

## Intergroup contact and intergroup attitudes: A longitudinal study

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### *Abstract*

*A longitudinal study (N = 109) of interschool contact and attitudes was conducted to test Allport's (1954) Contact Hypothesis and Brown and Hewstone's (2005) addendum to it on the moderating role of typicality in the contact-attitude relationship. Three different measures of intergroup attitude were employed, including a new measure of inhumanisation (Leyens et al., 2000). Support for the hypotheses was found on all three measures in the longitudinal analyses. Quantity of contact with a member of the outgroup was consistently associated with more favourable attitudes towards the outgroup as a whole. Importantly, contact was found to predict attitude but the reverse causal path was not significant. Also, on one measure there was an indication that the effects of contact quality were more beneficial when the contact persons were seen as typical of the outgroup than when they were not. It is concluded that, as originally hypothesised by Allport, contact with members of an outgroup can improve intergroup attitudes, but especially if those people can be seen as representative of their group. Copyright © 2006 John Wiley & Sons, Ltd.*

The persistence and pervasiveness of various kinds of intergroup bias is by now a well-documented phenomenon (Brewer, 1979; Mullen, Brown, & Smith, 1992; Turner, 1981). Fortunately, for those concerned with improving human social relations, it also appears that such biases are far from being an inevitable feature of intergroup relationships and, indeed, can be significantly reduced under the right circumstances. One of those circumstances is when members of groups have contact with each other, contact which involves cooperative activity between participants of equal standing, permits the development of meaningful cross-group friendships and enjoys the explicit support of institutional authorities (Allport, 1954).

This Contact Hypothesis, as it has come to be known, has been the subject of intensive research over the past 50 years and there is little doubt that most of its core propositions have been well supported (Amir, 1969; Brown & Hewstone, 2005; Pettigrew, 1998; Pettigrew & Tropp, 2000). However, despite

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this impressive empirical vindication, two issues remain relatively under-explored in tests of the Contact Hypothesis. One concerns its assumed causal direction *from* contact *to* attitude change. The vast majority of field tests of the Contact Hypothesis have employed cross-sectional designs in which the causal interpretability of the direction of effects remains more or less ambiguous (Pettigrew, 1998). There is still a scarcity of longitudinal designs that can help in this regard. The second issue is that of individual-group generalisation—that is, what factors facilitate the extension of the positive change towards the particular outgroup individuals with whom the contact occurs to the outgroup as a whole? Early on in the life of the Contact Hypothesis, Cook (1978) noted this as an important question and attempts to answer it remain controversial (Brown & Hewstone, 2005; Pettigrew, 1998). The research reported here is a modest attempt to address both of these issues.

In field settings, where experimental or quasi-experimental interventions are not always possible, the longitudinal design remains a powerful tool in the social scientist's search to identify causal processes (Bijleveld et al., 1998; Cook & Campbell, 1979; Finkel, 1995). Its essential logic is simple: if variable A (e.g. contact) is presumed to cause changes in an outcome variable B (e.g. intergroup attitude), then the correlation between A at time 1 ( $T_1$ ) with B at time 2 ( $T_2$ ), controlling for B at  $T_1$  should be higher than the correlation between B at  $T_1$  and A at  $T_2$  (controlling for A at  $T_1$ ). Although there are special circumstances when such an inference may be problematic (e.g. Cohen, Cohen, West, & Aiken, 2003; Finkel, 1995), longitudinal designs are still widely accepted as providing interpretative advantages over the more commonly used cross-sectional approach (Finkel, 1995; Pettigrew, 1996). In the context of research on intergroup contact, the question of causal order is important because, while the Contact Hypothesis makes a clear prediction that contact causes attitude change, the reverse direction is also quite plausible—that is, that people's prior attitudes will affect the number and nature of their contacts with outgroup members. It is thus surprising that longitudinal tests of the Contact Hypothesis are not that common.

