

A LONGITUDINAL TEST OF THE BIDIRECTIONAL RELATIONSHIPS BETWEEN INTERGROUP CONTACT, PREJUDICE, DISPOSITIONAL EMPATHY, AND SOCIAL DOMINANCE ORIENTATION

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We conducted a longitudinal study to test the bidirectional relationships between intergroup contact, prejudice, and a range of individual difference variables relevant to intergroup relations such as social dominance orientation (SDO) and dispositional empathy (empathic concern, perspective-taking). Participants were Italian high-school students, who completed a questionnaire at two time points separated by an interval of approximately seven months, focusing on immigrants as the outgroup. Results provide support for the importance of contact in reducing prejudice and changing personality. In particular, contact (i.e., cross-group friendships) was longitudinally associated with less SDO (although the effect was marginal) and more positive behavioral intentions. In addition, SDO revealed negative effects over time, on dispositional empathy and behavioral intentions. Mixed findings emerged for dispositional empathy, with positive effects for perspective-taking (negative association with SDO), and negative effects for empathic concern (negative association with contact, and positive associations with SDO and avoidance behavioral tendencies). Results are discussed in terms of importance of an approach that takes into account both situational and personality variables, and of the need to conduct studies that simultaneously consider a wide range of variables relevant to prejudice.

Key words: Intergroup contact; Personality; Dispositional empathy; Social dominance orientation (SDO); Prejudice.

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Research has provided consistent evidence that intergroup contact promotes positive intergroup attitudes (Pettigrew & Tropp, 2006). Likewise, empathy and perspective-taking, both dispositional (tapping on the interpersonal level) or specifically related to the outgroup (i.e., intergroup; Batson & Ahmad, 2009; Stephan & Finlay, 1999), can promote more positive affect and attitudes toward outgroup members (Bäckström & Björklund, 2007; Batson et al., 1997; Finlay & Stephan, 2000; Galinsky & Moskowitz, 2000). In

contrast, social dominance orientation (SDO; Sidanius & Pratto, 1999) is a strong predictor of negative attitudes toward low-status groups (e.g., Duckitt, 2006; Hodson & Costello, 2007). Although these relationships are well established, the bidirectional relationships between these variables have rarely been tested longitudinally. That is, there is relatively little evidence regarding whether contact, empathy, and SDO influence attitudes over time or whether the reverse is true. In addition, their effects have generally been tested separately. To the extent that all these variables are relevant to prejudice, however, it is important to test them simultaneously in order to understand their unique influence.

In order to address these gaps, we conducted a two-wave longitudinal study with Italian high-school students, where we assessed intergroup contact (i.e., cross-group friendships), prejudice (i.e., approach and avoidance behavioral intentions), and important individual difference variables such as SDO and dispositional empathy (empathic concern and perspective-taking). This test will allow us to clarify the reciprocal relationships between tested variables, and their relative role in the prediction of prejudice over time.

INTERGROUP CONTACT

There is a long tradition in social psychology that identifies intergroup contact as one of the most effective ways to reduce prejudice (Hodson & Hewstone, 2013; Pettigrew & Tropp, 2011; Vezzali & Stathi, 2017). Departing from the initial formulation of the contact hypothesis by Allport (1954), Pettigrew and Tropp (2006) found in their meta-analysis that optimal conditions (equal status, cooperation for superordinate goals, institutional support) are not necessary for contact to exert its effects, but they merely qualify as facilitating conditions (but see Di Bernardo et al., 2019). More recent distinctions point to the power of positive rather than negative contact, and on contact quality as the main aspect of contact that determines prejudice reduction (Árnadóttir, Lolliot, Brown, & Hewstone, 2018; Capozza, Trifiletti, Vezzali, & Favara, 2013; Graf & Paolini, 2017; Pettigrew, 1997; Wang, Huang, Stathi, & Vezzali, 2018).

