

## **Come together: longitudinal comparisons of Pettigrew's reformulated intergroup contact model and the Common Ingroup Identity Model in Anglo-French and Mexican-American contexts**

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### *Abstract*

*Both Anglo-French and Mexican-American relations are embedded in histories of conflict. Within these intergroup contexts, two longitudinal field studies of contact tested Pettigrew's (1998) reformulated model of the intergroup contact theory and Gaertner and Dovidio's (2000) Common Ingroup Identity Model (CIIM). In Pettigrew's model, intergroup friendship is accorded a special role and the contact-bias relation is mediated by changing behaviour, ingroup reappraisal, generating affective ties, and learning about the outgroup. Pettigrew's integration of the three central models of contact generalization into a time-sequence holds that contact first elicits decategorization, then salient categorization, and finally recategorization. In the CIIM, these three levels of categorization—plus a fourth, dual identity—are conceptualized to be mediators in the contact-bias relation. Results point to the crucial importance of intergroup friendship and underline the mediating roles of learning about the outgroup, behaviour modification, and generating affective ties, but not ingroup reappraisal in Pettigrew's model. As for the CIIM, in Study 1 interpersonal and intergroup levels were most central, while in Study 2 the dual identity and superordinate group levels were most effective. The implications of the findings are discussed with reference to the likely stability of these effects in different intergroup contexts. Copyright © 2004 John Wiley & Sons, