

A large-scale test of the link between intergroup contact and support for social change

Tabea Hässler^{1*}, Johannes Ullrich¹, Michelle Bernardino², Nurit Shnabel³, Colette Van Laar⁴, Daniel Valdenegro⁵, Simone Sebben¹, Linda R. Tropp⁶, Emilio Paolo Visintin^{7,8}, Roberto González², Ruth K. Ditlmann⁹, Dominic Abrams¹⁰, Hema Preya Selvanathan^{6,11}, Marija Branković¹², Stephen Wright¹³, Jorina von Zimmermann¹⁴, Michael Pasek^{15,16}, Anna Lisa Aydin¹⁷, Iris Žeželj¹⁸, Adrienne Pereira⁷, Nóra Anna Lantos¹⁹, Mario Sainz^{20,21}, Andreas Glenz¹, Hana Oberpfalzerová²², Michal Bilewicz²³, Anna Kende¹⁹, Olga Kuzawinska²³, Sabine Otten²⁴, Edona Maloku²⁵, Masi Noor²⁶, Pelin Gul²⁷, Jessica Pistella²⁸, Roberto Baiocco²⁸, Margareta Jelic²⁹, Evgeny Osin³⁰, Orly Bareket³, Dinka Corkalo Biruski²⁹, Jonathan E. Cook³¹, Maneeza Dawood³², Lisa Droogendyk³³, Angélica Herrera Loyo³⁴, Kaltrina Kelmendi³⁵ and Luiza Mugnol Ugarte³⁶

Guided by the early findings of social scientists, practitioners have long advocated for greater contact between groups to reduce prejudice and increase social cohesion. Recent work, however, suggests that intergroup contact can undermine support for social change towards greater equality, especially among disadvantaged group members. Using a large and heterogeneous dataset (12,997 individuals from 69 countries), we demonstrate that intergroup contact and support for social change towards greater equality are positively associated among members of advantaged groups (ethnic majorities and cis-heterosexuals) but negatively associated among disadvantaged groups (ethnic minorities and sexual and gender minorities). Specification-curve analysis revealed important variation in the size—and at times, direction—of correlations, depending on how contact and support for social change were measured. This allowed us to identify one type of support for change—willingness to work in solidarity— that is positively associated with intergroup contact among both advantaged and disadvantaged group members.

Since initial efforts towards racial desegregation in the United States, social scientists¹, policymakers and civic leaders supporting racial desegregation² have advocated for bringing advantaged and disadvantaged group members together for contact with each other in an effort to foster improved relations and greater intergroup equality. Evidence gathered over several decades shows that intergroup contact can reduce prejudice and increase social

cohesion across group divides^{3,4}. A new line of thinking, however, suggests that contact can have an unintended effect: greater perceptions of intergroup harmony may undermine people's willingness to demand and advocate for greater equality and social justice, especially among members of disadvantaged groups^{5–8}. Given the importance of these divergent trends for public policy, comprehensive and rigorous tests are needed to elucidate when contact may be

¹Department of Psychology, University of Zurich, Zurich, Switzerland. ²School of Psychology, Pontificia Universidad Católica de Chile, Santiago, Chile.

³The School of Psychological Sciences, Tel Aviv University, Tel Aviv, Israel. ⁴Department of Psychology, University of Leuven, Leuven, Belgium.

⁵School of Politics and International Studies, University of Leeds, Leeds, UK. ⁶Department of Psychological and Brain Sciences, University of Massachusetts

Amherst, Amherst, MA, USA. ⁷Department of Humanities, University of Ferrara, Ferrara, Italy. ⁸Institute of Psychology, University of Lausanne, Lausanne,

Switzerland. ⁹Migration, Integration and Transnationalization Department, WZB Berlin Social Science Center, Berlin, Germany. ¹⁰School of Psychology,

University of Kent, Kent, UK. ¹¹School of Psychology, The University of Queensland, Brisbane, Queensland, Australia. ¹²Department of Psychology,

Singidunum University, Belgrade, Serbia. ¹³Department of Psychology, Simon Fraser University, Burnaby, British Columbia, Canada. ¹⁴Experimental

Psychology, University College London, London, UK. ¹⁵Department of Psychology, The New School for Social Research, New York, NY, USA.

¹⁶ARTIS International, Scottsdale, AZ, USA. ¹⁷Department of Psychology, Goethe University, Frankfurt, Germany. ¹⁸Department of Psychology, University

of Belgrade, Belgrade, Serbia. ¹⁹Department of Social Psychology, ELTE Eötvös Loránd University, Budapest, Hungary. ²⁰Department of Psychology,

University of Granada, Granada, Spain. ²¹Department of Psychology, University of Monterrey, Monterrey, Mexico. ²²Institute of Political Studies,

Faculty of Social Sciences, Charles University, Prague, Czech Republic. ²³Faculty of Psychology, University of Warsaw, Warsaw, Poland.

²⁴Department of Psychology, University of Groningen, Groningen, the Netherlands. ²⁵Social Sciences Unit, Rochester Institute of Technology in Kosovo,

Pristina, Kosovo. ²⁶Department of Psychology, Keele University, Newcastle-under-Lyme, UK. ²⁷Department of Psychology, Iowa State University,

Ames, IA, USA. ²⁸Department of Developmental and Social Psychology, Sapienza University of Rome, Rome, Italy. ²⁹Department of Psychology,

University of Zagreb, Zagreb, Croatia. ³⁰Department of Psychology, National Research University Higher School of Economics, Moscow, Russia.

³¹Department of Psychology, The Pennsylvania State University, University Park, PA, USA. ³²Department of Psychology, Columbia University in the City of

New York, New York, NY, USA. ³³School of Social and Life Sciences, Sheridan College, Oakville, Ontario, Canada. ³⁴Department of Informatics, ETH Zurich,

Zurich, Switzerland. ³⁵Department of Psychology, University of Pristina, Pristina, Kosovo. ³⁶Department of Psychology, D'OR Institute for Research and

Education, Rio de Janeiro, Brazil. *e-mail: tabea.haessler@uzh.ch

associated with more or less support for social change. This research provides such a test using a large and heterogeneous dataset.

