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Intergroup contact and the projection of positivity☆

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ABSTRACT

Three studies investigated whether intergroup contact reduces prejudice, in part, via the extension of positive attributes that define the self to the outgroup. Study 1 found that positive intergroup contact predicted self-outgroup overlap, and this overlap mediated the contact–attitude relationship. This mediational path was specific to outgroup, but not ingroup, attitudes. In Study 2 we found that it was the attribution of specifically positive, as opposed to negative, traits that mediated the contact–attitude relationship in a model that also included intergroup anxiety. In Study 3 an elaborated model was supported, in which perceived self-other similarity mediated the effects of positive contact on the attribution of positive self-traits. We discuss the findings in the context of recent advances in Intergroup Contact Theory.

1. Introduction

A focus of contemporary intergroup relations research has been the assessment, explanation, and attenuation of intergroup bias (Hewstone, Rubin, & Willis, 2002). A theory that focused on reducing intergroup bias and has become one of the most influential theories in the field of intergroup relations is *Intergroup Contact Theory* (Allport, 1954; Pettigrew, 1998). The theory suggests that contact between groups can improve intergroup attitudes if it takes place under optimal conditions. According to Allport (1954), there are four pre-requisite conditions that promote favorable intergroup relations: equal status between the groups, common goals, co-operation and institutional support. Contact theory has suggested a range of cognitive and affective mediators that account for the success of contact at reducing intergroup bias. In this article we investigated a novel cognitive mediator of the contact–bias relationship, derived from an integration of work on the intergroup contact and social projection theories: The projection of trait positivity.

1.1. Why contact works: affective and cognitive processes

The contact hypothesis has been tested extensively throughout the past 50 years, across a wide range of participants and target groups, settings and methodological designs. The results of these studies have generally been supportive (e.g., Pettigrew, 1998; for meta-analysis see Pettigrew & Tropp, 2006). In their recent extensive meta-analysis, which included samples from studies written between 1949 and 2000, Pettigrew and Tropp (2006) demonstrated that intergroup contact is significantly associated with reduced prejudice ($r = -.215$) even when Allport's conditions are not present (see also Pettigrew, 1998).

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Significant emphasis has been placed on the affective factors that mediate the contact–bias relationship, that is, the affective processes that can explain why contact leads to improved intergroup relations (Pettigrew, 1998; Pettigrew & Tropp, 2008; Tropp & Pettigrew, 2005). Pettigrew's review on Intergroup Contact Theory (1998) argues that affective factors are crucial in cross-group contact and this idea has gained significant attention by researchers. In a meta-analysis of mediators of the effects of cross-group contact, Pettigrew and Tropp (2008) found that the mediational value of anxiety reduction and empathy is stronger than increased knowledge, a typical cognitive mediator. Paolini, Hewstone, Cairns, and Voci (2004), in a study of Catholics and Protestants in Northern Ireland, found that an anxiety-reduction mechanism facilitated the effects of cross-group friendships on rival populations. Similarly, Voci and Hewstone (2003) suggested that the positive effects of contact with immigrants at the workplace are mediated by reduced levels of intergroup anxiety. Furthermore, Landis, Brislin, and Hulgus (1985) showed that reduced anxiety during contact, as a result of prior intercultural training, facilitated positive attitudes and behaviors. In sum, anxiety has consistently been found to associate negatively with the contact experience, whereas reduction of anxiety is found to enhance the promotion of positive contact effects and generalization of positive feelings toward the outgroup as a whole. Reflecting this central role, in Pettigrew and Tropp's meta-analysis (2000), reduction in anxiety was found to explain approximately 20–25% of the effect of contact on prejudice.

In contrast to the attention paid to affective factors that mediate the contact–bias relationship, the role of cognitive factors has been investigated less extensively. However, some processes that facilitate positive impacts of contact have been identified. These include learning more about the outgroup (Gardiner, 1972), and changes in category representation (Gaertner, Dovidio, Anastasio, Bachman, & Rust 1993). The Common Ingroup Identity Model (Gaertner et al., 1993) argues that by transforming people's cognitive representations of group memberships from distinct groups to one more inclusive social unit, the differentiation that is the basis for intergroup bias is removed. Tangentially, uncertainty-sponsored anxiety about interaction with an outgroup is also reduced, as the outgroup becomes an ingroup at a superordinate level (Hogg, 2000, 2007). Gaertner, Mann, Dovidio, Murrell, and Pomare (1990) and Gaertner et al. (1993) argued that the formation of groups brings ingroup members closer to the self, without affecting the distance between the self and outgroup. Ingroups are more similar to the self than outgroups (Brown & Abrams, 1986) and similarity leads to attraction (Byrne, 1969). By re-categorizing outgroup members as instead members of a common ingroup at a superordinate level, Gaertner et al. (1990, 1993) argue that concomitant increases in similarity, and resulting attraction, lead to reductions in bias.

1.2. Contact and similarity

Similarity has played an important role in predicting affiliation and liking (Byrne, 1971; for review see McPherson, Smith-Lovin, & Cook, 2001). Sociometric research from the 1960s and 1970s suggested that similarity leads to attraction because it offers confirmation to people's worldview (Byrne, 1971; Festinger, 1954; Rokeach, 1960; Rokeach & Mezei, 1966) and enhances a "balanced" set of cognitions (Newcomb, 1961). Generally, similar others are considered to be more attractive and are rated more favorably than dissimilar others (Sykes, Larntz, & Fox, 1976; Varma & Stroh, 2001). The hypothesis that similarity leads to attraction has been confirmed by research across many different dimensions of similarity such as gender (Marsden, 1988; Varma & Stroh, 2001), race (Graham & Cohen, 1997; Ibarra, 1995; Kalmijn, 1998; Shrum, Cheek, & Hunter, 1988), age (Feld, 1982; Fischer, 1977), and social class (Marsden, 1987; Yamaguchi, 1990). It is perceived (rather than actual) similarity that plays a key role in predicting attraction (Hoyle, 1993; Klohnen & Luo, 2003). It is therefore clear that interpersonal similarity (what we refer to as similarity to self) can lead to more liking, and that this can transcend the interpersonal level and have a positive impact on intergroup relations. Research on intergroup contact and intergroup closeness has shown that similarity is indeed an important factor in reducing bias (Stephan, 1999; for a different view see Brown & Lopez, 2001).

