

**Changing the ideological roots of prejudice: Longitudinal effects of ethnic intergroup contact on social dominance orientation**

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## **Abstract**

Social Dominance Orientation (SDO) has been reported to be strongly related to a multitude of intergroup phenomena, but little is known about situational experiences that may influence SDO. Drawing from research on intergroup contact theory, we argue that positive intergroup contact is able to reduce SDO-levels. The results of an intergroup contact intervention study among high school students (Study 1,  $N=71$ ) demonstrated that SDO-levels were indeed attenuated after the intervention. Furthermore, this intervention effect on SDO was especially pronounced among students reporting a higher quality of contact. A cross-lagged longitudinal survey among adults (Study 2,  $N=363$ ) extended these findings by demonstrating that positive intergroup contact is able to decrease SDO over time. Moreover, we did not obtain evidence for the idea that people high in SDO would engage less in intergroup contact. These findings indicate that intergroup contact erodes one of the important socio-ideological bases of generalized prejudice and discrimination.

## **Changing the Ideological Roots of Prejudice:**

### **Longitudinal Effects of Ethnic Intergroup Contact on Social Dominance Orientation**

Bringing members of different groups together, as originally proposed by Allport's (1954) intergroup contact hypothesis, is one of the most effective methods of reducing prejudice (Brown & Hewstone, 2005; Hewstone, 2009; Pettigrew & Tropp, 2011). Intergroup contact has, however, been reported to have a more widespread impact than merely reducing prejudice as it affects a variety of dimensions related to generalized prejudice (Hewstone, 2009; Pettigrew & Tropp, 2011). We therefore argue that contact may, in addition, affect people's socio-ideological beliefs about intergroup relations, which have been shown to underlie this diverse set of dimensions.

In the current research, we focused on the potential impact of positive intergroup contact on social dominance orientation (SDO, Pratto, Sidanius, Stallworth, & Malle, 1994), which is conceptualized as a broad social attitude expressing an individual's preference for hierarchically structured group relations and inequality among social groups (Pratto et al., 1994; Sidanius & Pratto, 1999). Previous cross-sectional studies have reported a negative relationship between positive intergroup contact and SDO (e.g., Asbrock, Christ, Duckitt, & Sibley, 2012; Dhont & Van Hiel, 2009; Hodson, 2008), which seems to support the hypothesis that people high in SDO ('social dominators') tend to avoid intergroup contact. However, because these previous studies based on cross-sectional data do not allow us to draw inferences about the direction of the relationships, we used both an intervention study and a cross-lagged longitudinal study to investigate the relationship between positive intergroup contact and SDO.

### **SDO: Cause or Effect of Intergroup Attitudes, or Both?**

SDO has been reported to be a strong and unique predictor of a multitude of intergroup phenomena and types of prejudice across different domains, e.g., racial and ethnic

prejudice (Hodson & Esses, 2005; Pratto et al., 1994; Van Hiel & Mervielde, 2005) and sexism (Roets, Van Hiel, & Dhont, 2012; Sibley, Wilson, & Duckitt, 2007a). According to Social Dominance Theory (Pratto, Sidanius, & Levin, 2006; Sidanius & Pratto, 1999), the rejection of particularly low-status groups by people high in SDO should be considered as an endorsement of hierarchy-enhancing legitimizing myths that serve the preservation of group-based hierarchies in society. SDO is thus primarily conceived as a cause of prejudice and group-based attitudes. This causal perspective has been supported by several recent studies showing that SDO does indeed have a longitudinal influence on prejudice (Asbrock, Sibley, & Duckitt, 2010; Kteily, Sidanius, & Levin, 2011), as well as on attitudes towards inequality policies for specific groups (Sibley & Duckitt, 2010; Sibley & Liu, 2010).

Nevertheless, some studies testing the reverse causal direction also obtained evidence that attitudes and feelings towards a particular group can longitudinally predict SDO (Kteily et al., 2011; Matthews, Levin, & Sidanius, 2009; Sibley & Liu, 2010), which complements research showing that SDO is sensitive to situational and social influences. Experimental studies have shown, for instance, that SDO is enhanced with higher levels of societal resource scarcity and competition, or when membership of dominant social groups is made salient (Guimond, Dambrun, Michinove, & Duarte, 2003; Huang & Liu, 2005; Morrison & Ybarra, 2008; Schmitt, Branscombe, & Kappen, 2003). Together, these studies corroborate recent theorizing of Duckitt (2001) arguing that, despite being a strong predictor of prejudice, SDO is not an unchangeable or deeply rooted personality trait, but varies as a function of changing perceptions of the social world as a competitive place. These competitive worldviews are, in turn, derived from individual socialization experiences and exposure to particular social contexts characterized by high levels of inequality and competition (Perry, Sibley, & Duckitt, 2013; Sibley, Wilson, & Duckitt, 2007b).

Furthermore, social dominance theorists (Pratto et al., 2006; Sidanius & Pratto, 1999) have repeatedly acknowledged that individual SDO levels are sensitive to life and socialization experiences such as, among others, education and multicultural experiences (Pratto et al., 2006). However, due to the main research focus on SDO as a predictor of various measures of intergroup bias (e.g., Kteilly, Ho & Sidanius, 2012) or on (perceptions of) contextual factors that may *increase* SDO (e.g., Huang & Liu, 2005; Sibley et al., 2007b), the potential role of individual contextual experiences like intergroup contact in decreasing SDO has remained an under-studied topic.

### **The Relationship between Intergroup Contact and SDO**

In his seminal book, Gordon Allport (1954) proposed that contact between members of different groups reduces mutual prejudice when contact occurs under conditions of equal status, cooperation, common goals, and institutional support. The prejudice-reducing effect of positive intergroup contact has been confirmed by Pettigrew and Tropp's (2006) meta-analysis of 515 studies, revealing a negative relationship between intergroup contact and prejudice with a mean effect size of  $r = -.21$ . This impact is typically stronger when the contact situation meets Allport's necessary conditions, but these conditions are not essential to achieve the effects of intergroup contact.

