

Intergroup contact fosters more inclusive social identities

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Abstract

We examined how people construct their social identities from multiple group memberships—and whether intergroup contact can reduce prejudice by fostering more inclusive social identities. South Indian participants ($N = 351$) from diverse caste backgrounds viewed 24 identity cards, each representing a person with whom participants shared none, one, two, or all of three group memberships (caste, religion, nationality). Participants judged each person as “us” or “not us”, showing whom they included in their ingroup, and whom they excluded. Participants tended to exclude caste and religious minorities, replicating persistent social divides. Bridging these divides, cross-group friendship was associated with more inclusive identities which, in turn, were associated with more favourable outgroup attitudes. Negative contact was associated with less inclusive identities, showing that past experiences shaped whom participants considered “us” or “not us”. Contact and identity processes were unrelated to support for affirmative action in advantaged and disadvantaged caste groups.

Keywords: intergroup contact, social identity, multiple categorization, intergroup relations, affirmative action

1 How we feel about and act toward others depends on whom we consider “us” and
2 “them”—that is, whom we include in, and exclude from, our ingroup (for a review,
3 see Authors, in press). In some situations, this distinction rests on one salient cat-
4 egorization, for example, someone’s nationality at an international border. In diverse
5 societies, however, this distinction often depends on multiple, overlapping group
6 memberships. Individuals differ in how they construct their ingroup from these
7 group memberships. Some espouse narrow definitions of who is “us” and “them”,
8 while others adopt more inclusive identities (see Figure 1). Many Americans, for
9 example, associate being American with being White American (Devos & Banaji,

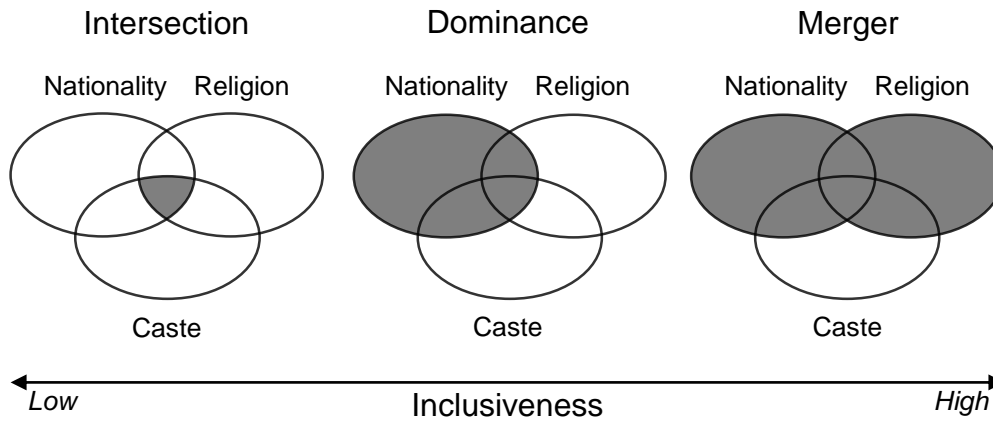


Figure 1. Schematic representations of social identity structures, ordered by social identity inclusiveness (van Dommelen, Schmid, Hewstone, Gonsalkorale & Brewer, 2015). Shaded regions represent the groups which a participant has to categorize as “us” to be assigned that structure. An Indian Hindu, for example, may consider only people who share their nationality, religion, and caste as ingroup members (intersection). Someone else may consider all their fellow Indians, whatever their religion or caste, as ingroup members (dominance). Another person may consider anyone who shares their nationality or religion as ingroup members (merger).

2005). This suggests that whom Americans consider “us” and “them” might depend on someone’s race *and* nationality. In this paper, we examine how group memberships shape whom people consider “us” and “not us”, and whether intergroup contact can reduce prejudice by fostering inclusive social identities.

Social psychologists have argued for the importance of considering two (Berry, 1997; Crisp & Hewstone, 2007; Dovidio, Gaertner & Saguy, 2009) or more (Roccas & Brewer, 2002) social categories for understanding intergroup relations. Broadly, these perspectives recognise that we are part of multiple overlapping groups; that we have a subjective sense of who is “us” and “them” that goes beyond the objective facts of group membership; and that identification across multiple categories affects our attitudes toward people with whom we share some, but not all, group memberships. However, these perspectives have lacked methods for measuring identification across multiple categories. Our research uses a novel method for studying subjective identity construals, as well as their antecedents (intergroup contact) and consequences (outgroup attitudes, intergroup threat, policy support).

Past research (van Dommelen et al., 2015) studied whom individuals considered “us” and “not us”, and observed substantial individual differences in how inclusive participants’ social identities were. In this research, all participants be-

1 longed to the same groups. Group memberships, however, likely influences whom
2 people consider “us” and “not us”. For majority-group members, negotiating their
3 ethnic and national identities means something different than for minority-group
4 members (Dovidio et al., 2009). We expect that group differences are as great as, if
5 not greater than, individual differences in social identity construals—especially if
6 groups differ in status and power. Our research includes participants from diverse
7 backgrounds to estimate these group differences.

8 Contact experiences could overcome group differences in social identity
9 construals. Encountering diverse others could initiate a process of cognitive differen-
10 tiation (Schmid & Hewstone, 2011) whereby individuals become aware of complex
11 interrelations between their group memberships, and thus start to question narrow
12 identity construals. Further, positive intergroup interactions motivate people to
13 include the outgroup of an interaction partner in their self-concept (Page-Gould,
14 Mendoza-Denton, Alegre & Siy, 2010). If contact motivates people to include partial
15 outgroups in the self, it should encourage social identities that include the interac-
16 tion partner’s combination of group memberships. Together, these mechanisms
17 suggest that contact could foster more inclusive identities.

18 Fostering more inclusive identities, in turn, could reduce intergroup bias.
19 Dividing others into “us” and “not us” is a necessary and sufficient condition for
20 ingroup favouritism (Tajfel, 1981). Considering more people as “us” should extend
21 ingroup favouritism to a wider range of people, and thus reduce discrimination
22 (Gaertner, Dovidio, Guerra, Hehman & Saguy, 2016). Ingroup favouritism can
23 turn into outgroup derogation when an outgroup threatens the ingroup (Brewer,
24 1999). Considering fewer people as “not us” should reduce the number of groups
25 which are perceived to threaten the ingroup. Together, these mechanisms suggest
26 that fostering inclusive identities could improve outgroup attitudes and reduce
27 intergroup threat.

28 Beyond prejudice, researchers have debated whether fostering inclusive
29 identities helps or hinders social change. Social change often requires advantaged
30 and disadvantaged groups to strive for redistributive policies. On the one hand,
31 fostering inclusive identities could break down the boundaries between the advant-
32 aged ingroup and the disadvantaged outgroup—turning injustice faced by “them”
33 into “our” problem. This process could narrow the gap between advantaged-group
34 members’ support for the principle of equality and their opposition to its imple-
35 mentation (Dixon, Durrheim & Tredoux, 2007). On the other hand, fostering more
36 inclusive identities could distract disadvantaged-group members from differences
37 in resources and power, and thus reduce their support for social change (Dovidio,
38 Saguy, Gaertner & Thomas, 2012). Together, these mechanisms suggest that more
39 inclusive identities could increase support for social change among the advantaged,
40 but decrease support among the disadvantaged.