An especially strong form of intergroup contact, which is by definition of intrinsically positive valence, is represented by cross-group friendships. Cross-group friendships provide an intimate environment where individuals from different groups can engage in self-disclosure (Reis & Shaver, 1988) and go beyond intergroup walls that create prejudice. Consistently, cross-group friendships are a powerful predictor of reduced prejudice toward a wide range of outgroups (Davies, Tropp, Aron, Pettigrew, & Wright, 2011; Turner, Hewstone, Voci, Paolini, & Christ, 2007). For instance, Pettigrew (1997), who placed emphasis on cross-group friendships as a special form of qualitative contact, showed that cross-group friendships were associated with more positive attitudes toward minority groups in a sample of 3,806 majority group members in France, Great Britain, the Netherlands, West Germany. Several studies have demonstrated since then that cross-group friendships have powerful effects (e.g., Christ et al., 2010; Turner, Hewstone, Voci, & Vonofakou, 2008), that go beyond traditional measures and extend to implicit prejudice (Turner, Hewstone, & Voci, 2007), intentions to engage in actions for social change (Vezzali, Andrighetto, Capozza, Di Bernardo, & Saguy, 2017), and attitudes toward outgroups uninvolved in the contact situation (Tausch et al., 2010).

Initial evidence also shows that contact, in addition to being shaped by different factors like prejudice (Binder et al., 2009) and personality (Turner, Dhont, Hewstone, Prestwich, & Vonofakou, 2014), is also associated with changes in personality (Vezzali, Turner, Capozza, & Trifiletti, 2018). The study we present specifically aimed to test these bidirectional relationships between contact and a range of prejudice and personality and individual difference variables.

EMPATHY, INTERGROUP CONTACT, AND PREJUDICE

Empathy represents an important human competence allowing the individual to take the perspective and/or recognize other individuals' feelings along with the ability to appropriately react to the emotional states of others (Baron-Cohen & Wheelwright, 2004). In his seminal work, Allport (1954) suggested that higher levels of empathy should be associated with less prejudice and more favorable attitudes toward the outgroup. More recently, Batson and Ahmad (2009) underlined the importance of empathy as a strategy for improving intergroup relations.

The effects of empathy have been mainly investigated at the interpersonal level, focusing on dispositional empathy (that is, assessing empathic responses toward general others). However, interactions with an outgroup may increase the possibility that one assumes the perspective and/or empathizes with its members (Aron & McLaughlin-Volpe, 2001; see also Mackie, Devos, & Smith, 2000). Consistently, when it comes to studies considering the role of empathy in intergroup relations, the relation between intergroup empathy, contact, and prejudice has emerged as stable and consistent (see, e.g., Pederson, Beven, Walker, & Griffiths, 2004; Swart, Hewstone, Christ, & Voci, 2011; Turner, Hewstone, Voci, Paolini, & Christ, 2007). Specifically, empathy in relation to outgroup members emerged as an affective mediator (along with intergroup anxiety) in the association between contact and reduced prejudice (see the meta-analysis by Pettigrew & Tropp, 2008). For example, considering the relation between White British and Asians, Turner, Hewstone, and Voci (2007, Study 4) found that cross-group friendships were indirectly associated with positive outgroup evaluations via (self-disclosure and) intergroup empathy.

Alongside correlational research, longitudinal and experimental studies have confirmed the beneficial effect of empathy in ameliorating outgroup perceptions. In a three-wave longitudinal research conducted in South Africa with Black participants (Swart et al., 2011), it emerged that having White friends (at Time 1) ameliorated positive outgroup attitudes and increased perceived outgroup variability (at Time 3) via the indirect effect of increased intergroup empathy (at Time 2). Note however that the reverse relation — from empathy to positive outgroup perception through the indirect effect of contact — was nonsignificant, therefore leaving an open question about the reciprocal relationship between contact and empathy. Finally, several experimental studies provided evidence that experimentally induced empathy and/or perspective-taking toward outgroup targets have positive effects on reduced prejudice (see, e.g., Batson, Chang, Orr, & Rowland, 2002; Batson et al., 1997; Finlay & Stephan, 2000; Galinsky & Moskowitz, 2000).

Much less research has investigated the effects of dispositional empathy or perspective-taking, tapping on more general dispositions toward empathic responses, in the context of intergroup relations. One exception is provided by Jugert, Noack, and Rutland (2013), who tested German and Turkish children in Germany adopting a two-wave longitudinal design, with waves collected at a distance of five months. They found that empathy (assessed with an 8-item scale adapted by Nesdale, Griffith, Durkin, & Maass, 2005, using items such “It makes me happy when I see another kid win a prize”) was marginally associated with stability of cross-group friendships over time. Miklikowska (2017) found in a three-wave study (with waves separated by two years) with a sample of Swedish adolescents that empathic concern but not perspective-taking (both subscales of the Interpersonal Reactivity Index; Davis, 1980) mediated the effects of cross-group friendships on improved attitudes toward immigrants. Miklikowska (2018) found, in a similar three-wave longitudinal study, bidirectional relationships between empathic concern, perspective-taking, and anti-immigrant prejudice.