An early example of such longitudinal research was Stephan and Rosenfield's (1978) study of white American school children's attitudes towards minority groups during a programme of school desegregation. Over a 2-year period, increases in interethnic contact were strongly predictive of more positive intergroup attitudes. Importantly, initial attitudes did not predict subsequent contact, supporting the causal direction indicated by the Contact Hypothesis. Several other longitudinal studies have also shown that contact generally has beneficial effects on intergroup attitudes (Eller & Abrams, 2003, 2004; Hamilton & Bishop, 1976; Maras & Brown, 1996) although, when the conditions under which the contact occurs are sub-optimal, the resulting change can sometimes be in a negative direction (Gerard & Miller, 1975; Schofield, 1979). More recently, however, Levin, van Laar, and Sidanius (2003) found evidence for both causal directions in their study of American college students: initial interethnic attitudes predicted the number of outgroup friends a year later; and the number of outgroup friends subsequently predicted final intergroup attitudes (see also Eller & Abrams, 2003, 2004). Most of the above studies were conducted in the context of interethnic or international attitudes. In the study to be reported below we use a longitudinal design to study contact and attitudes between two neighbouring schools, thus extending the range of contexts to which the Contact Hypothesis has been applied.

Cook (1978), whilst reviewing the evidence that intergroup contact produced short-term and positive attitude change, also noted that the wider effects of contact, particularly towards outgroup members not yet encountered, were much less frequently observed. In a recent reformulation of the Contact Hypothesis, Brown and Hewstone (2005) argued that the most promising avenue for addressing the generalisation issue was to ensure the retention of some category salience in contact situations. The reason for this is that, if categories are salient, then the respective group members are more likely to be seen as representative or typical of their groups and any change in attitude towards them will then be associated with the group as a whole. Brown and Hewstone (2005) reviewed several studies that showed that, indeed, increased category salience in cooperative encounters—usually

operationalised as the perceived typicality of the outgroup contact persons—was reliably associated with more favourable attitudes towards the outgroup as a whole (e.g. Brown, Maras, Masser, Vivian, & Hewstone, 2001; Brown, Vivian, & Hewstone, 1999; Greenland & Brown, 1999, study 1; Voci & Hewstone, 2003; Wilder, 1984). However, with a single exception (Greenland & Brown, 1999), there have been no longitudinal tests of this moderation hypothesis.

Before formally stating our hypotheses, a brief discussion of one of our dependent measures is necessary. In the contact literature the main outcome variables of interest have typically been various explicit measures of intergroup attitude, prejudice or affect (Pettigrew & Tropp, 2000). Indeed, we used two such measures in this study—desired closeness to the outgroup and evaluative ratings of it on some stereotypic dimensions. Useful though such indicators are, their very explicitness does mean that they may be vulnerable to social desirability factors. Respondents may not always feel inclined to express very negative attitudes or feelings on such measures. Although this will not usually be a serious problem when testing correlational hypotheses (as is the case here), still it would seem desirable to extend the range of measures employed in contact research to less direct indices of intergroup attitude.

One promising candidate in this respect has been provided by Leyens et al.'s (2000) *infracommunication* hypothesis. The starting point for this idea is 'psychological essentialism', the tendency for people to endow groups with certain inherent or essential properties (Rothbart & Taylor, 1992). According to Leyens et al. (2000) these 'essences' are often used by people to differentiate between ingroups and outgroups. Leyens and his colleagues propose that one particular form of that intergroup differentiation is for people to believe that their ingroups are more prototypically 'human' than outgroups. A characteristic way this occurs is to believe that ingroup members experience more uniquely human emotions (labelled 'secondary' emotions—Demoulin et al., 2004) than do outgroup members. No such difference is expected for more primitive (or 'primary') emotions. This phenomenon is labelled 'infracommunication' because it implies that members of outgroups are less 'human' than ingroup members because of their relative inability to access specifically human emotions. In a series of studies, using both explicit and implicit techniques in different intergroup settings, Leyens and others have found evidence that people do, indeed, attribute more secondary emotions to the ingroup than to the outgroup (Gaunt, Leyens, & Demoulin, 2002; Leyens et al., 2001; Paladino et al., 2002). Because the technique used to measure *infracommunication* is indirect—respondents are not aware, when attributing emotions typically held by members of ingroup/outgroup, which are 'primary' and which 'secondary'—it may be less susceptible to self-presentational demands than more conventional measures. In any event, it is of interest to explore if and how *infracommunication* is related to intergroup contact variables, the first time to our knowledge that this has been done. In summary, then, a longitudinal study was conducted to examine whether the amount and quality of contact with an outgroup affected subsequent intergroup attitudes. Assuming a contact-attitude causal sequence, it was hypothesised that contact at *T1* would be more strongly related to attitudes at *T2*, when controlling for initial attitude, than the reverse attitude-contact relationship. Furthermore, from the Brown and Hewstone (2005) model, it was hypothesised that perceived typicality of the outgroup person with whom one has contact would moderate the contact-attitude relationship such that stronger positive contact-attitude correlations were expected at higher levels of perceived typicality than at lower levels of typicality.