Gaertner et al. (1990, 1993) argue that an important part of the process leading from contact to the reduction of intergroup bias is the outgroup moving closer to the self. There is little research that has explicitly investigated this potential link between contact and similarity to self, but some studies have provided indicative support. Gaertner, Mann, Dovidio, Murrell and Pomare (1990), for instance, found that co-operation and the formation of a common ingroup identity increased perceptions of similarity to the self. However, in this study similarity to self was an outcome measure and not tested as a potential mediator of the contact–attitude relationship. Eller and Abrams (2004) also provide some evidence indicative of the proposed direct link between contact and similarity to self. Their measure of "affective ties" was Aron, Aron, and Smollan (1992)'s inclusion of the other in the self measure; essentially a measure of similarity to self, which they found to vary along with contact. Tangentially, in school settings McGlothlin and Killen (2005) found that intergroup contact influenced perceptions of similarity in 1st and 4th grade children. Furthermore, Wright and Tropp (2005) found that White pupils in bilingual classes (therefore in a social setting that favors positive contact with the outgroup) perceived greater similarity between the self and Latino children than pupils in English-only classes.

1.3. Similarity and projection

We can also delve a little deeper and ask *how* self-outgroup similarity might reduce bias. Why should outgroup members be seen as more positive just because they are seen as more similar to self? Recent work on the emergence of ingroup favoritism can shed some light on this issue. A means of explaining why similarity is associated with positive attitudes towards ingroup, but not outgroup, members, comes from Social Projection Theory (Clement & Krueger, 2002; Robbins &

Krueger, 2005). According to the theory, when people form opinions about others they are based on expected similarities or differences between self and others (in personality traits, feelings, behaviors, etc.). Robbins and Krueger (2005) define projection as "a process or a set of processes by which people expect others to be similar to themselves" (p. 32). In other words, people use the self as an informational base from which to draw conclusions about others (see Gramzow, Gaertner, & Sedikides, 2001).

Projection of self-characteristics to others appears to depend upon a range of moderators, one of the most consistent being social categorization (Clement & Krueger, 2002; Krueger & Zeiger, 1993). The prediction that projection to ingroups is higher and more positive than outgroups has been supported in a range of contexts (for review see Krueger, 2000) and is consistent with other research that has shown that projection is mediated by perceived social distance (Jones, 2004). Ames (2004a, 2004b) has demonstrated that similarity also moderates projection: perceived self-group similarity increased the levels of projection of self-attributes to others. Consistent with this, since ingroups are by definition more similar to self than outgroups (Tajfel & Turner, 1979) people project positivity to the ingroups more than to the outgroups (Clement & Krueger, 2002; Holtz & Miller, 2001; for meta-analysis see Robbins & Krueger, 2005). Since the self is invariably seen as mildly positive (Sears, 1983), projection to the ingroup, but not the outgroup, can account for ingroup bias.

If the reason why ingroups are seen as positive, compared to outgroups, is, *a priori*, due to the projection of positive attributes, then we might therefore reasonably expect the same processes to operate in contexts of intergroup contact. On the basis of the research we have discussed above, we therefore hypothesized that positive intergroup contact would improve attitudes towards outgroups via increased similarity to self, and, furthermore, that it is the projection of positive attributes that would be definitional of this role.

2. Study 1

This study was carried out in the UK using a sample of International and British students. Relations between International students and British people provided an ideal framework within which contact and its consequences should be examined. The context of these relations is of high relevance theoretically, because all four pre-requisite conditions stated by Allport (1954) are present: International and home students have equal status in British Universities, common academic goals, they need to co-operate as peers and intergroup contact is supported by the Universities.

This first study aimed to test a simple version of our contact-similarity-liking model before going on to test the more detailed projection predictions later on. Importantly, it is the locus of the similarity effect that indicates whether it takes the form of projection. Specifically, projection must involve the ascribing of ingroup traits to the outgroup, but not vice versa. As such, any observed increase in similarity can be defined as projection only if similarity between the self and outgroup increases and similarity between the self and ingroup remains the same, as a function of positive contact. We therefore expected positive contact with outgroup members to increase the perceived overlap between self and outgroup and outgroup evaluation. In contrast, the relationship with, and evaluation of, the respective ingroup should remain unchanged.

2.1. Method

2.1.1. Participants and procedure

Thirty-seven British and 43 International students at the University of Birmingham were approached individually around the campus and after language classes offered for foreign students, respectively. The students participated in this experiment in exchange for a small monetary payment. The sample consisted of 43 women and 37 men. Ages ranged from 18 to 44 years old ($M = 22.7$, SD = 4.5). Regarding the International students, 23 were European, 12 were from Asia, 3 from Americas, 3 from Africa and 1 from Oceania.

2.1.2. Predictor variables

2.1.2.1. Quantity of contact. Four items measured quantity in contact. The items were: "How much contact do you have with International students (or British students, respectively): (a) at University; (b) as neighbors; (c) as close friends" and "How frequently do you speak to International (or British) students" (based on Islam & Hewstone, 1993). A seven-point scale was used (1 not at all, 7 very much). The items were averaged to form a reliable index (Cronbach's $\alpha = .81$).

