to become open defecation free as unreserved villages, but that SC sarpanchs are less able to achieve recognition of this accomplishment from the government. This could be because they have less ability to interact with the government, on average, or because despite equal ability, government officials are less willing to recognise low-caste sarpanchs with this reward for being open defecation free. Our data cannot separate these possibilities.

4. Conclusion

Sanitation is an important constraint on health and human capital formation in rural India, and the Total Sanitation Campaign was the Indian government's primary strategy for improving this situation. Therefore, it is important to understand what limited the implementation of this programme, especially at the village level.

Reservation of government offices is a much debated policy in Indian politics. Although reservations are interesting in their own right, we study the interaction of village-level reservations and the

Table 3. SC reservation impacts winning conditional on construction, does not impact construction

sample dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	SC > 5% latrines built per hh	SC > 5% latrine per hh	SC > 5% one latrine per hh	SC > 5% latrine per hh	SC > 5% SC > 5% win NGP, conditional on ≥ 1 per hh			
SC sarpanch	-0.00650 (0.00920)	-0.00402 (0.00624)	-0.000583 (0.00561)	0.000425 (0.00540)	-0.123 [†] (0.0636)	-0.116 [†] (0.0655)	-0.120* (0.0586)	-0.124* (0.0607)
ST sarpanch	-0.0343 [†] (0.0187)	0.0155 (0.0121)	0.00398 (0.00810)	0.00203 (0.00876)	-0.118 [†] (0.0676)	-0.0189 (0.0618)	-0.116* (0.0573)	-0.0450 (0.0507)
OBC sarpanch	0.00522 (0.00982)	-0.000815 (0.00798)	-0.00105 (0.00615)	0.00308 (0.00566)	-0.0387 (0.0730)	-0.0305 (0.0698)	-0.0370 (0.0652)	-0.0345 (0.0632)
SC population: F_5		1.59		0.57		2.25		2.21
p -value		0.164		0.725		0.058		0.050
other controls		✓		✓				
constant	0.310** (0.0133)	0.190** (0.0501)	0.0271** -0.00402	0.0690* (0.0282)	0.200** (0.0471)	0.317 (0.268)	0.195** (0.0413)	0.162* (0.0701)
n (villages)	6464	6464	6464	6464	255	255	297	297

Standard errors in parentheses, clustered by blocks. Two-sided p -values: [†] $p < 0.10$, $*p < 0.05$, $**p < 0.01$. 'hh' stands for 'household'. Columns 5–8 include only villages that built at least one latrine per household. 'Other controls' are the full set of controls from column 6 of Table 2. 'SC population controls' are the fraction of the population that is Scheduled Caste as a quartic polynomial, and indicators for this fraction being 0 and 1.

TSC as a tool to understand how the special connections between caste and sanitation impact contemporary policy implementation.

Villages assigned to an SC sarpanch are about two percentage points (about one-third) less likely to win the Clean Village Prize for eliminating open defecation. However, villages with SC reservations build as many latrines as unreserved villages and are as likely to build at least one latrine per household. The resolution of this seeming paradox is that SC-reserved villages are half as likely to win the prize conditional on having built one latrine per household. This suggests either that SC sarpanchs are less able to motivate latrine use within their villages, or that despite achieving comparable levels of latrine use, they are unable to achieve recognition from the government (possibly because, anticipating corruption or discrimination, they do not apply for the award). Either possibility would indicate a persisting interaction of caste-based inequality with government policy. Although our data are unable to separate these hypotheses or to observe final open defecation rates directly, we particularly encourage further qualitative research into how caste is made relevant in local governance.

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Notes

1. 'Open defecation' is the term for when people defecate, usually outside, without a toilet or latrine. Throughout this article, we will use the word 'sanitation' to refer to safe disposal of human faeces in a toilet or latrine, rather than cleanliness or trash disposal more generally.
2. 'Clean Village Prize' is the English translation of the Hindi name of the prize. Thus we put quotation marks around 'cleanliness' in the title of this article. We can observe whether villages are officially labelled as clean, but not their actual rates of open defecation.
3. It is important to emphasise that latrine use is a constraint in the Indian context: even people given free, government-constructed latrines will often not use them for defecation, instead continuing to openly defecate while using latrines for storage, for example, or disassembling them for construction materials.
4. Ramaswamy (2005) claims that manual scavenging by low-caste people was 'institutionalised' by the British during colonial urbanisation and industrialisation. Nothing in this article – which uses data from the 2000s – makes any claim as to whether a relationship between caste and sanitation is somehow inherent or historical in the caste system, beyond a description of what the data reveal about caste today in the villages studied.
5. Other authors in the literature use the term 'pradhan'; we follow the usage in Rajasthan.
6. We call sub-village units 'hamlets'; thus, when we write 'village' we mean GP.
7. Spears (2012) and Spears and Lamba (2012) use similar data from the same source to document effects of the TSC on children's health and cognitive achievement, respectively, suggesting that the data – although noisy – are not without signal. Note that because the randomisation studied in our article occurred *within* districts, it does not impact the district-level identification strategies of these two papers.
8. The TSC was announced in 1999 and began spending money to construct latrines in 2001; we study reservations in a 2005 election.
9. It is not the case that this difference is statistically significant *at all levels of baseline coverage*, that is, that the confidence intervals for winning the prize conditional on each level of baseline coverage do not overlap. This would be a much stronger claim than that of this article: that, on average, villages with SC-reserved sarpanch positions are less likely to win, overall.

