Replicating and Extending Sengupta et al. (in press):

Contact Predicts No Within-Person Longitudinal Outgroup-Bias Change

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Abstract

Intergroup contact has long been touted as a premier means to reduce prejudice and forge

positive bonds with outgroups. Given its origins in psychological research, it is perhaps of

little surprise that contact is expected to induce change within people over time. Yet using

random-intercepts crossed-lagged modelling that parses within-person from between-person

effects, Sengupta and colleagues (in press) recently found no evidence of within-person

change, only unexplained between-person effects, regarding contact's effects on outgroup

solidarity in New Zealand. We conceptually replicated their study, focusing on modern

racism and an affect thermometer as the outcomes, in a 3-wave study of White Brits (N_{T1} =

946, N_{T2} = 667, N_{T3} = 591) and their attitudes toward foreigners. We replicated the general

pattern by Sengupta and colleagues, confirming between-person effects without within-

person effects, suggestive of third-variable explanations. As a novel finding, we discover that

differences in social dominance orientation (SDO) and right-wing authoritarianism (RWA)

can account for the observed between-person effects. Problematically for contact theory,

contact effects, at least those relying on self-reported accounts, increasingly appear to reflect

differences between people (person-factors) rather than being context-driven (situation-

factors) – such that those lower (*vs.* higher) in SDO and RWA are more favorable toward

outgroups, rather than intergroup contact bringing about positive outcomes itself.

Implications for theory development and intervention are discussed.

    Keywords: contact, longitudinal, within-person change, prejudice.

Public Significance Statement

Bringing different groups together holds promise in reducing outgroup biases. Yet here we

replicate Sengupta and colleagues (in press), finding no evidence that contact induces within-

person changes. Rather, low-bias expression seems characteristic of pre-existing between-

person differences in social dominance orientation and authoritarianism.

Replicating and Extending Sengupta et al. (in press):

Contact Predicts No Within-Person Longitudinal Outgroup-Bias Change

The contact hypothesis (or theory) is a deceptively simple idea with tremendous appeal to psychologists and policy-makers alike: increasing contact between representatives of their respective groups decreases prejudice toward that outgroup as a whole (Hodson & Hewstone, 2013; Pettigrew & Tropp, 2011; Vezzali & Stathi, 2017). Several meta-analyses support the basic premise (e.g., Beelmann & Heinemann, 2014; Pettigrew & Tropp, 2006), even in non-idealized, high-conflict zones (Lemmer & Wagner, 2015) or when group threat and discrimination are salient contextual features (Van Assche et al., in press). Impressively, contact has been shown to "work" on prejudice even among highly prejudiced people otherwise not prone to engaging in contact (Dhont & Van Hiel, 2009; Hodson, 2008, 2011; Hodson et al., 2009, 2013; Kteily et al., 2019; for recent review see Turner et al., 2020). More recently, the effects of contact have been expanded to consider its impact on other related intergroup outcomes, such as collective action (e.g., Górska & Tausch, in press), outgroup solidarity (e.g., Sengupta et al., in press), and social policy (Dixon et al., 2010), and also to non-intergroup outcomes such as cognitive performance benefits (Hodson et al., 2018).

Implicit (and at times explicit) within the discussion of the contact hypothesis (Allport, 1954) or contact theory (Hewstone & Swart, 2011) is the notion that *contact induces change within people that subsequently reduces their expressed prejudice* or related intergroup outcomes. Indeed, this level of analysis is presumably what psychologists bring to the table, relative to sociologists or political scientists. Specifically, contact theoretically engages a *process* of prejudice reduction, that is, change within people over time. Indeed, if contact researchers, ourselves included, did not believe or expect contact to induce within-person change, it is unclear the value in studying contact or promoting contact as an

intervention. This notion of personal change is thus central (if not foundational) to how contemporary researchers approach and interpret intergroup contact.

How Contact Researchers Traditionally or Commonly Study Contact Effects

The vast bulk of the evidence for contact theory is self-report and cross-sectional in nature (Christ & Wagner, 2013; Pettigrew & Tropp, 2006), meaning that participants think back to past contact experiences and rate their current attitudes (or relevant intergroup ratings). Preference for this method is understandable given the difficulty measuring repeated contact over time and in making arrangements for group representatives to interact, not to mention the potential of backfiring and making the intergroup context worse. But such data cannot address causality. Experiments are less frequently conducted but offer important insights into causality, confirming that contact (actual and mentally simulated) reduces prejudice (Miles & Crisp, 2014; Paluck et al., 2019; Pettigrew & Tropp, 2006). Unfortunately most of these studies are short term and most involve limited and infrequent contact, and even notable exceptions often involve quite limited recurrences of contact in somewhat unnatural circumstances (e.g., Page-Gould et al., 2008). In their recent meta-analysis involving experimental contact studies with delayed outcomes Paluck and colleagues found only "qualified support of the contact hypothesis" (p. 149), concluding that contact's effects are "equivocal." Worryingly they found that larger and better-quality studies produced weaker effect sizes, suggesting the presence of file-drawer effects or other biases in the literature. Paluck and colleagues particularly lamented the absence of (experimental) contact effects over time among adults (i.e., over 25 years), especially regarding outgroups that differ from the participant in race or ethnicity.