2.1.2.2. Quality of contact. Participants were asked to characterize the contact they have with outgroup members on a scale that consisted of five pairs of adjectives (superficial/deep, natural/forced, unpleasant/pleasant, competitive/co-operative and intimate/distant). A seven-point scale was used (1–7), Cronbach's $\alpha = .61$. Reflecting past findings for the need for optimal intergroup contact (Allport, 1954; Islam & Hewstone, 1993; Pettigrew, 1998), we highlight the requirement of not only frequent, but also positive, intergroup interactions. Considering quantity or quality of contact as separate factors proves in many cases to be insufficient to improve relations (see Pettigrew, 1998; Voci & Hewstone, 2003). Increasing *positive* contact appears optimal to observe improved relations, which is consistent with our focus on the projection of positivity to outgroups. Methodologically, this can be attained by measuring both quantity and quality of contact and obtaining a single index that outlines the multiplication of the two variables. This procedure is necessary in order to consider the two features of contact simultaneously (for similar arguments see Brown, Vivian, & Hewstone, 1999; Voci & Hewstone, 2003). For this reason, in order to obtain a single index of positive and frequent contact the average score for quantity and quality of contact

Table 1
Means, standard deviations and correlations between all variables, Study 1.

	M (SD)	1	2	3	4	5
1. Positive contact	15.26 (8.87)	–	.071	.509***	−.096	.227*
2. Self-ingroup overlap	4.78 (1.50)	–	–	.224*	.452***	−.087
3. Self-outgroup overlap	3.00 (1.43)	–	–	–	.175	.313**
4. Evaluation of ingroup	70.00 (17.72)	–	–	–	–	.119
5. Evaluation of outgroup	63.38 (14.40)	–	–	–	–	–

* Correlation is significant at the .05 level (2-tailed).
** Correlation is significant at the .01 level (2-tailed).
*** Correlation is significant at the .001 level (2-tailed).

was calculated for each participant, and then the two terms were multiplied to form a composite measure. The new variable, referred to as *positive contact*, represents frequent and also positive contact.

2.1.3. Mediating variables

2.1.3.1. Overlap with the ingroup and outgroup. As an initial test of projection we used a measure that captured the extent to which self-characteristics could be seen to overlap with the outgroup: the "inclusion of others in the self" scale (Aron et al., 1992; Tropp & Wright, 2001). This scale consisted of seven pairs of circles varying in the degree of overlap between the self (as one circle) and the ingroup or outgroup (as another circle). Participants were asked to choose the pair of circles that best described their relationship with members of the ingroup and outgroup. The choices varied from 1 (no overlap) to 7 (highest degree of overlap).

2.1.4. Criterion variable

2.1.4.1. Evaluation. An evaluation thermometer was used on which participants were asked to give their general impression of the ingroup and outgroup by ticking the number that best represented their general impression (based on Haddock, Zanna, & Esses, 1993). The response range was from 0 to 100 degrees and with increasing numbers representing more positive feelings towards the target group.

2.2. Results and discussion

Correlations between all variables (see Table 1) revealed that positive contact was associated with self-outgroup overlap and outgroup evaluation. As predicted, neither overlap with the ingroup nor ingroup evaluation were associated with positive contact with the outgroup. This finding is consistent with our projection hypothesis that any change in similarity as a function of contact would be observed in the self-outgroup, but not self-ingroup relationship.

2.2.1. Path analysis

Path analysis with observed variables was carried out in order to test the effect of positive contact on outgroup evaluation via an increase in self-outgroup overlap. Positive contact was associated with higher self-outgroup overlap ($\beta = .51$, $p < .0005$, $R^2 = .26$) which, in turn, was associated with outgroup evaluation ($\beta = .31$, $p < .005$, $R^2 = .10$). Positive contact and overlap accounted for 10% of the explained variance in outgroup evaluation. The model provided a good fit to the data, $\chi^2(1) = .545$, $p = .460$, CFI = 1.0 and RMSEA < .0005. Adding a direct path to this model, from contact to outgroup evaluation, replicated the indirect effect but the direct path was not statistically significant ($\beta = .09$, $p = .460$). A Sobel test confirmed this mediational path ($z = 1.97$, $p = .049$). An alternative model tested evaluation as a mediator of the contact-overlap relationship. All paths were significant but it had a poor model fit, $\chi^2(1) = 20.03$, $p < .0005$, CFI = .352 and RMSEA = .491.[1]

These findings support the proposed model: Frequent and positive intergroup contact predicted increased perceived overlap between self and outgroup which, accordingly, predicted outgroup evaluation. Importantly we observed that positive contact was associated with higher perceived self-outgroup overlap and outgroup evaluation, but not with higher perceived self-ingroup overlap nor ingroup evaluations. This is what we would expect if it is in fact projection of positivity from the self to the outgroup that is improving attitudes towards the outgroup, rather than the opposite effect (i.e., a devaluing of the ingroup by virtue of it becoming psychologically closer to the outgroup). This shows that positive contact has no impact on an ingroup-centered route and constitutes good evidence that positive contact reduces bias due to projection of positivity to the outgroup, rather than reduced projection to the ingroup.

In Study 2 we wanted to build on these findings and use a measure that more directly assessed the proposed projection process we outlined in the introduction. According to our model contact should encourage the perception that outgroupers

[1] Although past research indicates that the contact–prejudice relationship is weaker among minorities, we found no effect of group membership in this study. This may be due to the specific context of the International and British students relations. Although International students technically form a minority group, there are qualitative features in the context that differentiate them from the typical majority–minority relations. Specifically, International students *choose* to go to the host country, they have an equal status to the British students and there is no history of conflict or competition between them and the majority British group.

are closer to the self, and it is this that allows them to benefit from the attraction typically experienced between ingroup members. The basic idea of this research is that members of an outgroup are viewed more positively when similarities are emphasized because it facilitates the projection of *positivity* that is normally associated only with ingroup members. If it is specifically the projection of positive (not negative) attributes that explains why outgroupers come to be seen as more positive following positive contact, then frequent and positive contact should be associated with more overlap specifically of *positive*, not negative, attributes. The IOS measure used in Study 1 cannot capture this specific projection of positivity. In Study 2, we therefore used an alternative measure that assesses the projection process in more detail.