The relation between intergroup contact and support for social change is more nuanced than is typically recognized. Among members of advantaged groups, such as ethnic majorities and cis-heterosexuals (heterosexuals whose gender identity corresponds to their assigned sex), contact with members of disadvantaged groups, such as ethnic minorities and LGBTIQ+ individuals (individuals identifying as lesbian, gay, bisexual, transgender, intersexual, queer and other sexual or gender minorities) is generally—but not invariably—associated with greater support for intergroup equality and social change^{9–11}. Yet, in some cases, contact may improve advantaged group members' feelings towards disadvantaged groups while having little impact on their support for policies or actions designed to redress group-based inequalities¹².

Among disadvantaged group members, support for social change is generally thought to be motivated by perceived injustice and anger^{13,14}. Yet, it is possible that these feelings can be undercut to the extent that contact fosters perceptions of harmonious intergroup relations. As a result, intergroup contact may curb disadvantaged group members' motivation to fight for greater equality^{6,8,9}. The potential for contact to both promote and undermine support for social change highlights the need for research elucidating when, for whom and in what contexts intergroup contact predicts people's willingness to advocate and take action for social equality.

In trying to answer this question, it is important to recognize further that the forms, content and nature that contact can take are as varied as are efforts to achieve social change. To illustrate, members of advantaged and disadvantaged groups may be friends with each other; alternatively, they may only be acquainted with each other or they simply may know of people from their own group who have contact with people in the other group. Contact might also differ in its valence, ranging from positive to negative in experience. Similarly, action for social change can include a range of activities, such as attending demonstrations, signing petitions, raising peers' awareness of inequality, supporting policies that empower disadvantaged groups or working in solidarity with other groups. To establish both whether and when contact predicts social change, it is necessary to systematically assess the relationship between these different forms of contact and actions for social change.

However, as is typically the case in social science research, the existing studies have used a wide range of conceptualizations and measures of contact and support for change to assess these constructs. Research also makes use of a wide range of methodologies, analytic approaches and samples^{5,9,15}. While these diverse methods may help to triangulate the overall effects of contact, such variation makes it difficult to provide reliable answers to questions that carry critical implications for public policy. To assess the reliability of a particular finding and the characteristics of studies that are associated with stronger, weaker or reversed effects, a study must be repeated across many contexts using comparable measures and analytic procedures. The present research tests for both the reliability of the association between contact and support for social change and its potential variability across the many measures and analytic decisions commonly used.

In this multinational collaboration, all researchers included the same extensive array of commonly used measures of contact and support for social change in assessment (see Table 1). This enabled us to estimate an overall correlation between contact and social change, as well as conditional correlations that arise from different combinations of varied measures assessing contact and social change^{16–18}.

Heeding calls for more collaborative, high-powered, transparent and reproducible research processes¹⁹, we test the association between contact and support for social change using a large and heterogeneous dataset, sampling 12,997 participants from 69 countries

Table 1 | Overview of constructs, measures and example items

Construct	Intergroup contact
Measures	Example items
1. Quantity of contact ^a	How many [outgroup] people do you know, at least as acquaintances?
2. Positive contact	When you interact with [outgroup], to what extent do you experience the following: The contact is friendly?
3. Absence of negative contact	When you interact with [outgroup], to what extent do you experience the following: The contact is unfriendly? (recoded)
4. Number of outgroup friends	How many of your friends are [outgroup]?
5. Frequency of meeting outgroup friends	How often do you meet your [outgroup] friends?
6. Quantity of indirect outgroup friends ^a	As far as you are aware, how many of your [ingroup] friends or close relatives have [outgroup] friends?
7. Positive indirect contact	As far as you are aware, how many of your [ingroup] friends or close relatives have had good experiences with [outgroup] members?
8. Absence of negative indirect contact	As far as you are aware, how many of your [ingroup] friends or close relatives have had bad experiences with [outgroup] members, like tensions or conflict? (recoded)
Construct	Support for social change
Measures	Example items
1. Low-cost collective action	Signing an online or regular (offline) petition to support action against the unequal treatment of [disadvantaged group].
2. High-cost collective action	Attending demonstrations, protests or rallies against the unequal treatment of [disadvantaged group].
3. Support for empowering policies	[Disadvantaged group] should obtain much more power in the decision-centres of our society.
4. Raising ingroup awareness	When I come into contact with ingroup members, we talk about injustices in society regarding [disadvantaged group].
5. Working in solidarity	How willing are you to unite with [outgroup] to work for justice for [disadvantaged group]?

Appropriate names for ingroup, outgroup and disadvantaged group were inserted in each context.
^aQuantity of contact and quantity of indirect outgroup friends were not included among LGBTIQ+ individuals because almost every LGBTIQ+ individual has more cis-heterosexual friends than ten (the highest scale value) or LGBTIQ+ friends who have more than ten cis-heterosexual friends.

and four populations (ethnic majorities, cis-heterosexuals, ethnic minorities and LGBTIQ+ individuals; see Supplementary Tables 1–3 for details). Note that the term 'ethnic minorities' is used as an umbrella term, denoting groups within a country who are structurally disadvantaged due to their racial, ethnic, national, tribal, religious or cultural backgrounds; the specific backgrounds of ethnic minority groups are likely to vary across countries, depending on historical patterns of migration and colonization²⁰. While a large body of intergroup contact research has focused on racial and ethnic relations, contact between members of LGBTIQ+ communities and cis-heterosexuals has been largely neglected⁷. Including samples of cis-heterosexuals and LGBTIQ+ individuals—who often face direct discrimination by cis-heterosexuals²¹ as well as structural

Table 2 | Tests of preregistered hypotheses

Population	Sample size	Number of tests	Number of significant results in predicted direction ^a	<i>P</i> value ^b
Ethnic majorities	3,216	160	158 (154)	<0.001
Cis-heterosexuals	4,898	160	149 (145)	<0.001
Ethnic minorities	1,000	160	64 (52)	<0.001
LGBTIQ+ individuals	3,883	120	86 (84)	<0.001

^aThe number in parentheses indicates the number of significant results after adjusting the *P* values using the Benjamini–Yekutieli procedure so that the false discovery rate is at most 5%; ^b*P* values correspond to the number of shuffled datasets with as many or more significant correlations than in the original dataset, divided by the total number of shuffled datasets (1,000). The smallest possible *P* value with 1,000 reshuffled samples is $P < 1/1,000$.

disadvantages²²—allowed examination of the association between contact and support for social change among disadvantaged and advantaged groups that are consistent across all countries.