In conclusion, although there is evidence for the beneficial effects of empathy on intergroup relations and on its relationship with contact and prejudice, evidence for dispositional (rather than intergroup)

empathy, especially longitudinal, is scarce. We aim to provide further evidence, also considering a wider set of potentially relevant variables than previously done.

INTERGROUP CONTACT, PREJUDICE, AND SOCIAL DOMINANCE ORIENTATION

SDO represents an individual difference variable indicating the preference for unequal intergroup relationships. Individuals with high SDO express a desire for a hierarchical society where high-status, advantaged groups have a disproportionate amount of positive social values (e.g., resources, power, health) compared to low-status, disadvantaged groups (Sidanius & Pratto, 1999). SDO is generally associated with peculiar personality characteristics, such as authoritarian aggression (Passini, 2008), lack of agreeableness (Ekehammar, Akrami, Gylie, & Zakrisson, 2004), and insecure attachment style (Roccatto & Ricolfi, 2005). This personality pattern, along with the hierarchy-based vision of society, reflects on the relation between SDO and prejudice. In fact, research has widely demonstrated that individuals with high levels of SDO typically display higher levels of negative attitudes toward different types of disadvantaged, low-status groups such as ethnic groups, homosexuals, and individuals with disability (for a review, see Pratto, Sidanius, & Levin, 2006).

Even though SDO represents an individual difference variable, and one that presents high levels of stability over time (Bratt, Sidanius, & Sheehy-Skeffington, 2016), it is sensitive to several contextual and social factors (Pratto et al., 2006). In fact, in addition to shaping intergroup relations and prejudice, SDO can also be sensitive to prejudice and contact. For example, Vezzali, Di Bernardo, et al. (2018), considering Italian children attending elementary schools, found that cross-group friendships were negatively related to SDO, that in turn was positively associated with prejudice toward immigrants. These correlational findings are corroborated by experimental and longitudinal research showing effects of contact on SDO. Shook, Hopkins, and Koech (2016) found that university student participants who were assigned to live with a different-race roommate at the beginning of the academic year reported lower levels of SDO and prejudice toward different outgroups at the end of the semester, compared to participants who shared the room with an individual of the same race. The relation between contact and SDO was also confirmed by Dhont, Van Hiel, and Hewstone (2014, Study 2) using a longitudinal design. In this research, university students completed a questionnaire measuring contact and SDO at the beginning of the academic year (Time 1) and three months later (Time 2). Results showed a negative unidirectional relation from intergroup contact to SDO, namely, interactions with outgroup members reduced participants' orientation toward hierarchies, while SDO did not affect subsequent contact.

There are also studies examining the bidirectional relationship between SDO, affect, and prejudice. For instance, Kteili, Sidanius, and Levin (2011) found in two waves separated by an interval of four years that SDO displayed by White university students was (marginally) longitudinally associated with more negative outgroup affect, whereas the inverse relationship was not significant. Matthews, Levin, and Sidanius (2009) instead found that affect (intergroup anxiety) longitudinally predicted SDO among university students from both high- and low-status groups over a period of two years (from anxiety at Year 1 of college to SDO at Years 2 and 3 of college). Relevant to the present study, Sidanius et al. (2013) conducted one rare test of bidirectional relationships between SDO and dispositional empathy (i.e., empathy not specifically referred to outgroup members). In two two-wave studies (the first with Dutch-speaking students in Belgium and waves separated by six months, the second with high- and low-status group members in New Zealand and waves separated by one year), they demonstrated bidirectional negative relationships between empathic concern and SDO.

In sum, research indicates that SDO may also be affected, in addition to affect, by variables like contact, prejudice, and (dispositional and intergroup) empathy. However, evidence is scarce when it comes to effects on SDO, and specifically when testing the effects of relevant affective variables like general, dispositional empathy.