While contact studies typically used cross-sectional designs in the past, the literature has recently been enriched by a number of longitudinal studies, demonstrating the effects of intergroup contact on prejudice across time (e.g., Binder et al., 2009; Dhont, Van Hiel, De Bolle, & Roets, 2012; Swart, Hewstone, Christ, & Voci, 2011). Some of these studies also found evidence for a bidirectional relationship between intergroup contact and prejudice, indicating that positive intergroup contact reduces prejudice, but also that prejudiced people tend to avoid intergroup contact (e.g., Binder et al., 2009; Swart et al., 2011). Furthermore, research has shown that both frequency ('more contact') and quality ('better contact') of

intergroup contact are associated with less prejudice. When measured separately, however, contact quality is typically the stronger predictor of the two (e.g., Binder et al., 2009; Eller & Abrams, 2003). Nevertheless, an optimal combination of both frequent and positive intergroup contact, as expressed for instance in cross-group friendships or a high frequency of positive contact, is generally considered the most effective way to reduce prejudice (e.g., Davies, Tropp, Aron, Pettigrew, & Wright, 2011; Dhont, et al., 2012; Pettigrew, 1997; Swart et al., 2011; Voci & Hewstone, 2003).

Despite the overwhelming body of research on intergroup contact, the role of social-ideological attitudes in intergroup contact has been ignored for a long time. Researchers have only recently included measures of ideological attitudes in their research designs while investigating the effects of contact (e.g., Asbrock, et al., 2012; Dhont & Van Hiel, 2009; 2011; Hodson, 2008, 2011). These studies reported that SDO is negatively related to intergroup contact which points, according to Asbrock et al. (2012), to an important barrier for social dominators to benefit from intergroup contact. Perhaps people who do not want to have intergroup contact might be thought to be unlikely to benefit from it, although contact effects are actually stronger where there is no choice (see Pettigrew & Tropp, 2006). Asbrock et al. (2012) were therefore rather pessimistic about the usefulness of intergroup contact among people high in SDO. It should also be noted that Asbrock et al. (2012) reported that intergroup contact was still significantly associated with reduced prejudice among those high in SDO in their second study, whereas a non-significant relationship was found in their first study.

However, the cross-sectional nature of the available data on the relationship between intergroup contact and SDO (Asbrock et al., 2012; Dhont & Van Hiel, 2009; Hodson, 2008) does not allow for inferences concerning causality. Therefore, the pessimistic conclusion of Asbrock et al. (2012) needs further investigation. Indeed, just like the relationship between

intergroup contact and prejudice (e.g., Binder et al., 2009; Swart et al., 2011), the contact-SDO relationship may also reflect a bidirectional effect. People high in SDO may engage less in intergroup contact, but the negative correlation between contact and SDO might also indicate that intergroup contact has the potential to decrease SDO. Although both effects may operate simultaneously, we argue that the latter is more plausible than the former.

On the one hand, people tend to select environments that fit their attitudes and values (e.g., Bretz & Judge, 1994). Along similar lines, social dominance theorists (e.g., Haley & Sidanius, 2005), have argued that people endorsing anti-egalitarian values are likely to be attracted by environments and institutions that support hierarchically structured group relationships, whereas those with egalitarian values are more attracted by environments and institutions that attenuate group-based hierarchy. Sidanius, van Laar, Levin, and Sinclair (2003), for instance, found that high-SDO students are more attracted to 'hierarchy enhancing' careers such as national security officer or military personnel, compared to low-SDO students. Moreover, such environments are unlikely to be frequented by members of minority or subordinate groups and therefore high-SDO people may have less (positive) contact with them. Furthermore, if we conceive positive intergroup contact itself as a hierarchy attenuating environment, then we may expect that high-SDO people will not be eager to engage in such intergroup situations (Haley & Sidanius, 2005).

Yet, on the other hand, in modern multicultural societies most people are likely to come into some kind of contact with outgroup members, although to what extent will depend on various factors ranging from community segregation to motivation. The question of interest to us is why people high in SDO would try actively to avoid intergroup contact? According to Duckitt (2001), SDO is, unlike Right-Wing Authoritarianism, less fueled by threat-driven motives and negative emotions of fear and anxiety which are psychological processes that are typically related to avoidance tendencies (e.g., Mackie, Devos, & Smith,

2000). Instead, SDO is primarily related to dominance-driven motives, coldness, and a lack of positive emotions and empathy (Duckitt, 2001; Lippa & Arad, 1999; Pratto et al., 1994), psychological processes which do not seem to be associated with avoidant behavior in a straightforward manner.

Moreover, the relative stability of SDO over time does not preclude that SDO is influenced by social experiences (Pratto et al., 2006; Sidanius & Pratto, 1999). Positive intergroup contact likely represents such an influential social experience that might impact upon SDO, given its beneficial effects on implicit group associations, attitude strength, outgroup trust, forgiveness, and support for positive outgroup-targeted policies (see Hewstone, 2009; Pettigrew & Tropp, 2011). Furthermore, the impact of positive intergroup contact also generalizes to reduced prejudice against outgroups uninvolved in the contact situation (e.g., Schmid, Hewstone, Küpper, Zick, & Wagner, 2012; Tausch, et al., 2010). The finding that positive intergroup contact affects a multitude of intergroup variables seems to suggest that intergroup contact erodes the socio-ideological basis of generalized prejudice and discrimination, as represented by SDO (Duckitt, 2001; Pratto et al., 1994). Indeed, during positive intergroup encounters, people are provided with a social context that is characterized by equality and cooperation rather than inequality and competition. The frequent experience of a cooperative intergroup environment challenges people's view of the world as a competitive jungle, which is a typical psychological basis of SDO (Duckitt, 2001; Perry et al., 2013; Sibley et al., 2007b). Moreover, in terms of social dominance theory, positive intergroup contact may be considered as a small-scale, hierarchy attenuating situation which promotes egalitarianism. Frequent exposure to such an egalitarian micro-environment may gradually lead to the internalization of egalitarian norms by the interaction partners, which attenuates SDO levels (Haley & Sidanius, 2005). In sum, combining insights from intergroup contact research (e.g., Hewstone, 2009) with theorizing on SDO (e.g., Duckitt, 2001; Haley &

Sidanius, 2005; Pratto et al., 2006), it can be expected that positive intergroup contact decreases SDO. Furthermore, a combination of frequent and high-quality contact is likely to have the strongest effect on SDO.

