Intergroup contact and its effects on discriminatory attitudes

Evidence from India

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Abstract: The contact hypothesis posits that having diverse neighbours may reduce one's intergroup prejudice. This hypothesis is difficult to test as individuals self-select into neighbourhoods. Using a slum relocation programme in India that randomly assigned neighbours, I examine the effects of exposure to other-caste neighbours on trust and attitudes towards members of other castes. Combining administrative data on housing assignment with original survey data on attitudes, I find evidence corroborating the contact hypothesis. Exposure to more neighbours of other castes increases inter-caste trust, support for inter-caste marriage, and the belief that caste injustice is growing. I explore the role of friendships in facilitating these favourable attitudes. The findings shed light on the positive effects of exposure to diverse social groups through close proximity in neighbourhoods.

Key words: contact hypothesis, intergroup contact, caste, slum relocation, India

JEL classification: C83, R38, Z13

Note: As the research is part of the author's PhD thesis, the author will hold copyright to facilitate publication of the thesis.

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1   Introduction

Exposure to diverse social groups in neighbourhoods may shape individuals' attitudes towards members of other groups. However, it is difficult to identify the effect of exposure since people self-select into neighbourhoods, and often prefer to live among their own group (Wong 2013). Furthermore, it is difficult to measure such attitudes and how policies allowing for integration shape them.

I focus on exposure to diverse caste groups and seek to answer the following question: how does caste diversity in one's immediate neighbourhood affect one's attitudes towards other groups? I use a slum relocation policy in India to examine the effect of living among neighbours from other castes on inter-caste prejudice. The policy randomly assigns housing units within two relocation sites to slum dwellers. I combine administrative data on the assignment of housing with survey data that I collected from individuals living in these sites. I exploit the exogenous variation in neighbour composition *within* the housing site to identify the causal effect of living among other-caste neighbours on trust and attitudes towards other castes. I find that exposure to neighbours from other castes engenders more favourable attitudes towards other caste groups. Individuals surrounded by more neighbours from other castes experience an increase in inter-caste trust and are more accepting of inter-caste marriage. I explore the role of friendships in facilitating these favourable attitudes and find that cross-caste friendships are positively correlated with exposure to more neighbours from other castes, but these effects are imprecise.

In India, caste plays an instrumental role in access to labour market opportunities (Akerlof 1976) and social networks (Kandpal and Baylis 2019). The caste system is characterized by endogamy (i.e. people marry within their own caste). Only 4.9 per cent of marriages in India take place outside caste (Goli et al. 2013), despite state governments providing incentives for marrying outside caste (Hortaçsu et al. 2019). Affirmative action policies in India aim to counter caste-based injustice and discrimination, which are still rampant in Indian society (Bagde et al. 2016; Munshi 2017). The contact hypothesis states that, under certain conditions, interpersonal contact reduces prejudice between groups (Allport et al. 1954). Facilitating inter-caste contact may help in reducing caste-based prejudice. However, evidence on the effect of exposure to diversity is mixed. Finseraas et al. (2019) and Scacco and Warren (2018) find that exposure to diverse immigrant or ethnic groups increases trust. On the other hand, Alesina and La Ferrara (2002) and Dinesen and Sønderskov (2015) find that exposure to diversity leads to less trust. Additionally, no comprehensive data set exists on caste-related attitudes and it is difficult to discern and collect information on individuals' underlying caste preferences. I overcome this by collecting data from my own survey in the aforementioned relocation sites. My paper is related to previous literature that used random assignment of roommates in colleges and found a reduction in interracial prejudice in the USA (Boisjoly et al. 2006; Carrell et al. 2015; Sacerdote 2001).

I study slum dwellers who were relocated to public housing in the city of Pune, India. These slum dwellers were randomly assigned to apartments in buildings within two public housing sites. Since individuals are not given a choice in selecting their neighbours on their assigned floor, this generates exogenous variation in the caste composition of neighbours, which I use to measure contact. My identification strategy exploits this variation to estimate the effect of exposure to diverse-caste neighbours on attitudes towards members of other castes. To elicit responses on attitudes as well as friendships within the randomized neighbourhood, I designed and collected data from a survey on 692 adults. The attitudes I measure can be divided into two broad categories: (1) trust, which includes general trust and inter-caste trust; and (2) caste attitudes, which include beliefs about inter-caste marriage, importance of caste, caste injustice, and support for affirmative action. I collected information on friendships of the respondents in order to understand whether attitudes towards other caste groups are influenced by the caste composition of friendships.

I find a significant increase in the extent of inter-caste trust with exposure to more neighbours from other castes. A one standard deviation (s.d.) increase in neighbourhood caste diversity causes a 9.6 percentage point (p.p.) increase in trust in members of other castes; a 7.2 p.p. increase in support for inter-caste marriage among own family members, and a 9.5 p.p. increase in the belief that caste injustice has increased in the last ten years. I find no effects of caste diversity on support for affirmative action and importance attached to caste identities.

Having established the effects of exposure to neighbours from other castes on attitudes, I examine whether the caste composition of friends is a possible channel through which these effects operate. Being exposed to more caste diversity is positively correlated with having more friends from other castes, but these estimates are imprecise. On the whole, my findings suggest that increased exposure to diverse-caste neighbourhoods can itself induce less discriminatory attitudes, without changing the composition of one's friends.

When I repeat my analysis for sub-castes, sub-castes within the lower caste group tend to attach more importance to their caste identity when surrounded by more neighbours belonging to their sub-caste. Those who stay longer in their apartment and those who have more other-caste friends prior to residing in the new apartment show more favourable attitudes when exposed to greater caste diversity. My results are robust to alternate specifications and attrition from the sample.

This paper contributes to three strands of literature. First, there is work that shows the effects of contact on intergroup prejudice. Closely related are the works of Rao (2019), Lowe (2018), and Okunogbe (2018). Rao (2019) shows that integrating rich and poor children in schools in India can lead to more prosocial behaviour. Lowe (2018) shows that attitudes towards other castes in rural India are determined by the type of contact. Okunogbe (2018) looks at the effect of temporary random assignment of university graduates in Nigeria to different regions of the country for national service on inter-ethnic marriage and friendships, and finds that intermarriage tends to increase when individuals are transferred to regions with greater ethnic diversity. I find a significant increase in prosocial attitudes induced by proximity and exposure to other-caste neighbours, and in contrast to the aforementioned work, I find strong effects simply through living in proximity and the resulting exposure to other groups.

Second, my paper relates to research on the effects of slum relocation policies on integration. Evidence on the effect of these policies on integration is mixed. Bazzi et al. (2019) look at the effects of the Transmigration Resettlement Program on national integration in Indonesia, and find greater integration in communities that are ethnically diverse. In the Indian context, Barnhardt et al. (2017) find that those who won a housing lottery in the city of Ahmedabad lost access to their friends and previous networks after moving location, and were hence unhappy with the provision of public housing. These studies focus on the intent to treat effects of being assigned to a relocation site. I exploit a second level of randomization to measure the effect on intergroup interactions: I examine the effect of interactions within the relocation site by exploiting the random assignment of apartments *within* each building in the site, *after the relocation takes place*.

Third, I look at attitudes such as beliefs about caste injustice, beliefs about inter-caste marriage *within* an individual's family, and an individual's support for caste-based reservation. This contributes to the work done on caste in modern-day India, such as that of Appadurai (2004) and Goel and Deshpande (2016), who find that government schemes can change caste perceptions among individuals for the better.

The paper is organized as follows: Section 2 provides background and information on data collection. Section 3 explains the empirical strategy. Section 4 discusses the results, and Section 5 outlines additional results. Section 6 provides robustness checks. Section 7 provides a discussion, and Section 8 concludes.

2   Background

2.1   Caste and attitudes

Caste is a system of social categorization, wherein people are classified into closed groups by birth (Bagde et al. 2016). Each broad caste group consists of many sub-castes. Membership of a sub-caste ensures entry into a job specific to that sub-caste. Furthermore, marriage is allowed only within the same sub-caste (endogamy) (Lowe 2018). After India attained independence, affirmative action policies came into effect to help historically disadvantaged castes. These disadvantaged groups are formally recognized as the Scheduled Castes (SC), Scheduled Tribes (ST), and the Other Backward Castes (OBC). Under such policies, quotas for these groups were created in higher education, political office, and government jobs. In addition, there are monetary incentives offered by several states for couples marrying outside their castes (Hortaçsu et al. 2019). The role of caste has been studied extensively in rural India (Mosse 2018; Munshi 2017; Vijayabaskar and Kalaiyarasan 2014). Lowe (2018) finds that prejudice reduces when people from different castes work together, and increases when they are pitted against each other. Munshi and Rosenzweig (2008) find that a numerical sub-caste majority in local governments leads to increased public provision.

Despite the government implementing policies to bridge the caste divide, caste-based discrimination remains high in India. Results from the Social Attitudes Research for India (SARI) survey indicate that 30 per cent of urban India still practices untouchability,[1] and about 40 per cent of urban India does not support inter-caste marriage (Coffey et al. 2018).

Moreover, cities in India have been experiencing an increase in caste-based segregation. The state of Maharashtra, of which Pune is a part, has had 34 per cent of its cities experiencing an increase in caste-based segregation (Singh et al. 2019). The increase in caste-based segregation in Pune is consistent with this evidence.[2] I use the Duncan index of dissimilarity (Duncan and Duncan 1955) to calculate the extent of caste-based residential segregation in Pune. The index takes a value of 0 if there is complete integration of castes across wards within the city, and 1 if the groups are completely segregated. This measure is affected if members of the overrepresented caste group in a certain ward within the city move to a ward within the city where they are underrepresented (Gorard and Taylor 2002).[3] The index is calculated as:

$$D = 0.5 \sum_{i=1}^{n} \mid (P_{ig}/P_g) - (P_{ih}/P_h) \mid \tag{1}$$

where P_{ig} is the population of group g in ward i in the city, P_{ih} is the population of group h in ward i in the city, P_g is the total population of group g in the city, and P_h is the total population of group h in the city. I use Census data at the ward level to calculate this index for the years 2001 and 2011, using the framework outlined by Vithayathil and Singh (2012).[4] I divide caste into two broad groups: the SC/ST population and the non-SC/ST population. In 2001, the dissimilarity index for caste in Pune stood at 15.37 per cent. In 2011, the index increased to 20.27 per cent. This means that 20.27 per cent of the non-SC/ST population in 2011 need to move to other wards in the city to maintain an even

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[1] Untouchability is a practice in which those from the upper caste are not supposed to come into close contact with the other castes. They do not share food or allow entry of lower castes into their homes. Untouchability is banned by law in India, but is still practised (Coffey et al. 2018).