1 **Caste, Religion, Nation in South India**

2 We tested these predictions among South Indian students, examining the cross-
3 cutting categories of caste, religion, and nationality. Caste is a system of social
4 relations that concentrates resources in the hands of dominant castes by restricting
5 subordinate castes' occupations and land ownership, and by enforcing endogamy
6 and segregation (Jodhka, 2012). This system is underpinned by a tradition that
7 ranks castes according to their supposed ritual purity, and condemns contact with
8 less pure castes. Since Independence, the Indian State has sought to redress caste-
9 based injustices by enforcing 'reservations' of seats in state-run universities and
10 state-sector jobs for disadvantaged groups. It recognises Dalits—members of castes
11 affected by untouchability—as Scheduled Castes (SCs), Adivasi—India's indigenous
12 peoples—as Scheduled Tribes (STs), and other disadvantaged groups—who occupy
13 an intermediate position in the caste hierarchy—as Other Backward Classes (OBCs).
14 Historically advantaged castes do not have access to reservations (GM: General
15 Merit). Reservation policies, alongside ongoing discrimination, mean that caste
16 identities remain important.

17 South India is religiously diverse. In Karnataka, where we conducted this
18 research, 84% of inhabitants are Hindus, while 13% are Muslims. Muslims face both
19 structural inequalities and communal violence. In 2002, for example, a pogrom
20 killed over a thousand Muslims in Gujarat (Dhattiwala & Biggs, 2012). In recent
21 years, anti-Muslim violence has been increasing (Amnesty International, 2017).
22 Religion is intertwined with two currents of Indian nationalism (Menski, 2009). On
23 the one hand, the secular foundations of the Indian State resulted from an inclusive
24 nationalism that strives to include Indians of all religions. On the other hand,
25 Hindu nationalism (Hindutva) is an ideology that equates being Indian with being
26 Hindu, thus excluding Muslims from the national identity. Narendra Modi's BJP
27 government espouses Hindutva, and enjoys broad support in the Indian population
28 (Pew Research Center, 2017).

29 **Present research**

30 We examined how people construct their social identities from multiple group
31 memberships—and whether intergroup contact can reduce prejudice, and increase
32 support for social change, by fostering more inclusive identities. Our research used
33 a novel method to study social identification across multiple categories in a sample
34 of South Indians from various caste backgrounds.

35 First, we examined how participants' objective group memberships shaped
36 their subjective construals of social identity. We hypothesised that participants
37 would exclude targets from religious and national outgroups—and that participants

1 from advantaged castes would exclude targets from disadvantaged castes, and vice
2 versa. We did not have a clear prediction for participants from intermediate caste
3 groups. Second, we tested potential antecedents of more inclusive social identities.
4 We hypothesised that positive contact and cross-group friendship would be
5 associated with more, and negative contact with less, inclusive identities. As an alternative
6 hypothesis, we tested whether ideological preferences for social dominance
7 (Sidanius & Pratto, 1999) could have motivated individuals to exclude lower-status
8 outgroups. Third, we examined potential consequences of participants' identity
9 construals. We hypothesised that categorizing someone as "us" would be associated
10 with more favourable attitudes and less social distance toward that person. More
11 broadly, we expected more inclusive identities to be associated with less perceived
12 intergroup threat. We also tested whether more inclusive identities would be associated
13 with increased support for affirmative action among advantaged-group
14 members, but decreased support among disadvantaged-group members.

15 We tested these predictions in a triple crossed-categorization task (adapted
16 from van Dommelen et al., 2015). In this task, participants viewed identity cards,
17 each representing a person with whom participants shared none, one, two, or
18 all of three group memberships. Participants reported whether they considered
19 each person as "us" or "not us", showing whom they included in, or excluded
20 from, their ingroup. This task thus measured how participants combined multiple
21 group memberships to construct their social identities. We tested to what extent
22 participants' responses were associated with past contact experiences, ideological
23 preferences, and various outcome measures.

24 Method

25 All materials, data, analysis scripts, and appendices are available online (https://osf.io/ekb8z/?view_only=05b6a5c5cf5e43d9a7bba5e192f53f87). Here, we only report measures
26 testing our hypotheses, omitting measures replicating earlier research or validating
27 the categorization task (Appendix E). Reanalysing existing data (van Dommelen
28 et al., 2015), we determined that ~100 respondents per group would allow reasonably
29 precise estimates of model parameters.¹

31 Participants

32 We recruited 351 students at Karnatak University (Dharwad, India). Of these, we
33 excluded 49 participants who did not belong to any of four caste groups ($n = 20$),
34 failed to indicate their caste group ($n = 7$), or reported Islam as their own or

¹Models estimated posterior probabilities with precision $SD < 0.5$ on the log odds scale.

1 their family's religion ($n = 27$).² This left 302 participants who reported Hinduism
2 ($n = 286$), Jainism ($n = 8$), or Christianity ($n = 8$) as their or their family's religion,
3 and General Caste ($n = 99$), Other Backward Class ($n = 127$), Scheduled Caste
4 ($n = 54$), or Scheduled Tribe ($n = 22$) as their caste group. Table 1 summarises
5 participants by gender, age, nationality, religion, and caste.

6 Procedure

7 Participants completed a triple crossed-categorization task, in which they viewed
8 24 identity cards. Each showed a fictitious person's name, age, religion, nationality,
9 caste reservation, and a head-and-shoulders silhouette. Based on a pilot study,
10 we manipulated the target's caste, religion, and nationality such that each target
11 represented a person with whom participants shared none, one, two, or three group
12 memberships (Figure 2). We tested participants in classrooms of 24–71 students by
13 presenting targets in a slide-based presentation. Each slide contained a male and a
14 female target with participants focusing on the target corresponding to their gender.
15 Slides also contained a number identifying each target, and the response scale(s)
16 corresponding to the question(s) participants answered at the time.

17 In each session, participants first familiarised themselves with each target
18 (for 7s) in an automated slideshow. Participants viewed targets (in the same order)
19 for a second time, noting for each target whether they felt that this person was one of
20 their own group (1 = “us”), or not one of their own group (0 = “not us”). Participants
21 viewed targets for a third time, rating how comfortable or uncomfortable they
22 would feel to share a room with this person (social distance; 1 = *very uncomfortable*,
23 7 = *very comfortable*), and how they felt toward this person (feeling thermometer;
24 0 = *cold*, 100 = *warm*). Participants then completed a questionnaire containing the
25 measures described below.

26 Measures

27 We measured intergroup contact as: how often, from 1 = *never* to 5 = *very often*, par-
28 ticipants meet outgroup members in their everyday life (contact quantity), and how
29 often, on average, they have positive/good contact and negative/bad contact with
30 outgroup members (Barlow et al., 2012). We preceded these items with examples
31 of positive and negative contact experiences. We measured cross-group friendship
32 with two items (Turner, Hewstone & Voci, 2007): “How many close friends do
33 you have who are [outgroup members]?” (1 = *none*, 5 = *more than ten*), and “How
34 often do you spend time with [outgroup] friends?” (1 = *never* to 5 = *very often*;

²We excluded Muslim participants as this subsample was too small for meaningful analyses.