Against this backdrop, self-reported longitudinal research holds considerable promise to measure naturally occurring psychological processes as they unfold over time. Early longitudinal contact research using two waves or timepoints of data (e.g., Binder et al., 2009;

Dhont et al., 2014; Eller & Abrams, 2004) tested in crossed-lag panel models (CLPM) offered preliminary evidence concerning the efficacy of contact over time, but was also limited in the ability to measure change per se. Indeed, the ability of CLPM to measure change over time has increasingly come under considerable criticism (Hamaker et al., 2015; Lucas, 2023; Mulder & Hamaker, 2021; Sengupta et al., in press). Specifically, CLPM analyses contain a sizeable confound – they are unable to parse the variance and differentiate between effects that are *between-person* (i.e., reflect differences between people on constructs) and those that are *within-person* (i.e., reflect changes between time points for or within individuals). This is problematic because contact theory, as typically operationalized, posits changes within people over time that then lower prejudice (or affect other intergroup variables like outgroups solidarity). Indeed, Lucas (2023) demonstrates that "the cross-lagged panel model is almost never the right choice" (p. 1) for examining longitudinal effects. Thus, much of the extant longitudinal literature, cannot adequately address whether contact effects reflect differences between people (e.g., those with relatively more contact also have relatively lower prejudice or greater outgroup solidarity) or differences within people (e.g., those with lower prejudice or greater outgroup solidarity experienced elevated contact, relative to their baseline, prior to expressing their intergroup attitude).

Yet in the contact arena this distinction is critical. The field has long been dogged by concerns that much of the supposed "contact effect" might reflect person-factors (e.g., personality, ideology) or situation factors (e.g., contextual features that lower anxiety) (Christ & Wagner, 2013; Hodson et al., 2013). That is, in non-experimental studies the negative relation between contact and variables such as prejudice (or collective action) might simply reflect, contrary to the direction proposed by contact theory, the tendency for those lower in pre-existing biases to approach contact settings (or conversely, for those higher in such biases to avoid contact). Prior to the advent of more precise statistical tools, the field has coasted

rather comfortably on the assumption that contact exerted its effects over time through changes within people, without parsing person- from situation-effects (as would be needed to verify that assumption).

Advances in Examining Contact's Potential for Psychological Change Over Time

In their paper Sengupta et al. (in press) took advantage of statistical developments and recent innovations, namely the Random Intercept Cross Lagged Panel Model (RI-CLPM). Such models statistically model and thus parse variance explained by between-person effects and those caused by within-person effects, effectively removing the key confound from the traditional CLPM approach (Hamaker et al., 2015; Lucas, 2023; Mulder & Hamaker, 2021). In a contact context, between-person effects would represent differences between people, such as finding that people who engage in more contact have more favorable outgroup attitudes or orientations. In contrast, within-person effects can capture change within people over time, such as whether a specific individual has greater contact than their own typical tendencies and whether this translates to lower prejudice (or greater outgroup solidarity) relative to their own personal level. Critically, it is this latter process that contact researchers should be keen to capture because it would be consistent with a psychological process having occurred within individuals that has altered their other psychological states such as attitudes. Without evidence of within-person contact effects, especially in the presence of significant between-person effects, contact theory would need a serious rethink. After all, such a finding would be more consistent with the contact story being about differences across different people, not changes or differences within people over time.

Sengupta and colleagues (in press) drew on a large dataset from New Zealand, with 5-7 waves of data (depending on the measures) spaced one year apart. They tapped dominant European New Zealanders' contact experiences (e.g., number of hours of contact with outgroup friends) to predict potential changes in outgroup (Māori) solidarity in the form of

collective action, support for cultural protection policies, and economic reparations. Across the different measures they found robust evidence of stable between-person effects (e.g., people reporting more contact expressing more outgroup solidarity), but virtually no evidence for within-person effects that would connote personal change. The authors also found no significant within-wave, within-person correlations in their RI-CLPM analyses, suggesting that even short-term contact effects, like their longer-term counterparts, are not observed. Recognizing the implications of their findings for the field, Sengupta and colleagues indicated "… a need for more longitudinal contact research across different contexts that can separate between- and within-person effects", a call that we recognize in the present paper.

Here we bring several important elements to our conceptual replication of Sengupta et al. (in press). Whereas Sengupta and colleagues focused on outgroup solidarity, with implications for social structures (such as resource distribution), our project examines two outcome variables: (a) *modern racism*, which reflects concerns about outgroups "getting too much" in terms of resources or government/media attention; and (b) *negative affect* (or feelings) toward the outgroup. In focusing on political or structural outcomes (i.e., "equality"), modern racism is conceptually closer to (low) outgroup solidarity and thus more relevant from the perspective of replication. In contrast, affect is more central to (dis)liking the outgroup or "(dis)harmony", allowing us to ask whether the absence of within-person change also extends to more basic attitudes toward groups. If we observe within-person change on an affective thermometer it would suggest that the results of Sengupta and colleagues are specific to outgroup solidarity. If, however, we similarly find no within-person change using an affective thermometer, this finding would speak to the failure of contact to (longitudinally) live up to its promise as an intergroup intervention for attitudes.