References

- Bardhan, P. K., Mookherjee, D., & Parra Torrado, M. (2010). Impact of political reservations in West Bengal local governments on anti-poverty targeting. *Journal of Globalization and Development*, 1(1).
- Bathran, R. (2011). Indian sanitation. *Economic and Political Weekly*, 46(51), 34–37.
- Beaman, L., Dufllo, E., Pande, R., & Topalova, P. (2011). Political reservation and substantive representation: Evidence from Indian village councils. *India Policy Forum*, 2010–2011 Delhi: NCAER and Brookings Institute.

- Besley, T., Pande, R., Rahman, L., & Rao, V. (2004). The politics of public good provision: Evidence from Indian local government. *Journal of the European Economics Association*, 2, 416–426.
- Black, M., & Fawcett, B. (2008). *The last taboo: Ppening the door on the global sanitation crisis*. London: Earthscan.
- Chattopadhyay, R., & Duflo, E. (2004a). Impact of reservation in Panchayati Raj: Evidence from a nationwide randomised experiment. *Economic and Political Weekly*, 979–986.
- Chattopadhyay, R., & Duflo, E. (2004b). Women as policy makers: Evidence from an India-wide randomized policy experiment. *Econometrica*, 72(5), 1409–1444.
- Deshpande, A. 2011. *The grammar of caste: Economic discrimination in contemporary India*. New Delhi: Oxford University Press.
- Freedman, D. A. (2008). On regression adjustments to experimental data. *Advances in Applied Mathematics*, 40, 180–193.
- Hammer, J. S., Chaudhury, N., Moulik, S. G., & Pokharel, A. (2007). *Hygiene and health: An evaluation of the Total Sanitation Campaign in Maharashtra*. Working paper, World Bank Water and Sanitation Program.
- Heckman, J., Moon, S. H., Pinto, R., Savelyev, P., & Yavitz, A. (2010). Analyzing social experiments as implemented: A reexamination of the evidence form the HighScope Perry Preschool Program. *Quantitative Economics*, 1, 1–46.
- Joint Monitoring Programme for Water Supply and Sanitation. (2012). *Progress on drinking water and sanitation: 2012 update*. WHO and UNICEF.
- Kumar, A., Singh, U., & Prakash, M. (2010). *Monitoring systems for incentive programs: Learning from large-scale rural sanitation initiatives in India*. Guidance note, World Bank Water and Sanitation Program.
- Pande, R. (2003). Can mandated political representation increase policy influence for disadvantaged minorities? Theory and evidence from India. *American Economic Review*, 93, 1132–1151.
- Prashad, V. (2001). *Untouchable freedom: A social history of a dalit community*. Delhi: Oxford University Press.
- Rajaraman, I., & Gupta, M. (2009). *Further evidence on the policy impact of randomised political reservation*. Working paper, National Institute of Public Finance and Policy.
- Ramaswamy, G. (2005). *India stinking: Manual scavengers in Andhra Pradesh and their work*. Pondicherry: Navayana.
- Snehalatha, M., Anitha, V., Busenna, P., & Venkata Swamy, M. (2012). *Nirmal Gram Puraskar and sanitation service levels: Curse of slippage*. WASHCost Working Paper No. 126.
- Spears, D. (2012). *Effects of rural sanitation on infant mortality and human capital: Evidence from a local governance incentive in India*. Working paper, Princeton University.
- Spears, D. (2013). *How much international variation in child height can sanitation explain?* Working paper, Princeton University.
- Spears, D., & Lamba, L. (2012). *Effects of early-life exposure to rural sanitation on childhood cognitive skills: Evidence from India's Total Sanitation Campaign*. Working paper, Princeton University.
- Thorat, S., & Newman, K. S. (2010). *Blocked by caste: Economic discrimination in modern India*. New Delhi, Oxford University Press.
- UNICEF. (2011). *Converting dry latrines in the district of Budaun, Uttar Pradesh: A story of commitment, determination, and dignity*. Report, UNICEF Office for Uttar Pradesh.

Appendix. Randomisation and eligibility for reservation

How do we know that sarpanch reservations were, indeed, randomly assigned? This identification strategy is now common in the literature. Rajaraman and Gupta (2009) explicitly state, having analysed the relevant laws, that in Rajasthan SC reservations are done by ‘random rotation’ subject to an ‘if > 5% floor’ (p. 30). Similarly, Chattopadhyay and Duflo (2004a, p. 981) explain:

In both states [Rajasthan and West Bengal], a specific set of rules ensures the random selection of GPs where the office of Pradhan was to be reserved. All GPs in a district are ranked in consecutive order according to their serial legislative number (an administrative number pre-dating this reform). GPs that have less than 5% SCs (or STs) are excluded from the list of possible SC (or ST) reservation. A table of random numbers (in the electoral law) is then used to determine the seats that are to be reserved for SCs and STs, according to the numbers that need to be reserved in these particular districts. They are then ranked in three separate lists, according to whether or not the seats had been reserved for a SC, for a ST, or are unreserved.

We verified this in correspondence with a government officer.

Our [Table 1](#) of summary statistics indeed found no statistically significant mean differences among reserved and unreserved GPs, conditional on being eligible for randomisation. This lack of difference in means is exactly what randomisation is used to ensure in expectation. Curiously, however, a more complicated fourth-order polynomial of SC population predicts SC reservation, as documented in the Online Appendix. To our knowledge, none of the papers in literature studying randomised reservations in rural India has noted this fact. Because our results are unchanged controlling for this polynomial, and because of our non-parametric local polynomial results, we do not believe the validity of our conclusions are threatened by this finding (see Heckman, Moon, Pinto, Savelyev, & Yavitz, 2010). It is possible that this is a statistical fluke, from an over-ambitious search for an exhaustive list of controls, especially given the ability of high-order polynomials to over-fit.