Results

The study followed a preregistered analysis plan (20 October 2016) stored along with the questionnaires, data and code at <https://osf.io/m5pb6/> (see also Supplementary Table 13). To estimate the relation between contact and support for social change, we calculated bivariate correlations after removing the sample means from the data via residualization (which is comparable to a multilevel analysis with random intercepts). Although we expected that contact and support for social change would generally be positively related among advantaged groups (ethnic majorities and cis-heterosexuals) and negatively related among disadvantaged groups (ethnic minorities and LGBTIQ+ individuals), variations in these overall associations are of particular interest. We used specification-curve analysis²³ to probe the variation in the direction and magnitude of the association between contact and social change using every combination of available measures (see Supplementary Fig. 3). In addition, we tested the impact of two analytic decisions typically faced by survey researchers: whether to exclude or include statistical outliers and/or participants who failed the attention check. Combining these four model specification factors in a full factorial design (Supplementary Table 7)—5 (support for social change measures) × 8 (contact measures) (6 for LGBTIQ+ individuals for whom we did not assess quantity of contact, see Table 1) × 2 (attention check failures included/excluded) × 2 (outliers included/excluded)—results in 160 model specifications (120 for LGBTIQ+ individuals). Thus, summing across the four populations, there were 600 opportunities to estimate the correlation between contact and support for social change.

First, we conducted an individual significance test of the Pearson correlation for each single model specification. We performed one-tailed tests using an alpha of 0.05 in line with our preregistered directional hypotheses.

Next, to test the overall hypothesis that contact predicts social change positively for advantaged groups and negatively for disadvantaged groups, we conducted a joint significance test²³ (Supplementary Fig. 3) for each of the four populations. Considering results of all 160 (120) model specifications for a given population at once, this joint significance test indicates whether the null hypothesis should be rejected (that is, correlations are not different from zero). Using permutation, we determined the likelihood of obtaining the observed number of significant correlations by chance (if the null hypothesis was true) by shuffling the dataset 1,000 times. We rejected the null hypothesis when this likelihood was less than 0.05. Table 2 shows the key results of the tests of the

preregistered hypotheses. According to the joint significance test, the number of significant correlations in the predicted direction clearly exceeded the number expected by chance for all four populations. After adjusting the *P* values to cap the probability of false discoveries at 5% (ref. ²⁴), the number of significant correlations was only slightly smaller (compare numbers in parentheses in Table 2; see also Supplementary Tables 9 and 10). Thus, we obtained consistent support for the preregistered hypotheses that the correlation between contact and support for social change is positive among ethnic majority group members and cis-heterosexuals and negative among ethnic minority group members and LGBTIQ+ individuals.

To examine in more detail how results varied depending on model specification, we visually inspected the specification curves. Figure 1a shows all results for ethnic majorities. The top of the figure shows the sorted correlations between contact and support for social change, along with confidence intervals for the population value. The bottom of Fig. 1a indicates the model specification underlying each correlation. For example, the model specification that produced the largest positive correlation between contact and social change among ethnic majorities (far right of Fig. 1a) uses ‘working in solidarity’ as a measure of support for social change in combination with the measure ‘positive contact’, excluding participants who failed the attention check and statistical outliers. Figure 1b shows all results for cis-heterosexuals. Visual examination of Fig. 1a,b reveals that almost all correlations between contact and support for social change were positive among advantaged groups. Moreover, correlations varied considerably depending on model specification, ranging from $r = 0.01$ to $r = 0.46$ (mean $r = 0.20$) among ethnic majorities and from $r = -0.11$ to $r = 0.43$ (mean $r = 0.23$) among cis-heterosexuals.

Meta-regression (Supplementary Table 8) revealed which measures and analytic decisions produced larger or smaller correlations. The coefficients shown in parentheses in Fig. 1a,b represent the predicted change in correlations (relative to the grand mean of correlations) resulting from using one particular measure or analytic decision (see Supplementary Table 8 for individual significance tests).

The effects of using any particular measure of support for social change were similar across both advantaged groups (see cross-validation analyses in Supplementary Table 11).

Many of the largest positive correlations between intergroup contact and support for social change include the ‘working in solidarity’ measure. This means that the predicted positive correlation between contact and support for social change was particularly clear with regard to advantaged group members’ willingness to work in solidarity with members of disadvantaged groups. In contrast, model specifications including ‘raising ingroup awareness’ consistently produced smaller positive correlations. Among measures of contact, ‘positive contact’ produced larger positive correlations among both ethnic majorities and cis-heterosexuals, while patterns of effects for other contact measures were more varied across ethnic majorities and cis-heterosexuals. Finally, both analytic decisions—to include or exclude attention check failures or statistical outliers—had negligible effects on the size of the correlations.

In contrast to the consistent positive correlations observed among advantaged groups, visual examination of Fig. 2a,b reveals that correlation coefficients ranged from $r = -0.28$ to $r = 0.21$ (mean $r = -0.04$) among ethnic minorities and from $r = -0.37$ to $r = 0.15$ (mean $r = -0.09$) among LGBTIQ+ individuals.

Despite overall support for the predicted negative relation, the specific measure of support for social change used in model specification determined the size and direction of the correlation for both ethnic minorities and LGBTIQ+ individuals. Larger negative correlations between contact and support for social change resulted from model specifications including ‘raising ingroup awareness’ or ‘high-cost collective action’. By contrast, positive