Critically, we also sought to better understand the particularly interesting pattern observed by Sengupta and colleagues (in press): between-person effects, but no within-

person effects, of contact. As they suggest, this pattern means that unknown or unmodelled "third variables" may be responsible for the covariation of contact with intergroup outcomes, and that the relation between contact and prejudice is somewhat spurious, or at minimum reflects differences between people not differences within people over time. In our analysis we consider the potential for two ideological variables to serve this explanatory function: (a) right-wing authoritarianism (RWA; Altemeyer, 1996), the person-based tendency to conform to traditions, submit to recognized authorities and strong leaders, and aggress against ingroup norm violators; and (b) social dominance orientation (SDO; Pratto et al., 2013; Sidanius & Pratto, 1999), the endorsement of group hierarchies and inequalities between social groups. Both RWA and SDO are known correlates of both (low) contact and (high) prejudice (e.g., Dhont & Van Hiel, 2009; Hodson, 2008; Hodson et al., 2009; Kteily et al., 2019) that could explain any significant between-person relation between contact and prejudice (as proposed by Bohrer et al., 2019). Specifically, we tested the conceptual RI-CLPM model presented in Figure 1. In this model multiple waves of contact and prejudice were measured simultaneously, with autoregressive paths modelled, along with cross-lagged paths from contact to modern racism or affect thermometer and from these constructs to contact at successive waves. As unpacked further below, this analytic strategy parses between-person from within-person variability in the contact-bias relation; in subsequent models RWA and SDO can be added to the analysis to evaluate the extent to which contact-bias relations might be explained by these ideological variables.

Methods

Participants

We recruited 1001 participants via the online participant panel Prolific, with participation limited to White British individuals. The Time 1 sample included 361 men and 638 women (2 reported their gender as 'other'), aged between 18 and 75 ($M = 37.57$ $SD =$

13.08). The same participants were contacted to complete identical questionnaires every three months for a total of four measurement timepoints. However, the intended second wave of data collection coincided with a national COVID-19 lockdown in UK (January 2021), with people largely restricted to their homes. Problematically, our measure of intergroup contact concerned face-to-face (direct) contact with foreigners. This wave was therefore removed from the analysis; see supplemental file for more detail on this wave and RI-CLPM models including all four waves. The three retained waves of data collection were completed in October 2020, April 2021 and July 2021. Data were excluded from 6 non-White British participants and from those failing an attention check item in any wave (49 total). The final sample sizes were $N_{T1} = 946$, $N_{T2} = 667$ (70.51% of the T1 sample), and $N_{T3} = 591$ (62.47% of the T1 sample). Sample size was determined based on affordability and field norms. Ethics clearance was obtained at [masked].

Measures

Participants first provided demographic information. The order of all subsequent measures was randomised across participants.

Intergroup contact. Whereas Sengupta and colleagues tapped number of hours spent with outgroup friends in the previous week, and frequency ratings of positive outgroup contact in general, we employed a relatively "pure" contact measure assessing the number of hours spent interacting with foreigners in the previous week; this measure contains no valence information and is not restricted to friends. Intergroup contact was measured with a single item asking how many hours participants had spent interacting (face-to-face) with foreigners during the past week (0 – 10+).

Outgroup bias. As noted above, we considered two types of contact-relevant outcomes. Participants completed the 7-item Modern Racism Scale (McConahay et al., 1981), adapted for our target group (e.g., "Over the past few years, foreigners have gotten

more economically than they deserve", "Foreigners should not push themselves where they are not wanted"). Responses were recorded on a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*). Participants also completed an affect (or feeling) thermometer (Gidron et al., 2022) to indicate how cold (unfavorable) or warm (favorable) they felt towards foreigners, on a scale from 0-100. For ease of interpretation scores on both measures were (re)coded such that higher scores reflect greater prejudice.

   SDO. The 4-item Short SDO Scale (Pratto et al., 2013) tapped orientations toward intergroup hierarchies. Participants indicated favorability towards four statements from 1 (*Extremely oppose*) to 10 (*Extremely favor*), including "We should not push for group equality" and "Superior groups should dominate inferior groups".

   RWA. Right-wing authoritarianism was measured with 6 items adapted from Duckitt et al. (2010). Participants indicated agreement with statements including "Obedience and respect for authority are the more important values children should learn" and "The way things are going in this country, it's going to take a lot of strong medicine to straighten out the troublemakers, criminals and perverts" from 1 (*Strongly disagree*) to 5 (*Strongly agree*).

   Data, questionnaire items, and variable codes are available at

https://osf.io/3vduc/?view_only=892ec86f13e347f3a5ecfcd3cb6dd275 (Hodson & Meleady, 2023)[1]

Results

Analytic Strategy

   To reduce the undue influence of outliers, values greater than 3SD from the mean were winsorized to the variable's value at 3SD (see (Wilcox, 2011). Descriptive statistics and bivariate correlations between all variables at each timepoint are presented in Table 1. Analyses were conducted using the lavaan package (Rosseel, 2012) in R with analysis code

adapted from Mulder and Hamaker (2021). Separate models were tested for modern racism or affect thermometer outcomes.

To capture stable *between-person differences*, random intercepts were specified for each construct (contact and modern racism or affect thermometer) in the form of a latent variable with the measures of the construct at each of the three measurement waves serving as its indicators and all factor loading fixed to 1. Each intercept is equivalent to a person's average level of the given construct across waves. The random intercepts of contact and prejudice were allowed to covary. This correlation indicates the degree to which stable between-person differences in contact across all waves are associated with stable between-person differences in outgroup bias across all waves. The *within-person* part of the model consisted of latent variables regressed on each construct at each wave with factor loads fixed to 1. These within-person factors represent the time-specific deviation of a score from the individual's mean score on the respective variable (represented by the random intercepts). Structural relations were specified between the within components in the same manner as traditional cross-lagged panel models to assess auto-regressive and cross-lagged coefficients. These coefficients represent "pure" within-person change over time, for example, the degree to which deviations from an individual's mean score on contact at time point T is associated with deviations in the individual's mean in prejudice at the subsequent time point $T+1$, controlling for previous deviations from the individual's mean score in each variable (Hamaker et al., 2015).