[2] In contrast, about 41–63 per cent of cities in the southern states (Andhra Pradesh, Tamil Nadu, Karnataka) have seen a decline in caste-based segregation

[3] For example, if caste group A has an 80 per cent concentration in ward 1 and 20 per cent concentration in ward 2, the dissimilarity index would reflect a change when members of caste group A move from ward 1, where they are overrepresented, to ward 2, where they are underrepresented.

[4] A ward is an administrative unit of a city, usually used for electoral purposes.

distribution in population. A change of 0.05 in the dissimilarity index from 2001 to 2011 is indicative of significantly greater caste-based segregation in Pune. This implies that caste may be an important factor in an individual's housing decisions in this city. Recent work by Bharathi et al. (2018) provides evidence of higher levels of segregation at the intra-ward level than at the inter-ward level in Indian cities, which increases the need for more reliable neighbourhood-level segregation measures in urban India. The policy experiment I use allows me to define a neighbourhood at a precise and granular level, which can contribute to the discussion on intra-ward segregation.

2.2   The housing assignment

The housing scheme I evaluate is part of the Jawaharlal Nehru National Urban Renewal Mission (JN-NURM). The JNNURM was a national-level urban redevelopment programme introduced in 2005 by the Government of India. The Basic Services to Urban Poor (BSUP) is a sub-programme targeting urban poverty reform. The goal of the BSUP programme is to 'provide basic services (including water supply and sanitation) to all poor including security of tenure, and improved housing at affordable prices and ensure delivery of social services such as education, health and social security to poor people' (PMC 2006).

Under the BSUP, in the city of Pune, slum rehabilitation was one of the primary goals. The policy aimed to eradicate slums and provide affordable housing to slum dwellers. Local government officials in the city identified the slums that needed to be demolished, targeting those located in environmentally fragile zones within the city and those infringing on government land. The representatives of the Society for the Promotion of Area Resource Centers (SPARC), a non-governmental organization (NGO), worked with the municipality to make a list of all the residents in these slums and then conducted a lottery within the slum premises. Apartments were randomly assigned through a lottery system, in which slum dwellers were asked to pick out a slip of paper. The slip of paper had the name of the site and the apartment number written on it. The residents were not allowed to express preferences for their apartment or floor and were required to stay in the apartment allotted to them. Those who won the lottery got their house numbers assigned to them immediately and were asked to move in within six months of winning the lottery. The first lottery was conducted in November 2012, and the first phase of relocation was completed in May 2013, six months after the lottery was conducted. The lottery was conducted in this manner up until 2018, when all assignment was to be completed. The bulk of these relocations took place in the early years of 2013 and 2014.

Individuals from 33 slums were relocated to buildings in two sites, A and B. Slum dwellers living in slums to the west of the city were moved to Site A, whereas those located to the east were moved to Site B.[5] A total of 947 homes were allocated by lottery. I designed the survey and after training enumerators and conducting pilots, I conducted the survey in 2018. A timeline of the programme and the survey is presented in Figure 1. At the time of the survey, 37 apartments were vacant and expected to be filled in the next six months.[6] Since the floor and apartment allocated to the household under this scheme is random, this allows for localized randomization at the floor level, with neighbours from different caste groups randomly assigned to live next to each other.

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[5] Site A has seven buildings with seven floors, containing 16 apartments on each floor; Site B has ten buildings with five floors, containing four apartments on each floor.

[6] Discussions with the Pune Municipal Corporation chief, as well as the SPARC NGO chiefs, confirmed this process of random assignment.

Figure 1: Programme and survey timeline
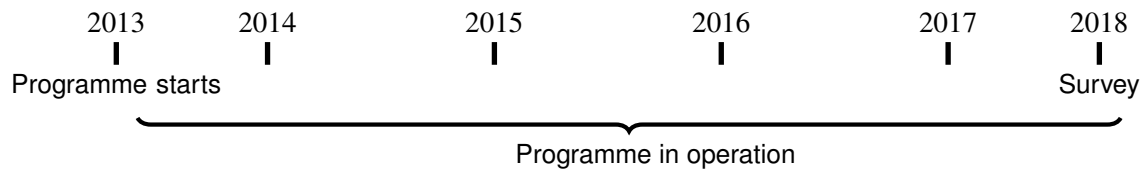
Source: author's construction.

Figure 2 shows the pattern of relocation in the individuals in the sample under study. Most of the sample under study relocated in the years 2013 and 2014. Figure 3 depicts the structure of a building in Site A. All residents in these 33 slums were to move. Subletting these apartments was forbidden. However, while conducting the survey I found many apartments where the original owners had sublet the premises. SPARC has an office at each of these relocation sites to keep track of the households living in each building, and they verified that 411 houses had been sublet illegally. As a result, there could be concerns of bias in estimates due to selection into the available households surveyed.[7] Those who took part in the survey may be a self-selected sample who are open-minded about caste and are willing to live in caste-diverse settings. Figure 4 shows the distribution of apartments participating in the survey against assigned apartments. I conduct a Kolmogorov–Smirnov test for equality of distributions, and the p-value is 0.073. This provides evidence to show that the distribution of participating and assigned apartments is the same. In Section 7, I provide further evidence to show that participation in the survey was not influenced by the caste composition of the floor of the building.

Figure 2: Distribution of year of relocation
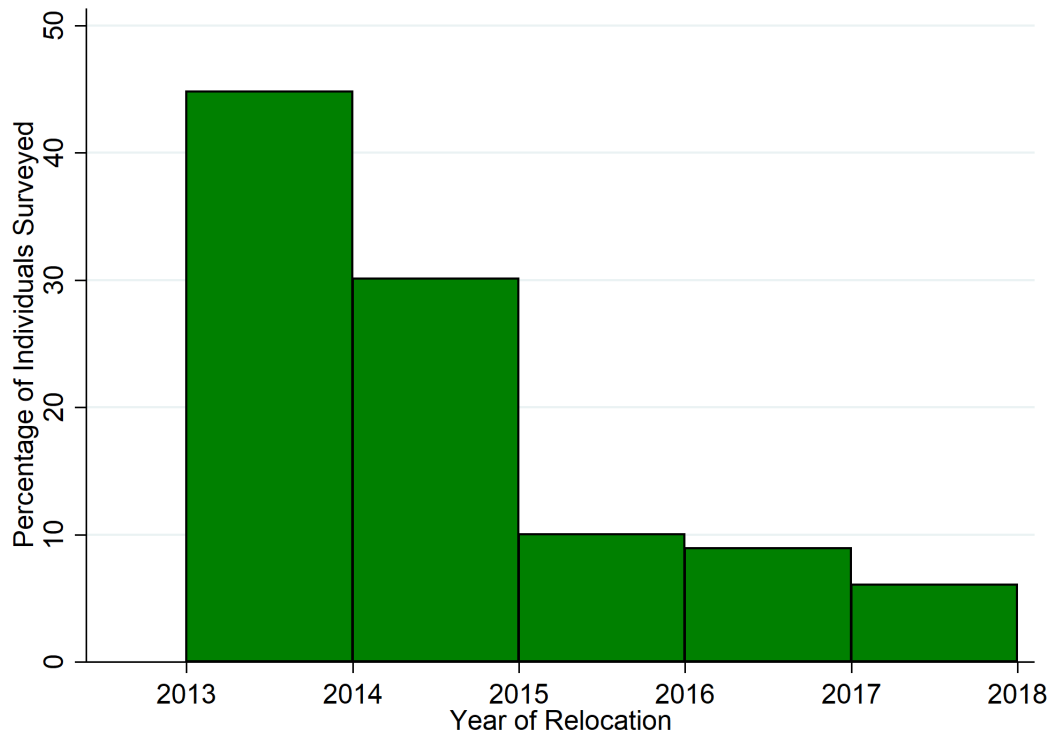
Source: author's construction based on survey data.

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[7] Out of these 411 households, I found 102 houses where tenants were living. I collected only demographic information on these individuals. These households have been excluded from the main analysis.

Figure 3: Relocation site

Source: author's photograph.

Figure 4: Distribution of participating and assigned households
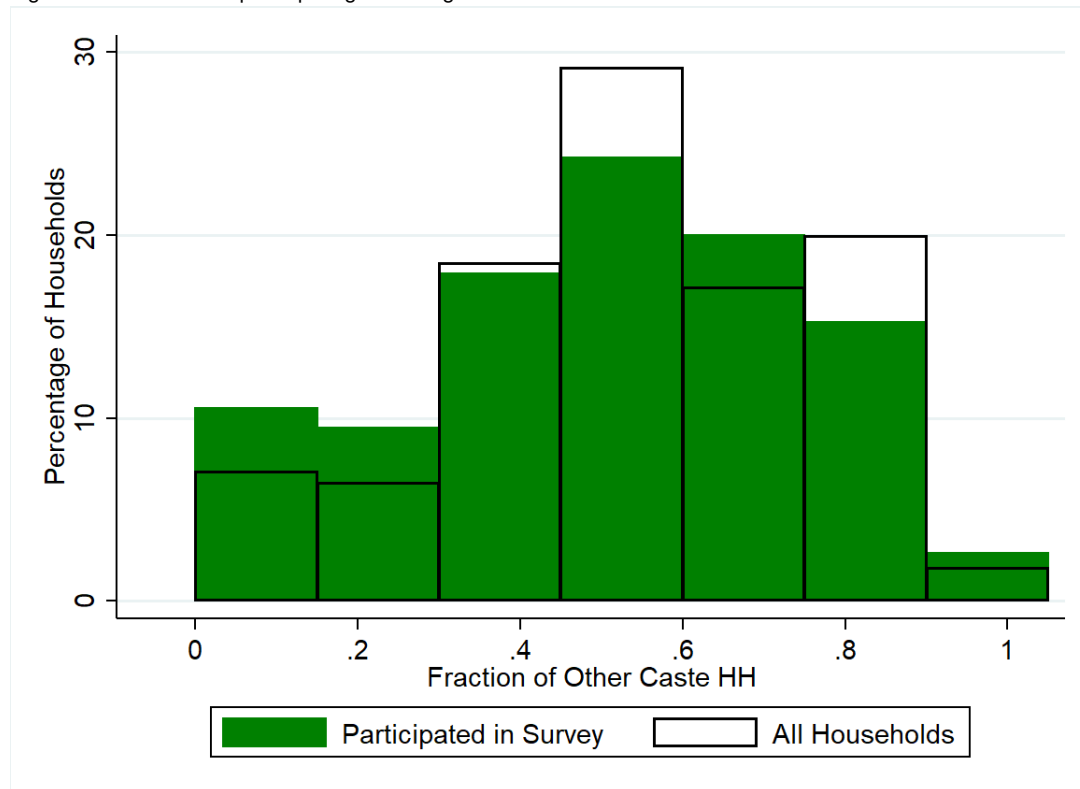
Source: author's construction based on survey data.