THE PRESENT RESEARCH

A two-wave longitudinal study was conducted with the aim of testing the bidirectional relationship between individual difference variables that are relevant to prejudice (SDO, dispositional empathy), intergroup contact, and prejudice towards immigrants. Participants were high-status (Italian) students enrolled in the first high-school year. As a contact measure, we focused on cross-group friendships, since they are an especially strong form of contact that can realistically “compete” with the potentially powerful effects of individual difference variables (Davies et al., 2011). As prejudice measures, we focused on behavioral intentions, and specifically on approach and avoidance intentions. Intentions are in fact the most proximal predictors of actual behavior (Fishbein & Ajzen, 1974), and constructs that are therefore presumably more difficult to change. In order to capture more specifically different types of contact intentions, we focused both on intentions to approach the outgroup and intentions to actively avoid it because although they are related, the two aspects may in fact be distinct.

As individual difference/personality variables, we focused on two constructs that are especially relevant to prejudice, specifically SDO (Duckitt, 2006; Hodson & Costello, 2007) and dispositional empathy (Bäckström & Björklund, 2007). The latter is differentiated in empathic concern and perspective-taking, two dimensions of a widely used measure, the Interpersonal Reactivity Index by Davis (1980). Although SDO has been tested as both predictor or outcome of prejudice and intergroup contact (but with mixed effects), these tests are rare. Importantly, to our knowledge SDO and dispositional empathy have never been considered together, leaving open the possibility of suppression and reciprocally inhibiting effects. We believe this represents an especially strong test for the concurrent predictivity of the tested variables.

METHOD

Participants and Procedure

Participants were 432 Italian students attending the first year of highschool in a city in Northern Italy. Data from two participants were deleted because of excessive number of missing values (> 25%), and 43 participants were not included in the main analyses because they did not take part in the second wave of data collection (see attrition analyses below). The final sample included 387 participants (183 females, 204 males; mean age = 14.09 years, $SD = 0.61$). The research was presented as a study on social attitudes. The same questionnaire was administered in two waves (November 2014, T1; May 2015, T2) during class time.

Measures¹

Cross-group friendships. To assess cross-group friendships we used five items: four asked about the number of immigrant friends in different contexts (e.g., “How many of your friends from the neighborhood are immigrant?”; see Capozza, Falvo, Favara, & Trifiletti, 2013; Turner et al., 2008), one asked about

the number of immigrant friends at school with whom participants hanged around. The response scale ranged from *none* (1) to *more than six* (5). Cronbach's alpha was .75 at T1 and .80 at T2, respectively.

SDO. We used the 16-item SDO₆ Scale (Pratto, Sidanius, Stallworth, & Malle, 1994) in the Italian version adapted by Aiello, Chirumbolo, Leone, and Pratto (2005). Participants answered on a 5-point scale, ranging from *strongly disagree* (1) to *strongly agree* (5). Higher scores indicated stronger support for social inequality. Cronbach's alpha was .84 at T1 and .87 at T2, respectively.

Empathic concern and perspective-taking (dispositional empathy). Affective and cognitive empathy were assessed with the empathic concern (7 items) and the perspective-taking (7 items) subscales of the Interpersonal Reactivity Index (Davis, 1980). Participants indicated how often the behaviors, feelings, or thoughts described in each item occurred to them by using a 5-point response scale, ranging from *never* (1) to *always* (5). For empathic concern, alpha was .74 at T1 and .77 at T2. For perspective-taking, alpha was .60 at T1 and .64 at T2, after removing one item ("If I'm sure I'm right about something, I don't waste much time listening to other people's arguments"), which presented a low correlation with the other items.

Prejudice. As an attitude, prejudice is articulated in the affective, cognitive, and behavioral tendencies components (Eagly & Chaiken 1998) Therefore, in the present study prejudice was assessed by measuring two specific behavioral tendencies, and in particular approach and avoidance intentions. Three items were used for each tendency, taken by from Tam, Hewstone, Kenworthy, and Cairns (2009). Participants were asked to report to what extent when thinking about immigrants they would engage in approach ("In general, when thinking about immigrants, I wish to . . . talk to them/find out more things about them/spend time with them) or avoidance behavior (avoid them/have nothing to do with them/keep them at distance). Responses were given on a 6-point scale ranging from *not at all* (0) to *very much* (5). Alphas were .82 (T1) and .85 (T2) for approach, .84 (T1) and .85 (T2) for avoidance behavioral intentions, respectively.