3. Study 2

The aim of our second study was to specify in more detail the projection process in contact settings. Importantly, by directly measuring projection we can test the prediction that it should be positive, not negative traits, that are projected into the outgroup, and that only these will vary with positive contact. As well as using a measure of projection (detailed in the method section below), we also extended our analysis in several important ways. Apart from testing the cognitive route by which positive contact can improve outgroup evaluation, we sought to ascertain the distinctiveness of this route with alternative routes, the most pertinent being affective. Dovidio et al. (2004) recently emphasized the importance of investigating cognitive and affective factors likely to have mediational effects in prejudice reduction *at the same time*. This is in order to ascertain their distinctive, or convergent, effects on key outcome measures like evaluations.

As mentioned in the introduction, reduced intergroup anxiety has a well-established role in reducing bias in contact settings (Islam & Hewstone, 1993; Landis et al., 1985; Stephan & Stephan, 1985, for meta-analytic support see Pettigrew & Tropp, 2000). As such, in conjunction with projection, the inclusion of anxiety in this study should help us specify a model that describes in more detail how positive contact can improve outgroup evaluations through *both* cognitive and affective routes. It was expected that frequent and positive contact would be associated with higher levels of projection of positivity to the outgroup, reduced intergroup anxiety, and improved outgroup attitudes.

3.1. Method

3.1.1. Participants and procedure

Questionnaires were distributed to 54 International students at the University of Birmingham. The participants were approached individually and were asked to participate in a study concerning the everyday life of International students in British Universities. The sample consisted of 34 women and 19 men.[2] Out of them, 30 participants were European, 17 from Asia, 2 from Africa and 5 did not indicate their nationality.

3.1.2. Predictor variables

3.1.2.1. Quantity and quality of contact. Five items measured quantity of contact (for example, "How many British people do you know", "In every-day life, how frequently do you interact with British people", "In the University, how frequently do you speak to British students", derived from Voci & Hewstone, 2003). A seven-point scale (1 not at all, 7 very much) was used (Cronbach's $\alpha = .75$). Similar to Study 1, to measure the quality of intergroup contact, participants were asked to characterize the contact they have with outgroup members on a scale that consisted of four pairs of adjectives (for example, superficial/deep, natural/forced, etc.). A seven-point scale (1–7) was used (Cronbach's $\alpha = .72$). Again, we then obtained a single index of the multiplication of the two variables.

3.1.3. Mediating variables

3.1.3.1. Projection to the outgroup. In order to measure the levels of projection, the IOS scale was substituted here by a measure of personality trait overlap which is a commonly used measure of trait projection (see Cadinu & Rothbart, 1996; Krueger & Stanke, 2001; Riketta, 2006). The scale consists of two identical lists of personality traits; participants were asked to choose the characteristics that apply to the self and then to a target group, which is a procedure that allows measuring the extent of self-target group overlap as a function of positive contact and enabled us to distinguish between the projection of positive and negative traits (only the former should apply if projection has a role to play in improving outgroup attitudes).

Two identical lists of 20 trait characteristics were used to measure projection. Participants were asked to tick the traits that they believed were characteristic (i) of themselves (first list) and (ii) of British people (second list). Ten personality traits were positive (*intelligent*, *resourceful*, *tolerant*, *observant*, *logical*, *practical*, *entertaining*, *careful*, *bold*, and *studious*), Cronbach's $\alpha_{self} = .57$, Cronbach's $\alpha_{outgroup} = .53$; and ten were negative: (*aggressive*, *boastful*, *messy*, *disrespectful*, *gullible*, *moody*, *opportunist*, *disagreeable*, *possessive*, and *snobbish*), Cronbach's $\alpha_{self} = .65$, Cronbach's $\alpha_{outgroup} = .70$ (taken from Anderson, 1968).

3.1.3.2. Intergroup anxiety. The intergroup anxiety scale (derived from Stephan & Stephan, 1985; Voci & Hewstone, 2003) consisted of seven adjectives (*awkward*, *suspicious*, *embarrassed*, *annoyed*, *happy*, *relaxed*, and *open-minded*). Participants

[2] One person did not indicate gender. Due to an omission in questionnaire construction, no age data were collected.

Table 2
Means, standard deviations and correlations between all variables, Study 2.

	M (SD)	1	2	3	4	5
1. Positive contact	25.78 (10.87)	–	−.551***	.404**	−.023	.279*
2. Intergroup anxiety	2.70 (1.15)	–	–	−.488***	.092	−.408**
3. Positive overlap	.26 (.21)	–	–	–	−.001	.429***
4. Negative overlap	.06 (.10)	–	–	–	–	−.154
5. Outgroup evaluation	4.50 (1.04)	–	–	–	–	–

* Correlation is significant at the .05 level (2-tailed).
** Correlation is significant at the .01 level (2-tailed).
*** Correlation is significant at the .001 level (2-tailed).

were asked to rate the extent to which each of the seven adjectives characterizes how they feel when mixing with British people (1 not at all, 7 very much), Cronbach's $\alpha = .83$.

3.1.4. Criterion variable

3.1.4.1. Evaluation of the outgroup. To enhance generalizability, we here used a different measure of evaluation to that used in Study 1. Participants were asked to rate their feelings toward British people on six bipolar evaluative dimensions (ranging from 1 to 7): *warm/cold*, *negative/positive*, *friendly/hostile*, *suspicious/trusting*, *respect/contempt*, and *admiration/disgust* (derived from the scale used by Wright, Aron, McLaughlin-Volpe, & Ropp, 1997), Cronbach's $\alpha = .79$.