In subsequent model tests we extended the RI-CLPM by including predictors of the stable between-person differences in contact and prejudice (Mulder & Hamaker, 2021). Specifically, SDO and RWA at Time 1 were treated as time-invariant predictors of the random intercepts for contact and modern racism or affect thermometer. We examined the direction and significance of the regression coefficients between the ideological individual

difference variables, and the change in the correlation between the between-person

differences in contact and modern racism or affect thermometer when the predictors were

added to the model. All multi-item scales (SDO, RWA, modern racism) were averaged and

manifest mean scores were submitted to the RI-CLPM models after evaluating the

dimensionality, reliability, and scalar measurement invariance where appropriate (see

Supplementary Materials). Full Information Maximum likelihood estimation was used to

handle missing data. The maximum likelihood robust estimator was also used to account for

skewness and kurtosis in the distributions of intergroup contact. We imposed some minor

constraints in the feeling thermometer model (Model 2) by constraining the residual

variances to be equal over time (see Mulder & Hamaker, 2021; Mund et al., 2021). Without

this constraint, this model produced Heywood cases. Model fit was evaluated using three

criteria, CFI $\geq$ .95, RMSEA $\leq$ 0.06 and SRMR $\leq$ .08 (Hu & Bentler, 1999).

Model 1: RI-CLPM for intergroup contact and modern racism. The first RI-

CLPM explored the longitudinal association between intergroup contact and modern racism.

The model fit the data well, $\chi2(1) = 0.87$; CFI = 1.00; RMSEA = <0001, 95% CI [<.001,

.092]; SRMR = .001. We compared the fit of our RI-CLPM to the fit of a traditional CLPM

with the same target variables. The fit of the CLPM was poor and significantly worse than the

RI-CLPM ($\chi2(4) = 127.65$; CFI = .932; RMSEA = .199, 95% CI [.170, .229]; SRMR = .045;

$\Delta\chi2(3) = 126.78$; $p < .001$). This confirmed that decomposing the target variables into within-

and between-person components was necessary.

At the between-person level we found that both intergroup contact and modern racism

demonstrated significant variances (RIcontact = 3.61 SE = 0.48 $p<.001$; RImodernracism =

.072 SE = 0.04 $p<.001$), suggesting that that there are stable, trait-like differences between

individuals on intergroup contact and on modern racism. Importantly, there was also

significant negative covariance between the random intercepts of intergroup contact and

modern racism of -.27 with SE = 0.07, indicating that individuals who reported higher

intergroup contact across the three waves also reported lower modern racism across the three

waves (the correlation is r = -.17, p <.001). This pattern mirrors that of Sengupta et al. (in

press).

In contrast, at the within-person level there were no significant cross-lagged paths

between intergroup contact and modern racism (see Table 2). Thus, experiencing more

intergroup contact than usual at a specific time point did *not* lead to less modern racism at a

subsequent time point or vice versa. This finding, consistent with the pattern obtained by

Sengupta et al. (in press) (examining outgroup solidarity) is inconsistent with a causal effect

of contact on prejudice -- it does not establish that changes in contact precede changes in

modern racism. Autoregressive parameters are typically lower in the RI-CLPM compared to

a traditional CLPM because the traditional CLPM confounds trait-like stability and moment-

to-moment stability, whereas the RI-CLPM separates these two forms of stability (Mulder &

Hamaker, 2021). There were two significant autoregressive effects in this model whereby

individuals who experienced increased intergroup contact at Wave 2 were also more likely to

experience increased intergroup contact at Wave 3. Similarly, individuals who reported

greater modern racism relative to his/her own expected score at Wave 2 were also more likely

to report elevated modern racism at the next timepoint. Our model also estimated associations

between the time-specific latent factors within each wave, known as 'innovations' (Hamaker

et al., 2015). Innovations are cross-sectional associations that represent the degree to which a

person's deviation from their expected score on one variable at a given timepoint is

correlated with their deviation from their expected score on another variable in that *same*

timepoint. We found no significant innovation effects in this model, meaning that, consistent

with our longitudinal findings, there was also no evidence of even short-term within-person

associations between contact and modern racism.

Model 2: RI-CLPM for intergroup contact and affect thermometer. The second

model explored the longitudinal association between intergroup contact and negative affect.

This model also fit the data well, $\chi2(3) = 5.70$; CFI = .997; RMSEA = .030, 95% CI [<.001,

.076]; SRMR = .022. As above, we compared the fit of our RI-CLPM to the fit of a

traditional CLPM with the same target variables. The fit of the CLPM was poor and

significantly worse than the RI-CLPM ($\chi2(4) = 61.55$; CFI = .932; RMSEA = .157, 95% CI

[.123, .192]; SRMR = .051; $\Delta\chi2(1) = 55.85$; $p< .001$).

In the between-person part of the model, the random intercepts for intergroup contact

and negative affect both exhibited significant variances (RIcontact = 3.33 SE =.50, $p < .001$;

RInegaffect = 340.26 SE = 27.08, $p <. 001$) and there was a significant negative covariance

between the random intercepts of -6.95 with SE = 2.52 (the correlation is $r = -.21, p = .003$),

again indicating again that individuals who report greater intergroup contact (in general) also

report less negative affect (in general). As with the modern racism variable, looking at the

within-person part of the model revealed no significant cross-lagged paths between

intergroup contact and affect (see Table 2). Experiencing more intergroup contact at a

specific time point relative to individual's average level of contact did not predict lower

negative affect at a subsequent time point or vice versa. The only significant autoregressive

path was between contact at Wave 2 and contact at Wave 3. There were also no significant

contact-affect innovations in this model. These patterns again conceptually replicate those of

Sengupta (in press) but with negative affect as the outcome of interest.