RESULTS

Introductory Analyses

To check for selective attrition, we compared matched participants (i.e., participants who completed both waves of data collection, $N = 387$) with unmatched participants (participants who only completed the first wave, $N = 43$) by means of a multivariate analysis of variance (MANOVA) on the following variables: age, cross-group friendships, SDO, empathic concern, perspective-taking, approach and avoidance behavioral intentions.

The multivariate difference between matched and unmatched participants was significant, $F(7,409) = 2.78, p = .01, \eta^2_p = .04$. Concerning the univariate statistics, only the average number of immigrant friends was significantly different, $F(1,415) = 11.59, p = .001, \eta^2_p = .03$, with unmatched ($M = 2.88, SD = 0.96$) participants reporting more friends than matched participants ($M = 2.51, SD = 0.80$). The distribution of males and females did not differ between matched and unmatched participants, $\chi^2(1) = 0.04, p = .85$. These results suggest the presence of an attrition bias. Therefore, unmatched participants were excluded from subsequent analyses and the final sample only included matched participants ($N = 387$). However, it should be noted that differences in mean scores were not large, as suggested by the effect size value.

Means, standard deviations, and correlations for the study variables at T1 and T2 are reported in Table 1 and Table 2, respectively. Paired t -tests showed that empathic concern, $t(386) = 2.89, p = .004, d = .15$, and approach behavioral intentions, $t(386) = 3.50, p = .001, d = .18$, were slightly lower at T2 com-

pared to T1, while avoidance behavioral intentions were greater at T2 compared to T1, $t(386) = 2.52, p = .012, d = .13$. As can be noted, effect sizes were however small for all comparisons.

TABLE 1
 Means and standard deviations (in parentheses) for the study variables at T1 and T2 ($N = 387$)

	Waves of data collection	
	T1 <i>M (SD)</i>	T2 <i>M (SD)</i>
Cross-group friendships	2.51 (0.80)	2.53 (0.85)
SDO	2.21 (0.64)	2.24 (0.69)
Empathic concern	3.64 (0.64)	3.55 (0.68)
Perspective-taking	3.21 (0.65)	3.19 (0.65)
Approach behavioral intentions	2.84 (1.16)	2.64 (1.14)
Avoidance behavioral intentions	1.21 (1.18)	1.58 (1.17)

Note. SDO = social dominance orientation.

Main Analyses

The hypothesized longitudinal relationships were tested using structural equation modeling with latent variables (LISREL; Jöreskog & Sorbom, 2006). Following Little, Cunningham, Shahar, and Widaman (2002), we created two parcels for each construct, except for SDO, for which four parcels were created. Item parceling allows to maintain an adequate ratio of cases to parameters and to reduce measurement error associated with individual items. The goodness of fit of the tested models was evaluated using the chi-square statistic (χ^2), the χ^2/df ratio, the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean-square residual (SRMR). The fit of a model is satisfactory with a χ^2/df ratio smaller than 3 (Kline, 2010), a CFI value equal to or greater than .95, a RMSEA value close to or lower than .06, and when SRMR is close to or lower than .08 (Hu & Bentler, 1999).

Longitudinal Measurement Model

To investigate invariance of the measurement model over time, we conducted a longitudinal confirmatory factorial analysis (CFA) including latent variables from the two time points. A model with freely estimated parameters was compared to a model in which factor loadings within constructs across the two time points were constrained to be equal. We used the corrected chi-square difference test (Satorra & Bentler, 2001) to compare the two models. Partial measurement invariance is a sufficient criterion for comparing latent models (Byrne, Shavelson, & Muthén, 1989; see also Dhont et al., 2014; Swart et al., 2011; Vezzali, Turner, et al., 2018). The fit of the model with freely estimated parameters was excellent: $\chi^2(284) = 396.19, p \cong .00, \chi^2/df = 1.40, CFI = .99, RMSEA = .031, SRMR = .034$, thus providing support for the factorial validity and construct independence of the latent factors at the two time points (Dhont et al., 2014; Swart et al., 2011; Vezzali, Turner, et al., 2018). The model with constrained loadings also fitted the data very well: $\chi^2(292) = 409.70, p \cong .00, \chi^2/df = 1.40, CFI = .99, RMSEA = .032, SRMR = .036$. The restrictions imposed in this second model