### **The Current Research**

Van Laar, Levin, Sinclair, and Sidanius (2005) reported the first direct evidence that positive intergroup contact has an effect on SDO. Based on a large cohort sample of college students, these authors investigated the effect of ethnic heterogeneity of students' roommates during college years on a range of outcome variables in the last year, including intergroup affect, symbolic racism, anti-miscegenation attitudes, intergroup unease and competence, and SDO (see Sidanius, Levin, van Laar, & Sears, 2009). Ethnic roommate heterogeneity was found to have a beneficial effect on several of the outcome variables, including SDO (see Van Laar et al. 2005, Table 3). Given the focus of these authors on the reduction of prejudice, this initial finding of a contact effect on SDO was not discussed in its own right and has therefore remained relatively unnoted by researchers. From these initial results, however, it can thus be inferred that SDO-levels can indeed be reduced, at least by high-quality, long-term contact.

The aim of the present studies was to further investigate the potential of intergroup contact to decrease SDO. Such research is needed because the characteristics of the intergroup context studied by Van Laar et al. (2005) were highly specific and by no means representative for intergroup contact as it generally occurs. Indeed, given the room-sharing context in Van Laar et al.'s (2005) study, the members of different ethnic groups were closely connected to each other because they needed, as the authors described, to maintain a mutually satisfactory home environment, were likely to share a wide range of activities, and were supported by a university setting which promotes egalitarian norms (Van Laar et al., 2005). These unique conditions may, however, rarely occur in other intergroup contexts. The question thus remains

whether relatively short-term contact interventions or daily experiences of positive intergroup contact in other contexts would yield similar results. To address this question, we first conducted a short-term contact intervention study (Study 1) among Belgian high-school students who went on a one-week school trip to Morocco. Along with people of Turkish descent, the Moroccan community constitutes the largest Muslim minority group in Belgium. Together, the two groups represent 11.5% of the immigrant population (approximately 10% of the total Belgian population have an immigrant background).

Short-term visits abroad that stimulate positive intergroup contact have been shown to increase favorable outgroup attitudes, to reduce ethnocentrism and to improve intercultural sensitivity (e.g., Amir, 1969; Church, 1982; Jackson, 2009; Schild, 1962; Pedersen, 2009; Pizam, Fleischer & Mansfeld, 2002), although not in the context of intractable conflict (e.g., Milman, Reichel, & Pizam, 1990). In line with these previous findings, the contact-based intervention program investigated in the current study has been demonstrated to successfully reduce negative attitudes towards Moroccan immigrants (Dhont, Roets, & Van Hiel, 2011, Study 3). In the current study, based on newly collected data, we investigated whether contact with Moroccans during a one-week school trip abroad would also affect adolescents' levels of SDO.

Our second study, a longitudinal survey, aimed to cross-validate the findings of Study 1 in a heterogeneous sample of adults who reported on their levels of SDO and daily contact experiences with Muslim immigrants of Moroccan or Turkish origin. Moreover, by using a cross-lagged panel design in Study 2, we were able to simultaneously investigate the longitudinal effect of intergroup contact on SDO and the longitudinal effect of SDO on intergroup contact, while controlling for the stability of both variables over time and the cross-sectional associations between the variables (see, Christ & Wagner, 2013).

## Study 1

### Method

#### Participants and procedure.

We recruited 71 students without migration background (79% female,  $M_{\text{age}} = 16.92$ ,  $SD_{\text{age}} = .91$ ) from three Belgian high schools. All three schools are located in Flanders, Belgium. Two schools provide general educational tracks, whereas one school provides technical and vocational educational tracks. Because the school principals and class teachers had chosen to participate in the program and all students of these classes were involved, self-selection effects were eliminated.

The goal of the school trip was to become acquainted with Moroccan students as well as with their school, religion, and way of life. The visiting Belgian and host Moroccan students spent much time together, being involved in joint activities, such as hiking, sightseeing, and visiting the families of the Moroccan students. They also needed to work together on assigned school tasks (e.g., preparing and conducting an interview of a local resident) and organized activities during leisure time. One week prior to the intervention, participants completed a pretest questionnaire in their classrooms during school hours. A posttest questionnaire was completed within two weeks of the students' returning from Morocco.

Both the pre- and posttest questionnaires included measures of SDO and prejudice. Because we did not have access to a comparable group of students who could have reasonably served as a control group, the posttest questionnaire included measures of quantity and quality of intergroup contact during the intervention. As such, we were able to check whether changes in SDO and prejudice could be attributed to the contact experiences during the intervention. In other words, we could investigate whether students reporting more or better contact experiences would show greater effects of the intervention.

### Measures.

In the pretest and posttest, we administered the 14-item SDO scale (Pratto et al., 1994; translated into Dutch by Van Hiel & Duriez, 2002) on a five-point Likert scale (1, *strongly disagree*; 5, *strongly agree*). Sample items are ‘Some groups of people are simply not the equals of others’ and ‘It’s sometimes necessary to step on others to get ahead in life’ (pretest,  $\alpha = .82$ ; posttest,  $\alpha = .88$ ).

At both pretest and posttest, we also measured prejudice towards Moroccans with an adapted 10-item modern racism scale (McConahay, 1986; translated into Dutch and adapted by Dhont, Cornelis, & Van Hiel, 2010) rated on a five-point Likert scale (1, *strongly disagree*; 5, *strongly agree*). A sample item is ‘Moroccans are getting too demanding in their push for equal rights’ (pretest,  $\alpha = .72$ ; posttest,  $\alpha = .71$ ).

Furthermore, the posttest questionnaire included scales measuring the quantity and quality of contact with Moroccans during the school trip (based on Dhont & Van Hiel, 2011; Voci & Hewstone, 2003). The quantity items ( $M = 5.80$ ,  $SD = .92$ ,  $\alpha = .77$ ) were: ‘How often did you have contact with Moroccans during the trip?’, ‘How often did you have a conversation with Moroccans during the trip?’, and ‘How often did you work with Moroccans?’ (1, *never*; 7, *very frequently*). The contact quality measure ( $M = 5.54$ ,  $SD = .95$ ,  $\alpha = .75$ ) started with the question ‘How would you characterize your contact with the Moroccan population?’ followed by four adjectives: (a) pleasant, (b) superficial (reverse coded), (c) annoying (reverse coded), and (d) enjoyable (1, *certainly not*; 7, *very certainly*).