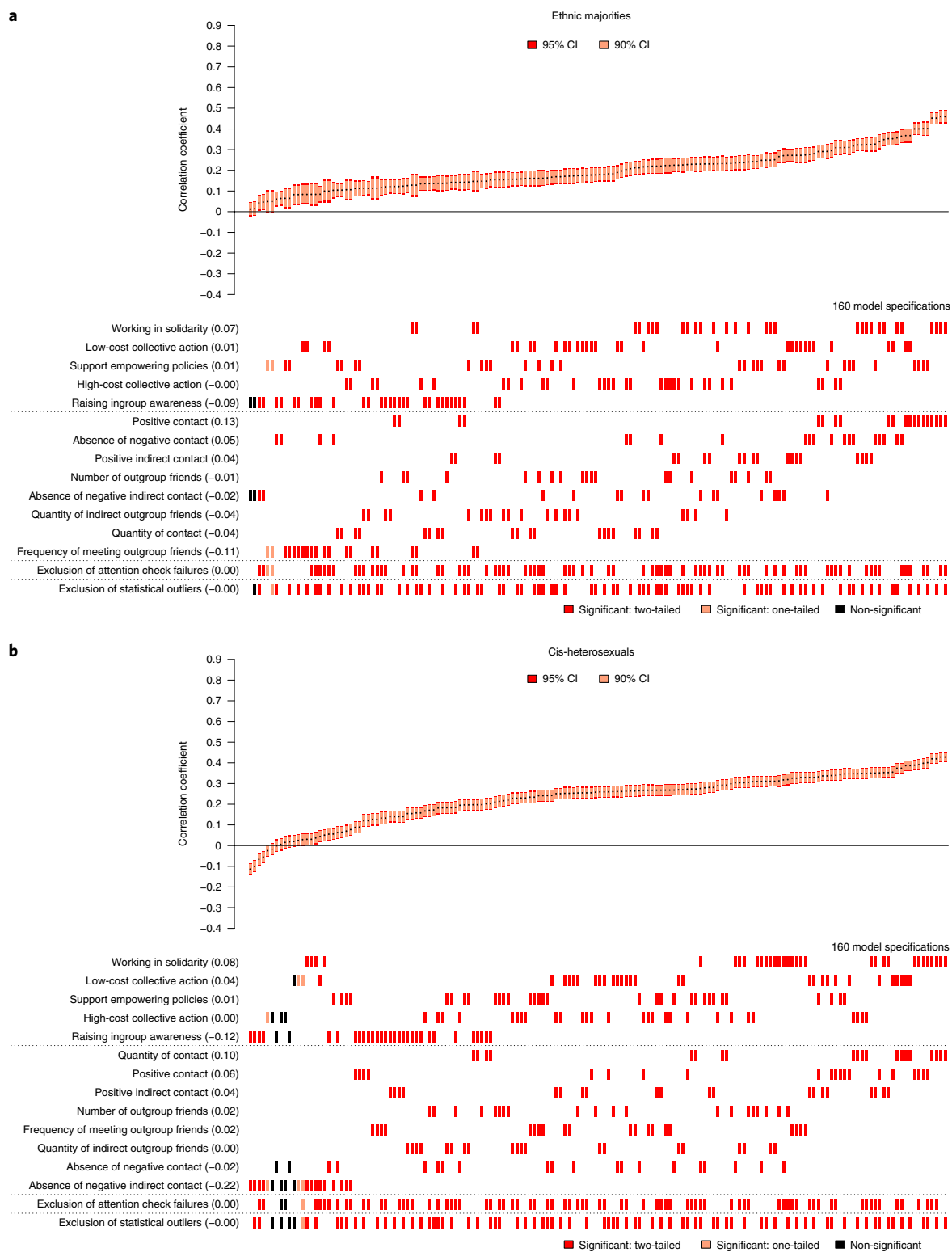


Fig. 1 | Results of the specification-curve analysis among advantaged groups. a, Results of the specification-curve analysis showing the correlation between intergroup contact and support for social change among ethnic majorities ($n = 3,216$). **b**, Results of the specification-curve analysis showing the correlation between intergroup contact and support for social change among cis-heterosexuals ($n = 4,898$). The top parts of **a** and **b** show sorted correlations and 90% (95%) confidence intervals (CI) in light (dark) red. The bottom parts show the combinations of measures and analytic decisions underlying each correlation. The numbers in parentheses on the left-hand side indicate the change in size of the correlations (relative to the grand mean of correlations) resulting from using this particular measure or analytic decision.

correlations were almost exclusively produced by model specifications including ‘working in solidarity’ as the measure of support for social change.

With regard to the contact measures, the most striking results were the strong negative correlations revealed by measures of ‘absence of negative contact’. That is, members of disadvantaged groups who