2.3 Data collection

I use two sources of data in this study: administrative records and survey data. I obtained administrative records from the local municipality, which contain details of the assignment of units to households. The records contain details on the name of the household head, caste, sub-caste, expected year of relocation, slum from where they were relocated, site allocated, the building, and the apartment number. Over-all, 947 apartments were assigned. Since these records are based on the initial assignment, they help me obtain an exogenous measure of other-caste neighbours that an individual is exposed to within the floor. This measure is defined as the fraction of other-caste households living on the same floor as the individual. Caste is defined as the SC/ST group and the non-SC/ST group.[8]. Figures 5 and 6 show the distribution of caste exposure of individual respondents and respondent households respectively. About 15 per cent (17 per cent) of the respondents (households) are surrounded by 50 per cent of households belonging to a different caste (Figure 4). Approximately 8 per cent (9 per cent) of respondents (house-holds) are surrounded entirely by their own group, whereas approximately 13 per cent (3 per cent) of respondents (households) are surrounded entirely by households from other caste groups.

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[8] SC/ST is defined as SC and ST, and non-SC/ST consists of the General Category and OBC.

Figure 5: Distribution of surveyed individuals exposed to fraction of other-caste households
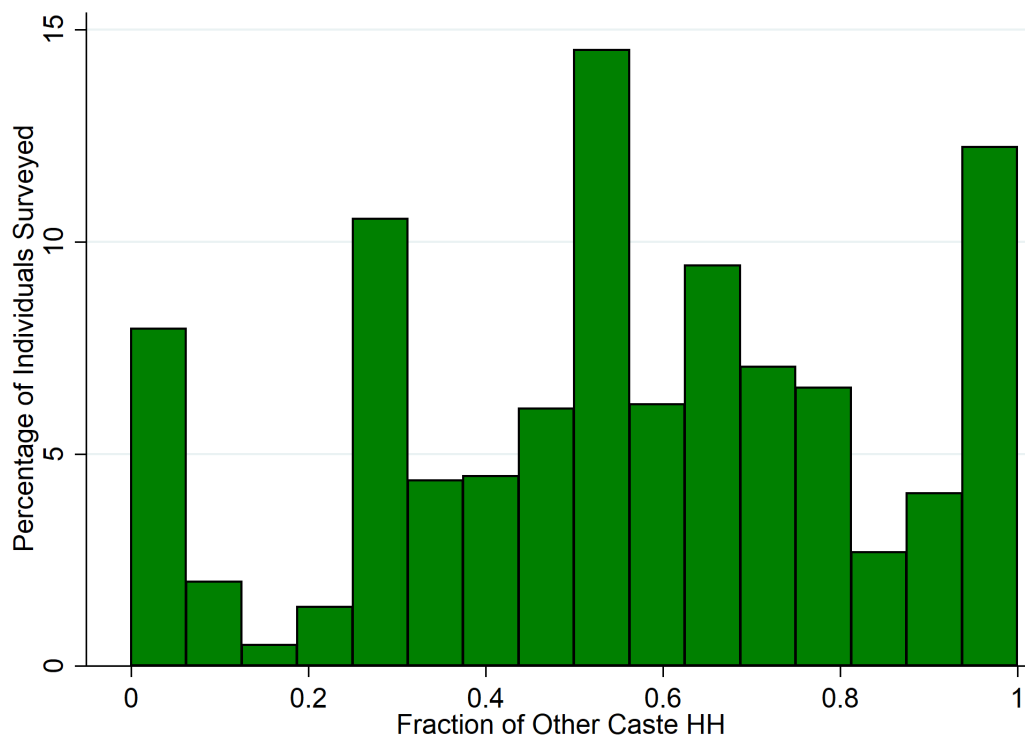
Source: author's construction based on survey data.

Figure 6: Distribution of surveyed households exposed to proportion of other-caste households

Source: author's construction based on survey data.

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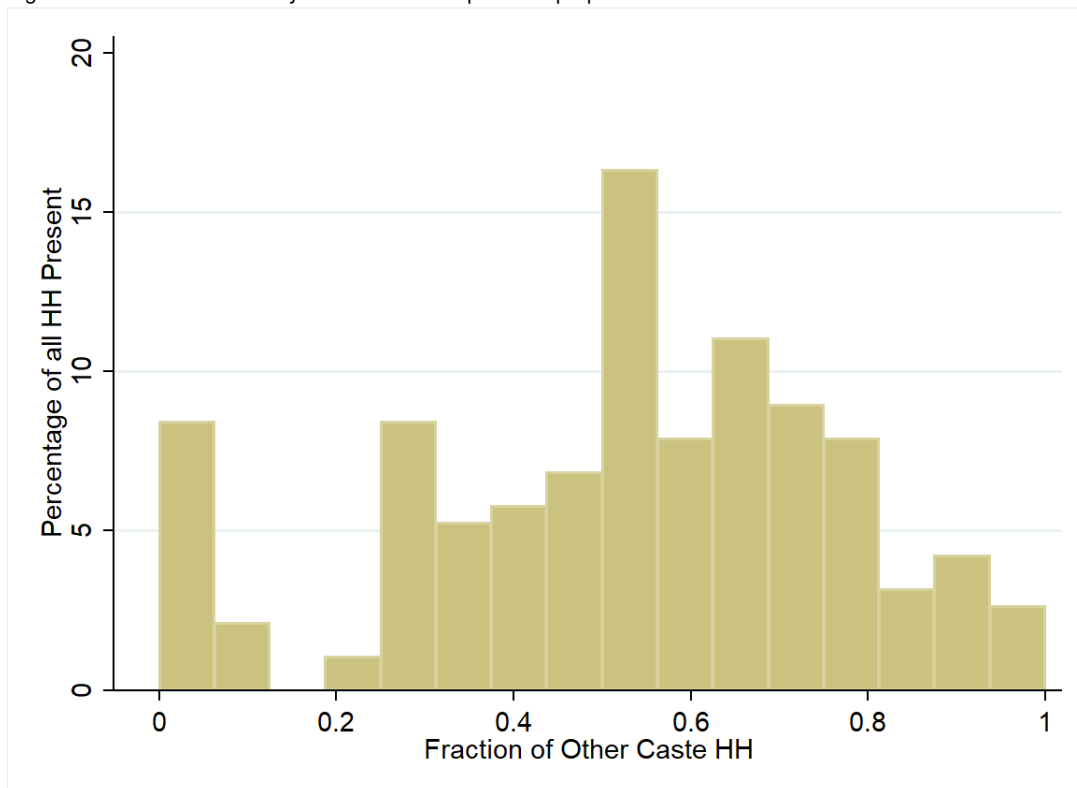
The survey modules were designed to cover all consenting adults living in a particular household. The first module consisted of questions on baseline characteristics such as family composition, education, previous slum location, and employment. The second module contained questions on attitudes to trust, inter-caste marriage, and caste salience. A totla of 219 households (692 adults) were covered in the survey.[9] The response rate for the survey was 40.83 per cent. While conducting the survey, I found incidents of non-occupancy and renting in these apartments, and collected information from SPARC's records on the exact apartment numbers that had been sublet, as well as those that were unoccupied.[10]

The second module of the survey contains information on respondents' attitudes and friendships. I measure attitudes on two dimensions: trust and caste-related attitudes. I ask two questions on trust. The first question is a modified version of the World Values Survey (2012) for India.[11] It is worded as follows: 'How much do you trust people in general?' The second question focuses on inter-caste trust and asks 'How much do you trust individuals from another caste?'. A concern here may be that people could have anticipated these questions and may mask their true responses, in order to appear socially compliant (social desirability bias). Therefore, I randomized the order in which these questions were asked to minimize the incidence of biased responses.

The second set of outcomes pertains to caste-related attitudes. This can be further divided into two categories: beliefs about inter-caste marriage and attitudes towards caste. I ask two questions on beliefs about inter-caste marriage, taken from the SARI. The general question on inter-caste marriage is worded as follows: 'How much do you support a law prohibiting inter-caste marriage?'. Respondents may exhibit social desirability bias while answering this question. Responses might be influenced by the perceived views of the enumerator. The second question attempts to counter this by asking opinions on support for inter-caste marriage *within the individual's family*. The wording of this question is: 'How much do you support inter-caste marriage within your own family?'. In a further attempt to elicit true preferences and to maintain consistency with the SARI survey, I randomize the order of these questions.

Questions on attitudes towards caste examine an individual's beliefs regarding caste injustice ('In your opinion, has caste injustice increased, decreased, or remained the same compared to ten years ago?'), the importance attached to caste identity ('In your opinion, is caste as important in people's lives as it was ten years ago?'), and the extent of support for caste-based quotas (reservations) in schools and government jobs (affirmative action) on the basis of caste ('How much do you support caste-based reservation?').

In addition to the questions covering attitudes, I ask respondents to name their five closest friends within the building, as well as people known to them from their previous slum. The questions on trust and marriage are coded on a 1–5 scale, similar to the Afrobarometer survey used by Nunn and Wantchekon (2011). Tables 1 and 2 provide the distribution of responses to the questions on trust and caste-related attitudes, respectively.

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[9] Out of these 219 households, I collected data from 87 households. I supervised the collection of 132 households by enumerators.

[10] The response rate is calculated as the number of households surveyed divided by the total number of households eligible. In total, there were 947 households; 219 households responded to the survey; 317 households were unavailable and could not be contacted; 411 households were found to be living in apartments sublet by the original owners; 15 households refused to participate in the survey, leading to a low refusal rate of 1.5 per cent. I show robustness checks to address the concerns of selection due to households staying on rent in Section 7.

[11] The World Values Survey question for India is: 'Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?'

Table 1: Distribution of responses to trust question

Response	General trust		Trust other caste	
	%	N	%	N
Trust completely	45.09	312	29.62	205
Trust a little	47.83	331	31.21	216
Do not trust too much	5.92	41	30.06	208
Do not trust at all	1.01	7	7.37	51
Don't know/can't say	0.14	1	1.73	12
Total	100	692	100	692

Note: the table shows the distribution of responses to questions on trust. *General trust* represents responses to the question: 'How much do you trust people in general?'. *Trust other caste* represents responses to the question: 'How much do you trust individuals from another caste?'.

Source: author's compilation based on survey data.