### Results and Discussion

First, we investigated whether there were significant differences in SDO and anti-immigrant prejudice before and after the contact intervention. We therefore performed a oneway, within subjects (pretest vs posttest) multivariate analysis of variance (MANOVA) with SDO and prejudice as the dependent variables. In line with our expectations, this

analysis showed a significant multivariate difference between the scores on the pretest and the posttest,  $F(2,69) = 9.59, p < .001$ , partial  $\eta^2 = .22$ . The univariate test results demonstrated that both SDO and prejudice posttest scores were significantly lower ( $M_{\text{SDO}} = 2.21$  and  $M_{\text{prejudice}} = 2.81$ ) than the pretest scores ( $M_{\text{SDO}} = 2.39$  and  $M_{\text{prejudice}} = 2.94$ ),  $F(1,70) = 13.56, p < .001$ , partial  $\eta^2 = .16$ , and  $F(1,70) = 9.03, p < .005$ , partial  $\eta^2 = .11$ , respectively. These results thus demonstrate an overall decrease in SDO and prejudice against Moroccans after the intervention.

We hypothesized that this intervention effect would be attributable to the students' contact experiences with Moroccans during the trip. Or, in other words, we expected that the quality and quantity of intergroup contact would moderate the intervention effect. To test this moderation effect, we followed the analytical recommendations of Judd, Kenny, and McClelland (2001) for testing moderation in within-subject designs using OLS regression analyses. In the current design, moderation is demonstrated when contact quantity or quality significantly predicts the difference between the posttest and pretest scores of SDO and prejudice, i.e., the intervention effect. Accordingly, we calculated a difference score for both dependent variables by subtracting the pretest scores from the posttest scores. Hence, a higher difference score of SDO or prejudice indicated a stronger intervention effect and thus a stronger decrease in SDO or prejudice, respectively.

In a first regression analysis, we regressed the SDO difference scores on both contact quantity and quality. The results showed that contact quality but not contact quantity significantly predicted the SDO difference score,  $\beta = .31, p = .01$  and  $\beta = .05, p = .70$ , respectively,  $R^2 = .11$ . Similarly, a second regression analysis with the difference scores of prejudice also revealed that contact quality, but not contact quantity, significantly predicted the prejudice difference scores,  $\beta = .28, p = .03$  and  $\beta = -.10, p = .43$ , respectively,  $R^2 = .07$ .

To summarize, the results of Study 1 demonstrated that a short-term period of intensive intergroup contact reduced the levels of both SDO and prejudice against Moroccans. However, an important limitation of the design of Study 1 is that we were not able to compare the intervention group with a control group (e.g., students of the same age from the same school who did not travel to Morocco). As such, we cannot rule out completely that a testing effect influenced our results (see Shadish, Cook, & Campbell, 2002). For instance, respondents may have talked about the measures during the intervention, potentially resulting in more socially desirable responses in the post-test.<sup>1</sup>

Despite this limitation, we were able to demonstrate that the intergroup contact experiences during the intervention were indeed significantly related to changes in SDO, which increases our confidence in the validity of our findings. In particular, the higher the contact quality, but not quantity, was, the stronger the effect of the intervention was on both SDO and prejudice. The superior role of contact quality compared to contact quantity is consistent with several studies that have demonstrated the stronger value of contact quality relative to quantity in the prediction of intergroup attitudes (see Brown & Hewstone, 2005). The limited role of contact quantity in the present study might, however, also be attributed to the fact that all respondents had experienced a considerable amount of intergroup contact because they were all involved in a contact intervention program. Such regulated context characterized by a high prevalence of intergroup contact may have reduced the predictive value of intergroup contact quantity.

## **Study 2**

Although the findings of Study 1 indicated that intergroup contact is able to reduce SDO, these findings do not clarify whether the negative association between intergroup contact and SDO reported in previous cross-sectional studies (Asbrock et al., 2012; Dhont & Van Hiel, 2009; Hodson, 2008) is solely uni-directional or bidirectional. Moreover, Pettigrew

and Tropp's (2006) meta-analysis has shown that intergroup contact effects are strongest in confined settings where participants cannot avoid intergroup contact. Hence, the question arises whether the effects of positive contact on SDO would still emerge in the context of daily intergroup interactions, where people can avoid intergroup contact (see also Dhont & Van Hiel, 2009; Hodson, Harry, & Mitchell, 2009).

To address this issue, we conducted a cross-lagged longitudinal survey study in a heterogeneous sample of adults. In this second study, we focused on the frequency of positive contact experiences with immigrants of Turkish and Moroccan descent. Thus, rather than making a distinction between contact quantity and quality, we focused on the effects of a combined index of both contact quantity and quality. It was reasonable to assume that the non-significant role of the mere quantity of intergroup contact in Study 1 was caused by the highly regulated intergroup context. In less or non-regulated intergroup contexts, however, having both frequent and positive intergroup contact has been considered to result in the most powerful effects on intergroup variables (e.g., Davies, et al., 2011; Dhont, et al., 2012; Swart et al., 2011).

An effect of positive intergroup contact on SDO can be demonstrated if contact at Time 1 affects SDO at Time 2 after controlling for a) the stability of both these variables over time, i.e., the autoregressive paths, and b) the indirect effects from the covariation of the two variables and the autoregressive path (Christ & Wagner, 2013; Dhont et al., 2012). Such a design allows for simultaneously testing the cross-lagged effect of contact at Time 1 on SDO at Time 2 and the effect of SDO at Time 1 on contact at Time 2.

## **Method**

### **Participants and procedure.**

A heterogeneous sample of 363 Belgian adults were recruited at the start of the academic year (Time 1) by undergraduate psychology students. The students were asked to

recruit one non-Muslim adult without migration background from their parents' social network or from their neighborhood. Participants received an envelope that included a questionnaire and a letter of informed consent explaining the survey procedure and the participants' rights. The study was introduced as an investigation of attitudes and beliefs about societal topics. To assure confidentiality, questionnaires were returned in a closed envelope. All respondents from Time 1 were contacted again approximately three months later (Time 2) with the request to complete a second questionnaire. A total of 92% of the initial sample ( $N_{\text{Time 2}} = 333$ ) participated at Time 2.

Participants (71% female) were between 19 and 64 years old, with a mean age of 48.29 years ( $SD = 5.09$ ). Of this sample, 18% had attended university, 46% had completed non-university higher education, 26% had completed secondary school, 10% had completed only basic education.