### **Intergroup Context**

This research examined the attitudes of students attending a British state secondary school towards members of a private secondary school in the same town. Within the British education system the relationship between state and private schools is marked by very clear differences in class and

educational achievement (private schools being of generally higher status) and not a little mutual suspicion and wariness (Hewstone, Jaspars, & Lalljee, 1982). Moreover, children enter the state or private sector quite early in their educational careers, typically attending 'primary' (state) or 'preparatory' (private) schools prior to entering their secondary institutions. There is thus marked segregation in friendship networks from a young age with only incidental contact prior to secondary schooling. The particular context studied here was no exception to these general patterns.

## METHOD

### Participants

The final sample for the longitudinal design consisted of 109 students (56 girls and 53 boys; mean age = 12.2 years, range 11–16 years) at a British secondary school who agreed to participate on a voluntary basis. These participants were those remaining from a larger sample of 219 students who were recruited at *T1* and 148 students at *T2* (approximately 14 weeks later) whose responses could be matched at both time points. The reasons for this relatively high attrition rate were variously absenteeism, failures to return questionnaires or incorrect recall of individual code numbers. However, as we report below, there was no reason to suppose that these 'matched' participants differed noticeably from the 'unmatched' participants at either testing point.

### Procedure

All measures were included in two identical questionnaires that were distributed to students during registration periods at the beginning of a week (once near the start of the school year, the other at the start of the next term). After a brief explanation of the study by two of the researchers, participants were asked to return the completed questionnaires by the end of the same week. After the second period of data collection, all students were provided with a short written debriefing sheet.

### Measures

There were three main sets of measures in the questionnaire. The first were questions assessing the amount and quality of contact the participant had with a student that they knew at the private school.<sup>1</sup> Amount of contact was assessed by asking how often they saw that person ('less than once a year' (1) to 'daily' (7)). This was followed by three questions tapping the quality of their relationship with that person in terms of its 'closeness', 'equality' and 'cooperativeness' (all on 1–7 scales). These were combined to form a reliable index of contact quality ( $\alpha = 0.66$  at *T1*,  $0.77$  at *T2*). Typicality was assessed with a single item asking how typical the contact person was of the outgroup (1–7 scale).<sup>2</sup> Then followed the measures of intergroup attitude: four items tapping a desire for closeness with the other school ('How much do you like Z school students?', 'How much would you like to attend Z school?', 'How much would you like to go on a school trip with students from Z school?', 'How much would you like to be

<sup>1</sup>Students who reported not knowing anyone at the other school skipped these questions and moved directly to the intergroup measures. Thus, the analyses involving contact measures had a reduced sample size.

<sup>2</sup>Typicality was measured with a single item because of practical constraints imposed on us in terms of the permitted length of the questionnaire. Obviously, it would have been preferable to have had a multi-item index.

friends with a student from Z school?';  $\alpha = 0.86$  at  $T1$ ,  $0.83$  at  $T2$ ; these were anchored with 'not at all' (1) and 'a lot' (7)); four items evaluating the other school on bipolar 7-point traits ('In general, I see Z students as "unfriendly–friendly", "lazy–hard-working", "not clever–clever", "not good at sport–good at sport";  $\alpha = 0.80$  at  $T1$ ,  $0.85$  at  $T2$ );<sup>3</sup> and the measure of inhumanisation.