Table 2: Distribution of responses to questions on caste-related attitudes

Panel A: Beliefs about marriage

	Inter-caste marriage ban		Inter-caste marriage within family	
Response	%	N	%	N
Do not support at all	33.24	230	14.16	98
Do not support too much	46.82	324	29.48	204
Support a little	10.40	72	28.90	200
Strongly support	8.82	61	22.25	154
Don't know/can't say	0.72	5	5.20	36

Panel B: Caste injustice

	Caste injustice	
Response	%	N
Increased	36.42	252
Decreased	39.45	273
Same as before	24.13	167

Panel C: Importance of caste

	Importance caste	
Response	%	N
Yes	60.98	422
No	38.01	263
Can't say	1.01	7

Panel D: Affirmative action

	Support reservation	
Response	%	N
Strongly support	52.31	362
Support a little	16.91	117
Do not support much	14.45	100
Do not support at all	11.85	82
Don't know/can't say	4.48	31
Total	100	692

Source: author's compilation based on survey data.

2.4 Descriptive statistics

Table 3 shows the characteristics of all individuals surveyed. I show attributes of SC/ST, non-SC/ST, and all individuals in the survey. The average age of an individual surveyed is about 35, and 52 per cent of those surveyed in both groups are female; on average, 54.9 per cent of the individuals belonging to the

non-SC/ST category are employed, as opposed to 48.1 per cent of those belonging to the SC/ST category. In order to motivate the importance of caste in this setting, I showed the individuals a photograph of the list of residents in the building and asked them to guess the caste and sub-caste of the person. The sub-caste is easy to ascertain by the last name (surname) of the person. I verified the responses using the administrative-level data provided by the municipality. Sixty per cent of the respondents accurately guessed the sub-castes of the other residents, which is suggestive of a high level of caste consciousness among the respondents. Across all individuals, the general level of trust is high, at almost 96 per cent. When it comes to inter-caste trust, however, only 59.4 per cent of all individuals trust those from another caste. The support for caste intermarriage is greater among members of the SC/ST group than the non-SC/ST group.

Table 3: Descriptive statistics of surveyed individuals

	SC/ST	Non-SC/ST	Full sample
	(1)	(2)	(3)
General trust	0.975	0.948	0.959
	(0.155)	(0.222)	(0.197)
Trust other caste	0.604	0.589	0.594
	(0.490)	(0.492)	(0.491)
Against marriage ban	0.87	0.806	0.833
	(0.337)	(0.396)	(0.374)
Support inter-caste marriage within family	0.549	0.492	0.432
	(0.498)	(0.500)	(0.496)
Caste injustice has increased	0.411	0.402	0.401
	(0.493)	(0.491)	(0.491)
Support reservation	0.739	0.660	0.693
	(0.440)	(0.474)	(0.461)
Caste is important	0.571	0.635	0.609
	(0.496)	(0.482)	(0.488)
Fraction of other-caste HH	0.497	0.562	0.535
	(0.271)	(0.286)	(0.281)
Age	36.06	35.08	35.48
	(22.26)	(13.80)	(17.78)
Female	0.521	0.52	0.001
	(0.970)	(0.975)	(0.974)
Completed primary education	0.717	0.768	0.747
	(0.451)	(0.422)	(0.435)
Employed	0.481	0.549	0.521
	(0.501)	(0.498)	(0.500)
Duration of stay	2.122	1.975	2.036
	(1.304)	(1.243)	(1.270)
General	–	–	0.423
			(0.494)
OBC	–	–	0.163
			(0.370)
SC/ST	–	–	0.413
			(0.493)
N	286	406	692

Note: mean coefficients; standard deviations in parentheses.

Source: author's compilation based on survey data.

To ascertain the salience of caste among individuals, one of the survey questions asks people how highly they rank the importance of caste and religion today as against ten years ago. Table 3 shows that 63.5 per cent of the non-SC/ST group attach importance to caste, as compared to 57 per cent from the disadvantaged groups. This reflects the growing economic insecurity among those from higher castes, and anecdotal evidence from the field confirms the same. At the time of the survey, there was an increasing

clamour for higher quotas from those belonging to the General Category.[12] The survey also asks questions about affirmative action: 85 per cent of the respondents were aware of the existence of caste-based quotas for disadvantaged groups in government jobs and higher education institutes. Table 3 shows that there seems to be a high level of support for these quotas, especially among members of the SC/ST category, who are the main beneficiaries of affirmative action in India. When asked for reasons why they supported caste-based reservations, 62 per cent of respondents from the SC/ST group claimed it was to address historic inequalities faced by marginalized groups. On the other hand, 52 per cent of non-SC/ST group respondents felt that they needed caste-based reservation in order to obtain opportunities at parity with those from the disadvantaged groups. In response to a question on whether caste-based injustice has increased, respondents belonging to both groups seem to think that caste injustice has increased in the last ten years.

2.5 Balance tests

If the initial assignment of housing was indeed random, this requires that the fraction of households belonging to another caste on any given floor, as assigned by the programme, should be random. To test the identifying assumption, I regress the independent variable in my main specification on the baseline characteristics of the individuals present in the survey. The specification is given as follows:

$$FractionOtherCasteHH_{icf} = \beta_0 + \eta X_{icf} + \varepsilon_{icf} \tag{2}$$

where $FractionOtherCasteHH_{icf}$ is the fraction of other-caste households living on the same floor f as individual i belonging to caste c. X_{icf} is a vector of baseline characteristics such as age, gender, percentage of surveyed individuals who have completed primary education, number of family members, age of oldest child, number of children before the move into public housing, and a dummy for caste. To control for unobserved characteristics across slums of origin, I include slum fixed effects. The null hypothesis for the F-test is that none of the predetermined characteristics of the surveyed individuals should jointly influence the measure of caste exposure of an individual. If the null hypothesis holds, it would show that caste exposure is indeed random and not influenced by any predetermined variables.

Table 4 reports results for the full sample, SC/ST, and non-SC/ST groups. The joint F-test in Table 4 shows that the null hypothesis holds (p-values at 0.71 for the full sample, 0.73 for the SC/ST group, and 0.76 for the non-SC/ST group). This provides evidence to show that characteristics of the surveyed slum dwellers do not influence the initial assignment of the houses to slum dwellers. The caste diversity measure is mechanically correlated with the coefficients for the General Category as well as the SC/ST category, as a result of construction.

In light of the high incidence of renting in these locations, the balance test shows that the initial assignment was not influenced by any predetermined characteristics. It also shows that there was no differential attrition on the basis of these characteristics.

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[12] http://www.newindianexpress.com/nation/2018/aug/07/maratha-agitation-police-to-step-up-vigil-in-pune-on-august-9-1854631. html.

Table 4: Balance tests: dependent var. is fraction of other caste HH

	Full sample (1)	SC/ST (2)	Non-SC/ST (3)
Age	−0.0006	0.0008	−0.0008
	(0.0007)	(0.0006)	(0.004)
Male age	−0.00005	0.0002	−0.0001
	(0.0005)	(0.0004)	(0.003)
Female	−0.002	0.007	−0.001
	(0.012)	(0.014)	(0.011)
Female age	−0.0002	−0.0005	−0.0002
	(0.002)	(0.002)	(0.002)
Completed primary	−0.015	−0.028	0.003
	(0.027)	(0.036)	(0.0260)
Number of family members	−0.005	−0.012	0.011
	(0.013)	(0.025)	(0.016)
Age of oldest child	0.005	0.003	0.007
	(0.004)	(0.006)	(0.005)
Number of children before move	−0.021	−0.015	−0.028
	(0.015)	(0.023)	(0.025)
Female respondent	−0.035	−0.132	−0.051
	(0.094)	(0.131)	(0.186)
OBC	−0.177***	–	0.196***
	(0.055)		(0.054)
SC/ST	0.036	–	–
	(0.054)		
Previous slum FE	Y	Y	Y
Observations	692	286	406

Note: the table shows the regression of composition of other-caste households on a given floor on baseline characteristics. General Caste is the omitted caste category. Standard errors are clustered at the floor level. ***,**, and * denote significance at the 1, 5, and 10 per cent levels, respectively.

Source: author's compilation based on survey data.

3   Empirical strategy

My identification strategy exploits the random assignment of public housing to identify the effect that interacting with a neighbour of a different caste has on trust and caste-related attitudes. I estimate the main effects using an ordinary least squares (OLS) specification as follows:

$$y_{icf} = \beta FractionOtherCasteHH_{icf} + \eta X_{icf} + \alpha_c + \varepsilon_{icf} \qquad (3)$$

where y_{icf} denotes the outcome on an attitude y for individual i, who belongs to caste c and lives on floor f. The coefficient of interest is β, which identifies the causal effect of an individual having a certain proportion of his neighbours from another caste on his attitudes. Section 2 shows that the estimate for β is balanced across predetermined covariates, conditional on the caste of the individual. Therefore, all specifications in the main analysis will include caste fixed effects. The results can be interpreted as changes in attitudes of individuals *within* a certain caste group. To allow for correlated shocks within the floor, I cluster standard errors at the floor level. In addition to the OLS specification, I also use a probit specification for the main results. In Section 6, I show that β is not affected by selection into the sample.

The General Castes (GC) form the uppermost rung of the caste hierarchy, with OBC and SC/ST coming in second and third. In this paper, I look at two broad caste groups: SC/ST and non-SC/ST, the latter of which consists of the OBC and GC groups. This is consistent with the categorization followed by the

Census of India,[13] and is also politically meaningful, as OBC constitute socially forward but economically backward castes of India, and are hence closer to the GC (Government of India 2011).

3.1 Independent variable

FractionOtherCaste is the fraction of households who belong to a different caste living on the same floor as individual i. I construct this from administrative records, which contain details on the initial random assignment. When repeating the analysis for sub-castes in Section 5, I modify the independent variable to show the presence of sub-castes on a given floor. α_c represents caste fixed effects, to control for unobserved differences across caste groups. X_{icf} are a set of time-invariant control variables, which are obtained from the survey modules. The controls include an individual's education level, age, employment status, previous slum location, and the caste of the interviewer collecting information from the respondent.

3.2 Dependent variables

I measure the effect of diversity in caste on two sets of outcomes: trust and caste-related attitudes. For the purposes of analysis and ease of interpretation, all responses have been reduced to binary outcomes and responses where people answer with 'Don't know/can't say' have been excluded from the analysis.

The first set of outcomes pertain to trust through two questions. The first is taken from the World Values Survey (2012) for India. This question[14] is modified and worded as follows: 'How much do you trust people in general?'. The second question focuses on inter-caste trust and asks 'How much do you trust individuals from another caste?'. I combine the responses to both questions into a binary variable, and generate two measures: 'General trust' and 'Trust other caste'. These measures take a value of 1 if the individual is trusting (if the individual reports that he/she trusts a little or completely), 0 if not trusting (if he reports he/she does not trust too much or does not trust at all).