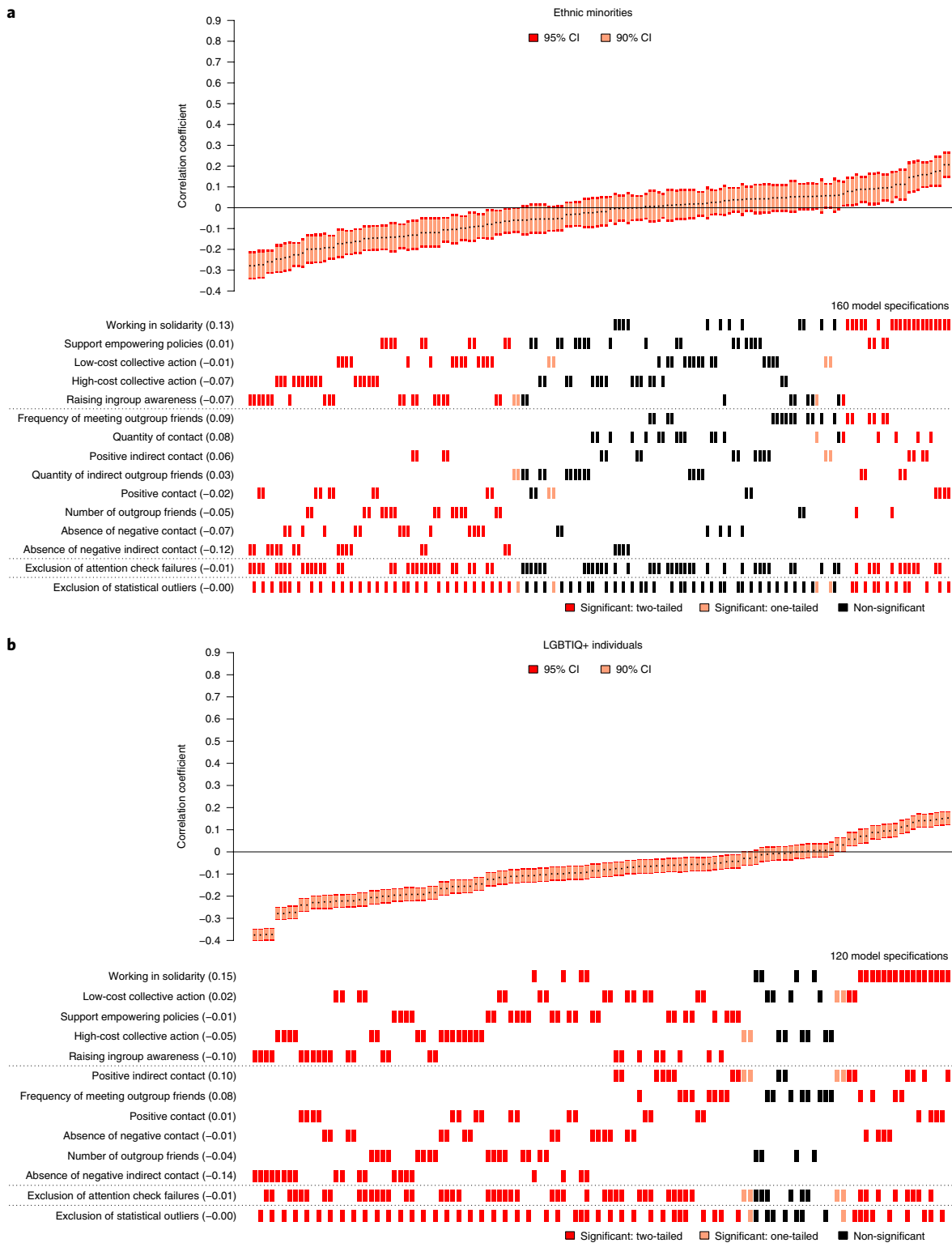


Fig. 2 | Results of the specification-curve analysis among disadvantaged groups. a, Results of the specification-curve analysis showing the correlation between intergroup contact and support for social change among ethnic minorities ($n=1,000$). **b**, Results of the specification-curve analysis showing the correlation between intergroup contact and support for social change among LGBTIQ+ individuals ($n=3,883$). The top parts of **a** and **b** show sorted correlations and 90% (95%) confidence intervals in light (dark) red. The bottom parts show the combinations of measures and analytic decisions underlying each correlation. The numbers in parentheses on the left-hand side indicate the change in size of the correlations (relative to the grand mean of correlations) resulting from using this particular measure or analytic decision.

reported fewer negative contact experiences (for example, direct or indirect experiences of derogation and discrimination) reported less support for social change. Also, model specifications including 'number

of outgroup friends' as the contact measure produced fairly consistent and significant negative correlations with measures of support for social change. Interestingly, 'positive contact' was positively related

to ‘working in solidarity’ but negatively related to other measures of support for social change. Again, the exclusion of attention check failures and statistical outliers (that is, analytic decisions) had negligible effects on the size of the correlations. Cross-validation analyses (Supplementary Table 11) confirmed that there were highly similar patterns of results among ethnic minorities and LGBTIQ+ individuals, indicating robustness and generalizability.

Discussion

In summary, the confirmatory analyses support the preregistered hypotheses that intergroup contact and support for social change towards greater equality are positively associated among members of advantaged groups (ethnic majorities and cis-heterosexuals) but negatively associated among disadvantaged groups (ethnic minorities and LGBTIQ+ individuals). However, the multifaceted analyses presented here, involving 600 tests of the association between contact and support for social change, put into perspective potential concerns associated with intergroup contact.

Overall, the more ethnic minorities and LGBTIQ+ individuals experience positive and intimate intergroup contact (for example, friendships) or lack negative intergroup contact experiences, the less inclined they are to support efforts for social change. These findings are consistent with research showing that contact between members of different groups—which is experienced as positive in valence yet does not address structural inequalities—can decrease anger²⁵, distract attention away from group-based inequality^{6,7} and decrease identification with the disadvantaged ingroup^{8,25}. All these factors can reduce support for social change among members of disadvantaged groups^{7,8,14,26,27}.

However, among both advantaged and disadvantaged groups, contact was positively associated with one particular form of support for social change: working in solidarity toward social change. The more contact that occurs between advantaged and disadvantaged group members and the more positively this contact is experienced, the more willing members of both groups are to collaborate in efforts to achieve greater social equality. This finding is unique and the ‘working in solidarity’ measure captures a pathway to social change that is increasingly observed (for example, LGBTIQ+/straight alliances)²⁸ but has been largely overlooked in prior research on the relation between contact and social change. Moreover, the ‘working in solidarity’ measure taps both support for social change and positive orientations towards collaborating with outgroup members to enact such change. Given other findings we report in this paper, it is possible that these two elements may be seen or valued differently by members of advantaged and disadvantaged groups. Among advantaged groups, willingness to work in solidarity might reflect a recognition that social change is the responsibility of many in the larger society as a whole, rather than a burden to be carried solely by members of disadvantaged groups^{29,30}. At the same time, it is not entirely clear the extent to which members of disadvantaged groups who endorse this measure actually desire social change on top of achieving the positive intergroup relations implied by the solidarity concept. Such questions offer intriguing directions for future research.

Nonetheless, the present results suggest some inherent difficulties in leveraging solidarity for social change among advantaged and disadvantaged groups. The positive association between contact and working in solidarity coexists with the negative association between contact and engagement in high-cost collective action and raising ingroup awareness among members of disadvantaged groups. If, through contact with the advantaged, disadvantaged group members become less inclined to raise awareness about inequalities or engage in public protest and/or other more direct efforts to produce social change, solidarity of advantaged group members would lack meaningful routes for deployment.

Thus, our results pose two major questions for future research. How can positive and intimate contact between groups occur without

reducing disadvantaged group members’ support for social change? And how can support for social change be bolstered among disadvantaged group members without requiring negative contact experiences? Possible answers to both questions involve having advantaged group members openly acknowledge structural inequalities and express support for efforts to reduce these inequalities during contact with disadvantaged groups^{31,32}. For efforts to promote and support social change to succeed, it seems essential that contact between advantaged and disadvantaged groups is not simply experienced as pleasant but that it prepares members of both groups to address structural inequalities.

Although this research advances our understanding of the relation between intergroup contact and social change, a limitation is that our design cannot support causal conclusions. Future research would benefit from longitudinal designs to this end¹⁰. Also, in the interest of a succinct presentation, we set aside potentially interesting variance across contexts (for example, due to institutional policies³³). Nevertheless, a clear strength of the present research is the robust evidence it provides that members of advantaged groups with more frequent, positive and intimate forms of intergroup contact reported greater support for social change, while such forms of contact were associated with less support for social change among members of disadvantaged groups. There is, however, an important exception: among both advantaged and disadvantaged groups, contact predicted greater willingness to work in solidarity to achieve greater social equality. This finding offers a new, understudied route to reach social cohesion and social change, such that social harmony would not come at the expense of social justice.