Table 1. Participants by gender, age, nationality, religion, and caste. Categories in *italics* were excluded from the final sample. N/A marks missing responses.

Category		<i>n</i>	%
Gender	Woman	215	61
	Man	121	34
	Other	0	0
	N/A	15	4
Age	18–20	1	0
	21–23	254	72
	24–26	77	22
	27–29	10	3
	30–32	1	0
	33–35	0	0
	36 or older	1	0
	N/A	7	2
Nationality	Indian	339	97
	Other	0	0
	N/A	12	3
Religion	Buddhism	1	0
	Christianity	11	3
	Hinduism	297	85
	<i>Islam</i>	27	8
	Jainism	8	2
	Other	2	1
	N/A	5	1
Caste	General Caste	104	30
	Other Backward Class	143	41
	Scheduled Caste	54	15
	Scheduled Tribe	23	7
	<i>Other / Not applicable</i>	20	6
	N/A	7	2
Total		351	100

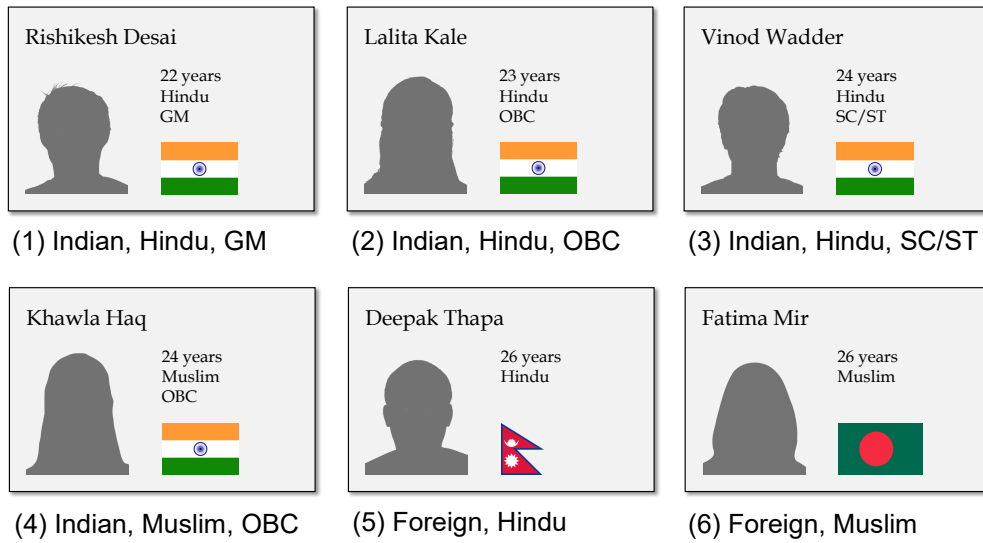


Figure 2. Examples of targets used in the triple crossed-categorization task. Based on ratings in a pilot study ($N = 26$), we selected the four most prototypical targets (out of fifty initial targets) for each of six plausible combinations of caste, religion, and nationality (for details, see Appendix A). Each target showed a person's caste reservation (GM = General Merit, OBC = Other Backward Class, SC/ST = Scheduled Caste/Scheduled Tribe), religion (Hindu, Muslim), and nationality (Indian, Nepali, Sri Lankan, Bangladeshi). Each target also showed the person's first and last name, age (21–26 years), and a silhouette corresponding to the person's gender (adapted from Ma et al., 2015). Each target's age and silhouette, as well as the order in which the targets were presented, varied across sessions.

1 .47 ≤ r_s ≤ .58). Participants reported contact with four groups: Dalits, people from
2 other backward classes, people from general castes, and Muslims.

3 We measured social dominance orientation as how much, between 1 =
4 *strongly oppose* and 7 = *strongly favour*, participants endorsed eight statements
5 about social hierarchies (Ho et al., 2015). Four items measured support for group-
6 based dominance (SDO-Dominance), e.g., “some groups of people are simply in-
7 ferior to other groups”. Four items measured opposition to egalitarian ideologies
8 (SDO-Egalitarianism), e.g., “it is unjust to try to make groups equal”.³

9 We measured realistic threat—from Muslims and Dalits—with three items
10 per outgroup (Schmid, Hewstone, Küpper, Zick & Tausch, 2014), e.g., “the more
11 power [Muslims/Dalits] gain in this country, the more difficult it is for [Hindus/people
12 from my caste group]” (1 = *strongly disagree*, 5 = *strongly agree*; $\alpha_{Muslims} = .71$,
13 $\alpha_{Dalits} = .79$). Two items measured symbolic threat, e.g., “[Muslims/Dalits] threaten
14 [Hindus’/my caste group’s] way of life” (1 = *strongly disagree*, 5 = *strongly agree*;
15 $r_{Muslims} = .44$, $r_{Dalits} = .48$).

16 We measured perceived (dis-)advantage as how easy or hard participants
17 thought it was, on average, for people from various groups to succeed in India
18 today (1 = *very hard*, 7 = *very easy*). Participants rated seven groups: People from
19 your own background, Scheduled Caste, Scheduled Tribe, Other Backward Class,
20 General Caste, Hindus, and Muslims.

21 Five items measured policy support. Participants read that “currently, 22.5%
22 of seats in central-government funded universities are reserved for Scheduled
23 Caste and Scheduled Tribe students”, and that “an additional 27.5% of seats in
24 central-government funded universities are reserved for students from Other Back-
25 ward Classes”. Participants indicated to what extent they opposed or supported
26 reservation in higher education for students from each group (1 = *strongly oppose*,
27 5 = *strongly support*), and whether they thought that reservation in higher educa-
28 tion for students from that group should increase, decrease, or remain unchanged
29 (1 = *decrease a lot*, 5 = *increase a lot*; $r_{SC/ST} = .67$, $r_{OBC} = .67$). Participants then read
30 that “no seats in central-government funded universities are reserved for Muslim
31 students nationally, though some states have introduced quotas for Muslim students”.
32 Participants indicated to what extent they opposed or supported reservation for
33 Muslim students.

³Replicating Ho et al.’s (2015) findings, we found a four-factor model (with two method factors) to represent the data better than the one-factor ($\Delta\chi^2 = 155.14$, $p < .001$) or two-factor ($\Delta\chi^2 = 138.67$, $p < .001$) alternatives. Accounting for this structure, we used latent factor scores for SDO-Dominance and SDO-Egalitarianism in our analyses.

1 Results

2 We used the following analysis strategy: First, we estimated group differences
3 in whom participants categorized as “us” and “not us”. Second, we examined to
4 what extent intergroup contact and ideological orientations explained individual
5 differences in participants’ categorizations. Third, we tested whether participants’
6 categorizations were associated with their attitudes and beliefs.

7 Group differences

8 We compared *how likely* participants were to categorize *which* target as “us” versus
9 “not us”—and how that probability varied across targets’ and participants’ group
10 memberships.⁴

11 We estimated a series of Bayesian multilevel models in RStan (Stan Devel-
12 opment Team, 2018) with participants’ target categorizations (1 = “us”, 0 = “not us”)
13 as outcome variable. Models derived the likelihood of the observed proportions of
14 “us” categorizations from the Bernoulli likelihood with a logit link function. Models
15 assigned weakly informative prior distributions to all fixed parameters (Gelman,
16 Simpson & Betancourt, 2017).⁵ Models used the non-centred parameterisation
17 for all varying effects (Betancourt & Girolami, 2015). We compared models using
18 stratified 10-fold cross-validation to estimate each model’s out-of-sample predictive
19 accuracy (Vehtari et al., 2017). We selected more complex over simpler models when
20 the difference in predictive accuracy was at least twice its standard error.