The second set of outcomes pertains to caste-related attitudes. This can be further divided into two categories: beliefs about inter-caste marriage and attitudes towards caste. The general question on inter-caste marriage is worded as follows: 'How much do you support a law prohibiting inter-caste marriage?'. The second question seeks opinions on support for inter-caste marriage within the individual's family. The wording of this question is 'How much do you support inter-caste marriage within your own family?'. I combine the responses to both questions into a binary variable, and generate two measures: 'Against marriage ban' and 'Support inter-caste marriage'. These measures take a value of 1 if the individual supports inter-caste marriage (if the individual reports that he/she supports it a little or completely), 0 if he/she opposes inter-caste marriage (if the individual reports he/she does not support it too much or does not support it at all).

Questions on attitudes towards caste are of three types. The first question examines an individual's beliefs regarding caste injustice ('In your opinion, has caste injustice increased, decreased, or remained the same compared to ten years ago?'). I combine the response to this question into a binary variable, and generate a measure called 'Caste injustice', which takes a value of 1 to represent an increase in caste injustice, or 0 reflecting a decrease or feeling that caste injustice has remained the same. The second question examines the importance of caste at present ('In your opinion, is caste as important

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[13] The 2011 Census classifies caste groups as SC/ST and non-SC/ST. The distribution of OBC in Pune is only 22 per cent, according to the National Sample Survey Organisation (MOSPI 2010). In the city Census carried out in 2011, the non-SC/ST population was 86 per cent, with no clear distinction between the GC and OBC categories.

[14] The World Values Survey question for India is: 'Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?'.

in people's lives as it was ten years ago?'). Responses to this measure, called 'Importance caste' are categorized as 1 ('Yes') and 0 ('No'). The third question examines the extent of support for affirmative action (reservations) on the basis of caste ('How much do you support caste-based reservation?'). This measure is called 'Support reservation', and takes a value of 1 if there is higher support for caste-based reservation, 0 if there is little or no support.

4 Results

4.1 Trust

Table 5 presents results highlighting the causal relationship between exposure to neighbours of other castes and trust outcomes for an individual. I ask two questions on trust. The first question is 'How much do you trust people in general?'. At an all-India level, 77.9 per cent of respondents to the survey believe that people cannot be easily trusted. In contrast, for the surveyed sample, Table 3 shows that trust levels in the relocation site are high, at around 93 per cent. Table 5 shows that exposure to caste diversity does not have an effect on an individual's general trust level.

Table 5: Relationship between trust and exposure to other-caste neighbours

	General trust		Trust other caste	
	OLS (1)	Probit (2)	OLS (3)	Probit (4)
Fraction of other-caste HH	0.066	0.147	0.342*	0.352*
	(0.074)	(0.117)	(0.157)	(0.148)
OBC	0.034	0.032	−0.208	−0.211
	(0.044)	(0.043)	(0.157)	(0.148)
SC/ST	0.049	0.047	−0.096	−0.098
	(0.047)	(0.043)	(0.082)	(0.085)
Outcome mean	0.937	0.936	0.603	0.601
Previous slum FE	Y	Y	Y	Y
Controls	Y	Y	Y	Y
N	691	691	680	680

Note: each column represents a separate regression. Standard errors in parentheses and clustered at the floor level. Controls include age, education, employment status, previous slum location, and caste of interviewer. Results reported in the probit columns are the marginal effects. *General trust*: generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people? (0 – do not trust; 1 – trust); *Trust other caste*: How much do you trust members of another caste? (0 – do not trust; 1 – trust). ***,**, and * denote significance at the 1, 5, and 10 per cent levels, respectively.

Source: author's compilation based on survey data.

The second question I ask in my survey examines inter-caste trust: 'How much do you trust members of another caste?'. On average, the level of inter-caste trust is lower than general trust, at 59.4 per cent (Table 3). Column 3 of Table 5 shows a statistically significant increase in the extent of trust in other castes, when exposed to greater caste diversity. A one unit increase (1 s.d.) in the proportion of other-caste households on an individual's floor results in an increase in inter-caste trust by 34.2 p.p (9.6 pp).

In order to understand the difference in significance of effect between general and inter-caste trust, I check whether controlling for the order in which the questions were asked makes a difference. The estimates remain unchanged. My results are consistent with those of Finseraas et al. (2019) and Vezzali et al. (2014), who show evidence for increased trust with increased exposure to other social groups.

4.2 Caste attitudes

Beliefs about inter-caste marriage

The caste system is characterized by endogamy. Members of a particular caste are only allowed to marry within their own caste. Goli et al. (2013), in their study of inter-caste marriages in India using data from the India Human Development Survey (IHDS), find that inter-caste marriages rose from 3.5 per cent in 1981 to 6.1 per cent in 2005. In particular, in the state of Maharashtra, which is where the city of Pune is located, only 3.7 per cent of all married women in the state have married outside their caste (Goli et al. 2013). This shows that the norms of the caste system are remain rigid, despite evidence showing that out-marriage usually allows for integration (McDoom 2019). Intermarriage between social groups is crucial to the formation of wider networks and helpful in fostering greater intergroup contact (Qian and Lichter 2007).

In order to understand the attachment to this social norm for the surveyed sample, I ask two questions on inter-caste marriage, which are taken from the SARI questionnaire. To gauge general attitudes towards inter-caste marriage, I ask the question 'How much do you support a law prohibiting inter-caste marriage?'. Column 1 of Table 6 presents results on the effect of exposure to caste diversity in neighbours on an individual's attitudes towards inter-caste marriage. A positive coefficient can be interpreted as an increase in opposition to the discriminatory law, which indicates increased acceptance of inter-caste marriage. I find a significant decrease in support for the law, where at the baseline 80 per cent of individuals do not support it. A one unit (1 s.d.) increase in exposure to neighbourhood caste diversity increases opposition to the discriminatory hypothetical marriage law by 19.7 p.p. (4.8 p.p.).

In an attempt to understand the true preferences of the individual with respect to inter-caste marriage, I frame the second question on inter-caste marriage as follows: 'How much do you support inter-caste marriage within your own family?'. Column 3 of Table 6 shows that, on average, 54.2 per cent of respondents support inter-caste marriage within their own family. A one unit increase (1 s.d. increase) in exposure to caste diversity among neighbours increases support for inter-caste marriage within the family by 26.1 p.p. (7.2 p.p.). Table 7 shows no evidence of difference in attitudes across caste groups when it comes to questions on inter-caste marriage. Given the rigid social norms surrounding inter-caste marriage and the low rate of out-marriage in India, a change in beliefs when exposed to greater caste diversity could be an indicator of more favourable attitudes towards other caste groups.

Table 6: Relationship between caste attitudes and exposure to other caste neighbours

	Against marriage ban		Support inter-caste marriage		Caste injustice		Importance caste		Support reservation	
	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit	OLS	Probit
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Fraction of other-caste HH	0.197**	0.206*	0.261**	0.267**	0.354**	0.351**	−0.048	−0.03	−0.144	−0.14
	(0.086)	(0.112)	(0.131)	(0.127)	(0.169)	(0.159)	(0.165)	(0.158)	(0.155)	(0.144)
OBC	0.183	0.180	0.079	0.076	−0.035	−0.033	−0.14	−0.15	−0.035	−0.032
	(0.084)	(0.081)	(0.123)	(0.120)	(0.116)	(0.115)	(0.127)	(0.129)	(0.115)	(0.113)
SC/ST	0.099	0.097	0.014	0.015	−0.046	−0.043	−0.155	−0.153	−0.046	−0.048
	(0.063)	(0.061)	(0.077)	(0.074)	(0.097)	(0.097)	(0.096)	(0.079)	(0.075)	(0.097)
Outcome mean	0.8	0.8	0.542	0.541	0.521	0.52	0.601	0.601	0.692	0.69
Previous slum FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	687	687	656	656	525	525	672	672	623	623

Note: each column represents a separate regression. Results reported in the probit columns are the marginal effects. Controls include age, education, employment status, previous slum location, and caste of interviewer. Standard errors in parentheses and clustered at the floor level. *Against marriage ban*: how much would you support a law prohibiting inter-caste marriage? (0 – support, 1 – do not support marriage ban (more accepting of inter-caste marriage)); *Support inter-caste marriage*: how much do you support inter-caste marriage within your own family? (0 – do not support, 1 – support); *Caste injustice*: in your opinion, has caste injustice decreased, increased, or seen no change? (0 – decreased/no change, 1 – increased); *Importance caste*: in your opinion, is caste still as important in people's lives today as it was ten years ago? (0 – not important, 1 – important); *Support reservation*: how much do you support caste-based reservation? (0 – do not support, 1 – support). ***,**, and * denote significance at the 1, 5, and 10 per cent levels, respectively.

Source: author's compilation based on survey data.

Table 7: Outcomes on caste attitudes interacted with caste categories

	Against marriage ban (1)	Support inter-caste marriage (2)	Caste injustice (3)	Support reservation (4)	Importance caste (5)
Fraction of other-caste HH	0.240*	0.380*	0.407*	−0.189	−0.175
	(0.132)	(0.197)	(0.216)	(0.201)	(0.205)
SC/ST	0.183	0.154	0.079	−0.009	−0.238
	(0.131)	(0.162)	(0.197)	(0.148)	(0.190)
Fraction of other-caste HH × SC/ST	0.160	0.267	−0.209	−0.092	0.217
	(0.220)	(0.291)	(0.286)	(0.271)	(0.322)
Observations	687	656	525	623	672

Note: each column represents a separate regression. Standard errors in parentheses and clustered at the floor level. Controls include age, education, employment status, previous slum location, and caste of interviewer. *Against marriage ban*: how much would you support a law prohibiting inter-caste marriage? (0 – support, 1 – do not support marriage ban (more accepting of inter-caste marriage)); *Support inter-caste marriage*: how much do you support inter-caste marriage within your own family? (0 – do not support, 1 – support); *Caste injustice*: in your opinion, has caste injustice decreased, increased, or seen no change? (0 – decreased/no change, 1 – increased); *Importance caste*: in your opinion, is caste still as important in people's lives today as it was ten years ago? (0 – not important, 1 – important); *Support reservation*: how much do you support caste-based reservation? (0 – do not support, 1 – support). Omitted caste category is non-SC/ST. ***,**, and * denote significance at the 1, 5, and 10 per cent levels, respectively.