For the latter we developed a different technique from that conventionally used (e.g. Leyens et al., 2001). Because we were concerned that some of our younger respondents (aged as young as 11 years) might find the usual technique too abstract, we constructed four scenarios in which protagonists had a positive or negative experience. Two of the protagonists were said to come from the participants' own school, two from the other school. The wording was as follows:

The following are accounts of things which happened to two students at X/Z school last term. They are about your age. Think about how they might have felt after these events.

- (a) Chris enjoys playing football and is in the school team. At the end of the summer term last year he scored the winning goal in a match against another local school.
- (b) Amy really enjoys art and her parents are both artists. She thought that she had done well in the art exam that she took last term but she found out that she had failed.
- (c) Beccy is a talented athlete and a member of the school athletics team. In a recent interschool tournament her relay team won their event and ensured that their school won the tournament overall.
- (d) David is best friends with Tom. They see each other most nights and usually play computer games together. Recently, David found out that Tom's granddad had died.

Beneath each scenario was the same list of 16 emotion words (randomly ordered) and participants were asked to underline all that might apply to how the protagonist felt after the event described. Eight of these words were designated as 'primary' (enjoyment, pleasure, excitement, affection, happiness, caring, anger, distress), and eight 'secondary' (hope, good mood, tenderness, sympathy, optimism, elation, humiliation, sorrow).<sup>4</sup> The order of the two 'ingroup' scenarios and the two 'outgroup' scenarios was counterbalanced, that is for half the respondents scenarios 1 and 2 had ingroup protagonists, and scenarios 3 and 4 had outgroup protagonists; for the remainder this order was reversed.

## RESULTS

Our analytic strategy was first to compare the  $T1$  participants that remained in or dropped out of the study between  $T1$  and  $T2$  to see whether the groups were comparable on the different measures. We then analysed the measure of inhumanisation to establish if the phenomenon could be observed in this context with our new measure. Finally, we conducted a longitudinal analysis to investigate whether contact was causally related to the intergroup attitude (outcome) measures.

### Panel Attrition and Comparison of Participants

A MANOVA across the set of measures at  $T1$  revealed that there were no significant differences between the people who later dropped out of the study and those who stayed in the sample at both time

<sup>3</sup>These two measures were shown to correlate quite highly with one another, but their empirical distinction was clearly established: Principal components analysis showed that these two scales loaded on two distinct factors, explaining 36.0% and 32.1% of the variance at  $T1$  and 34.7% and 34.2% of the variance at  $T2$ , respectively.

<sup>4</sup>The words were taken from Demoulin et al. (2004). According to Appendix A in that paper, the mean 'humanity' ratings of the 'primary' and 'secondary' emotion words were 2.70 and 4.86, respectively (on a 1–7 scale). These ratings were obtained from a sample of 27 English-speaking respondents.

points, multivariate  $F(6, 129) = 1.15, p = 0.34$ . Examination of the individual univariate analyses of all measures confirmed this.

### Infrachumanisation

We first examined the infrachumanisation measure. Initially, we summed up the number of primary and secondary emotions attributed to ingroup and outgroup members, respectively, across the four vignettes. To assess the extent of general infrachumanisation (one of our outcome measures), we conducted two (protagonist Group membership: Ingroup vs. Outgroup)  $\times$  2 (type of Emotion: Primary vs. Secondary)  $\times$  2 (Valence of emotion: Positive vs. Negative) within-participants ANOVAs separately at  $T1$  and  $T2$ . Evidence of the infrachumanisation phenomenon is indicated by any interaction effect simultaneously involving Group and Emotion.

At  $T1$ , results showed that there were significant main effects of Group,  $F(1, 218) = 39.71, p < 0.001$ ,  $MSe = 1.30$ ; Emotion,  $F(1, 218) = 345.69, p < 0.001$ ,  $MSe = 0.88$ ; and Valence,  $F(1, 218) = 893.88, p < 0.001$ ,  $MSe = 1.60$ . Further, there was a significant Emotion  $\times$  Valence interaction,  $F(1, 218) = 347.75, p < 0.001$ ,  $MSe = 0.91$ , and a significant Group  $\times$  Valence interaction,  $F(1, 218) = 5.17, p < 0.05$ ,  $MSe = 2.79$ .<sup>5</sup> Since there was no Group  $\times$  Emotion interaction, no infrachumanisation was evident at  $T1$ .