### **Measures.**

Intergroup contact was assessed with four questions about the frequency of positive contact with immigrants (see also Dhont et al., 2011), answered on a seven-point Likert scale (1, *never*; 7, *very frequently*). A sample item is 'How often do you have pleasant contact with immigrants?' (Time 1,  $\alpha = .94$ ; Time 2,  $\alpha = .96$ ). A higher score thus indicated more frequent positive intergroup contact.

Participants also completed the same 14-item SDO scale as administered in Study 1 and a 9-item anti-immigrant prejudice scale (based on Billiet & De Witte, 1991) rated on a five-point Likert scale (1, *strongly disagree*; 5, *strongly agree*). A sample item of the prejudice scale is 'Belgium should never have allowed immigrants into the country'. Both scales were internally consistent at Time 1 (SDO,  $\alpha = .86$ ; prejudice,  $\alpha = .90$ ) and Time 2 (SDO,  $\alpha = .90$ ; prejudice,  $\alpha = .91$ ).

## **Results and Discussion**

### **Preliminary analyses.**

We first conducted a MANOVA on the three variables under study (intergroup contact, SDO, and prejudice) to determine whether the respondents who completed the questionnaire at both time points differed significantly from the respondents who dropped out after Time 1. The results of this analysis revealed neither a significant multivariate difference between both groups,  $F(3, 359) = .97, p = .41$ , nor a significant univariate difference between the groups for any of these variables, all  $F$ 's  $< 2.34, p$ 's  $> .12$ . Based on these results, we can conclude that selective attrition did not play a significant role in subsequent findings and missing data are missing at random. All respondents who participated at Time 1 were therefore included in the subsequent analyses, and missing values were estimated using maximum likelihood estimation with the expectation maximization algorithm. Applying Maximum Likelihood procedures has been shown to produce more reliable parameter estimates and standard errors as compared to conventional methods of dealing with missing data, e.g., pairwise or listwise deletion (Schafer, 1997; Schafer & Graham, 2002, see e.g., Al Ramiah & Hewstone, 2012; Swart et al., 2011).

Table 1 presents the descriptive statistics and the correlations among the measures within and across time points. The cross-sectional and cross-lagged correlations showed that positive intergroup contact was negatively related to SDO and prejudice within and across time points, whereas SDO and prejudice were positively interrelated within and across time points.

### **Longitudinal analyses with latent constructs.**

To test the hypothesized longitudinal effects, we used structural equation modeling (SEM) with latent variables using Lisrel. To smooth measurement error and to maintain an adequate ratio of cases to parameters, we averaged subsets of items into indicator parcels

(Little, Cunningham, Shahar, & Widaman, 2002), which were held constant over time. Two parcels were created for the latent factor of the frequency of positive intergroup contact, and three parcels were created for the latent factors of SDO and prejudice.<sup>2</sup> The first factor loading of each latent variable was set to unity in order to scale the factors and the residual errors of parallel indicators were allowed to correlate in all analyses, reflecting stability in systematic error over time. The Chi-square test statistic ( $\chi^2$ ), the comparative fit index (CFI), the root-mean-square error of approximation (RMSEA), and the Standardized Root-Mean-Square residual (SRMR) were used to evaluate the goodness-of-fit of the tested models. A satisfactory fit is indicated by a CFI value greater than .95, an RMSEA value close to .06, an SRMR close to .08 (Hu & Bentler, 1999), and a  $\chi^2/df$  ratio smaller than three (Kline, 2010).

***Longitudinal relationships between intergroup contact and SDO.*** In a first series of model tests, we focused on the relationships between intergroup contact and SDO (without including prejudice). However, before testing these longitudinal relationships, it was necessary a) to test the fit of the longitudinal measurement model to investigate the factorial validity and construct independence of the latent constructs and b) to investigate whether the measurement properties of the contact and SDO measures could be considered invariant over time (Byrne, Shavelon, & Muthén, 1989; Little, Preacher, Selig, & Card, 2007; Meredith, 1993; see also Swart et al., 2011).

Therefore, we first tested a model including the latent factors and accompanying indicators of SDO and contact from each time point with freely estimated parameters. This longitudinal measurement model showed good model fit,  $\chi^2(24) = 36.04$ ,  $p = .05$ ; CFI = 1.00; RMSEA = .037; SRMR = .026.<sup>3</sup> Next, we compared this unrestrictive longitudinal model with a second model in which factor loadings of corresponding indicators across time were constrained to be invariant, i.e., a longitudinal metric invariance model (cf. Brown, 2006; Christ & Wagner, 2013; Swart et al., 2011) to establish longitudinal measurement invariance

(MI). The restrictions imposed in this second model did not result in a significantly worse fit compared to the less restricted model (with freely estimated parameters),  $\Delta\chi^2(3) = 2.10, p = .55$ , confirming metric MI over time. Longitudinal metric invariance (i.e., partial MI) is considered sufficient for purposes of testing and comparing latent models (Byrne et al., 1989).

Having established satisfactory measurement invariance for the latent factors of contact and SDO, we simultaneously investigated the effects of contact and SDO at Time 1 on contact and SDO at Time 2. This full cross-lagged model thus included all paths from contact and SDO at Time 1 to contact and SDO at Time 2 (i.e., the autoregressive and cross-lagged paths) while controlling for the within-time associations between the two variables, i.e., the latent variables were allowed to be correlated at Time 1, whereas the latent variable residuals (the disturbance terms) were allowed to be correlated at Time 2. Figure 1 depicts the results (i.e., standardized estimates) of this analysis,  $\chi^2(27) = 38.14, p = .08$ ; CFI = 1.00; RMSEA = .034; SRMR = .026.<sup>4</sup> In line with our hypotheses, intergroup contact had a significant negative longitudinal effect on SDO,  $\beta = -.17, p < .001$ , whereas no significant longitudinal effect of SDO on contact was found,  $\beta = -.04, ns$ . Moreover, constraining the path from intergroup contact at Time 1 to SDO at Time 2 to 0, resulted in a significantly worse model fit,  $\Delta\chi^2(1) = 16.54, p < .001$ . In contrast, constraining the path from SDO at Time 1 to intergroup contact at Time 2 had no significant impact on the model fit,  $\Delta\chi^2(1) = 1.08, p = .30$ . Hence, the results of Study 2 demonstrated that intergroup contact decreases SDO, whereas no support was found for the idea that people scoring high on SDO would avoid intergroup contact.<sup>5</sup>

***Longitudinal relationships between intergroup contact, SDO, and anti-immigrant prejudice.*** In a second series of model tests, we also included the latent factors of prejudice at Time 1 and Time 2 in addition to the Time 1 and Time 2 factors of intergroup contact and SDO. As such, we wanted to rule out the possibility that the obtained longitudinal effect of

contact on SDO emerged solely because contact with immigrants and SDO are both related to anti-immigrant prejudice. A longitudinal measurement model including the Time 1 and Time 2 factors of intergroup contact, SDO, and prejudice with freely estimated parameters showed a good model fit,  $\chi^2(81) = 128.26, p < .001$ ; CFI = .99; RMSEA = .040; SRMR = .038.<sup>6</sup> Again, restricting this model by constraining the factor loadings of corresponding indicators to be invariant across time did not result in a significantly worse fit,  $\Delta\chi^2(5) = 6.84, p = .23$ , confirming metric MI over time.

Then, we tested a full cross-lagged model that enabled us to simultaneously investigate the longitudinal effects of contact, SDO, and prejudice at Time 1 on contact, SDO, and prejudice at Time 2. As with the previous cross-lagged model without prejudice, we controlled for the stability effects of the three factors over time (i.e., the autoregressive effects) as well as all cross-sectional associations between the three variables within each wave. The results of this model test showed that the model had adequate fit,  $\chi^2(86) = 135.10, p < .001$ ; CFI = .99; RMSEA = .040; SRMR = .038.<sup>7</sup> The results (i.e., standardized estimates) of this model test are presented in Figure 2. The longitudinal negative effect of contact on SDO remained significant,  $\beta = -.08, p < .05$ , even after including, and thus controlling for, the variance explained by the factors representing prejudice at Time 1 and Time 2. The longitudinal effect of SDO on contact was still non-significant,  $\beta = .03, ns$ . Furthermore, the results showed that contact had a significant longitudinal negative effect on prejudice,  $\beta = -.07, p < .05$ , but also that prejudice had a significant longitudinal negative effect on contact,  $\beta = -.15, p < .01$ . A final noteworthy result is that SDO and prejudice mutually influenced each other over time, although the effect of prejudice on SDO was stronger,  $\beta = .22, p < .001$ , than the effect of SDO on prejudice,  $\beta = .09, p < .05$ .<sup>8</sup>

The results of this second study, using a heterogeneous adult sample, extended the findings of the short-term contact intervention study (Study 1) and indicated that intergroup

contact is able to reduce SDO over a three-month period. More specifically, more frequent positive intergroup contact at Time 1 was significantly associated with lower SDO-levels at Time 2. We did not, however, obtain evidence for the idea that people high in SDO would engage less in intergroup contact, since SDO at Time 1 was not significantly related to contact levels at Time 2. This non-significant effect of SDO on contact cannot be attributed to the general absence, in this particular sample, of a tendency to avoid contact. Indeed, despite the absence of a bidirectional effect between SDO and contact, the relationship between prejudice and intergroup contact was found to be bidirectional. The results showed that intergroup contact leads to lower prejudice levels, but also that higher prejudice levels are related to less intergroup contact over time. In fact, the latter path, i.e., from prejudice to intergroup contact, was even stronger than the former, i.e., from intergroup contact to prejudice.

### **General Discussion**

Despite almost two decades of research on social dominance orientation, relatively little is known about situational factors that may affect SDO. Some authors have focused on the influence of changes in contextual factors and individuals' competitive world views that may *increase* SDO (e.g., Huang & Liu, 2005; Sibley et al., 2007b) but the question whether individual contextual experiences may *decrease* SDO has not yet been well researched. The current research addressed this lacuna by focusing on the attenuating effect of positive intergroup contact on SDO. Consistent with our expectations, a pretest-posttest intervention study among high school students and a cross-lagged longitudinal survey study using a heterogeneous adult sample revealed that positive contact with ethnic outgroup members reduces SDO.

Study 1 demonstrated that a contact intervention lowered school students' SDO-levels. In the absence of a no-contact control condition, we could show that a marked decrease in SDO was obtained especially among school students reporting higher quality contact during

the intervention. These results corroborated the findings obtained by Van Laar et al. (2005) who reported that ethnic roommate heterogeneity at a college campus longitudinally predicted reduced SDO over several years. The particular type of intergroup contact studied by Van Laar et al. (2005), roommate contact at college, is expected to be of high quality, yet is likely to be difficult to engineer in other situations. The present results clarified that a short-term contact intervention of one week is also able to lower SDO-levels. Short-term contact interventions like the one studied in the current research are relatively easy to implement in the school context and in applied settings (see also Church, 1982; Stephan & Vogt, 2004), and therefore clarify the value of intergroup contact as an intervention strategy to counter group dominance and inequality beliefs.

Nevertheless, both the high school students in the contact intervention of Study 1 as well as the university students with close outgroup roommates (Van Laar et al., 2005) were located in a setting characterized by strong situational constraints, likely maximizing the effects of intergroup contact (Pettigrew & Tropp, 2006), and particularly the effects of quality of intergroup contact. Such intergroup contexts might not correspond to every-day life, where people are free to avoid or to engage in intergroup contact.

Therefore, in Study 2, we adopted a cross-lagged panel design and tested the longitudinal effects of self-reported levels of frequency of positive intergroup contact as they occur in respondents' daily life. This cross-lagged approach and the focus on daily intergroup experiences enabled us to simultaneously test whether positive intergroup contact reduces SDO, as well as whether people high in SDO tend to avoid intergroup contact, while controlling for the stability effects of contact and SDO over time and the cross-sectional associations between contact and SDO. This rigorous longitudinal test provided further evidence for the effect of intergroup contact on SDO, an effect that remained significant after controlling for participants' prejudice scores.

The suggestion that people high in SDO would avoid intergroup contact was not confirmed, as demonstrated by the non-significant longitudinal path from SDO to intergroup contact. A self-selection effect did, however, emerge for prejudice, indicating that highly prejudiced people tend to avoid intergroup contact (see also Binder et al., 2009; Swart et al., 2011; for an exception, see Dhont et al., 2012). This does not, however, indicate that contact is somehow less important than prejudice. The significant effect from contact to reduced prejudice over time reinforces the view that contact can be a part of interventions aimed at reducing prejudice. The present results added the demonstration that the tendency for prejudiced people to avoid contact is not driven by their SDO levels.

Overall, the results of the current studies are encouraging with respect to the potential of intergroup contact to change people's attitudes towards group dominance and inequality. Nevertheless, it should be noted that the operationalization of intergroup contact employed in Study 2 is more common in intergroup contact research than the methods used in Study 1. Indeed, in Study 2, we focused on participants' contact experiences with a minority group in their own country, whereas in Study 1 participants went to the country of the target outgroup where they were the numerical minority during their stay abroad. The different perspectives in these two contexts raise the question of whether similar processes were operating in the two contexts. At the same time, these different contexts provide a cross-validation of the effects, attesting to their robustness. Indeed, we obtained consistent evidence for the effect of positive intergroup contact on SDO using different methods and research designs (i.e., a pretest-posttest intervention abroad versus a longitudinal survey study), which were applied in different samples (high-school students versus a community sample). The consistent findings increase the confidence in the validity of our findings.

We now elaborate on how these findings can be integrated within social dominance theory and relate them to some other recent findings from intergroup contact research. We

also point to promising pathways for future research and highlight the implications of our findings.

### **Bridging Social Dominance Theory and Intergroup Contact Theory**

Sidanius and Pratto (1999) argued that striving for dominance is likely to be strongest with respect to groups that are most salient in society, while such striving is weaker with respect to groups that do not elicit much attention. In Western European countries like Belgium, immigrants with a Moroccan or Turkish background are highly salient groups that are debated in the media and among politicians (see also Billiet & De Witte, 2008; Coenders, Lubbers, Scheepers, & Verkuyten, 2008). It can therefore reasonably be argued that positive personal contact with members of such a highly salient group will not only lead to more positive attitudes towards this particular outgroup, but also represents a relevant and influential experience on which people rely to shape or adjust their attitudes about intergroup relations and inequality 'in general'.

The effect of intergroup contact on SDO reminds us of the secondary transfer effect of intergroup contact, which refers to the finding that contact with members of one outgroup also leads to more positive attitudes towards other, 'secondary' outgroups that were not involved in the contact situation (Pettigrew, 2009; Schmid et al., 2012; Tausch et al., 2010). Instead of focusing on attitudes towards specific secondary outgroups, however, we focused on a generalized orientation that represent an important, social attitudinal basis of attitudes towards all kinds of secondary outgroups (see Kteily et al., 2012; Sibley & Liu, 2010).

Studies by both Schmid et al. (2012) and Tausch et al. (2010) further indicated that the generalized effects of contact on attitudes towards secondary outgroups operate through an attitude generalization process. That is, attitudes towards the primary outgroup mediate the effect of contact with that outgroup on attitudes towards secondary outgroups. Based on these findings, we may expect that intergroup contact first has an effect on prejudice and, then,

further generalizes to SDO. This explanation is consistent with the present findings showing cross-lagged effects of contact on prejudice and SDO as well as a cross-lagged effect of prejudice on SDO. The design of the present studies did not, however, allow for an appropriate test of longitudinal mediation; future studies collecting longitudinal data across three waves (e.g., Swart et al., 2011) are needed to clarify this issue.

The work of Duckitt (2001) offers another plausible explanation worthy of further investigation. According to Duckitt's model (Duckitt, 2001; Perry et al., 2013), SDO is driven by schematic beliefs and perceptions about the social world as a competitive and cut-throat place versus a cooperative place characterized by mutually beneficial exchange. These schematic social worldview beliefs, in turn, vary as a function of changes in the social environment and socialization experiences. In particular, exposure to social situations characterized by high levels of inequality and competition increases competitive worldviews, whereas exposure to an egalitarian social context characterized by cooperation – as in the case of positive intergroup contact - should decrease these worldviews and lead to the internalization of egalitarian norms. As a result, a decrease in SDO can be expected (see Haley & Sidanius, 2005). However, because we did not measure either perceived intergroup norms or competitive worldviews in the current studies, future studies may further clarify their role as intermediary processes.

Future research may also extend the current findings by studying the effects of positive intergroup contact on SDO from a minority perspective. It is unlikely that the current results will generalize in a straightforward manner to members of minority status groups. Indeed, being well aware of their lower status, minority members tend to approach and experience an intergroup contact situation in a different way than members of majority groups because they likely anticipate prejudice and discrimination against them from dominant group members (Saguy, Tropp, & Hawi, 2013; Tropp, 2006). As such, the effect of positive

intergroup contact on reduced prejudice is typically weaker for minority than for majority group members. Allport's optimal conditions (e.g., equal status and cooperation) have also been found not to facilitate the effects of intergroup contact among minority members (Tropp & Pettigrew, 2005). Furthermore, recent research has indicated that positive contact with majority members may also attract minority members' attention away from group inequality and decrease their efforts to challenge the status quo of group-based inequality and injustice (Dixon, Tropp, Durrheim, & Tredoux, 2010; Saguy et al., 2013). From these latter findings, it may be expected that positive intergroup contact may be positively, rather than negatively, related to SDO among minority group members. In sum, the extension of the present findings to the minority perspective surely represents a challenging and exciting field of future inquiry.

### **Conclusion**

The main focus on SDO as a generalized orientation towards group-based inequality and hierarchy (Kteily et al., 2012; Pratto et al., 1994) and as the basis of intergroup attitudes diverted research attention from the questions of which situational variables may influence SDO, and ultimately how SDO can be changed. Nevertheless, the identification of situational factors that impact on SDO is an important topic, given that such findings may lead to the development of techniques to attenuate SDO. Intergroup contact (see Hewstone, 2009; Pettigrew & Tropp, 2011) holds promise as a situational influence on SDO, as shown by our two studies. These findings have potentially far-reaching implications because intergroup contact may attack some of the ideological roots of prejudice and thus indirectly affect the range of variables that are predicted by SDO.