Model 3: SDO and RWA as predictors of stable between-person differences in

intergroup contact and modern racism. Subsequent models went on to explore whether

ideological individual difference variables may explain stable between-person differences in

intergroup contact, modern racism (or negative affect), and their association. SDO and RWA

were entered in the model as predictors of random intercepts for intergroup contact and

modern racism (see Mulder & Hamaker, 2021). The model fit was good, $\chi2(9) = 6.54$; CFI = 1.00; RMSEA = <.001, 95% CI [<.001, .030]; SRMR = .014. The results showed a significant positive relation between SDO and stable between-person differences in modern racism ($\beta = .41$, $p < .001$), and a significant positive relation between RWA and stable between-person differences in modern racism ($\beta = .55$, $p < .001$), indicating that individuals higher in either right-wing ideology report higher modern racism generally (see Table 3). There was no significant association between either SDO or RWA and stable between-person differences in intergroup contact (but the SDO-relation was $p = .062$). Of note, when SDO and RWA were included in the model, the (residual) correlation between the random intercepts for contact and modern racism became non-significant, $r = -.09$ $p = .159$ (whereas it was significant in the original model). This indicates that our chosen ideological predictor variables explained the between-person association identified between contact and modern racism[2].

Model 4: SDO and RWA as predictors of stable between-person differences in intergroup contact and affect thermometer. A second follow-up model examined whether SDO and RWA explained between-person associations between intergroup contact and negative affect (thermometer). The model fit the data well, $\chi2(11) = 16.94$; CFI = .996; RMSEA = .025, 95% CI [<.001, .048]; SRMR = .024. As with modern racism, we found a significant positive association between both SDO and between-person differences in negative affect ($\beta = .48$ $p < .001$) and between RWA and between-person differences in negative affect ($\beta = .26$ $p < .001$), indicating that individuals higher in SDO and RWA reported greater prejudice across all timepoints. There was no significant association between either SDO or RWA and stable between-person differences in intergroup contact (SDO-relation was $p = .057$). The (residual) correlation between the random intercepts for contact

and negative affect again became non-significant when SDO and RWA were included as predictors of the random intercepts, $r = -.17$ $p = .080$.

General Discussion

The present investigation measured contact-prejudice relations across three waves of data concerning White British participants' contact with foreigners, conceptually replicating the basic pattern reported by Sengupta and colleagues (in press) in a New Zealand context regarding the dominant White/European group positioning around Indigenous people. Specifically, we observed between-person negative relations between contact and modern racism or negative affect but no evidence of within-person relations (and little evidence of significant innovations, or within-wave, within-person change). This now-replicated effect confirms that contact effects are better (and perhaps only) empirically supported with regards to the differences between people in terms of both contact and modern racism or negative affect, and not with regards to change within people over time. These findings are incongruent with mainstream thinking about contact as a process capable of changing intergroup outcomes over time.

Extending Sengupta and colleagues findings, we also examined the extent to which RWA and SDO could potentially explain the between-person contact-bias relations observed (see Bohrer et al., 2019; Friehs et al., in press; Sengupta et al., in press). Consistent with the between-person effects observed, SDO and RWA as predictors could account for the stable relations between contact and modern racism or negative affect. In other words, longitudinal contact effects previously documented using CLPM may more meaningfully reflect between-person differences in SDO and RWA. Of note, SDO and RWA are themselves generally quite stable over time (e.g. Sibley et al., 2007; Stanley et al., 2019) with sizeable heritability estimates (see Kleppestø et al., 2019; Lewis & Bates, 2014; Stößel et al., 2006). Collectively, the accumulating evidence points toward a story of stable, between-person individual

differences more than toward contact-induced change within individuals, thus failing to support key assumptions in the contact literature, at least using these common self-report measures.

With such contact effects being better explained by between-person than within-person differences, contact may be much more about the *type of person* involved in contact than about *changes in the people* who engage in contact. The negative relation between contact and modern racism or negative affect most clearly reflect the finding that lower-prejudice people, such as those lower in SDO and RWA, have relatively more contact. This is not a minor semantic issue or niche concern but rather is fundamental to our understanding of intergroup relations and how to design interventions, not to mention policy decisions around resettling refugees and so on. Sengupta and colleagues (in press) were cautious in their interpretations, and rightfully so, being among the first to highlight this problem and presumably not wanting to overstate their case. But the accumulating evidence is showing that their analyses point to a genuine challenge for contact theory. Indeed, the assumed benefits of contact may actually be reflections of the participants who enter the contact arena (and less about the processes induced by contact itself). If nothing else, we may need to more fully heed Allport's (1954) age-old insight: "Prejudice (*unless deeply rooted in the character structure of the individual*) may be reduced by equal status contact between majority and minority groups in the pursuit of common goals [emphasis added] (p. 281)." His cautious tone appears to be more warranted than we have realized.