At  $T2$ , the same 3-way ANOVA revealed that there were significant main effects of Group,  $F(1, 144) = 7.65, p < 0.01$ ,  $MSe = 1.17$ ; Emotion,  $F(1, 144) = 185.43, p < 0.001$ ,  $MSe = 1.14$ ; and Valence,  $F(1, 144) = 742.80, p < 0.001$ ,  $MSe = 1.66$ . There was also a significant Emotion  $\times$  Valence interaction,  $F(1, 144) = 221.27, p < 0.001$ ,  $MSe = 1.01$ .<sup>6</sup> More importantly, there was a significant Group  $\times$  Emotion interaction,  $F(1, 144) = 19.15, p < 0.001$ ,  $MSe = 0.65$ , and a marginally significant Group  $\times$  Emotion  $\times$  Valence interaction,  $F(1, 144) = 3.33, p = 0.07$ ,  $MSe = 0.65$ . Examining the simple effects of Group within Emotions revealed that more secondary emotions were attributed to the ingroup than to the outgroup ( $Ms = 3.69$  and  $2.92$ ),  $t(144) = 5.73, p < 0.001$ , whilst the ingroup–outgroup difference for the primary emotions was negligible ( $Ms = 4.98$  and  $5.04$ ),  $t(144) = 0.46$ . This is consistent with Leyens et al.'s (2000) infrachumanisation hypothesis. However, in view of the marginal 3-way interaction, we then investigated whether there were differences in infrachumanisation for positive versus negative emotions. We conducted a 2 (protagonist Group membership: Ingroup vs. Outgroup)  $\times$  2 (type of Emotion: Primary vs. Secondary) within-participants ANOVA, separately for positive and negative emotions. For the positive emotions, there was a significant Group  $\times$  Emotion interaction,  $F(1, 144) = 14.20, p < 0.001$ ,  $MSe = 0.88$  (see Table 1).<sup>7</sup> Tests of the simple main effect of Group revealed that only the ingroup–outgroup difference for secondary emotions was reliable,  $t(146) = 3.93, p < 0.001$ , and not that for the primary emotions,  $t(146) = 0.33, p = 0.74$ . This is exactly the expected infrachumanisation pattern. For the negative emotions, only the Group  $\times$  Emotion

<sup>5</sup>The simple effects of Valence within Emotions showed that more positive than negative secondary emotions were attributed ( $Ms = 3.90$  and  $1.98$ ),  $t(218) = 13.75, p < 0.001$ , and also more positive than negative primary emotions were assigned ( $Ms = 7.26$  and  $1.95$ ),  $t(218) = 32.73, p < 0.001$ . The simple effects of Valence within Group revealed that more positive than negative emotions were attributed to the outgroup ( $Ms = 5.05$  and  $1.80$ ),  $t(218) = -17.67, p < 0.001$ , and more positive than negative emotions were also assigned to the ingroup ( $Ms = 6.10$  and  $2.12$ ),  $t(218) = -18.48, p < 0.001$ .

<sup>6</sup>The simple effects of Valence within Emotions showed that more positive than negative secondary emotions were attributed ( $Ms = 4.46$  and  $2.13$ ),  $t(146) = 12.39, p < 0.001$ , and also more positive than negative primary emotions were assigned ( $Ms = 7.94$  and  $2.12$ ),  $t(144) = 29.24, p < 0.001$ .

<sup>7</sup>There were also significant main effects of Group,  $F(1, 144) = 5.78, p < 0.02$ ,  $MSe = 3.04$  and Emotion,  $F(1, 144) = 249.28, p < 0.001$ ,  $MSe = 1.74$ .