TABLE 2
 Correlations between the study variables ($N = 387$)

	1	2	3	4	5	6	7	8	9	10	11	12
1. Cross-group friendships (T1)	-											
2. Social dominance orientation (T1)	-.08	-										
3. Empathic concern (T1)	.11*	-.40***	-									
4. Perspective-taking (T1)	.05	-.31***	.43***	-								
5. Approach behavioral intentions (T1)	.33***	-.33***	.35***	.29***	-							
6. Avoidance behavioral intentions (T1)	-.21***	.37***	-.25***	-.19***	-.43***	-						
7. Cross-group friendships (T2)	.62***	-.07	.04	.07	.29***	-.15**	-					
8. Social dominance orientation (T2)	-.10	.64***	-.25***	-.27***	-.30***	.28***	-.20***	-				
9. Empathic concern (T2)	.02	-.36***	.65***	.37***	.25***	-.17***	.04	-.42***	-			
10. Perspective-taking (T2)	.01	-.25***	.32***	.50***	.15**	.07	.05	-.36***	.51***	-		
11. Approach behavioral intentions (T2)	.25***	-.28***	.24***	.19***	.52***	-.25***	.41***	-.38***	.33***	.26***	-	
12. Avoidance behavioral intentions (T2)	-.15**	.32***	-.10*	-.11*	-.34***	.44***	-.27***	.48***	-.25***	-.17***	-.49***	-

* $p < .05$. ** $p < .01$. *** $p \leq .001$.

did not cause a significantly worse fit compared to the unrestricted model, as showed by the corrected chi-square difference test: $\Delta\chi^2(8) = 13.51, p = .10$, thus confirming partial measurement invariance of the model.

Longitudinal Model

To test the longitudinal relationship between the considered variables, we tested a cross-lagged model (see Figure 1) including all paths from T1 to T2. At T2, we allowed correlation between empathic concern and perspective-taking, as well as between approach and avoidance behavioral intentions. The fit of the cross-lagged model was satisfactory: $\chi^2(297) = 559.36, p \cong .00, \chi^2/df = 1.88, CFI = .98, RMSEA = .056, SRMR = .051$.