After decades of being considered one of the field's most reliable and dependable means to lessen prejudice, outgroup animosity, or indifference (Beelmann & Heinemann, 2014; Hodson & Hewstone, 2013; Pettigrew & Tropp, 2006, 2011; Vezzali & Stathi, 2017), contact theory is clearly facing new challenges. Our findings replicate the Sengupta (in press) outgroup solidarity findings not only with a related measure of modern racism but with

a basic negative affect measure. It is becoming clearer in this emerging literature that it is not simply in the domain of equality (e.g., structural issues, resources) where the effects of contact need to be clarified or better examined longitudinally, but also in the domain of harmony (i.e., liking). Some other recent findings are in keeping with this position. Whereas we examined "pure" outgroup contact (i.e., simple frequency), Bohrer and colleagues (2019) employed RI-CLPM to examine positive contact with foreigners in neighborhoods and at work, with four waves of data spaced approximately 6 months apart. They found no within-person effects, only between-person effects, and openly speculated that RWA and SDO might account for the latter relation (a suspicion we are able to confirm). A 2-week apart, 3-wave study on contact effects on collective action (conceptually similar to outgroup solidarity) among Poles dealing with Ukrainian refugees in 2022 found within-person effects for outgroup friendship but not for basic outgroup contact (Górska & Tausch, in press). The researchers concluded that contact's effect was indeed only viable through the effects of outgroup friendship (with the latter doing the real "work" of changing intergroup positions). This would suggest that contact itself is not inducing personal change, but does lead to outgroup friendships, with can induce change, keeping an important role for contact (albeit downgraded from the original theorizing).

In another study using the same New Zealand database as Sengupta and colleagues, Barlow and collaborators (2019) used a related statistical technique (auto-regressive latent-trajectory modelling). The authors found relatively mixed or weak contact effects on intergroup feelings such as warmth or anger, with "only a few lagged effects" (p. 925) after adjusting for between-person differences. More recently Friehs and colleagues (in press) examined the effects of outgroup contact on attitudes among White British schoolchildren (Study 1; 5 waves of data over 1 year) or German adults (Study 2; 4 waves of data over 1.5 years). These researchers similarly found evidence of contact effects on prejudicial attitudes

that were between-person, and not within-person, in nature. Although these authors were not able to account for or explain the between-person variance they observed, we found that RWA and SDO were able to account for such variance in our data, adding to this growing literature.

How Did We Get Here?

Despite its successes, contact theory is no stranger to criticism. In their prominent critique, Dixon and colleagues (2005) argued that researchers have idealized the operationalizations of contact beyond what they mean to laypeople, and have overly focused on prejudice reduction as the critical outcome. To these criticisms we add that the contact field has long ignored person-factors, or dismissed them as relevant, or treated them as troublesome obstacles to contact that (problematically) should therefore not be examined directly (see Hodson et al., 2013) (Hodson, 2011; Hodson et al., 2017; R. N. Turner et al., 2020). Downplaying individual differences or person-factors, while playing up the supposed social or situational elements, is part of a larger pattern within the broader prejudice literature (see Hodson & Dhont, 2015) and social psychology at large (Swann & Jetten, 2017). Some social psychologists even argue that a focus on individual differences such as SDO paints far too "bleak" a picture for theorists to take on the problem of prejudice (J. C. Turner & Reynolds, 2003). In some ways, our results, along with other recent findings (Barlow et al., 2019; Bohrer et al., 2019; Friehs et al., in press; Górska & Tausch, in press; Sengupta et al., in press), highlight the risks of ignoring or downplaying the role of the person (*vs*. situation) in contact settings.

A related problem is that contact theorists may have labelled intergroup contact and related constructs as conceptually *social* in nature without sufficient justification (Hodson et al., 2013). Self-reported intergroup contact is widely taken as a social or situational variable, of the sort preferred by social psychologists. But inherent in these questions is the *person,* as

construed by the individual: how much contact *you* experience, *your* perceived contact norms. Even in experiments intergroup contact concerns personal perceptions, meaning that there will be a non-negligible amount of person-variance contributing to prediction of outcome measures such as prejudice or outgroup solidarity. Variables that are routinely treated as "social", such intergroup anxiety and intergroup threat, may not warrant the designation (Hodson et al., 2013). Much of what the contact field assumes represents social processes may in fact reflect person-based differences.

Where Do We Go From Here?

To be clear, there remains considerable value in the idea of intergroup contact. Meta-analytic evidence supports contact having experimentally-induced positive effects on intergroup outcomes (Beelmann & Heinemann, 2014; Paluck et al., 2019; Pettigrew & Tropp, 2006). Moreover, although contact may largely reflect a between-persons effect, such that those less prone to prejudice engage in more contact, it is still the case that prejudice-prone people who *do* experience or report more (*vs*. less) contact express lower levels of outgroup bias (Dhont & Van Hiel, 2009, p. 201; Hodson, 2008; Hodson et al., 2009; Kteily et al., 2019; West et al., 2017). Next we need longitudinal research on the benefits of contact among highly-prejudiced people, with new tools such as RI-CLPM. In general we hope that researchers will become even more engaged in solving the riddle of contact. The strength of science is measured by how we face and deal with challenges such as those put forward by Sengupta and colleagues (in press) and confirmed in the current analysis.

So where do we go from here? As a starting point, we call for re-analyses of existing CLPM-based contact analyses, using tools such as RI-CLPM that can parse between- and within-person variance, and for Editors to be open to publishing these updated results. Of course, new empirical data on the longitudinal nature of contact is also needed. We also need to better understand the intervals that should be considered when testing contact

longitudinally. Is within-person change best captured in minutes, hours, weeks, months, or years? Key to tapping contact's processes will be examining multiple different time intervals (see Dormann & Griffin, 2015). We note, however, that in the literature reviewed here, within-person changes in contact had no effect whether measured in 2-week, multiple month, or yearly intervals[3]. MacInnis and Page-Gould (2015) convincingly argue that both the interval length between contact sessions and the number of contact repetitions are important factors to consider. In keeping with their notion of the contact threshold, at some point contact theoretically shifts from being aversive and tense to being warmer and positive. It is entirely possible, therefore, that within-person change occurs during contact, but the field has not captured such thresholds sufficiently. A heavy reliance on cross-sectional data, and on longitudinal data analyzed with CLPM, has left a murky picture, with new evidence suggesting that between-person differences have pulled much of the weight but were concealed when being unparsed from within-person effects.