Source: author's compilation based on survey data.

Caste salience

Table 6 presents results for three sets of questions on general attitudes towards caste. The first question is framed as 'In your opinion, has caste injustice decreased, increased, or seen no change compared to ten years ago?'. This question attempts to capture general sentiments about caste injustice. On average, 52.1 per cent of respondents felt that caste injustice has increased. A one unit (1 s.d.) increase in the exposure to caste-diverse neighbours increases the belief that caste injustice has increased in the past few years by 35.4 p.p. (9.5 p.p.). The second question is intended to understand how salient caste is among the surveyed individuals. The question is framed as 'In your opinion, is caste as important in people's lives as it was ten years ago?'. The third question gauges the support for caste-based affirmative action. Affirmative action in India consists of caste-based quotas in government jobs and institutions of higher education (Mosse 2018). The effects on attitudes towards the importance an individual places on caste as well as support for affirmative action are not affected by exposure to caste-diverse neighbours.

These results represent aggregated views on caste identity, and cannot discern whether people refer to their own or others' caste identities when answering these questions. Members of castes that have been historically disadvantaged, for example, may feel more excluded and hence push more for affirmative action than the more privileged non-SC/ST group. To examine whether responses to these questions differ by caste group, I interact the explanatory variable, proportion of other-caste households on the floor, with the caste group of the individual. Table 7 shows no evidence of difference in attitudes across caste groups when it comes to questions on caste injustice, affirmative action policies, or importance given to caste. Hence, the results in Table 7 reflect that people seem to care less about caste identity and may be more concerned about caste-based atrocities.[15] This may also reflect a lack of last-place aversion, wherein those from the non-SC/ST group do not feel threatened by being surrounded by the disadvantaged SC/ST group (Kuziemko et al. 2014).

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[15] At the time of the survey there was an increased clamour for increased quotas for the upper caste community, leading to caste-based violence in several parts of the city of Pune. The press coverage of this may have led to responses on average indicating increased caste injustice (https://www.indiatoday.in/india/story/maratha-protesters-in-violence-pune-maharashtra-1300233-2018-07-30). Moreover, I asked a qualitative question to understand whether people knew why the government had caste-based reservations. About 40 per cent of the respondents felt that reservations were misused to gain political mileage and divide society.

5   Additional results

5.1   Sub-caste variation

The two broad caste groups have many sub-castes within them. These sub-castes are endogamous in nature, with the sub-caste determining occupational choice and marriage (Appadurai 2004; Mosse 2018; Vijayabaskar and Kalaiyarasan 2014). The administrative records have information on sub-castes of households, which I use to test whether the sub-caste composition of the floor has an effect on attitudes:

$$y_{icf} = \alpha_c + \beta MorethanOneSubcasteHH_{icf} + X_{icf} + \varepsilon_{icf} \qquad (4)$$

where $MorethanOneSubcasteHH_{icf}$ is an indicator variable that takes the value 1 if there is more than one other household of the same sub-caste on floor f. This represents a homogeneous neighbourhood for the individual. A value of 0 represents heterogeneous sub-caste composition on the floor. This helps examine the role of sub-caste minority and majority floors, akin to work done by Tropp and Pettigrew (2005) on the differences between behaviours exhibited by ethnic minorities and majorities when made to interact with each other.

Tables 8 and 9 report results on the main outcome variables, with the explanatory variable representing the presence of a sub-caste majority on a floor. Column 4 of Table 9 shows that an individual from a particular sub-caste within the disadvantaged SC/ST group shows greater support for reservations (affirmative action) and Column 5 shows the same group places more emphasis on the importance of caste, if he/she stays on a floor surrounded by more people of the same sub-caste. This effect is consistent with the work of Åslund et al. (2011), who find that exposure to own ethnicity is shown to have a greater effect for disadvantaged groups than advantaged groups in a randomly assigned resettlement programme in Sweden. This is also reflective of last-place aversion, probably showing up in the case of more granular definitions of caste. On most other margins, however, sub-caste does not have an effect on people's attitudes.[16]

Table 8: Outcomes on trust using sub-caste variation

	General trust (1)	Trust other caste (2)
More than one sub-caste: SC/ST	−0.075	−0.062
	(0.059)	(0.143)
Observations	285	282
More than one sub-caste: Non-SC/ST	−0.021	−0.030
	(0.041)	(0.126)
Observations	406	398

Note: each column represents a separate regression. Standard errors in parentheses and clustered at the floor level. Controls include age, education, employment status, previous slum location, and caste of interviewer *General trust*: generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people? (0 – do not trust, 1 – trust); *Trust other caste*: how much do you trust members of another caste? (0 – do not trust, 1 – trust). ***,**, and * denote significance at the 1, 5, and 10 per cent levels, respectively.

Source: author's compilation based on survey data.

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[16] In Table 9, sub-castes within the SC/ST group show less support for inter-caste marriage (though imprecise), contrary to the main effects shown in Table 5. This may be due to a tendency for members of higher caste groups to intermarry, and hence punish those who intermarry with lower ranked groups (McDoom 2019).

Table 9: Outcomes on caste attitudes using sub-caste variation

	Against marriage ban (1)	Support inter-caste marriage (2)	Caste injustice (3)	Support reservation (4)	Importance caste (5)
More than one sub-caste: SC/ST	−0.022	−0.054	−0.131	0.303**	0.255*
	(0.077)	(0.136)	(0.139)	(0.115)	(0.149)
Observations	284	266	214	264	280
More than one sub-caste: Non-SC/ST	−0.020	0.065	0.007	0.042	0.057
	(0.083)	(0.098)	(0.131)	(0.099)	(0.113)
Observations	403	390	311	359	392

Note: each column represents a separate regression. Standard errors in parentheses and clustered at the floor level. Controls include age, education, employment status, previous slum location, and caste of interviewer. *Against marriage ban*: how much would you support a law prohibiting inter-caste marriage? (0 – support, 1 – do not support marriage ban (more accepting of inter-caste marriage)); *Support inter-caste marriage*: how much do you support inter-caste marriage within your own family? (0 – do not support, 1 – support); *Caste injustice attitude*: in your opinion, has caste injustice decreased, increased, or seen no change? (0 – decreased, 1 – increased); *Importance caste*: in your opinion, is caste still as important in people's lives today as it was ten years ago? (0 – not important; 1 – important); *Support reservation*: how much do you support caste-based reservation? (0 – do not support, 1 – support). ***,**, and * denote significance at the 1, 5, and 10 per cent levels, respectively. Source: author's compilation based on survey data.

5.2 Impact of duration of stay

Exposure to different groups over a longer period of time may make the individual less discriminatory (Chetty et al. 2016). To test this, I interact the length of stay at the allocated apartment, as mentioned in the administrative records, with the explanatory variable. The individual questionnaire asks a question on year of move. I corroborate this with the administrative data, which has information on expected month and year of move, and match the survey responses to ensure accuracy.[17] I use the following specification:

$$y_{icf} = \alpha_c + \beta FractionOtherCasteHH_{icf} \times YearsSinceMove_{icf} + $$
$$\gamma FractionOtherCasteHH_{icf} + \lambda YearsSinceMove_{icf} + X_{icf} + \varepsilon_{icf}$$

where $YearsSinceMove_{icf}$ is an indicator variable that takes the value 1 if individual i has stayed more than three years, and 0 if individual i has stayed less than three years.

Tables 10 and 11 present results estimates from this equation on each set of outcomes. Column 2 of Table 11 shows that with longer exposure, there is an increasing acceptance of inter-caste marriage within their family. There is an increase of 0.42 p.p. in support for inter-caste marriage for individuals living in these locations for a longer duration. This reflects an increase of 63 per cent in support of inter-caste marriage.[18] The increase in positive attitudes towards inter-caste marriage is consistent with the work of Åslund et al. (2011), who find that characteristics of the ethnic environment have a significant effect on children who were randomly assigned to refugee locations in Sweden at an early age rather than later. However, duration of stay at the site does not have an effect on attitudes related to caste identities.

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[17] There was no incorrect response to this question from all individuals surveyed.

[18] Baseline means for the regression Column 2 of Table 11 is 0.661.

Table 10: Outcomes on trust interacted with years since move

	General trust (1)	Extent trust another caste (2)
Fraction of other-caste HH	0.052	0.285
	(0.077)	(0.177)
Years since move	−0.080	0.062
	(0.123)	(0.175)
Fraction of other-caste HH × years since move	0.118	−0.004
	(0.170)	(0.287)
Caste fixed effects	Y	Y
Observations	691	680

Note: each column represents a separate regression. Standard errors in parentheses and clustered at the floor level. Controls include age, education, employment status, previous slum location, and caste of interviewer. *General trust*: generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people? (0 – do not trust, 1 – trust); *Trust other caste*: how much do you trust members of another caste? (0 – do not trust, 1 – trust); *Years since move*: less than three years is the omitted category. ***,**, and * denote significance at the 1, 5, and 10 per cent levels, respectively.

Source: author's compilation based on survey data.

Table 11: Outcomes on attitudes towards caste interacted with duration of stay

	Against marriage ban (1)	Support inter-caste marriage (2)	Caste injustice (3)	Support reservation (4)	Importance caste (5)
Fraction of other-caste HH	−0.249**	0.130	0.305	−0.096	−0.109
	(0.108)	(0.136)	(0.189)	(0.165)	(0.171)
Years since move	−0.099	0.417**	0.187	0.135	−0.034
	(0.121)	(0.174)	(0.183)	(0.170)	(0.217)
Fraction of other-caste HH × years since move	0.201	0.635**	0.136	−0.325	0.197
	(0.217)	(0.297)	(0.251)	(0.316)	(0.368)
Observations	687	656	525	623	672

Note: each column represents a separate regression. Controls include age, education, employment status, previous slum location, and caste of interviewer. *Against marriage ban*: how much would you support a law prohibiting inter-caste marriage? (0 – support, 1 – do not support marriage ban (more accepting of inter-caste marriage)); *Support inter-caste marriage*: how much do you support inter-caste marriage within your own family? (0 – do not support, 1 – support); *Caste injustice attitude*: in your opinion, has caste injustice decreased, increased, or seen no change? (0 – decreased, 1 – increased); *Importance caste*: in your opinion, is caste still as important in people's lives today as it was ten years ago? (0 – not important, 1 – important); *Support reservation*: how much do you support caste-based reservation? (0 – do not support, 1 – support). *Years since move*: less than three years is the omitted category. ***,**, and * denote significance at the 1, 5, and 10 per cent levels, respectively.

Source: author's compilation based on survey data.