### Notes

1. If the students completed the SDO and prejudice measures differently after the intervention because they had discussed the measures during the intervention, this should also be reflected in a higher intra-class correlation (ICC) between the SDO and prejudice scores at Time 2 compared to Time 1. This was, however, not the case, ICC = .54 at Time 1 and ICC = .51 at Time 2.
2. Details of the items included in each parcel can be obtained from the first author on request.
3. Tests of the cross-sectional measurement models at Time 1 and Time 2 with the latent factors of contact and SDO also yielded satisfactory model fits,  $\chi^2(4) = 10.50$ ,  $p = .03$ ; CFI = .99; RMSEA = .067; SRMR = .028 for Time 1 and  $\chi^2(4) = 1.24$ ,  $p = .87$ ; CFI = 1.00; RMSEA = .00; SRMR = .006 for Time 2.
4. The model fit of this same model but without correlating the latent variable residuals at Time 2 was,  $\chi^2(28) = 40.04$ ,  $p = .07$ ; CFI = 1.00; RMSEA = .034; SRMR = .028.
5. We also tested our model for the participants who provided data at both Time 1 and Time 2. These analyses yielded analogous results. The model had a very good fit,  $\chi^2(27) = 30.84$ ,  $p = .28$ ; CFI = 1.00; RMSEA = .021; SRMR = .024, and we obtained virtually identical estimates of all paths to the ones presented in Figure 1, i.e., with cross-lagged paths of contact on SDO,  $\beta = -.17$ , and of SDO on contact,  $\beta = -.05$ .
6. The tests of the cross-sectional measurement models at Time 1 and Time 2 with the inclusion of the latent factor of prejudice also yielded satisfactory model fits,  $\chi^2(17) = 36.59$ ,  $p = .004$ ; CFI = .99; RMSEA = .056; SRMR = .041 for Time 1 and  $\chi^2(17) = 32.13$ ,  $p = .014$ ; CFI = 1.00; RMSEA = .00; SRMR = .026 for Time 2.
7. The model fit of this same model but without correlating the latent variable residuals at Time 2 was,  $\chi^2(89) = 161.94$ ,  $p < .001$ ; CFI = .99; RMSEA = .048; SRMR = .045.

8. Again, testing this model exclusively on the participants who provided data on the two measurement points yielded a good fit,  $\chi^2(86) = 118.32, p = .01$ ; CFI = .99; RMSEA = .034; SRMR = .037, and analogous estimates of the paths as those presented in Figure 2, i.e., for the effect of contact T1 on SDO T2 and prejudice T2,  $\beta = -.08$  and  $\beta = -.07$ , respectively, for the effect of SDO T1 on contact T2 and prejudice T2,  $\beta = .02$  and  $\beta = -.08$ , respectively, and for the effect of prejudice T1 on SDO T2 and contact T2,  $\beta = .22$  and  $\beta = -.15$ , respectively.

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Table 1. Descriptive statistics and correlations between the variables in Study 2 at Time 1 (T1) and Time 2 (T2)

		Mean	SD	Contact		SDO		Prejudice	
				T1	T2	T1	T2	T1	T2
Contact	T1	3.23	1.58		.63 <sup>***</sup>	-.14 <sup>**</sup>	-.26 <sup>***</sup>	-.38 <sup>***</sup>	-.40 <sup>***</sup>
	T2	3.01	1.72			-.12 <sup>*</sup>	-.23 <sup>***</sup>	-.35 <sup>***</sup>	-.37 <sup>***</sup>
SDO	T1	2.17	0.65				.68 <sup>***</sup>	.42 <sup>***</sup>	.43 <sup>***</sup>
	T2	2.20	0.64					.49 <sup>***</sup>	.58 <sup>***</sup>
Prejudice	T1	2.17	0.78						.80 <sup>***</sup>
	T2	2.23	0.78						

Note. <sup>\*</sup>  $p < .05$ , <sup>\*\*</sup>  $p < .01$ ; <sup>\*\*\*</sup>  $p < .001$

### Figure Captions

*Figure 1.* Cross-lagged model testing the longitudinal relationships between intergroup contact and SDO in Study 2. *Note* Presented values are standardized coefficients. The error term for each indicator at Time 1 was allowed to correlate with the error term for the same indicator at Time 2. \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

*Figure 2.* Cross-lagged model testing the longitudinal relationships between intergroup contact, SDO, and prejudice in Study 2. *Note* Presented values are standardized coefficients. The error term for each indicator at Time 1 was allowed to correlate with the error term for the same indicator at Time 2. \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

Figure 1

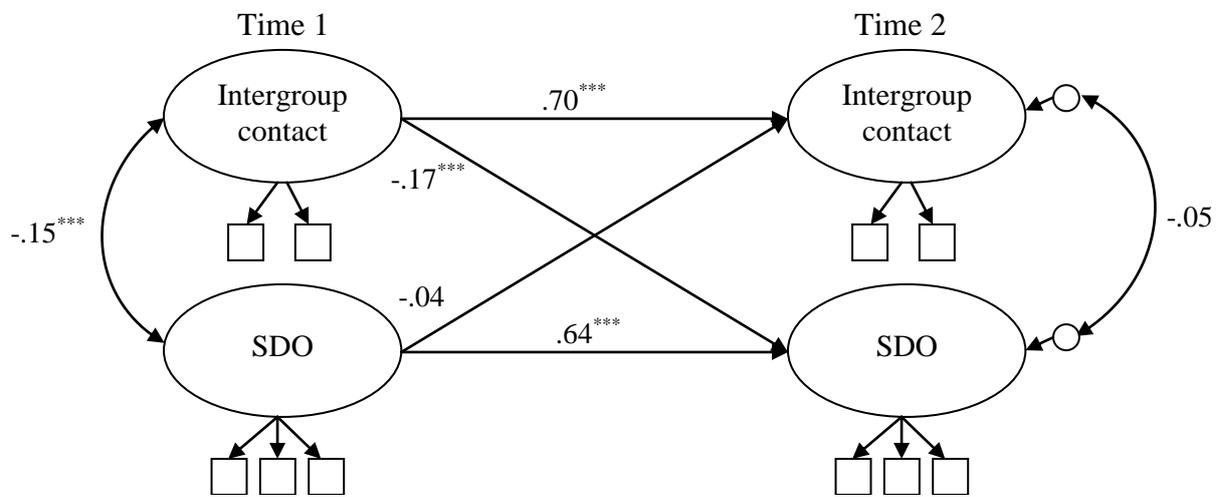


Figure 2