3.2. Results and discussion

3.2.1. Preliminary analysis

In order to form the projection index, we calculated for each participant (a) the number of positive traits that were shared between the self and outgroup and (b) the number of negative traits that were shared between the self and outgroup. Each participant's answers were coded as 1 if the personality trait was ticked and 0 if it was not ticked. Then, each participant's answers for the self were multiplied with the answers for the outgroup, a process that resulted in a measure of the traits that were selected for both self and outgroup (coded as 1 if the trait was shared and 0 if the trait was not shared). From this new index of 20 traits, we averaged the number of positive and negative traits that were simultaneously attributed to both the self and the outgroup per participant (resulting in a range from 0 if none of the traits were shared to 1 if all the traits were shared); that is, projection from the self to the outgroup.

Correlations between all variables can be found in Table 2. Positive contact was positively related to evaluation of the outgroup and to projection of positive traits, while negatively related to intergroup anxiety. As predicted, there was no relationship between positive contact and projection of negative traits. The mediators, again apart from negative overlap, were highly correlated in the expected directions both with each other and with the outcome variable (evaluation). Of particular note is the finding that intergroup anxiety and projection were negatively correlated.

3.2.2. Path analysis

Path analysis was computed to examine whether positive contact predicted evaluation of the outgroup via positive trait projection and intergroup anxiety. Fig. 1 shows the significant paths of the hypothesized model (hereafter referred to as Model 1). As this figure illustrates, there was an indirect path from positive contact to outgroup evaluation via both hypothesized mediators. Positive contact was related to higher projection of positive traits to the outgroup ($\beta = .38$, $p < .01$) and in turn, projection of positive traits was associated with higher outgroup evaluation ($\beta = .30$, $p < .05$).

Positive contact was also related to outgroup evaluation via intergroup anxiety. Specifically, positive contact reduced intergroup anxiety ($\beta = -.55$, $p < .001$); while reduced anxiety was related to higher outgroup evaluation ($\beta = -.26$, $p = .065$). Positive contact, overlap in positive traits and intergroup anxiety explained 23% of the variance in evaluation of the outgroup.

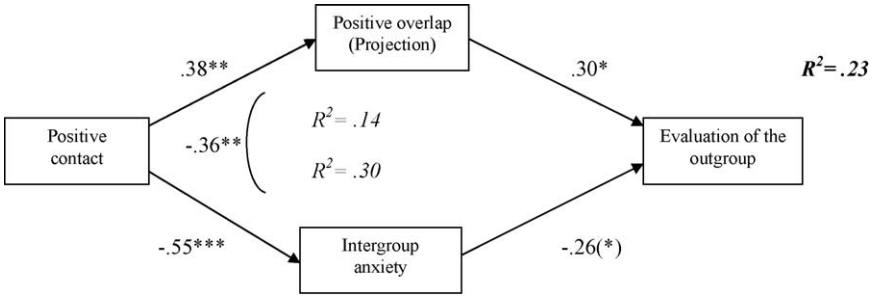

Fig. 1. Path model showing the relationship between positive contact, positive overlap, intergroup anxiety and the outcome of evaluation of the outgroup (Study 2). Numbers are standardized regression coefficients (β). Only significant paths are reported. $^{+}p = .065$; $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

Table 3
Summary of the alternative models tested in Study 2.

	Level 2	Level 3	Level 4	Chi-square	RMSEA	CFI
Model 1	Projection Anxiety	Outgroup evaluation		(1) = .001, p = .969	<.0005	1.000
Model 2	Projection	Anxiety	Outgroup evaluation	(3) = 14.88, p = .002	.273	.678
Model 3	Anxiety	Projection	Outgroup evaluation	(3) = 4.30, p = .231	.090	.965
Model 4	Outgroup evaluation	Anxiety Projection		(2) = 14.97, p = .001	.350	.649

Level 1 = predictor (positive contact).

The fit of Model 1 was good, $\chi^2(1) = .001$, $p = .969$, CFI = 1.000 and RMSEA < .0005. When we added a direct path from contact to evaluation, this path was not significant ($\beta = .01$, $p = .969$), and a Sobel test revealed that positive overlap mediated the contact-evaluation relationship ($z = 2.01$, $p < .05$).[3] The anxiety-evaluation path became non-significant ($\beta = -.25$, $p = .105$), however a Sobel test confirmed this indirect mediational path from contact to evaluation via anxiety ($z = 2.95$, $p < .01$). In order to establish if the fit of this model was better than alternatives, three other models were tested. Overall, the suggested model had the best fit compared to all other models. A summary of the fit of all alternative models can be found in Table 3.

To summarize, we found frequent and positive contact to be associated with higher projection of positive characteristics from the self to outgroup, which in turn, was related to increased evaluation of the outgroup. Importantly, there was no relationship between contact and the projection of negative traits. The role of intergroup anxiety was also confirmed. Positive intergroup contact was related to reduced intergroup anxiety, which, in turn was associated with higher evaluations (although the meditational role of anxiety was somewhat more mixed; the relevant Sobel test confirmed the mediation, however the anxiety-evaluation path was non-significant when the direct path from contact to anxiety was added). Comparison of different models also supports the conclusion that these cognitive and affective routes to bias reduction are independent from each other, rather than one being the route by which the other has its effects.

These results provided support for the hypothesis that projection is an underlying mechanism that can help explain why positive contact improves outgroup evaluations. Study 2 shows how positive contact can heighten the projection of positive traits, and how this projection can improve outgroup attitudes, but we have not yet tested a complete model that also includes the hypothesized relationship between similarity to self and projection. If we want to argue that the projection of positivity accounts for improved outgroup attitudes because those outgroup members come to be perceived as generally more similar to self, we must include this as an intermediate step between contact and projection. Such a step is specified both as part of the process leading to improved attitudes following contact (Gaertner et al., 1993) and as a pre-condition for projection (Ames, 2004a, 2004b). We therefore tested an elaborated model including similarity to self in Study 3.