Table 1. Evidence for infrahumanisation on positive emotional attributes (T2)

Ingroup	Primary emotions	4.00 (1.57)
	Secondary emotions	2.57 (1.68)
Outgroup	Primary emotions	3.94 (1.68)
	Secondary emotions	1.92 (1.36)

Note: Numbers are means, standard deviations are in parentheses.

interaction was (just) significant,  $F(1, 146) = 4.74, p < 0.05$ ,  $MSe = 0.42$ , but neither of the ingroup–outgroup simple effects tests were reliable,  $t(146) = 1.39, p = 0.17$ , for secondary emotions, and  $t(146) = -0.93, p = 0.36$ , for primary emotions. Thus, given that most of the general infrahumanisation effect appears to be driven by the positive emotional attributes, we decided to use these in the analyses reported below. To simplify our analyses, we created a composite infrahumanisation index (secondary positive emotions attributed to ingroup members minus secondary positive emotions attributed to outgroup members).

### Longitudinal Effects of Contact

Table 2 shows the descriptives and interrelationships among all variables at  $T1$  and  $T2$  and Table 3 shows the correlations between the measures across time. At  $T1$ , quantity of contact correlates significantly and positively with its quality and with desired closeness and it correlates negatively with negative evaluations. This is also true for quality of contact. Typicality during contact is associated with less negative evaluations of the outgroup, while infrahumanisation is not significantly related to any other variable. At  $T2$ , the pattern looks rather similar, except that typicality did not have any significant effects and infrahumanisation correlated with all variables save for typicality. With respect to the interrelationships of variables across time, quantity of contact at  $T1$  was associated with higher desired closeness, lower negative evaluations and lower infrahumanisation at  $T2$ , whereas quality of contact did not have any significant longitudinal effects. Typicality at  $T1$  related to higher desired closeness at  $T2$ .

Longitudinal analyses employed a multiple regression approach. For each outcome measure we constructed hierarchical regression models with  $T1$  quantity and quality of contact,  $T1$  typicality of outgroup members during contact and  $T1$  criterion variable (desired closeness, stereotyping or infrahumanisation) in step 1 and the contact  $\times$  typicality interaction terms (i.e. quantity of

Table 2. Descriptives and interrelationships of variables at  $T1$  (above the diagonal) and  $T2$  (below the diagonal)

Measure	Time		Pearson's correlations ( $r$ )					
	1	2	1	2	3	4	5	6
Quantity of contact	4.57 (2.09)	4.57 (1.94)		0.43***	0.02	0.41***	-0.18*	-0.11
Quality of contact	4.17 (1.31)	4.51 (1.43)	0.43***		0.15	0.44***	-0.33***	-0.05
Typicality	4.63 (1.67)	4.57 (1.80)	-0.11	0.14		0.16	-0.27**	0.02
Desired closeness+	3.82 (1.62)	4.12 (1.47)	0.38***	0.38***	0.09		-0.57***	-0.06
Negative evaluation	3.03 (1.19)	2.86 (1.13)	-0.35***	-0.43***	-0.08	-0.68***		-0.05
Infrahumanisation+	0.60 (1.80)	0.00 (1.33)	-0.25*	-0.28**	0.05	-0.38***	0.45***	

Note: + Means at  $T1$  and  $T2$  differ at  $p < 0.02$ .

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

Table 3. Interrelationships of variables across time (*T1–T2*)

Measures at time 1	Measures at Time 2					
	1	2	3	4	5	6
Quantity of contact	0.72***	0.23	-0.22	0.43***	-0.28*	-0.28*
Quality of contact	-0.00	0.12	0.19	0.22	-0.13	-0.14
Typicality	-0.06	0.07	0.44***	0.28*	-0.09	-0.06
Desired closeness	0.19	0.12	0.18	0.67***	-0.38***	-0.07
Negative evaluation	-0.04	-0.04	-0.12	-0.27**	0.39***	-0.02
Infrahumanisation	-0.26*	0.00	0.09	-0.11	0.17	0.18

Note: Numbers are Pearson's correlations (*r*).

\**p* < 0.05; \*\**p* < 0.01; \*\*\**p* < 0.001.

contact × typicality and quality of contact × typicality) in step 2. The predictors and the moderator were centred before being employed in regression analyses. In these analyses, the effective sample sizes were somewhat reduced (to 67) because they required participants who knew at least one contact person at *T1* in order to conduct the full longitudinal analysis. Table 4 presents the results of the three analyses conducted.