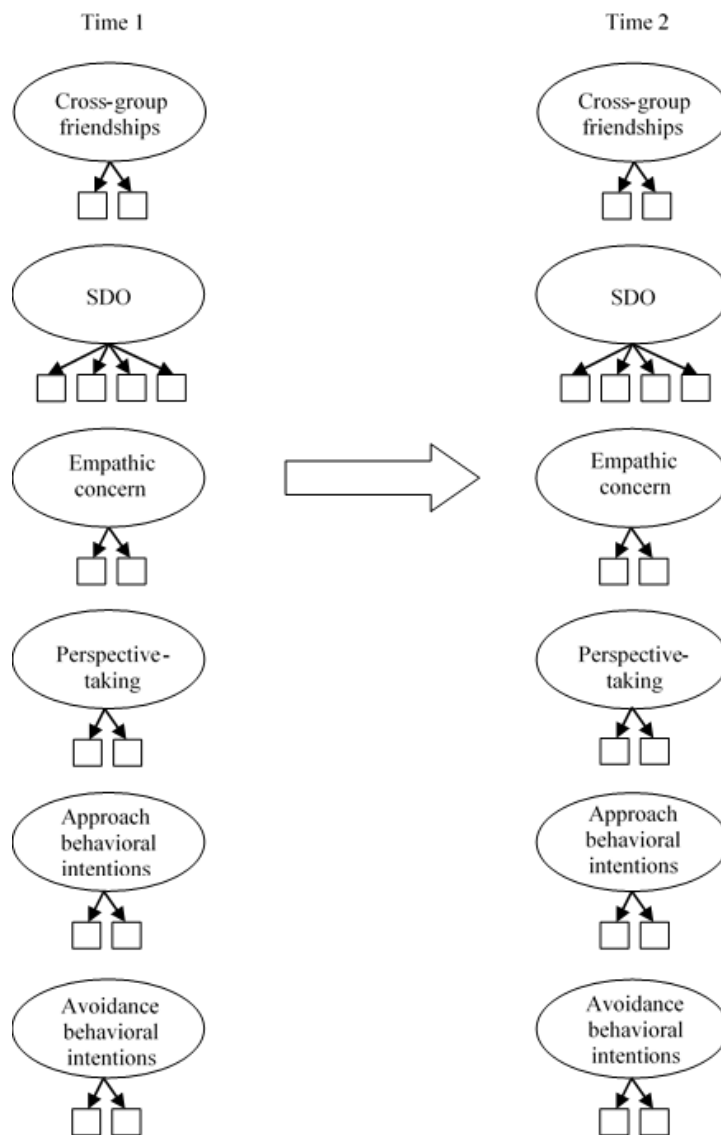


FIGURE 1

Cross-lagged model of the longitudinal relationships between cross-group friendships, SDO, dispositional empathy (empathic concern, perspective-taking), behavioral intentions (approach and avoidance). All cross-lagged paths were estimated.

As shown in Table 3, auto-regressive paths for contact, SDO, empathic concern and perspective-taking were all significant and large. We also found moderately strong auto-regressive paths for behavioral intentions. Cross-group friendships at T1 positively predicted approach behavioral intentions at T2 and negatively predicted avoidance behavioral intentions at T2. A negative longitudinal relationship (marginal effect) between cross-group friendships and SDO also emerged. SDO at T1 was negatively associated with empathic concern and perspective-taking at T2; in addition, there was a negative longitudinal association with approach behavioral intentions and a positive longitudinal relationship with avoidance behavioral intentions. Perspective-taking at T1 negatively predicted SDO at T2. We also found some unexpected significant paths: empathic concern at T1 was negatively associated with cross-group friendships at T2 and positively associated with SDO and avoidance behavioral intentions at T2; avoidance behavioral intentions at T1 positively predicted approach behavioral intentions at T2. Lastly, the cross-lagged paths from approach behavioral intentions at T1 to T2 variables were all nonsignificant.

DISCUSSION

We conducted a longitudinal study with the aim of testing the bidirectional relationships between intergroup contact, SDO, dispositional empathy, and prejudice in a sample of ethnic majority high-school students. Our findings supported the stability over time of the constructs investigated. In particular, we found strong auto-regressive paths for both SDO and empathy (both empathic concern and perspective-taking), which support the idea that these variables are relatively stable, and add to the importance of identifying factors that can change them over time. A strong auto-regressive path also emerged for cross-group friendships, indicating the stability of friendship networks over time. We also found moderate test-retest correlation between behavioral intentions, which provide support for the relative stability of these constructs and highlight the need for identifying factors that can change them.

Concerning contact, we found longitudinal effects for all variables except for dispositional empathy. First, results support previous work that has found causal (Shook et al., 2016) or longitudinal effects (Dhont et al., 2014) of intergroup contact on SDO (although the effect we found is only marginally significant). Given that SDO is considered a stable construct, and one that can have pervasive detrimental effects on prejudice and discrimination (Pratto et al., 2006), the finding that it can change depending on relevant contextual (intergroup contact) and psychological (empathy; see below) variables is encouraging. Second, we found that intergroup contact was longitudinally associated with more positive behavioral intentions; specifically, participants with earlier contact experience reported less avoidance and more approach behavioral intentions. These findings are in line with the larger contact literature (Pettigrew & Tropp, 2006), add to previous research which emphasizes the importance of cross-group friendships (Davies et al., 2011), and shows that intergroup contact can influence not only attitudes, but also behavior (of which intentions, that we have assessed here, represent a close proxy; see Fishbein & Ajzen, 1974).

The absence of longitudinal relations between cross-group friendships and the two dimensions of dispositional empathy is only apparently in contrast with the larger contact literature, which in fact focused on intergroup empathy. It may be the case that cross-group friendships do not enhance empathy toward others in general but their effects on empathy are rather confined to outgroup members only. Note however that these findings are in contrast with results by Miklikowska (2017), who instead found a longitudinal relation between cross-group friendship and empathic concern (but in any case not perspective-taking), and therefore warrant further investigation.