Methods

We planned to collect 64 samples with at least 100 participants each (see preregistration). Due to widespread dissemination of the link to the survey, individuals from additional countries participated in the survey (see also Supplementary Table 13). Therefore, this project sampled a total of 12,997 participants from four populations (ethnic majorities, cis-heterosexuals, ethnic minorities and LGBTIQ+ individuals). We administered surveys in 69 countries (including several non-Western, educated, industrialized, rich or democratic countries)³⁴. Our total sample includes 3,216 ethnic majority group members (1,040 male, 2,162 female, 14 other, $M_{age} = 28.08$, $s.d._{age} = 11.28$), 4,898 cis-heterosexuals (1,575 male, 3,323 female, $M_{age} = 29.47$, $s.d._{age} = 12.84$), 1,000 ethnic minority group members (412 male, 585 female, one other, two unavailable, $M_{age} = 29.15$, $s.d._{age} = 11.13$) and 3,883 LGBTIQ+ individuals (1,445 male, 2,061 female, 377 other, $M_{age} = 30.42$, $s.d._{age} = 12.53$) (see Supplementary Fig. 1 for inclusion criteria and Supplementary Tables 1–3 for more details).

Ethical review. According to the checklist of the Ethics Committee of the Faculty of Arts and Social Sciences at the University of Zurich, this research fulfils the guidelines of the American Psychological Association and the Swiss Psychological Society, meaning that no formal approval was necessary. Additionally, several researchers or research teams have obtained approval from their local ethics committee if their institutions required them to do so (Eötvös Loránd University, Budapest, 236/2016; University of Massachusetts Amherst, 2015–2460; University of Leuven, G-2016 02 488; Pontificia Universidad Católica de Chile, 160323010; University of Kent, 20163785; Tel Aviv University; Simon Fraser University, 20160473).

Analytic procedure. First, we regressed the original items on the subsample identifier variable to obtain residualized item scores. This was done to ensure that we would test the association of contact and support for social change at the level of individuals rather than at the level of subsamples or countries. Next, we conducted confirmatory factor analyses to select the final set of items and scales (all steps of the confirmatory factor analyses can be reproduced with the file `Scale_Construction_CFA.R`; see “Code availability” section). Confirmatory factor analyses justified using the same eight contact scales and five support for social change scales for all four populations except for contact reported by LGBTIQ+ individuals where we used only six contact scales (Table 1, see Supplementary Table 4 for a detailed overview and Supplementary Tables 5 and 6 for descriptive statistics). Finally, to estimate the bivariate correlations between intergroup contact and support for social change conditional on methodological choices, we conducted specification-curve analyses following Simonsohn and colleagues’ procedure²². Supplementary Fig. 2 gives an overview of the procedure. Please note that we also ran additional specification-curve analyses controlling for age, gender and socioeconomic status; the conclusions remain unchanged when these controls are included (see Supplementary Table 12 and Supplementary Figs. 4 and 5). Please note also that our conclusions do not depend on using Pearson correlations. Alternative analyses using Spearman correlations, which do not rely on the assumption of normality, produced highly similar results.

All steps of the specification-curve analysis can be reproduced with the Master_Script.R and the underlying Functions.R script.

Reporting Summary. Further information on research design is available in the Nature Research Reporting Summary linked to this article.

Data availability

Data underlying the analyses reported in the paper have been deposited on the Open Science Framework under the following link: <https://osf.io/wgdhb/>.

Code availability

R code and scripts to reproduce the analyses presented in the manuscript can be found on the Open Science Framework at: <https://osf.io/8rcz9/>.

Received: 25 March 2019; Accepted: 13 December 2019;

Published online: 27 January 2020

References

- Allport, G. W. *The Nature of Prejudice* (Addison-Wesley, 1954).
- Schofield, J. W. School desegregation and intergroup relations: a review of the literature. *Rev. Educ. Res.* **17**, 335–409 (1991).
- Lemmer, G. & Wagner, U. Can we really reduce ethnic prejudice outside the lab? A meta-analysis of direct and indirect contact interventions. *Eur. J. Soc. Psychol.* **4**, 152–168 (2015).
- Pettigrew, T. F. & Tropp, L. R. A meta-analytic test of intergroup contact theory. *J. Pers. Soc. Psychol.* **90**, 751–783 (2006).
- Çakal, H., Hewstone, M., Schwär, G. & Heath, A. An investigation of the social identity model of collective action and the 'sedative' effect of intergroup contact among black and white students in South Africa. *Br. J. Soc. Psychol.* **50**, 606–627 (2011).
- Dixon, J., Durrheim, K. & Tredoux, C. Intergroup contact and attitudes toward the principle and practice of racial equality. *Psychol. Sci.* **18**, 867–872 (2007).
- Saguy, T., Tausch, N., Dovidio, J. F. & Pratto, F. The irony of harmony: intergroup contact can produce false expectations for equality. *Psychol. Sci.* **20**, 114–121 (2009).
- Wright, S. C. & Lubensky, M. E. in *Intergroup Misunderstandings: Impact of Divergent Social Realities* (eds Demoulin, S. et al.) 291–310 (Psychology Press, 2009).
- Kamberi, E., Martinovic, B. & Verkuyten, M. Intergroup contact and minority group empowerment: the perspective of Roma and non-Roma adolescents in Macedonia. *J. Community Appl. Soc. Psychol.* **27**, 424–434 (2017).
- Reimer, N. K. et al. Intergroup contact and social change. *Pers. Soc. Psychol. Bull.* **4**, 121–136 (2017).
- Tropp, L. R. & Barlow, F. K. Making advantaged racial groups care about racial inequality: intergroup contact as a route to psychological investment. *Curr. Dir. Psychol. Sci.* **27**, 194–199 (2018).
- Jackman, M. R. & Crane, M. 'Some of my best friends are Black': interracial friendship and Whites' racial attitudes. *Public Opin. Q.* **50**, 459–486 (1986).
- Van Stekelenburg, J. & Klandermans, B. The social psychology of protest. *Curr. Sociol.* **61**, 886–905 (2013).
- Van Zomeren, M., Postmes, T. & Spears, R. Toward an integrative social identity model of collective action: a quantitative research synthesis of three socio-psychological perspectives. *Psychol. Bull.* **134**, 504–535 (2008).
- Droogendyk, L., Louis, W. R. & Wright, S. C. Renewed promise for positive cross-group contact: the role of supportive contact in empowering collective action. *Can. J. Behav. Sci. Rev. Can. Sci. Comput.* **48**, 317–327 (2016).
- Patel, C. J., Burford, B. & Ioannidis, J. P. A. Assessment of vibration of effects due to model specification can demonstrate the instability of observational associations. *J. Clin. Epidemiol.* **68**, 1046–1058 (2015).
- Rubin, D. Meta-analysis: literature synthesis or effect-size surface estimation? *J. Educ. Stat.* **17**, 363–374 (1992).
- Stegen, S., Tuerlinckx, F., Gelman, A. & Vanpaemel, W. Increasing transparency through a multiverse analysis. *Perspect. Psychol. Sci.* **11**, 702–712 (2016).
- Nosek, B. A. et al. Promoting an open research culture. *Science* **348**, 1422–1425 (2015).
- Alba, R., & Foner, N. *Strangers No More: Immigration and the Challenges of Integration in North America and Western Europe* (Princeton Univ. Press, 2015).
- Herek, G. M. & McLemore, K. A. Sexual prejudice. *Annu. Rev. Psychol.* **64**, 309–333 (2013).
- Discrimination and Violence Against Individuals Based On Their Sexual Orientation And Gender Identity A/HRC/29/23* (UN Human Rights Council, 2015); <http://www.refworld.org/docid/5571577c4.html>
- Simonsohn, U., Simmons, J. P. & Nelson, L. D. Specification curve: descriptive and inferential statistics on all reasonable specifications. Preprint at SSRN http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2694998 (2015).
- Benjamini, Y. & Yekutieli, D. The control of the false discovery rate in multiple testing under dependency. *Ann. Stat.* **29**, 1165–1188 (2001).