4. Study 3

From social projection research, it is clear that perceived general similarity between self and a target is a key factor facilitating projection (Ames, 2004a, 2004b; Holtz, 2003). People project more when the target group is more similar to the self. Ames (2004b) proposed a Similarity Contingency Model of social inference in which perceived similarity moderated the levels of projection to target groups. Importantly, according to the model, similarity and projection are two quite distinct cognitive processes, with perceived self-target group similarity preceding projection and being a more general process than attributing projected characteristics to others. Perceived similarity is also found to promote a common group membership (Dovidio, Gaertner, Kawakami, & Hodson, 2002; Gaertner et al., 1990) and mutual attraction (Byrne, 1969), all of which are consistent with the idea that positive contact leads to more positive outgroup attitudes because outgroups are drawn closer to the self, a situation that facilitates projection.

4.1. Method

4.1.1. Participants and procedure

Sixty-seven International students of the University of Birmingham participated in this questionnaire-based study that examined their relations with British people. The participants were approached individually after language classes at the University and received a small payment in exchange for their participation. Out of them, 35 were women and 32 were men.[4] With respect to their background, 40 were from Asia, 14 from Europe, 9 from Americas and 4 from Africa.

[3] Overlap in both positive and negative traits (overall overlap), despite being correlated with contact and evaluation was not found to mediate their relationship ($z = 1.29$, $p = .200$).

[4] Due to an omission in questionnaire construction, no age data were collected.

Table 4
Means, standard deviations and correlations between all variables, Study 3.

	M (SD)	1.	2.	3.	4.	5.	6.	7.	8.
1. Positive contact	23.69 (10.55)	–	.502***	−.449***	.170	.173	.242 (*p* = .056)	−.089	.229 (*p* = .065)
2. Self–outgroup similarity	3.36 (1.60)	–	–	−.446***	.177	.013	.356**	−.225	.264*
3. Intergroup anxiety	2.99 (1.01)	–	–	–	−.195	.023	−.349**	.144	−.401***
4. Self-ingroup overlap in positive traits	.36 (.25)	–	–	–	–	.406***	.582***	.317*	.327**
5. Self-ingroup overlap in negative traits	.06 (.10)	–	–	–	–	–	.425***	.657***	.084
6. Self-outgroup overlap in positive traits	.24 (.24)	–	–	–	–	–	–	.234	.328**
7. Self-outgroup overlap in negative traits	.04 (.09)	–	–	–	–	–	–	–	−.054
8. Evaluation of the outgroup	4.56 (.93)	–	–	–	–	–	–	–	–

* Correlation is significant at the .05 level (2-tailed).
** Correlation is significant at the .01 level (2-tailed).
*** Correlation is significant at the .001 level (2-tailed).

4.1.2. Predictor variables

4.1.2.1. Quantity and quality of contact. Three items measured quantity of International students' contact with British people. The items were: "How many British people do you know", "In every-day life how frequently do you interact with British people and at university", "How frequently do you speak to British students". A 7-point scale (1–7) was used and high numbers indicated quantitatively high contact (Cronbach's $\alpha = .77$). The same items as in Study 2 were used to measure quality of contact (Cronbach's $\alpha = .58$). Again, we calculated a single index of the multiplication of the two variables.

4.1.3. Mediating variables

4.1.3.1. Similarity with the outgroup. One item measured general perceived similarity to self: "In terms of general attitudes and beliefs, how similar do you feel to British people?" (1, not at all, 7, very much).

4.1.3.2. Intergroup anxiety. The same items were used as in Study 2 (Cronbach's $\alpha = .77$).

4.1.3.3. Projection. The same items as in Study 2 were used with the addition of a third list of traits referring to the ingroup ("people who share your nationality"). The Cronbach's alphas are $\alpha_{\text{self-positive}} = .62$, $\alpha_{\text{self-negative}} = .41$; $\alpha_{\text{ingroup-positive}} = .64$, $\alpha_{\text{ingroup-negative}} = .71$; $\alpha_{\text{outgroup-positive}} = .67$, $\alpha_{\text{outgroup-negative}} = .69$.

4.1.4. Criterion variable

4.1.4.1. Evaluation of the outgroup. The same items were used as in Study 2 (Cronbach's $\alpha = .71$).

4.2. Results and discussion

Correlations between all variables (see Table 4) showed that positive contact was related to outgroup evaluation and both intergroup anxiety and the projection of positive traits to the outgroup. In contrast, as predicted, overlap with the ingroup did not correlate with positive contact. This finding, as in Study 1, confirmed Gaertner et al.'s specification (1993) that, after positive contact, the self-outgroup overlap is higher but the self-ingroup overlap remains unchanged. As in Study 2, negative trait overlap was uncorrelated with the predictor and outcome variable and anxiety was negatively correlated with projection of positive traits to the outgroup and with evaluation of the outgroup; outgroup projection of positive traits was positively associated with outgroup evaluation.