21 Models 0 to 3 estimated the probabilities of “us” categorizations as varying
22 between participants but fixed across target categories (M₀), as varying across
23 participants and target categories (M₁), and tested whether SC/ST participants’
24 categorizations of Indian targets differed from GM and OBC participants’ (M₂)
25 and whether OBC participants’ categorizations differed from GM participants’
26 (M₃). Models 1 and 2, but not Model 3, made more accurate predictions than less
27 complex models (Table 2). This suggests that the targets’ group memberships shaped
28 participants’ categorizations, and that GM and OBC participants’ categorizations
29 resembled each other but differed from SC/ST participants’. Below, we report median
30 point estimates, with 97% highest posterior density intervals (Plummer, Best, Cowles
31 & Vines, 2006), from the model’s posterior distribution.

32 Figure 3 shows the estimated probabilities of General Merit (GM), Other
33 Backward Class (OBC), and Scheduled Caste/Scheduled Tribe (SC/ST) participants
34 categorizing a target as “us”. Participants tended to define their ingroup in terms

⁴In Appendix B, we report analyses using van Dommelen et al.’s (2015) operationalisation; they analysed *which* and *how many* targets participants included as distinct questions.

⁵Models assigned the following priors: $\beta \sim \text{Student}(2.5, 0, 1)$ for fixed effects, and $\sigma \sim \text{Cauchy}(0, 1)$ for standard deviations of varying effects.

Table 2. Comparison of models estimating the probability of participants categorizing targets as “us” versus “not us”. *ELPD* is the expected log predictive density, with higher numbers indicating that a model is expected to make more accurate out-of-sample predictions (Vehtari, Gelman & Gabry, 2017). $\Delta ELPD$ is the difference in *ELPD* between the current and previous model, with positive values indicating that the current model is expected to make more accurate out-of-sample predictions. We selected a more complex model over a simpler model when $\frac{\Delta ELPD}{SE} \geq 2$. *w* are stacking weights based on the models’ expected log predictive densities (Yao et al., 2018).

#	Description	<i>ELPD</i>	<i>SE</i>	$\Delta ELPD$	<i>SE</i>	$\frac{\Delta ELPD}{SE}$	<i>w</i>
0	Intercept (Participant)	-4703.5	23.7	-	-	-	.00
1 vs 0	Intercept (Category)	-3853.5	41.6	850.1	37.4	22.7	.00
2 vs 1	Group differences (SC/ST)	-3791.3	42.0	62.1	11.1	5.6	.00
3 vs 2	Group differences (OBC)	-3792.1	42.2	-0.8	3.6	-0.2	.07
4 vs 2	Intergroup contact (4)	-3743.4	42.8	47.9	8.8	5.4	.00
5 vs 4	Intergroup contact (2)	-3736.7	42.6	6.7	1.8	3.8	.92
6 vs 5	Intergroup contact (2)	-3747.8	42.7	-11.1	3.2	-3.5	.00
7 vs 2	Social dominance orientation	-3791.0	42.1	0.4	3.3	0.1	.00

of nationality, though about half of the responses indicated more inclusive identities. Few participants considered Bangladeshi Muslims part of their ingroup, $\Pr(\text{“us”}|\text{M}_2) = .17, [.14, .21]$. Roughly half of the participants included Sri Lankan and Nepali Hindus in their ingroup, $\Pr(\text{“us”}|\text{M}_2) = .46, [.41, .52]$. Participants were thus more likely to include foreign targets when they were Hindu, $\Delta\Pr(\text{“us”}|\text{M}_2) = .29, [.25, .34]$. Still, GM/OBC and SC/ST participants were, respectively, 1.95, [1.73, 2.18] and 1.90, [1.71, 2.14] times more likely to categorize Indian, Hindu targets as “us” compared to foreign, Hindu targets.

As expected, participants’ caste membership shaped how they categorized Indians of different castes and religions. Most GM and OBC participants included *Hindu*, GM and *Hindu*, OBC targets in their ingroup, $\Pr(\text{“us”}|\text{M}_2) = .94, [.92, .96]$ and $\Pr(\text{“us”}|\text{M}_2) = .93, [.91, .95]$. Fewer GM and OBC participants categorized *Hindu*, SC/ST targets as “us”, $\Pr(\text{“us”}|\text{M}_2) = .84, [.80, .87]$. They were least likely to categorize *Muslim*, OBC targets as “us”, $\Pr(\text{“us”}|\text{M}_2) = .75, [.70, .80]$. Dalit/Adivasi (SC/ST) participants’ responses differed from GM and OBC participants’. Almost all SC/ST participants included *Hindu*, SC/ST targets in their ingroup, $\Pr(\text{“us”}|\text{M}_2) = .97, [.95, .99]$. Fewer SC/ST participants included *Hindu*, GM and *Hindu*, OBC targets in their ingroup, $\Pr(\text{“us”}|\text{M}_2) = .88, [.83, .92]$ and $\Pr(\text{“us”}|\text{M}_2) = .80, [.73, .86]$. SC/ST participants were less likely than others to include *Muslim*, OBC targets as “us”, $\Pr(\text{“us”}|\text{M}_2) = .47, [.38, .57]$. These findings showed that participants from advantaged backgrounds tended to exclude targets from disadvantaged back-