6   Robustness checks

The results are robust to a binary probit specification. The marginal effects coincide with the estimates obtained from the linear probability specification. Tables 5 and 6 report estimates of the marginal effects from the probit regressions.

An important threat to identification is non-availability of eligible households and subletting of apartments in both sites. There were 411 homes found to be rented and 317 homes were not occupied. If owners sublet their homes or do not move in because they are averse to being surrounded by neighbours of other castes, the sample I survey could suffer from selection bias. I may have only captured a sub-sample of individuals who are open to associating with individuals from other castes. I was able to confirm the exact apartments that were either sublet or not occupied from my own survey and SPARC officials. This allows me to determine the exact number of participants and non-participants in the survey.

In order to show that participation in my survey is not affected by exposure to caste diversity among immediate neighbours, I estimate the following equation:

$$SurveyParticipation_{cf} = \beta_0 + \beta_1 FractionOtherCasteHH_{cf} + \alpha_c + \alpha_s + \varepsilon_{icf} \tag{5}$$

where $SurveyParticipation_{cf}$ is a dummy variable that takes the value of 1 if a household participated in the survey, and α_s represents site fixed effects, which control for unobserved characteristics of the public housing site. Table 12 reports estimates from Equation (5) . The caste diversity measure has no effect on participation in the survey. It is possible that people of a particular caste group are more averse to living among diverse individuals. This attrition may also depend on the particular housing site. I split the sample by caste and site, and find no effect on participation in the survey.[19] This provides further evidence for initial random assignment and minimization of selection bias. This allows me to conclude that the estimates I present in Sections 4 and 5 are indeed causal.

Table 12: Effect of exposure to other caste neighbours on survey participation

	Participation in survey
Fraction other caste HH	0.028
	(0.064)
OBC	−0.014
	(0.032)
SC/ST	−0.02
	(0.025)
Observations	947

Note: this table shows the regression of survey participation on the composition of other-caste households. Standard errors are clustered at the floor level. *Participation in survey*: 0 if the household is not in the survey, 1 if the household is in the survey. Site fixed effects included. ***,**, and * denote significance at the 1, 5, and 10 per cent levels, respectively.

Source: author's compilation based on survey data.

7   Discussion

I show evidence of favourable attitudes towards the other caste group with greater exposure to caste-diverse neighbours. Living in proximity to more caste-diverse neighbours leads to more favourable attitudes towards other groups. However, a change in inner circles of friendship may also be an underlying channel that may influence the change in beliefs. To examine the role of an individual's inner circle, I explore the role that friendships have to play in promoting these favourable attitudes. Kandpal and Baylis (2019) show the importance of friendships to women's security, but the composition of these friendship circles are restricted to one's own caste group.

In the survey, I ask the respondent to name his/her five closest friends within the building.[20] I verify the caste of these friends along with their exact residence within the building from administrative records. This allows me to construct a variable, *FractionFriend*, which represents the fraction of friends from the other caste. In addition, I ask the individual to identify people within the building who they knew from the previous slum.[21] This helps me separate those previously known to an individual and new friends made by him/her after moving to the new neighbourhood. I construct a variable, *Fraction-NewFriend*, which measures the proportion of *new* friends from the other caste. To measure whether

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[19] These results are in Tables A1–A5 in Appendix A. I tracked about 30 apartment owners who had sublet their apartments and asked their reasons for leaving the apartment; 20 cited distance from the workplace as a major factor, whereas the others stated the availability of cheaper public schools around the whole neighbourhood, which was lacking around the public housing site.

[20] 'Who are your five closest friends within this building?'.

[21] 'From the list of residents in this building, identify five of those you know from your previous slum.'

any friend or new friend is from the opposite caste, I create dummy variables, *AtleastOneFriend* and *AtleastOneNewFriend*, which switch on when an individual has at least one friend and one new friend from the other caste group, respectively.[22] Figures 7 and 8 show the distribution of current friends and new friends, respectively.

Figure 7: Distribution of friends
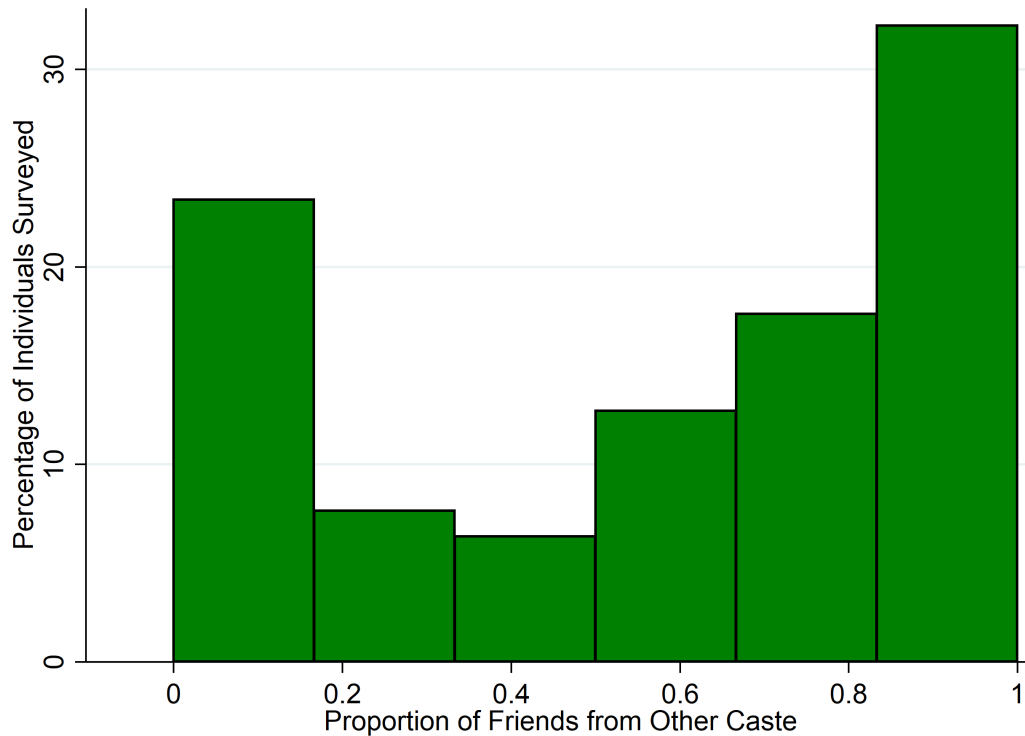
Source: author's construction based on survey data.

Table 13 depicts the relationship between exposure to caste diversity and friendship. Although friendship with the other caste seems to be positively influenced by diversity in caste composition, these effects are imprecise. Only the likelihood of having at least one new friend is weakly influenced by the caste diversity among neighbours.[23] The results in Table 13 imply that randomly assigning people to live with each other seems to make them more accepting of people from other groups, even if their inner circle of friends does not change. If not exposure to caste diversity, there may be a role that pre-existing inner circles have in fostering current caste-diverse friendships.

While conducting the survey, I ask a question on 'people known in the building from the previous slum'. I show the respondent the roster of the building, asking them to identify those who they knew previously. From the administrative records, I can then decipher the caste of the person previously known. I show evidence in Tables A7 and A8 for random assignment of previously known individuals, which allows me to use it as a proxy measure for previous contact. I also find high correlation between previous and current friendships, which indicates that those who had more other-caste friends before the move continue to maintain cross-caste friendships.

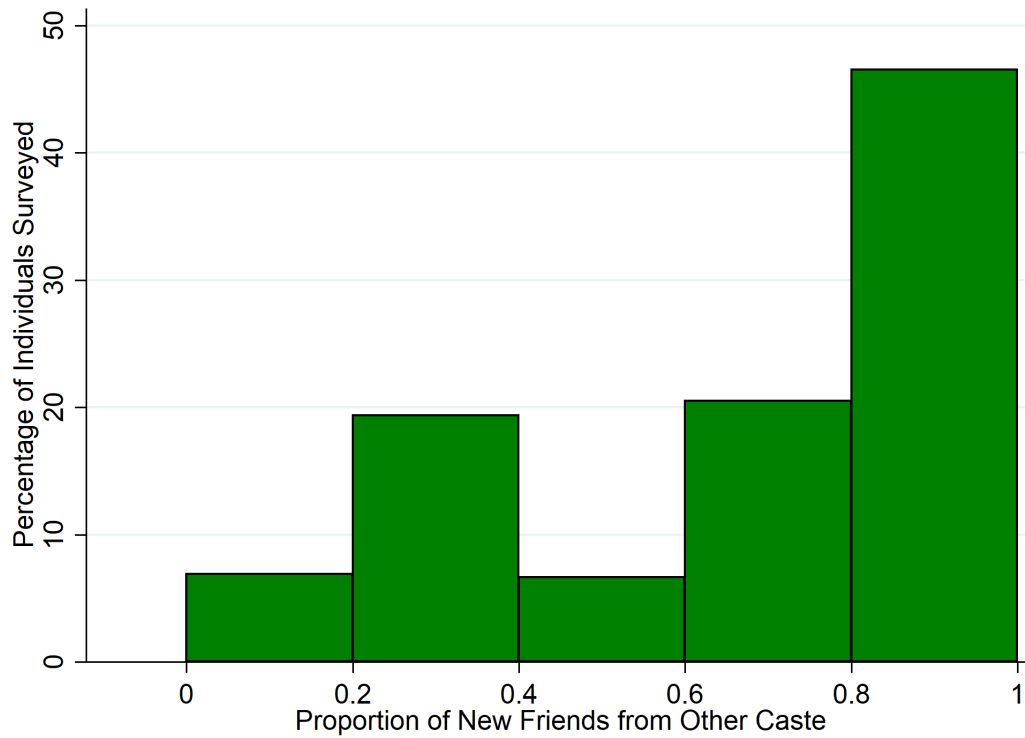[22] The specification is as follows:

$$y_{icf} = \alpha_c + \beta FractionOtherCasteHH_{cf} + X_{icf} + \varepsilon_{icf} \tag{6}$$

where y_{icf} denotes the measures of other-caste friendship mentioned above.

[23] The number of friends is also not influenced by the caste diversity measure (see Table A6).

Figure 8: Distribution of new friends

Source: author's construction based on survey data.