4.2.1. Path analysis

Fig. 2 illustrates the significant paths of the predicted model. As hypothesized, the results of the path analysis suggested that positive contact had an indirect effect on outgroup evaluation via both projection and intergroup anxiety, but also had its effect on both mediators via a common indirect route, similarity to self. Positive contact had a significant positive effect on perceived similarity to self ($\beta = .50$, $p < .001$) which, in turn, was positively related to projection ($\beta = .38$, $p < .001$). Projection then predicted outgroup evaluation ($\beta = .24$, $p = .045$). Similarity also predicted lower intergroup anxiety ($\beta = -.45$, $p < .001$),

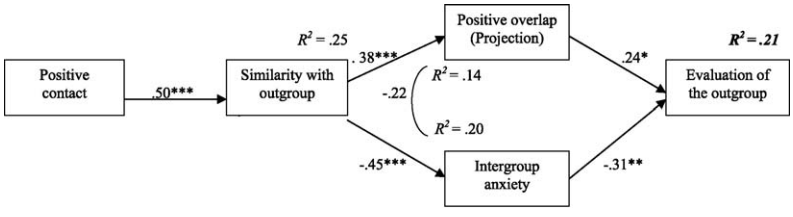

Fig. 2. Path model showing the relationship between positive contact, positive overlap, intergroup anxiety and evaluation of the outgroup, moderated by identification (Study 3). Numbers are standardized regression coefficients (β). Only significant paths are reported. *$p < .05$; **$p < .01$; ***$p < .001$.

Table 5
Summary of the alternative models tested in Study 3.

	Level 2	Level 3	Level 4	Chi-square	RMSEA	CFI
Model 1	Similarity	Projection Anxiety	Outgroup evaluation	(4) = 5.88, p = .208	.084	.964
Model 2	Projection	Similarity Anxiety	Outgroup evaluation	(4) = 23.45, p = .000	.271	.624
Model 3	Anxiety	Projection Similarity	Outgroup evaluation	(4) = 15.40, p = .004	.208	.779
Model 4	Projection Anxiety	Similarity	Outgroup evaluation	(4) = 19.76, p = .001	.244	.695
Model 5	Similarity	Anxiety Outgroup evaluation	Projection	(4) = 9.62, p = .047	.146	.891
Model 6	Similarity	Projection Outgroup evaluation	Anxiety	(4) = 13.42, p = .009	.189	.818
Model 7	Outgroup evaluation	Projection Anxiety	Similarity	(4) = 21.23, p = .000	.255	.666

Level 1 = predictor (positive contact).

and anxiety was negatively associated with outgroup evaluation ($\beta = -.31$, $p < .01$). Positive contact, similarity, projection and anxiety accounted for 21% of the explained variance in outgroup evaluation. The fit of the proposed model was good, $\chi^2(4) = 5.88$, $p = .208$, CFI = .964 and RMSEA = .084. When adding a direct path from contact to evaluation, the indirect paths remained significant but this path was not significant ($\beta = .03$, $p = .770$) and the model fit was not good, $\chi^2(3) = 5.81$, $p = .121$, CFI = .946 and RMSEA = .119. Sobel tests were calculated to confirm the hypothesized mediational paths. A Sobel test revealed that similarity mediated the relationship between positive contact and projection of positive traits to the outgroup ($z = 2.12$, $p = .034$). This confirmed the predictions derived from Ames' (2004b) Similarity Contingency Model. A further Sobel test confirmed that projection (marginally) mediated the similarity-evaluation path ($z = 1.80$, $p = .07$). Similarity was also found to mediate the contact-anxiety path ($z = -.2.11$, $p = .035$). Finally, a Sobel test confirmed the mediational role of anxiety in the similarity-evaluation path ($z = 2.29$, $p = .02$).

With the intention of testing weather this model fit the data better than other models, a number of alternatives were tested. The fit of these alternative models, all of which systematically vary the hypothesized relations between similarity, projection, anxiety and evaluation, can be found in Table 5. It was clear that only Model 1 fit the data well, and it did so better than all the alternatives tested.

To summarize, in this study we replicated and extended the model developed in Studies 1 and 2. Critically, general self-outgroup similarity, mediated the contact-projection relationship. This is consistent with both Gaertner and Dovidio's (2000) Common Ingroup Identity Model and Ames's Similarity Contingency Model of social inference. Positive and frequent contact weakened the barriers between self and outgroup and increased similarity. Consistent with the Similarity Contingency Model, higher projection to the target group is related to increased perceived similarity to the self (Ames, 2004a, 2004b). Similarity associated with positive contact therefore appeared to encourage the projection of positivity to former outgroup members (although this effect was marginal), which, in conjunction with reduced anxiety, related to improved outgroup attitudes.

5. General discussion

5.1. Theoretical implications

This research investigated the role of projected positive attributes in explaining the relationship between intergroup contact and outgroup attitudes. We have proposed an integration of intergroup contact and social projection theories. As shown in the projection literature, projection is higher under general perceived overlap (similarity) (Ames, 2004a, 2004b). Also the projected positivity to ingroups can explain ingroup favoritism (Clement & Krueger, 2002). In the same way, the increased general perceived similarity and the corresponding projection of positivity to outgroups, following positive intergroup contact, should improve outgroup attitudes. Along the way we have supported other key processes that we know operate in intergroup contexts. These include the idea that the self is typically positive (so what is projected should primarily be positive, Cadinu & Rothbart, 1996) and that intergroup contact changes attributes towards outgroups, not ingroups (Gaertner & Dovidio, 2000; Gaertner et al., 1990, 1993). In three studies, on the basis of an integration of these research areas, we tested our model that contact leads to improved outgroup evaluation via increased perceived similarity between the self and outgroup and the corresponding projection of positive traits. The findings we have reported support this model, in varied contexts, and using different measures.

In Study 1 we investigated the role of perceived self-outgroup overlap in contact relations. Frequent and positive contact was associated with improved outgroup evaluations. Importantly, however, we found this relationship to be mediated by perceived self-outgroup overlap. We showed that positive contact was related to improved outgroup attitudes via increased

self-outgroup overlap; and there was no association between contact and self-ingroup overlap or ingroup evaluations. This supported the idea that positive contact predicted projection processes focused on the outgroup, but did not relate to projection to the ingroup. This first study offered good support for the hypothesized projection process but did not allow a test of the more precise prediction that it would be specifically *positive* self-traits that would be projected to the former outgroup members.