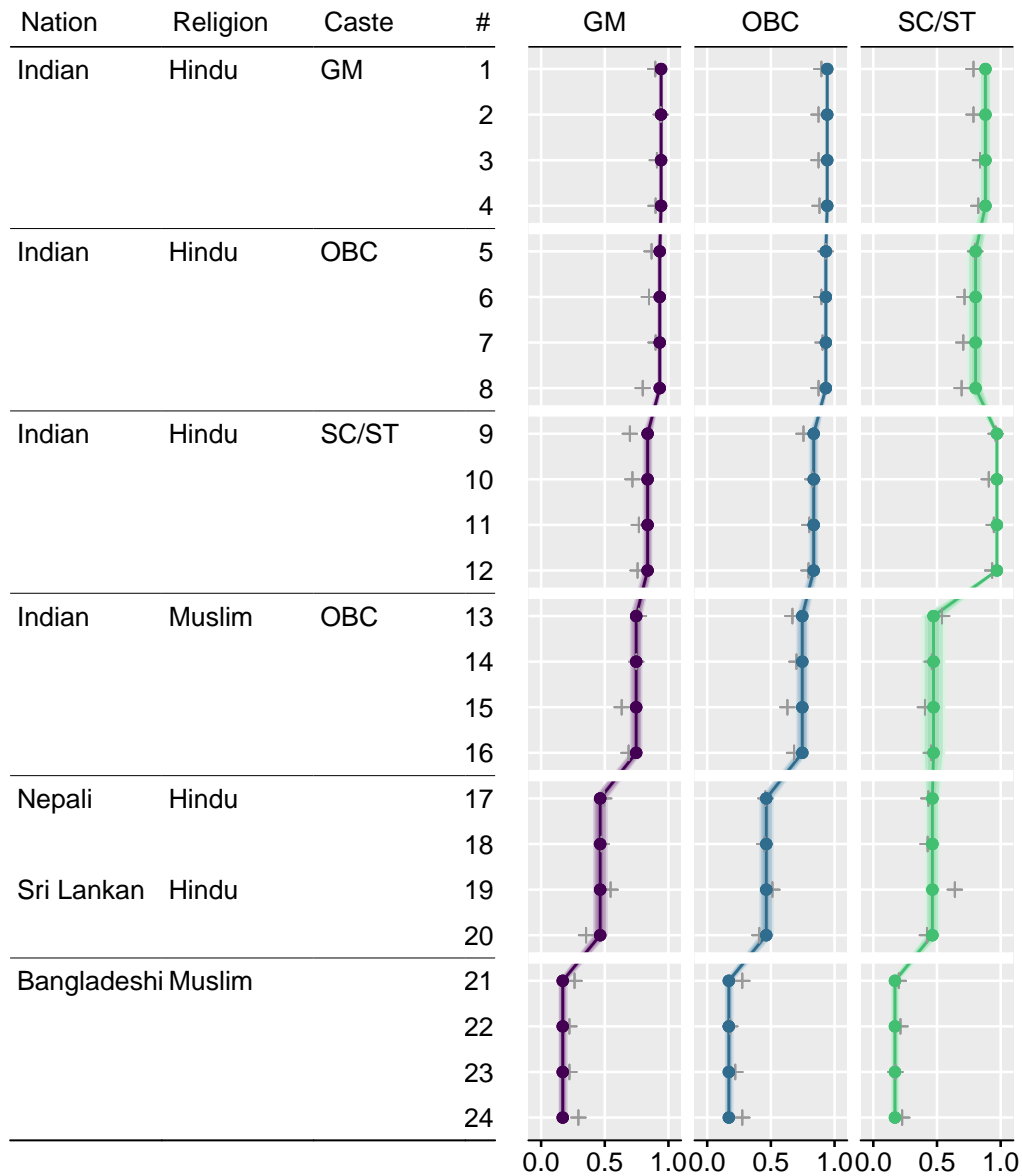


Figure 3. Estimated probability of participants categorizing a target as “us” versus “not us” by targets’ nationality, religion, and caste (vertical), and participants’ caste membership (horizontal). Dots (•) indicate the most plausible *estimate* for a given target’s probability of being included in participants’ ingroup (in Model 2, Table 2), while the shaded ribbons encompass the 67% (darkest shade), 89%, and 97% (lightest shade) most plausible estimates of that probability. Pluses (+) indicate the *observed* proportion of participants who included a given target in their ingroup. Comparing predicted and observed proportion shows that the model represents the data reasonably well. GM = General Merit, OBC = Other Backward Class, SC/ST = Scheduled Caste/Scheduled Tribe.

1 grounds (and vice versa), while all participants tended to exclude targets from the
2 Muslim minority.

3 **Individual differences**

4 We examined to what extent individual differences in past experiences and ideolo-
5 gical orientations explain why some participants excluded targets from caste and
6 religious outgroups—and why others did not.

7 Models 4 to 6 tested whether intergroup contact was associated with how
8 participants categorized Indian targets of caste or religious outgroups. Model 4
9 extended Model 2 by including contact quantity, positive contact, negative contact,
10 and outgroup friendship as predictors of participants' categorizations. Model 4 made
11 more accurate predictions than Model 2. Negative contact ($e^{\beta} = 0.81, [0.72, 0.90]$)
12 and outgroup friendship ($e^{\beta} = 1.50, [1.28, 1.72]$) were associated with participants'
13 categorizations, but neither positive contact ($e^{\beta} = 1.01, [0.87, 1.16]$) nor contact
14 quantity ($e^{\beta} = 0.99, [0.86, 1.15]$) were. Model 5 included only negative contact and
15 outgroup friendship, and made more accurate predictions than Model 4. Model 6
16 estimated the relationships between contact and categorizations as varying across
17 the four combinations of target caste and religion. Model 6 made less accurate
18 predictions than Model 5.

19 Figure 4 shows the estimated probabilities of participants categorizing tar-
20 gets as “us” as a function of contact experiences. Across targets and participants,
21 the odds of categorizing an outgroup target as “us” were $e^{\beta} = 1.50, [1.32, 1.69]$
22 times higher for each additional standard deviation of outgroup friendship. These
23 odds were $e^{\beta} = 0.81, [0.72, 0.90]$ times lower for each standard deviation of neg-
24 ative contact. This means, for example, that GM/OBC participants who reported
25 “never” having any negative contact with Muslims were more likely to categorize
26 Indian Muslims as “us” than participants who reported “sometimes” having negative
27 contact, $\Delta\text{Pr}(\text{“us”}|\text{M5}) = .05, [.09, .03]$. GM/OBC participants who reported no
28 friendships with Muslims were a lot less likely to include Indian Muslims in their
29 ingroup than participants who had 2–5 Muslim friends with whom they “sometimes”
30 spent time, $\Delta\text{Pr}(\text{“us”}|\text{M5}) = .18, [.12, .24]$. Contact experiences were thus associated
31 with whom participants categorized as “us” and “not us”.

32 Models 7 tested whether social dominance orientation was associated with
33 participants' categorizations of targets from lower status outgroups. Model 7 found
34 little evidence for associations between participants' categorizations and their SDO-
35 Dominance scores ($e^{\beta} = 0.87, [0.69, 1.06]$) or SDO-Egalitarianism scores ($e^{\beta} = 0.98,$
36 $[0.78, 1.21]$). Together, these findings show that group and individual differences
37 explained whom participants included in their ingroup. As expected, past experi-
38 ences with outgroup members explained why some participants included targets of
39 (objective) caste or religions outgroups in their (subjective) ingroup, when others