Table 13: Relationship between friendship and exposure to other-caste neighbours

	Fraction friend	At least one friend	Fraction new	At least one new
X: Fraction of other-caste HH	0.056	0.005	0.034	0.076*
	(0.122)	(0.116)	(0.095)	(0.046)
Outcome mean	0.512	0.713	0.44	0.971
Caste FE	Y	Y	Y	Y
Observations	692	692	692	692

Note: each column represents a separate regression. *Fraction friend* is defined as the proportion of friends from the other castes; *At least one friend* is defined as a dummy that takes a value of 1 if the individual has at least one other caste friend; *Fraction new* is defined as the proportion of new friends from the other castes; *At least one new* is defined as a dummy that takes a value of 1 if the individual has at least one other-caste new friend. Standard errors in parentheses and clustered at the floor level. Controls include age, education, employment status, previous slum location, and caste of interviewer. ***,**, and * denote significance at the 1, 5, and 10 per cent levels, respectively.

Source: author's compilation based on survey data.

It is possible that those who already had more other-caste friends prior to the move could have more favourable attitudes, when exposed to greater caste diversity among immediate neighbours. To test this, I regress the outcomes on attitudes on an interaction of the caste diversity measure and the fraction of previous slum friends who are from another caste group.[24]

The estimates in Column 2 of Table 14 show that inter-caste trust increases significantly for those who live in more caste-diverse settings *and* had more friends from other castes prior to moving. This inter-

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[24] The specification is as follows:

$$y_{icf} = \alpha_c + \beta FractionOtherCasteHH_{icf} \times FractionPreviousFriend_{icf} +$$
$$\gamma FractionOtherCasteHH_{icf} + \lambda FractionPreviousFriend_{icf} + X_{icf} + \varepsilon_{icf}$$

where $FractionPreviousFriend_{icf}$ refers to the fraction of friends known previously to the individual from the other caste.

action does not have any additional impact on marriage or caste-related beliefs (Table 15). These results indicate that prosocial attitudes may be facilitated simply through exposure, instead of directly affecting inner circles of friendships. This demonstrates the strength of weak ties (Granovetter 1977), wherein close friendships seem to play a lesser role in fostering favourable attitudes, as compared to the much stronger effects of mere exposure to other caste groups.

Table 14: Trust outcomes: interaction between exposure to other-caste neighbours and previous slum friends

	General trust (1)	Trust other caste (2)
Fraction of other-caste HH	0.062	0.340***
	(0.071)	(0.159)
Fraction previous friend	0.034	0.262***
	(0.278)	(0.121)
Fraction other caste × previous friend	0.272	0.420***
	(0.404)	(0.208)
Outcome mean	0.897	0.271
Caste FE	Y	Y
Controls	Y	Y
N	691	680

Note: each column represents a separate regression. *Fraction previous friend* is defined as the previously known residents from another caste; *At least one previous friend* is a dummy that takes the value of 1 if the person knows at least one person from the slum he/she previously stayed in. Standard errors in parentheses and clustered at the floor level. Controls include age, education, employment status, and caste of interviewer. ***,**, and * denote significance at the 1, 5, and 10 per cent levels, respectively.

Source: author's compilation based on survey data.

Table 15: Outcomes on caste attitudes: interaction between exposure to other-caste neighbours and previous slum friends

	Against marriage ban (1)	Support inter-caste marriage (2)	Caste injustice (3)	Importance caste (4)	Support reservation (5)
Fraction of other-caste HH	−0.199**	0.257**	0.351**	−0.045	−0.146
	(0.087)	(0.128)	(0.163)	(0.21)	(0.208)
Fraction previous friend	−0.207	0.361	0.61	0.227	−0.141
	(0.233)	(0.264)	(0.303)	(0.244)	(0.25)
Fraction other caste × Previous friend	−0.02	0.097	0.28	−0.226	0.319
	(0.37)	(0.393)	(0.473)	(0.395)	(0.44)
Outcome mean	0.744	0.541	0.521	Mean=0.601	Mean=0.692
Caste FE	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y
N	687	656	525	672	623

Note: each column represents a separate regression. *Fraction previous friend* is defined as the previously known residents from another caste; *At least one previous friend* is a dummy that takes the value of 1 if the person knows at least one person from the slum he/she previously stayed in. Standard errors in parentheses and clustered at the floor level. Controls include age, education, employment status, and caste of interviewer. ***,**, and * denote significance at the 1, 5, and 10 per cent levels respectively.

Source: author's compilation based on survey data.

8   Conclusion

In this paper, I examine the effect of cross-caste contact between neighbours on individual attitudes towards trust and caste-related attitudes. I use administrative records on random assignment of apartments within public housing to slum dwellers to construct a measure for exposure to neighbours from other castes. To measure attitudes, I designed a survey and collected responses from 692 individuals residing in these sites. I find an increase in favourable attitudes with exposure to more neighbours from other castes. Inter-caste trust increases with exposure to more neighbours from other castes. Support for

inter-caste marriage, in general as well as within the family, increases when exposed to more neighbours from other castes. Exposure to more neighbours from other castes makes people aware of greater caste injustice.

Additional results show that length of exposure to caste diversity matters for positive attitudes towards inter-caste marriage. When splitting the sample by sub-castes, I find that the presence of the same sub-caste on a floor may make caste identities appear more salient. The likelihood of making a new close friend from the other caste is a suggestive mechanism through which these effects take place. Having more friends from the other caste prior to moving may also have a role to play in enhancing inter-caste trust. My findings support the contact hypothesis, and in contrast to Rao (2019), I find strong effects with mere exposure, as compared to direct contact.

I rely on self-reported attitudes, and it may not be obvious to what extent attitudes translate into more accepting behaviours. For instance, in the case of questions related to inter-caste marriage, responses supporting inter-caste marriage may not necessarily translate into action, given the low incidence of inter-caste marriage in India (Goli et al. 2013; Hortaçsu et al. 2019). In the future, it may be possible to follow up with the sample and test actual behaviours in order to see if attitudes translate into more prosocial behaviours.

From a policy perspective, my results may have implications for the design of housing programmes in other settings. While relocating people to live in unfamiliar settings may come with costs such as loss of previous friendships (Barnhardt et al. 2017), there may be substantial benefits to living close to members of other social groups (Dragan et al. 2019). There is a need to examine the potential costs and benefits, both explicit and implicit, of such programmes and potential trade-offs through 'forced' integration (Miguel 2004). My findings throw light on the reintegrating effects of housing policies, thus serving as a potential tool to reduce intergroup prejudice. Future research seeks to examine the longer-term effects of exposure to neighbours from other groups on both behaviours and attitudes, to examine whether these effects grow stronger with time.

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Appendix A: extra figures and tables

Table A1: Effect of caste composition on survey participation: Site A

	Participation in survey
Fraction of other-caste HH	−0.0002
	(0.113)
OBC	−0.018
	(0.036)
SC/ST	−0.04
	(0.032)
Observations	765

Note: this table shows the regression of survey participation on the composition of other-caste households. Standard errors are clustered at the floor level. Participation in survey: 0 if the household is not in the survey, 1 if the household is in the survey.

Source: author's calculations.

Table A2: Effect of caste composition on survey participation: Site B

	Participation in survey
Fraction of other-caste HH	−0.131
	(0.104)
OBC	−0.021
	(0.166)
SC/ST	−0.081
	(0.081)
Observations	182

Note: this table shows the regression of survey participation on the composition of other-caste households. Standard errors are clustered at the floor level. Participation in survey: 0 if the household is not in the survey, 1 if the household is in the survey.

Source: author's calculations.

Table A3: Effect of caste composition on survey participation: general category

	Participation in survey
Fraction of other-caste HH	−0.135
	(0.161)
Observations	283

Note: this table shows the regression of survey participation on the composition of other-caste households for general category households. Standard errors are clustered at the floor level. Participation in survey: 0 if the household is not in the survey, 1 if the household is in the survey.

Source: author's calculations.

Table A4: Effect of caste composition on survey participation: OBC households

	Participation in survey
Fraction of other-caste HH	−0.125
	(0.307)
Observations	135

Note: this table shows the regression of survey participation on the composition of other-caste households for OBC households. Standard errors are clustered at the floor level. Participation in survey: 0 if the household is not in the survey, 1 if the household is in the survey.

Source: author's calculations.

Table A5: Effect of caste composition on survey participation: SC/ST households

	Participation in survey
Fraction of other-caste HH	0.078
	(0.141)
Observations	347

Note: this table shows the regression of survey participation on the composition of other-caste households for SC/ST households. Standard errors are clustered at the floor level. Participation in Survey: 0 if the household is not in the survey, 1 if the household is in the survey.

Source: author's calculations.

Table A6: Relationship between number of friends and caste diversity of neighbours

	Number of friends	Number of new friends
X: fraction of other-caste HH	0.278	0.081
	(0.611)	(0.457)
Outcome mean	0.886	1.122
Caste FE	Y	Y
Observations	692	692

Note: each column represents a separate regression. *Number of friends* is defined as the number of friends from the other castes. *Number of new friends* is defined as the number of new friends from the other castes. Standard errors in parentheses and clustered at the floor level. Controls include age, education, nature of work, and previous slum location. ** denotes significance at the 5 per cent level, * denotes significance at the 10 per cent level.

Source: author's calculations.

Table A7: Balance: previous slum other-caste friends and predetermined variables

	Fraction previous friend (1)	At least one previous friend (2)
Age	0.0002	0.003
	(0.0008)	(0.003)
Male age	−0.0007	−0.0002
	(0.0005)	(0.001)
Female	0.008	0.0005
	(0.014)	(0.005)
Female age	−0.001	−0.0016
	(0.0028)	(0.0016)
Completed primary	0.027	0.014
	(0.029)	(0.009)
No. family members	−0.053	−0.008
	(0.063)	(0.009)
Age of oldest child	0.001	0.0009
	(0.006)	(0.0018)
Female respondent	−0.056	−0.037
	(0.151)	(0.073)
Number of children	0.009	0.011
	(0.018)	(0.008)
General	0.028	0.061
	(0.079)	(0.057)
SC/ST	0.021	0.069
	(0.078)	(0.048)
N	692	692

Note: this table shows the regression of composition of other-caste friends known from the previous slum on a given floor on baseline characteristics. Each column represents a separate regression. *Fraction previous friend* is defined as the fraction of friends known from the previous slum who belong to another caste. *At least one previous friend* is a dummy that takes the value of 1 if the person has at least one other-caste friend from the slum he/she previously stayed in. These regressions includes slum fixed effects and site fixed effects. OBC is the omitted caste category. Standard errors are clustered at the floor level. ** denotes significance at the 5 per cent level, * denotes significance at the 10 per cent level.

Source: author's calculations.

Table A8: Relationship between friends and previous slum acquaintances of other caste

	Fraction friend	At least one friend
X: Fraction previous friend	0.483***	0.534***
	(0.042)	(0.045)
Outcome mean	0.832	0.925
Site FE	Y	Y
Caste FE	Y	Y
Observations	692	692

Source: author's calculations.