In Studies 2 and 3, to do this we used a different scale that has been used to measure projection of traits previously (e.g., Krueger & Stanke, 2001; Riketta, 2006). The findings supported our hypotheses and model of the contact–bias relationship. Positive contact predicted outgroup evaluation via the mediating mechanisms of intergroup anxiety and the projection of positive, but not negative, traits to the outgroup. This is consistent with Gaertner and Dovidio's (2000) Common Ingroup Identity Model which argues bias is reduced because, following contact, former outgroupers benefit from the same association with self-positivity as original ingroupers. It is also consistent with Self-Anchoring Theory (Cadinu & Rothbart, 1996), which argues that ingroup favoritism can be explained by the projection of self-attributes, that are typically positive (Sears, 1983), to the ingroup. The findings were consistent with Ames' (2004b) Similarity Contingency Model: similarity to the outgroup mediated the positive contact-positive projection relationship. Finally, the findings also build on research by Riketta (2006) who found that outgroup projection is stronger under conditions of intergroup harmony and weaker under perceived intergroup conflict. Here we specify how it is positive contact and the resulting increase in self-outgroup similarity that facilitates the projection of positivity to outgroups.

Another finding worthy of discussion was that in Study 3 we showed that projection of positivity to the ingroup does not change with contact: more positive outgroup attitudes are attributable only to increased projection of positivity to the outgroup. Again, this is consistent with our argument that bias is reduced due to former outgroup members moving closer to the self, not by any variation in the perception of original ingroup members. Intergroup contact is related to higher similarity with outgroupers, which correspondingly associates with more projection of positivity the outgroup, not with changes in the level of projection to original ingroupers.

Taken together, the results from three studies highlight the interplay between affect and cognition on attitudes. Our research adds to a growing literature specifying the mediators of reduced prejudice in contact settings. Research on intergroup relations places important emphasis on understanding how biases are created and with which interventions they can be reduced. Dovidio et al. (2004) emphasized the importance of explaining how affective and cognitive mediating processes may differentially influence responses towards outgroups (see also Esses & Dovidio, 2002). Based on the findings of this research we argue that positive contact evokes greater self-outgroup similarity, which increases outgroup liking via projection of positivity. Importantly, both projection of positivity and reduced anxiety resulted in improved outgroup attitudes, but they did so independently (models testing whether projection predicted anxiety; or whether anxiety predicted projection, did not fit the data as well as our predicted model). This suggests that cognitive and affective processes that improve outgroup attitudes do so independently from one another.

Despite the consistent findings, we should acknowledge that we employed a cross-sectional design throughout our research. A main criticism of correlational studies derives from the fact that they do not allow the inference of causality between variables. Consistent with other researchers (Paolini et al., 2004, Vonofakou, Hewstone, & Voci, 2007) we argue that a way of addressing this limitation came by comparing the fit of the predicted model with the fit of alternative models that investigated different relations between the variables. In all cases the model with the best fit to our data was the predicted projection model. Nevertheless, further research into the projection of positivity in intergroup contact will undoubtedly benefit from a range of alternative approaches (e.g., longitudinal and experimental). Longitudinal studies, for example, that test the relationship between contact and reduced biases will shed light in the causal directions between the variables. Furthermore, the full model we propose (Study 3) was tested only with International students in the United Kingdom; further research should examine if the model applies equally well to other contexts and with regard to different groups. Future research can also investigate the possible effects of negative contact on projection, and other cognitive processes related to intergroup interactions.

5.2. Practical implications

The findings of our research have important implications for the understanding of International students' experiences in host nations. It is estimated that the number of International students in higher education will reach 5.8 million by 2020 (Bohm et al., 2004). It is therefore important to identify the problems that arise from this new social reality for both the newcomers and the host society. Problematic relations with host nationals, like home students, have been found to have negative consequences in the cultural adjustment of International students (Paige, 1990; Pedersen, 1991). It has been found that International students report feelings of isolation and difficulties when mixing with home students (UKCOSA, 2004). Respectively, home students tend to ascribe unfavorable attributes to International students (such as frightened, depressed) due to perceived cultural and social adjustment problems (Spencer-Rodgers & McGovern, 2002) or communication barriers like different languages (Giles & Robinson, 1990; Wiseman & Koester, 1993). Positive, co-operative contact can potentially help improve the perceptions of both groups. According to the report of the Council for International Education in the United Kingdom (UKCOSA, 2004) a significant minority of International students (37%) reported that they did not have enough opportunities to meet UK students. Acknowledging the benefits of cross-group contact for increasing similarity and improving attitudes, Universities should offer the opportunity for International and home students to interact positively, not

only in academics but also social contexts (for example by organizing and supporting trips, activities, etc.). Such initiatives can facilitate the cultural adjustment of International students.

By applying the core ideas of this research, we can be optimistic that promoting positive contact between International and British students or the host society in general, will improve intergroup attitudes and promote the social adjustment of International students. As academic institutions around the world, primarily in the European Union and the United States, are "internationalizing" by recruiting students from abroad, intercultural understanding is mandatory. Our research may help towards a better understanding of the nature of the relations between International students and host societies and provide some answers regarding how the relations can be improved.

6. Conclusion

The aim of this research was to explore the role of similarity to self and projection in the relationship between intergroup contact and outgroup evaluation. We integrated two previous distinct literatures: Intergroup Contact Theory and Social Projection Theory. The combination of these ideas led to the prediction not only that positive contact will bring the outgroup closer to the self, but that this will create the conditions needed to facilitate social projection. In three studies, we consistently found support for this model. Positive contact was associated with improved intergroup attitudes via not only reduced intergroup anxiety but also increased projection of positive self-attributes to the outgroup. These findings therefore serve to both confirm the processes outlined in previous work on contact and projection, while extending and applying them to the development of interventions to reduce prejudice, discrimination, and social conflict.

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