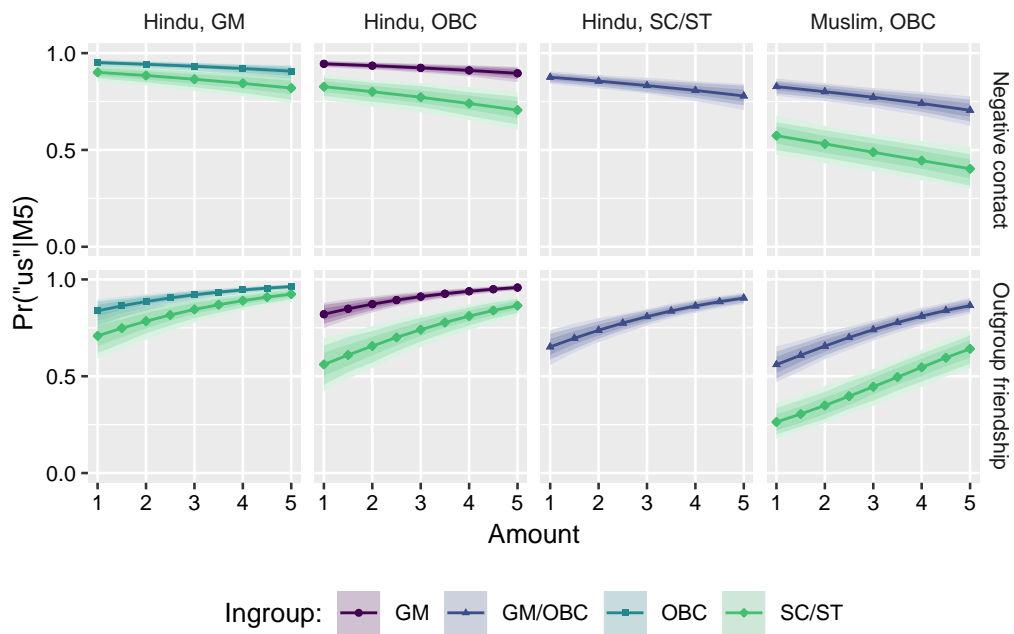


Figure 4. Estimated probability of participants categorizing a target as "us" versus "not us" as a function of the targets' group memberships (horizontal), the participants' group memberships (colour), and the reported amount of negative contact and outgroup friendship with the relevant groups (in Model 5, Table 2). GM = General Merit, OBC = Other Backward Class, SC/ST = Scheduled Caste/Scheduled Tribe.

Table 3. Comparison of models estimating participants’ social distance (SD) and feeling thermometer (FT) ratings for each target as a function of group differences and target categorizations. As in Table 2, we selected a more complex model over a simpler model when $\frac{\Delta ELPD}{SE} \geq 2$. R^2 is a Bayesian analogue to R^2 in maximum likelihood estimation (Gelman, Goodrich, Gabry & Ali, 2017).

#	Description	R^2_{SD}	R^2_{FT}	$ELPD$	SE	$\Delta ELPD$	SE	$\frac{\Delta ELPD}{SE}$	w
0	Participant	.23	.26	-16964	71.0	-	-	-	.12
1 vs 0	Category	.38	.42	-16338	79.6	626.8	40.2	15.6	.02
2 vs 1	SC/ST	.38	.43	-16317	79.6	20.1	9.8	2.1	.00
3 vs 2	OBC	.39	.43	-16293	80.5	24.2	9.7	2.5	.00
4 vs 3	Categorization	.42	.47	-16028	83.5	264.8	24.5	10.8	.19
5 vs 4	... (Category)	.42	.47	-16007	83.6	21.1	8.7	2.4	.67
6 vs 5	... (Ingroup)	.42	.47	-16025	84.3	-17.4	5.9	-3.0	.00

- 1 did not. In contrast, ideological orientations did not motivate participants to exclude
2 lower-status groups.

3 Consequences

4 We analysed how participants’ categorizations related to their feeling thermometer <https://www.dur.ac.uk/journal/Over> and social distance ratings for each target in the categorization task, to
5 10/Over and social distance ratings for each target in the categorization task, to
6 intergroup threat, and to their perceived (dis-)advantage and policy support.

7 We estimated multivariate models with participants’ target-wise social dis-
8 tance and feeling thermometer ratings as outcome variables (Table 3). Models 0 to
9 3 estimated ratings (on either outcome) as varying between participants but fixed
10 across targets (M0), as varying across participants and targets (M1), and tested
11 whether SC/ST participants’ responses differed from GM and OBC participants’
12 (M2), and whether OBC participants’ responses differed from GM participants
13 (M3). Models 1 to 3 improved upon the predictions of simpler models, showing that
14 participants’ ratings depended on targets’ and participants’ group memberships.

15 Models 4 to 6 tested whether participants who categorized a target as “us”
16 rated that target more favourably than participants categorizing the same target as
17 “not us”. Models estimated this difference as constant across targets and participants
18 (M4), as varying across target categories (M5), and tested whether this difference
19 depended on participants’ caste memberships (M6). Models 4 and 5, but not Model
20 6, made better predictions than less complex models, showing that how favourably
21 participants felt toward a target depended on whether they had categorized that
22 target as “us” or “not us”, and that the size of this difference depended on the targets’—
23 but not the participants’—group memberships.

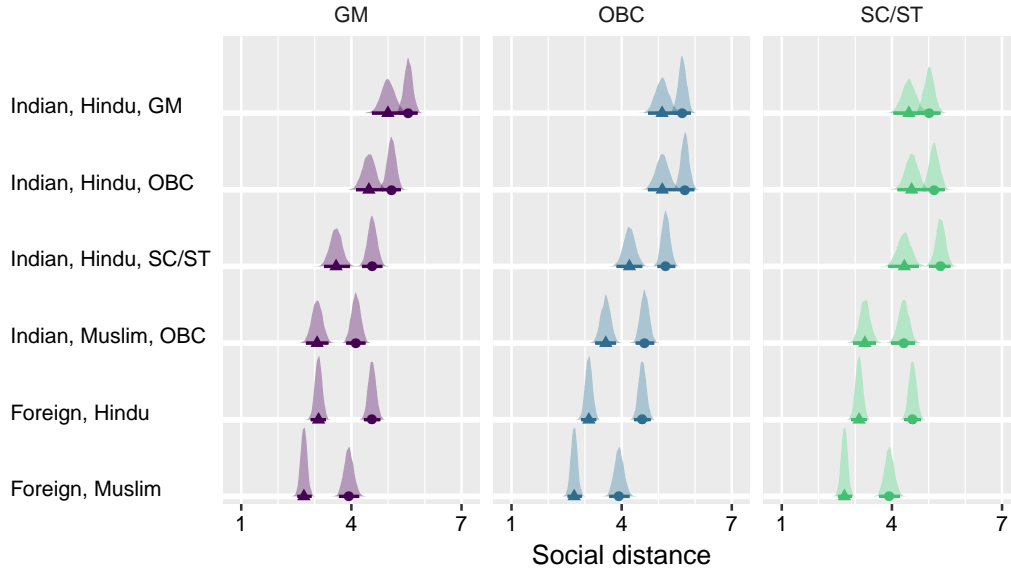


Figure 5. Posterior probabilities of social distance ratings as a function of target categorizations (in Model 5, Table 3). Points are the estimated mean ratings for targets categorized as “us”; triangles are the estimated mean ratings for targets categorized as “not us”. GM = General Merit, OBC = Other Backward Class, SC/ST = Scheduled Caste/Scheduled Tribe.

Figures 5 and 6 show, respectively, the estimated social distance and feeling thermometer ratings as a function of target categorizations and participants’ caste memberships. For all categories, participants felt more comfortable sharing a room with targets that they categorized as “us” than with targets they categorized as “not us”. This difference was smallest for *Indian, Hindu, GM* targets ($\beta = 0.55, [0.19, 0.90]$; $d = 0.24, [0.08, 0.39]$) and greatest for *foreign, Muslim* targets ($\beta = 1.46, [1.21, 1.70]$; $d = 0.63, [0.52, 0.73]$). We found a similar pattern for feeling thermometer ratings. The difference was smallest for *Indian, Hindu, OBC* targets ($\beta = 6.5, [2.1, 11.0]$, $d = 0.20, [0.06, 0.33]$) and greatest for *foreign, Hindu* targets ($\beta = 21.8, [18.6, 25.0]$, $d = 0.66, [0.56, 0.76]$). Feeling thermometer and social distance ratings were highly correlated ($r = .58, [.56, .60]$). Categorizing a target as “us” was thus associated with more warmth and less social distance toward that target.