- Tausch, N., Saguy, T. & Bryson, J. How does intergroup contact affect social change? Its impact on collective action and individual mobility intentions among members of a disadvantaged group. *J. Soc. Issues* **71**, 536–553 (2015).
- Ufkes, E. G., Dovidio, J. F. & Tel, G. Identity and collective action among European Kurds. *Br. J. Soc. Psychol.* **54**, 176–186 (2015).
- Saguy, T. Downside of intergroup harmony?: When reconciliation might backfire and what to do. *Policy Insights Behav. Brain Sci.* **5**, 75–81 (2018).
- Fingerhut, A. W. Straight allies: what predicts heterosexuals' alliance with the LGBT community? *1. J. Appl. Soc. Psychol.* **41**, 2230–2248 (2011).
- Subašić, E., Reynolds, K. J. & Turner, J. C. The political solidarity model of social change: dynamics of self-categorization in intergroup power relations. *Pers. Soc. Psychol. Rev.* **12**, 330–352 (2008).
- Pettigrew, T. F. & Hewstone, M. The single factor fallacy: implications of missing critical variables from an analysis of intergroup contact theory. *Soc. Issues Policy Rev.* **11**, 8–37 (2017).
- Becker, J. C., Wright, S. C., Lubensky, M. E. & Zhou, S. Friend or ally: whether cross-group contact undermines collective action depends what advantaged group members say (or don't say). *Pers. Soc. Psychol. Bull.* **39**, 442–455 (2013).
- Droogendyk, L., Wright, S. C., Lubensky, M. & Louis, W. R. Acting in solidarity: cross-group contact between disadvantaged group members and advantaged group allies. *J. Soc. Issues* **72**, 315–334 (2016).
- Tankard, M. E. & Paluck, E. L. The effect of a Supreme Court decision regarding gay marriage on social norms and personal attitudes. *Psychol. Sci.* **28**, 1334–1344 (2017).
- Henrich, J., Heine, S. J. & Norenzayan, A. The weirdest people in the world? *Behav. Brain Sci.* **33**, 61–135 (2010).

Acknowledgements

This project received direct financial support through the Swiss Bilateral Programme of the State Secretariat for Education, Research and Innovation awarded to J.U., R.G., T.H., M.Bernadino and D.V. The Chilean research team was supported by Fondecyt (grant no. 1161371), the Center for Social Conflict and Cohesion Studies (grant no. FONDAP 15130009) and the Center for Intercultural and Indigenous Research (grant no. FONDAP 15110006) awarded to R.G. The Dutch part of this research was funded by FWO Odysseus grant no. G.O.E66.14N awarded to C.L. The English part of this research was funded by the ESRC commissioning grant no. 403006662 awarded to D.A. and G.T.S.W. was funded by a grant from the Social Science & Humanities Research Council of Canada. I.Ž. was funded by the Serbian Ministry of Education, Science and Technological Development (grant no. 179018). The Polish part of this research was funded by the Foundation for Polish Science (TEAM), co-financed by the EU ERDF ('Language as a Cure' Project) awarded to M.Bilewicz and O.K.E.O. was supported by the HSE University Basic Research Programme and the Russian Academic Excellence Project '5–100'. The funders had no role in study design, data collection and analysis, decision to publish or preparation of the manuscript. We thank L. Liekefett, D. Kokdemir, D. Dreica, A. Figueiredo, N. Mühlemann and Y. Koc for their additional help with the translation and/or data collection. We also thank J. Ginges and L. Eisner for their insightful comments. Finally, we thank the SoSci Panel, PlanetRomeo, East meets West, Psychologie Heute and all other LGBTIQ+ organizations for distributing our survey.