Another exciting opportunity is to examine developmental trajectories more closely. For instance, a recent project shows that the strength of contact-prejudice relations drops through the progression of adolescence (Merrilees et al., in press). Although this pattern may concern some researchers, it might indicate that contact exerts most of its within-person influence in early-to-mid childhood but then stabilizes in adulthood (leaving between-person effects to drive more of the effects, as in our analyses). That is, contact may exert meaningful within-person effects at a specific developmental stage; if so, contact would a very relevant contact intervention, but one to be introduced much earlier than is often the focus of the field. It would also be valuable to compare contact during COVID-19 (or other pandemics) with contact during less restricted time periods. Although our data, collected during a pandemic, align with findings from non-pandemic periods (Bohrer et al., 2019; Friehs et al., in press;

Górska & Tausch, in press; Sengupta et al., in press), such comparisons warrant further exploration.

Concluding Remarks

Social and personality psychology have faced sizeable challenges in the past, as when faced with claims that personality (Mischel, 1968) or attitudes (Wicker, 1969) are not strong predictors of behavior, or upon learning that attitudes and political ideologies have sizeable heritable bases (see Kleppestø et al., 2019; Lewis & Bates, 2014; Stößel et al., 2006) rather than being the result of social learning alone. Psychological science weathered these storms in large part by rising to the challenge and bettering both our conceptual and measurement game. The discussion introduced by Sengupta and colleagues (in press) points to a statistical problem concerning the partitioning of between- from within-person effects, with serious consequences for data interpretation, but one that our field can address.

As long-time contact researchers ourselves, we see tremendous value in pursuing intergroup contact as a means to improve intergroup relations. Contact theory has a long and successful track record, with too much evidence confirming its efficacy to warrant its dismissal. But the accruing evidence that contact does not induce within-person change on intergroup outcomes such as modern racism, negative affect, collective action, and outgroup solidarity, should give our field pause for thought. We may need to rethink our theoretical assumptions about psychological processes, how we measure such processes, or how we longitudinally measure contact itself. Most certainly we need to incorporate and test for the role of individual differences, such as RWA and SDO. Considerably less viable is the choice of maintaining the status quo, that is, arguing for within-person change based on statistical techniques that confound between- and within-person change.

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Footnotes

[1] These data were initially collected to address another research question that we have not pursued, hence the lack of pre-registration for the present hypotheses. In the OSF we have included all relevant variables for the present research question.

[2] We also tested similar stepwise versions of Model 3 and Model 4 but including only SDO or RWA as predictors of the random intercepts for contact and modern racism or affect thermometer. In both cases, the (residual) correlation between stable differences in contact and either outgroup bias measure remained significant in the SDO-only (Model 3: $r = -.12$ $p = .025$, Model 4: $r = -.18$ $p = .047$) and RWA-only model (Model 3: $r = -.12$ $p = .037$, Model 4: $r = -.18$ $p = .027$). That is, only when both individual difference variables were included in the model together did the between-person association between contact and outgroup bias become statistically non-significant.

[3] We note that the observed pattern of between-person effects in the absence of within-person effects have been found in research that examines specific group contact (e.g., Friehs et al., in press; Sengupta et al., in press) but also using our approach of asking British participants about contact with less specified others ("foreigners"). Regardless, future research would be advised to further explore the implications of precision and specificity regarding not only the intervals but the contact-group itself.

Table 1

Descriptive statistics and bivariate correlations for all variables at each timepoint (T)

	M (SD)	1	2	3	4	5	6	7	8	9	10	11
1. Intergroup contact T1	1.56 (2.56)	-	-.07	-.14	.44	-.10	-.10	.43	-.11	-.09	-.07	-.07
2. Modern racism T1	2.07 (0.92)		-	.59	-.07	.85	.51	-.12	.85	.56	.60	.68
3. Feeling thermometer T1	23.17 (23.81)			-	-.13	.59	.64	-.16	.61	.66	.48	.39
4. Intergroup contact T2	1.62 (2.84)				-	-.05	-.12	.49	-.07	-.10	-.06	-.04
5. Modern racism T2	2.15 (0.96)					-	.56	-.13	.89	.60	.58	.65
6. Feeling thermometer T2	23.89 (22.61)						-	-.18	.62	.74	.44	.34
7. Intergroup contact T3	1.99 (2.98)							-	-.14	-.18	-.10	-.11
8. Modern racism T3	2.06 (0.95)								-	.63	.61	.67
9. Feeling thermometer T3	23.50 (23.16)									-	.51	.38
10. SDO	2.50 (1.59)										-	.43
11. RWA	2.68 (1.04)											-

Note. Significant ($p<.05$) correlation coefficients are presented in bold. SDO = social dominance orientation; RWA = right-wing authoritarianism. Thermometer coded so that higher scores reflect more negative affect.