TABLE 3
 Paths (γ standardized coefficients) in the longitudinal regression model ($N = 387$)

Variables at T1	Variables at T2					
	Cross-group friendships	SDO	Empathic concern	Perspective-taking	Approach behavioral intentions	Avoidance behavioral intentions
Cross-group friendships	.85***	-.10 [†]	-.02	.00	.18**	-.13*
SDO	-.09	.77***	-.18**	-.15*	-.19**	.31***
Empathic concern	-.20*	.15*	.73***	-.03	-.04	.16*
Perspective-taking	.13	-.16*	.05	.66***	.02	.04
Approach behavioral intentions	.11	-.04	-.01	-.03	.55***	-.11
Avoidance behavioral intentions	.12	-.06	.09	.09	.16*	.29***

Note. SDO = social dominance orientation.
[†] $p < .06$. * $p < .05$. ** $p < .01$. *** $p < .001$.

SDO was predictably associated with worse intergroup relations (less approach and more avoidance behavioral intentions). It also was negatively associated with the two negative dimensions of empathy that we assessed, empathic concern and perspective-taking. These results support the idea that high-SDO individuals are less empathic (Sidanius & Pratto, 1999), and confirm the relevance of the construct of SDO for understanding personality, in addition to intergroup relations and social relations more generally.

The relation between SDO and empathy was bidirectional. In fact, a negative longitudinal relationship emerged between perspective-taking and SDO, revealing that being able to take the others' perspective helps reduce the desire for unequal social relationships. We also found some unexpected findings, concerning empathic concern. In contrast with Sidanius et al. (2013), who found negative bidirectional relationships between SDO and empathic concern, in this study T1 empathic concern was negatively associated with T2 cross-group friendships, and positively associated with T2 SDO and avoidance behavioral intentions. Possibly, empathic concern is mainly addressed to the ingroup. In fact, there is evidence that individuals feel more personally connected to, and empathize more, with ingroup rather than outgroup members (Aron et al., 2004; Dovidio & Gaertner, 2010; Stürmer, Snyder, Kropp, & Siem, 2006; Wohl, Hornsey, & Bennett, 2012). Since our measures of cross-group friendships and avoidance behavioral intentions were specifically referred to outgroup members, empathic concern for the ingroup may have led participants to being more inclined to be friends and stay in touch with members of the ingroup. This interpretation is indirectly supported by the association between T1 empathic concern and T2 SDO, which indicates that more empathic concern led to greater support for group-based dominance, that is for the prevalence of the dominant ingroup over the subordinate outgroup (participants belonged to the high-status group). It is also important to note that the correlations between T1 empathic concern and T2 variables were in the opposite direction to what emerged from the tested model (cf. Table 2). It is possible that the simultaneous inclusion of a wide set of relevant variables may have uncovered suppression effects and unexpected relations. Future research is needed to replicate and clarify these findings.

Also unexpectedly, avoidance behavioral intentions were positively associated with approach behavioral intentions. It is likely that this association reflects shared method variance, therefore problems associated with multiple behavioral intentions items of different valence (approach and avoidance). There is therefore a need for future longitudinal tests taking into account these and further relevant psychological variables, including differential attitude measures.

The current findings, some of which were unexpected and likely due to the simultaneous inclusion of all predictors, highlight the importance of simultaneously considering a wide range of predictor variables relevant to prejudice. In their recent review, Pettigrew and Hewstone (2017) outlined the absence of critical variables as a key risk to psychological results, particularly in the domain of intergroup contact research. They note that there are key variables that, if excluded, limit the relevance of psychological tests to policy makers, and therefore should be considered in order to provide both theoretical and practical advancement. This was precisely one of the aims of the study that we present in this article.

We acknowledge that there are, however, some limitations. First, our analysis is limited by the short interval between waves (approximately seven months) and by the fact that we only collected two waves, which does not allow tests of longitudinal mediation effects. Second, the present analysis only considers high-status group members. It is crucial that future research addresses these concerns.

CONCLUSIONS

The present findings complement studies showing that contact can change personality (Vezzali, Turner, et al., 2018), and point to the need for a person \times situation approach that considers the bidirectional

relations, but also the more complex interplay between contact and personality variables (Hodson, Turner, & Choma, 2017). Our findings also highlight the need for longitudinal studies that consider a wide set of theoretically relevant psychological variables. By doing so, it is possible to develop a better understanding of changes over time in personality and prejudice.

NOTE

1. The questionnaire included additional measures not used here, some of which (different from those used in the present study) have been used in Vezzali, Turner, et al. (2018).

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