Next, we tested whether participants’ perceptions of realistic and symbolic threat depended on how inclusive their identity construals were. Results from a series of multilevel models showed that participants reported more realistic ($M = 3.62, [3.49, 3.75]$) than symbolic ($M = 3.21, [3.09, 3.33]$) threat from (same-religion) Dalits, but more symbolic ($M = 3.47, [3.34, 3.61]$) than realistic ($M = 3.23, [3.06, 3.38]$) threat from (different-religion) Muslims. Contrary to predictions, we did not find that participants felt less threatened by Muslims and Dalits if they

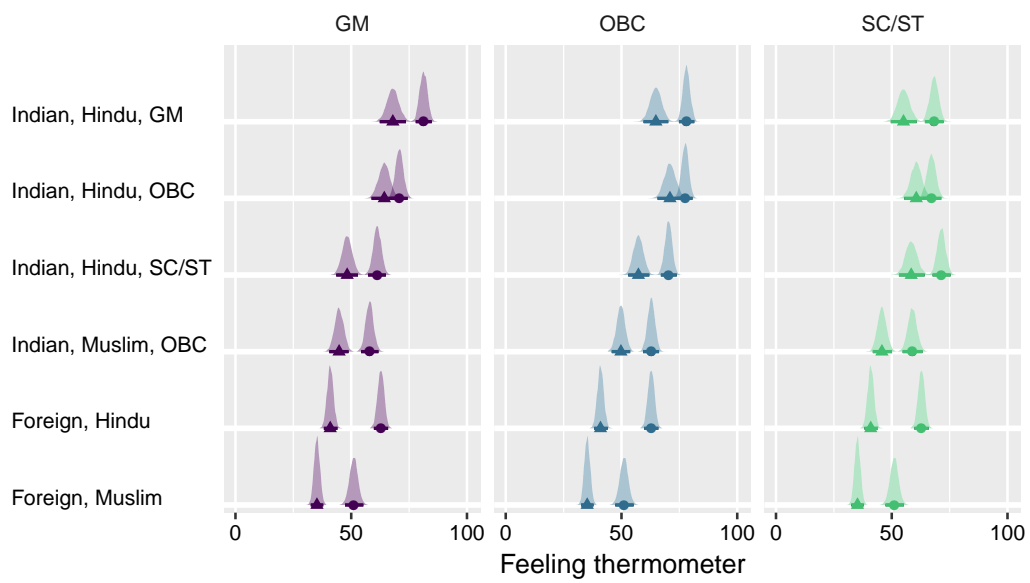


Figure 6. Posterior probabilities of feeling thermometer ratings as a function of target categorizations (in Model 5, Table 3). Points are the estimated mean ratings for targets categorized as "us"; triangles are the estimated mean ratings for targets categorized as "not us". GM = General Merit, OBC = Other Backward Class, SC/ST = Scheduled Caste/Scheduled Tribe.

1 categorized more targets from these outgroups as “us”. For details, see Appendix C.

2 Finally, we estimated group differences in perceived (dis-)advantage and
3 policy support. Figures 7 and 8 show the estimated group differences in both
4 outcomes. Contradicting prevailing social inequalities, GM and OBC participants
5 rated their own groups’ lives as substantially harder than SC/ST members’ lives.
6 Policy support strongly aligned with participants’ caste interests. SC/ST participants
7 supported reservations for both SC/ST and OBC students, while OBC participants
8 only supported reservations for their own group. Contrary to predictions, we did not
9 find more inclusive identities to be associated with either perceived (dis-)advantage
10 or policy support. Contrary to past research (Dixon, Levine, Reicher & Durrheim,
11 2012), intergroup contact was similarly unrelated to these outcomes. For details, see
12 Appendix D.

13 Overall, we found that when participants included a person in their ingroup,
14 they had, on average, more favourable attitudes to and desired less social distance
15 from that person. Participants’ categorizations, however, were unrelated to percep-
16 tions of intergroup threat and relative (dis-)advantage, and to support for affirmative
17 action.

18 Discussion

19 This research examined how people construct their social identities from multiple
20 cross-cutting categories, and how these identities relate to intergroup contact and
21 intergroup attitudes. As hypothesised, we found that cross-group friendship was
22 associated with more inclusive identities which, in turn, were associated with more
23 favourable outgroup attitudes. Negative contact was associated with less inclusive
24 identities. Below, we discuss strengths, limitations, and implications of the research.

25 Our findings show that the triple crossed-categorization task (van Dommelen
26 et al., 2015) is an intuitive and informative method for studying social identification
27 across multiple categories. We adapted the task to answer new questions about
28 social identification. First, we recruited respondents from multiple groups, allowing
29 us to study both individual and group differences (see also Branković et al., 2015).
30 Second, we estimated responses as varying across targets and participants using
31 multilevel models. This allowed more fine-grained analyses than van Dommelen et
32 al.’s quantitative and qualitative summaries, and may explain why we found more
33 consistent effects of intergroup contact. Together, these changes open the triple
34 crossed-categorization task to a broader range of research questions.

35 Still, our research is qualified by some methodological limitations. We
36 presented all participants with the same combination of target groups. This design
37 cannot determine whether the observed construals generalise beyond the specific
38 combination of stimuli used. Relatedly, we did not control for factors that correlate
39 with the categories under study, but were not made explicit. Class, rather than