Author contributions

T.H. and J.U. conceived the primary idea. T.H., J.U., M.Bernardino, D.V. and R.G. conceptualized the project and acquired the seed money. T.H., J.U., M.Bernardino, D.V., N.S., C.V., S.S., E.P.V., L.R.T., R.G., R.D., D.A., H.S., J.Z. and A.A. were involved in research design/instrument construction. T.H., J.U., M.Bernardino and D.V. wrote the draft of preregistration. T.H. and J.U. coordinated the project. T.H., J.U., M.Bernardino, N.S., C.L., D.V., S.S., L.R.T., E.P.V., R.G., R.K.D., D.A., H.P.S., M.Brancovic, S.W., J.Z., M.P., A.L.A., I.Z., A.P., N.A.L., M.S., A.G., H.O., M.Bilewicz, A.K., O.K., S.O., E.M., M.N., P.G., J.P., R.B., M.J., E.O., O.B., D.C.B., J.C., M.D., L.D., A.H.L., K.K. and L.M.U. were involved in data collection. T.H. and S.S. undertook data preparation. A.G., J.U., T.H. and S.S. conducted data analysis. T.H. and J.U., supported by S.S., prepared the draft manuscript. C.V., N.S., L.R.T., E.P.V., M.Bernadino, D.V., R.D., S.W., H.S., M.P., M.Brancovic, R.G. and D.A., supported by A.K., E.M., J.Z., I.Z., N.L., M.N., J.P., M.S., A.A., M.Bilewicz, R.B., P.G., S.O., O.B. and E.O., revised the manuscript. L.R.T. did the final editing.

Competing interests

The authors declare no competing interests.

Additional information

Supplementary information is available for this paper at <https://doi.org/10.1038/s41562-019-0815-z>.

Correspondence and requests for materials should be addressed to T.H.

Peer review information Primary Handling Editor: Stavroula Kousta.

Reprints and permissions information is available at www.nature.com/reprints.

Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

© The Author(s), under exclusive licence to Springer Nature Limited 2020

Reporting Summary

Nature Research wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Research policies, see [Authors & Referees](#) and the [Editorial Policy Checklist](#).

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a Confirmed

- | | | |
|-------------------------------------|-------------------------------------|--|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | The exact sample size (n) for each experimental group/condition, given as a discrete number and unit of measurement |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | The statistical test(s) used AND whether they are one- or two-sided
<i>Only common tests should be described solely by name; describe more complex techniques in the Methods section.</i> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | A description of all covariates tested |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals) |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | For null hypothesis testing, the test statistic (e.g. F , t , r) with confidence intervals, effect sizes, degrees of freedom and P value noted
<i>Give P values as exact values whenever suitable.</i> |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Estimates of effect sizes (e.g. Cohen's d , Pearson's r), indicating how they were calculated |

Our web collection on [statistics for biologists](#) contains articles on many of the points above.

Software and code

Policy information about [availability of computer code](#)

Data collection

We recruited most participants through online platforms (Unipark and Qualtrics). Some participants completed paper/pencil surveys.

Data analysis

We used R as our statistical analysis software. Our code can be found on the open science framework as described in the paper.

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors/reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Research [guidelines for submitting code & software](#) for further information.

Data

Policy information about [availability of data](#)

All manuscripts must include a [data availability statement](#). This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A list of figures that have associated raw data
- A description of any restrictions on data availability

The data that support the findings of this study are available at the open science framework as described in the paper. Since publishing the raw data may pose a threat to the confidentiality and safety of the participants, we published the residualized data only. That is, each variable containing participants' responses was subjected to a one-way ANOVA using the subsample identifier variable as factor. The residuals of this ANOVA were used for all analyses reported in the paper.

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

Life sciences Behavioural & social sciences Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see nature.com/documents/nr-reporting-summary-flat.pdf

Behavioural & social sciences study design

All studies must disclose on these points even when the disclosure is negative.

Study description	We collected and used quantitative data from multiple countries.
Research sample	We initiated the Zurich Intergroup Contact Project to heed calls for more comprehensive studies on intergroup contact and support for social change (e.g., Dovidio, Love, Schellhaas, Hewstone, 2017; Pettigrew & Hewstone, 2017). A large number of international research teams worked together to generate this large and heterogenous dataset. Our convenience sample includes 12,997 participants from 69 countries. The sample is made up of 3,216 ethnic majority group members, 4,898 cis-heterosexuals, 1,000 ethnic minority group members, and 3,883 LGBTIQ+ individuals (for more details see Table S1 for the ethnic context and Table S2 for the LGBTIQ+ context).
Sampling strategy	We recruited participants through online platforms (e.g., social networking sites, snowball sampling, and contacting relevant organizations) to voluntarily complete our survey online. Further, we recruited some additional participants on university campuses and on the street to voluntarily complete paper/pencil surveys. As defined in our preregistration plan, we planned to collect 64 sub-samples with each at least 100 usable participants. Given this lower estimate of the maximal sample size (i.e., 100 times 64), we expected reasonable statistical power even for small effect sizes (for a rough approximation, the power to detect a correlation of $r = .05$ with a 5% alpha level is 99%). Our survey got more widely distributed than expected and we reached additional participants from population which are normally underrepresented. Since the hypotheses reported in this publication are tested at the level of individuals (using residualized variables) instead of samples, we were able to also include those underrepresented participants from smaller sub-samples.
Data collection	Participants were invited to participate voluntarily in our online or paper/pencil survey. Participants provided informed consent before filling out the questionnaire. We used parallel survey items for each of the four populations. All questionnaires contained additional measures not reported in the main article and this supplementary material (the full questionnaires can be found here: https://osf.io/uv7aq/). The constructs of interest were intergroup contact and support for social change.
Timing	We collected the data between June 2016 and June 2017.
Data exclusions	For details on data exclusion see Figure S1.
Non-participation	23,304 participants clicked on the first page (including possible multiple opening of the first page and test participations). Of those, 18,040 participants (77%) filled out their country of residency as well as their age and were included in the initial dataset. Among all participants from this initial dataset, 12,997 (72%) passed our three inclusion criteria (see Figure S1) and were included for the final analysis.
Randomization	N/A

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

n/a	Involvement	Included in the study
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Antibodies
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Eukaryotic cell lines
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Palaeontology
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Animals and other organisms
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Human research participants
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Clinical data

Methods

n/a	Involvement	Included in the study
<input checked="" type="checkbox"/>	<input type="checkbox"/>	ChIP-seq
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Flow cytometry
<input checked="" type="checkbox"/>	<input type="checkbox"/>	MRI-based neuroimaging

Human research participants

Policy information about [studies involving human research participants](#)

Population characteristics

See above and Tables S1-S3.

Recruitment

We recruited a large and heterogenous set of convenience samples (see above).

Ethics oversight

We have complied with all relevant ethical regulations.

Note that full information on the approval of the study protocol must also be provided in the manuscript.