Table 2

RI-CLPM parameter estimates for intergroup contact and outgroup bias (modern racism or negative affect thermometer)

	Model 1 – Modern Racism				Model 2 – Feeling thermometer			
	B	*SE*	β	*p*	*B*	*SE*	β	*p*
Autoregressive paths								
T2 contact on T1 contact	-0.12	0.18	-.10	.489	0.03	0.13	.02	.846
T3 contact on T2 contact	0.20	0.10	.18	.041	0.23	0.10	.22	.017
T2 prejudice on T1 outgroup bias	-0.05	0.23	-.04	.841	0.01	0.10	.01	.894
T3 prejudice on T2 outgroup bias	0.28	0.10	.28	.004	0.20	0.12	.19	.093
Cross-lagged paths								
T2 prejudice on T1 contact	0.01	0.03	.02	.839	-0.08	1.00	-.01	.937
T3 prejudice on T2 contact	0.02	0.02	.10	.248	-0.14	0.50	-.03	.775
T2 contact on T1 outgroup bias	0.86	0.94	.13	.360	-0.01	0.01	-.06	.495
T3 contact on T2 outgroup bias	-0.24	0.37	-.04	.528	-0.01	0.02	-.08	.334
Other estimates								
Covariance at T1	0.09	0.06	.16	.142	-1.73	2.48	-.06	.486
(Residual) covariance at T2	0.15	0.11	.18	.165	-1.26	3.19	-.04	.698
(Residual) covariance at T3	-0.07	0.04	-.09	.073	-2.84	1.77	-.10	.109
Between-person (RI) covariance	-0.27	0.07	-.17	<.001	-6.95	2.52	-.21	.006

Note. T1 = first time point, T2 = second time point, T3 = third time point. RI = random intercepts. SE = standard error.

Table 3

Parameter estimates for the associations between SDO/RWA and between-person differences in contact and outgroup-bias

	Model 3 – Modern Racism				**Model 4 – Feeling thermometer**			
	B	*SE*	*β*	*p*	*B*	*SE*	*β*	*p*
RIcontact on SDO	-0.09	0.05	-.06	.062	-0.10	0.05	-.08	.057
RIcontact on RWA	-0.12	0.09	-.07	.164	-0.12	0.09	-.07	.166
RIoutgroupbias on SDO	0.22	0.02	.41	<.001	5.34	0.44	.48	.<.001
RIoutgroupbias on RWA	0.45	0.02	.55	<.001	4.63	0.64	.26	<.001

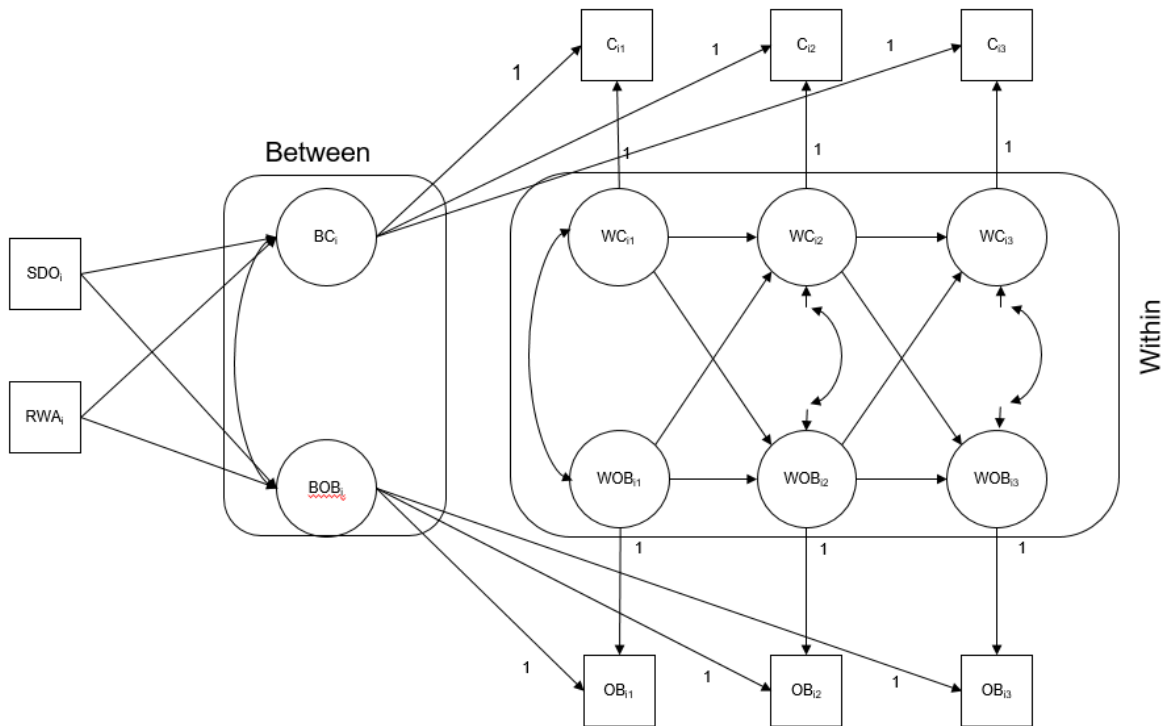*Note.* RI = random intercepts. SDO = social dominance orientation; RWA = right-wing authoritarianism.

Figure 1. Graphical representation of the RI-CLPM. C_{it} denotes observed intergroup contact and P_{it} denotes observed outgroup-bias of unit i at occasion t. Separate models were tested for modern racism and negative affect (thermometer). Social dominance orientation (SDO) and Right-wing authoritarianism (RWA) were included in Model 3 and 4 only.

Author Note