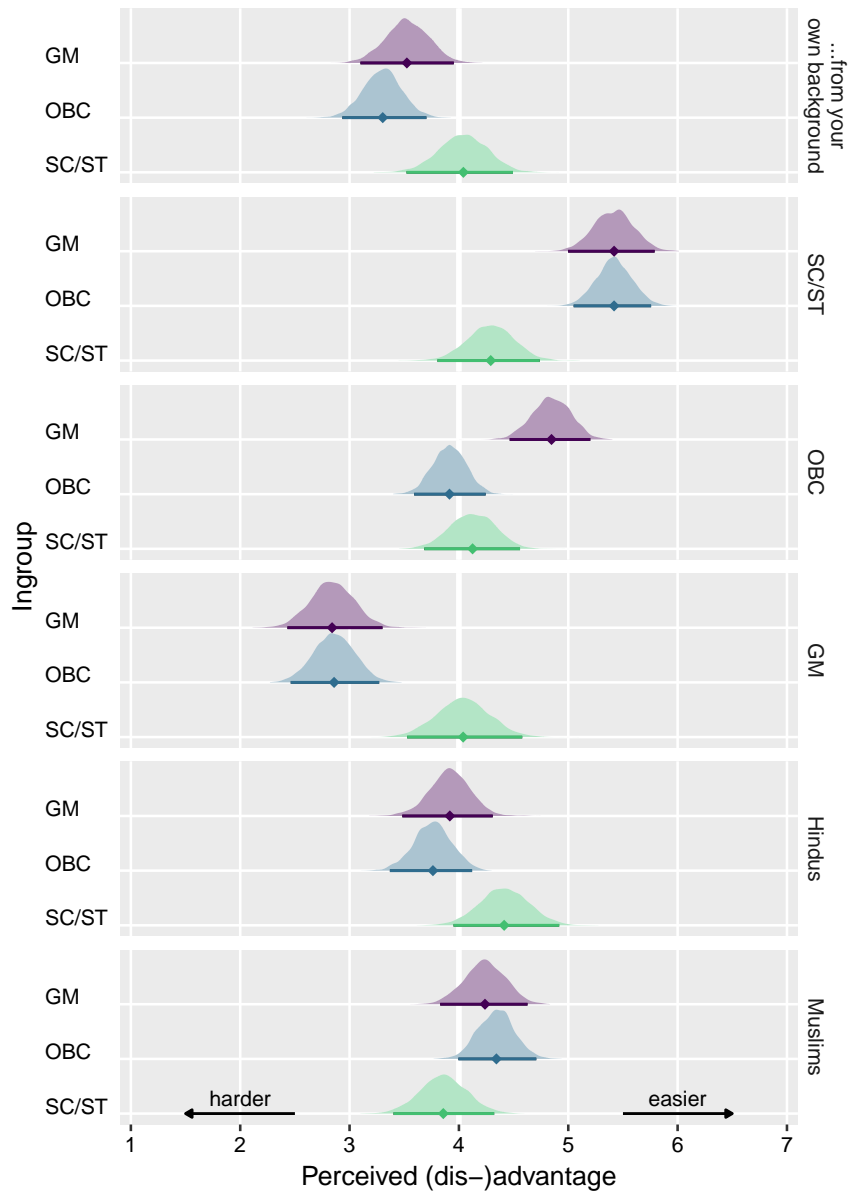


Figure 7. Posterior probabilities of perceived (dis-)advantage ratings for different target groups (right) by participants' caste ingroup (left). Diamonds mark the most plausible estimate of each mean rating; intervals encompass the 97% most plausible estimates. GM = General Merit, OBC = Other Backward Class, SC/ST = Scheduled Caste/Scheduled Tribe.

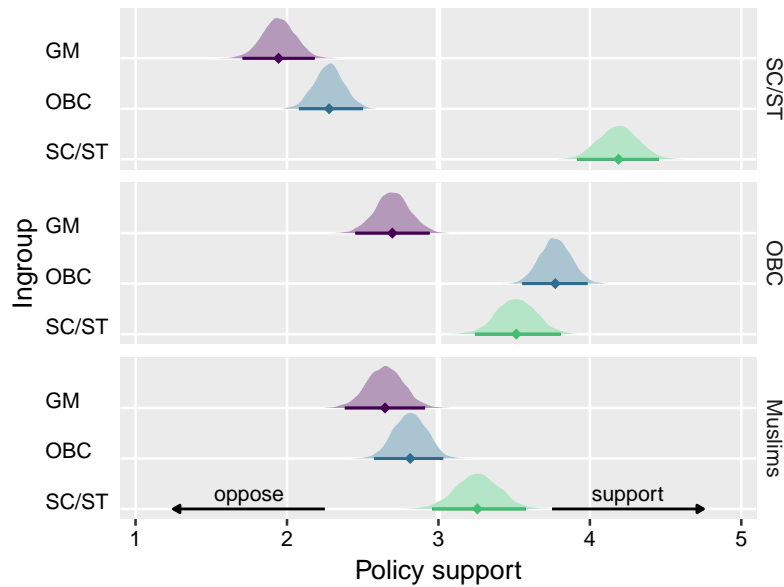


Figure 8. Posterior probabilities of policy support ratings for different target groups (right) by participants' caste ingroup (left). Diamonds mark the most plausible estimate of each mean rating; intervals encompass the 97% most plausible estimates. GM = General Merit, OBC = Other Backward Class, SC/ST = Scheduled Caste/Scheduled Tribe.

1 caste, could explain why some participants excluded targets from disadvantaged
2 outgroups. Further, we measured categorization and attitudes for the same targets.
3 This design cannot rule out that these variables measure the same construct, rather
4 than represent an association across constructs. Intergroup threat, a more distal
5 measure, did not correlate with participants' categorizations.⁶ Future research
6 should address these limitations by varying target categories across participants, by
7 including more target categories, by assessing intergroup bias with proximal and
8 distal measures, and by testing the hypothesised relationships over time.

9 Our research has implications for understanding intergroup relations in
10 unequal societies. Among advantaged groups, our research documented patterns
11 of inclusion and exclusion that map onto persistent social divides. Participants
12 from dominant caste groups tended to exclude subordinate caste groups from the
13 common ingroup. Hindu participants tended to exclude Indian Muslims. Among
14 disadvantaged groups, we found more complex patterns of inclusion and exclusion.
15 Participants from intermediate caste groups (OBC) faced the choice of aligning
16 themselves with dominant caste groups (GM), or forming a coalition with subordin-

⁶An explanation for this finding might be that threat perceptions stem from economic anxieties (e.g., fearing affirmative action as a threat to one's career) and ideological beliefs (e.g., Hindutva), rather than identity processes.

1 ate caste groups (SC/ST). OBC participants tended to include dominant GM targets
2 and exclude subordinate SC/ST targets, thus choosing derogation over coalition
3 (Craig & Richeson, 2012). Similarly, SC/ST participants rejected a solidarity-based
4 identity that includes Indian Muslims.

5 Our findings suggest that cross-group friendship can overcome these divi-
6 sions by fostering social identities that include Indians of all castes and religions.
7 As more inclusive identities were related to less social distance and more warmth
8 toward caste and religious minorities, our research suggests that positive contact
9 could help reduce interpersonal discrimination and violence against these groups.
10 In line with recent research (e.g., Hayward, Tropp, Hornsey & Barlow, 2018), we
11 found that negative contact could exacerbate social divisions by fostering less inclu-
12 sive identities. More broadly, our research speaks to *how* contact reduces prejudice
13 (Pettigrew & Tropp, 2008). Our findings support arguments (Gaertner & Dovi-
14 dio, 2000; Pettigrew, 1998) that contact can reduce prejudice by changing how we
15 understand our social identities.

16 Our research also examined support for social change. Contrary to past
17 research, neither positive nor negative contact (Reimer et al., 2017) were associated
18 with support for social change in advantaged (Dixon et al., 2007) and disadvantaged
19 (Dixon et al., 2012) groups. Similarly, more inclusive identities were not associated
20 with opposition to affirmative action among the disadvantaged (Dovidio et al., 2012).
21 Features of the participants' situation might explain this discrepancy. As university
22 students, participants have personally experienced the impact of reservation policies.
23 For SC/ST and OBC students, reservation policies facilitated admission to state-
24 funded universities. This experience might explain why these students strongly
25 support reservation (at least for their own group). For GM students, reservation
26 policies thwarted admission to state-funded universities. This experience might
27 explain why, in contrast to societal realities, GM students saw themselves at a
28 disadvantage relative to other caste groups (see Norton & Sommers, 2011).

29 To conclude, we found correlational evidence that intergroup contact can
30 change not only how we see others, but also how we see ourselves. That is, intergroup
31 contact can foster more inclusive social identities—and thus improve intergroup
32 relations. Fostering more inclusive identities, however, does not seem to overcome
33 entrenched opposition to (or undermine support for) affirmative action.

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