Confirming Hypothesis 1, higher quantity of contact at *T1* predicted more desired closeness, less negative evaluation and less infrahumanisation at *T2*. The overall amounts of variance explained were substantial (58%) for desired closeness, and more modest for evaluation (22%) and infrahumanisation (12%). Quality of contact showed no significant effects on criterion variables over time by itself, but it

Table 4. Longitudinal (*T1–T2*) regression analysis results

IV ( <i>T1</i> )	DV ( <i>T2</i> )	<i>R</i> <sup>2</sup>	$\beta$	<i>t</i>	<i>p</i>
	Desired closeness	0.58**			
Quantity of contact			0.22	2.43	0.02
Quality of contact			-0.16	-1.67	0.10
Typicality			0.17	1.98	0.05
Quantity × Typicality			0.03	0.32	0.75
Quality × Typicality			0.08	0.90	0.37
	Negative evaluation	0.22*			
Quantity of contact			-0.27	-2.23	0.03
Quality of contact			0.01	0.09	0.93
Typicality			0.02	0.16	0.87
Quantity × Typicality			-0.10	-0.80	0.43
Quality × Typicality			-0.22	-1.80	0.08
	Infrahumanisation	0.12			
Quantity of contact			-0.26	-2.07	0.04
Quality of contact			-0.06	-0.44	0.66
Typicality			-0.05	-0.37	0.72
Quantity × Typicality			-0.08	-0.59	0.56
Quality × Typicality			0.03	0.21	0.84

Note:

\**p* < 0.05; \*\**p* < 0.001.



marginally interacted with typicality to predict reduced negative evaluation at *T2*. Because of the relatively low power in our analyses engendered by the participant attrition, we also re-ran the regressions using quantity and quality of contact as unique predictors (i.e. in separate analyses, to conserve df).<sup>8</sup> In these analyses, all the main effects for quantity of contact remained as reported and the Quality  $\times$  Typicality interaction on negative evaluation became significant ( $\beta = -0.20$ ,  $t = -2.01$ ,  $p < 0.05$ ). Analysis of simple slopes (see Aiken & West, 1991) revealed that contact (non-significantly) reduced negative evaluations when typicality was high,  $\beta = -0.21$ ,  $t = -1.44$ ,  $p = 0.15$ , whereas it (non-significantly) increased them when typicality was low,  $\beta = 0.21$ ,  $t = 1.18$ ,  $p = 0.24$ .

### Reversed Longitudinal Analysis

For a complete test of Hypothesis 1, we explored the reverse causal direction of variables. For this purpose, we constructed simultaneous regression models with *T2* quantity and quality of contact as criterion variables, and *T1* desired closeness (or evaluation or infrahumanisation, respectively), *T1* typicality and *T1* contact as predictors. There were no significant effects of desired closeness, evaluation or infrahumanisation at *T1* on either quantity or quality of contact at *T2* (all  $\beta$ s  $< 0.18$ , all  $p$ s  $> 0.11$ ), providing strong support for the hypothesised causal direction.

## DISCUSSION

The main findings of this study can be briefly summarised. First, the *amount* of (self-reported) contact with a member of the outgroup was predictive of more favourable attitudes towards the outgroup as a whole on all three outcome measures, even when controlling for initial attitudes. Second, there was a tendency for perceived typicality to moderate the longitudinal relationship between contact and attitude such that a more positive association between quality of contact and favourable attitude was observed for those believing that the outgroup person was highly typical of the other group than they were for those who saw him/her as less typical. Third, we have developed a new measure of infrahumanisation and shown that it, too, is predicted by contact.

In discussing these findings, four issues seem noteworthy. First, it is important to record that in this novel context of interschool relations—novel, at least from the stand-point of the Contact Hypothesis—we have demonstrated that amount of contact does seem to lead to more favourable intergroup attitudes rather than the other way around. This is further evidence for the causal direction indicated by Allport (1954) and most subsequent contact theorists and is a significant addition to the small corpus of longitudinal tests of the Contact Hypothesis (Eller & Abrams, 2003, 2004; Levin et al., 2003; Stephan & Rosenfield, 1978). It is also noteworthy that the *quality* of contact was not particularly influential on its own in this context. This was somewhat surprising since several other studies have found it to be important, consistent with Allport's (1954) original hypothesis (Brown & Hewstone, 2005). Given the low statistical power of our longitudinal analyses and the less than optimal reliability of the quality measure, we are not inclined to attribute much general significance to its lack of potency here. This conclusion is strengthened by the fact that it did, in fact, interact, albeit weakly, with typicality in one analysis, as we now discuss.

<sup>8</sup>We also investigated whether a multiplicative index of Quantity  $\times$  Quality of contact was predictive of intergroup attitudes, as suggested by Voci and Hewstone (2003). It proved not to be so.

Second, and consistent with Hypothesis 2, there was some weak evidence that the perceived typicality of the contact person as a member of the outgroup was a moderator of the contact-attitude relationship. The quality  $\times$  typicality term was marginally significant in the full regression model and significant in a more restricted model. This was observed longitudinally: the relationship between contact quality at *T1* and negative stereotyping at *T2* was negative for those seeing their contact person as highly typical but was positive for those who saw him/her as less typical. This is the first time that such a moderation effect of typicality has been observed longitudinally. The fact that it did not emerge more strongly or consistently may again be attributed to the relatively low sample size in the longitudinal analyses. Nevertheless, when taken together with the several other similar moderation effects for typicality (or group salience) that have been reported elsewhere (Brown & Hewstone, 2005), there is now good support for Brown and Hewstone's (2005) contention that a modicum of group salience in the contact relationship can be beneficial for ensuring that contact effects generalise to the outgroup as a whole.

A third issue concerns the range of measures that were employed in this research. Consistent with many other studies of intergroup contact, our principal indicators of intergroup attitude were a measure with a strong affective component (desire for closeness with members of the outgroup) and a more cognitive measure (negative evaluation of the outgroup on a series of traits). Reliable associations with contact were found with both of these, thus providing some reassurance that the effects we observed were not artefacts of the particular measures employed but indicated quite general changes of attitude in response to contact.

A fourth contribution of the study was the successful development of a new measure of infrahumanisation. Previous research on this phenomenon has usually asked respondents to check which of a list of primary and secondary emotions typically apply to members of the ingroup and outgroup (e.g. Leyens et al., 2001). Our more concrete measure, developed specially for our younger respondents, proved successful. At *T2* the predicted Group  $\times$  Emotion interaction emerged, most strongly on the positive emotions, such that significantly more secondary (and positive) emotions were attributed to the ingroup protagonist than to the outgroup protagonist. No such difference was observed on the primary emotions. These data were supportive of Leyens et al.'s (2000) hypothesis, even if they have not previously reported any difference between positive and negative emotions. Moreover, the derivation of an infrahumanisation index (subtracting positive secondary emotions attributed to outgroup protagonists from those attributed to ingroup protagonists) proved useful. At *T2* this index was reliably correlated with the two other measures of intergroup attitude (positively with the negative stereotype measure and negatively with desire for closeness), thus providing evidence of its construct validity.<sup>9</sup> Furthermore, it was also correlated with contact variables, even longitudinally. These findings suggest that infrahumanisation measures, whether variants of the one developed here or those more conventionally used, hold considerable promise for future research on intergroup contact. One valuable aspect of them is that they are less 'obvious' than many other measures of intergroup attitude and hence may be less susceptible to social desirability effects.

In conclusion, this study has provided further longitudinal evidence that amount of contact with a member of an outgroup is predictive of more favourable intergroup attitudes. Furthermore, when that contact is with someone perceived to be typical of their group, it may have stronger and more beneficial effects than when it is with an atypical 'individual'. Although in the larger scheme of fractious intergroup relationships around the world, the particular context studied here is hardly of major social significance, the underlying social psychological processes that we have shown to be operative are

<sup>9</sup>Unexpectedly, the infrahumanisation effect was not visible at *T1* and nor did the index correlate with other outcome measures at that time point (as it did at *T2*). We can only assume that the relative unfamiliarity of the measure to the respondents at *T1* introduced some unwanted 'noise' to the data, thus inflating the error terms and making it harder to obtain reliable effects.

nonetheless important and likely to generalise elsewhere. Indeed, the coherence of the results obtained here with those found in intergroup, interethnic and intergenerational situations lends some confidence to their validity and robustness.

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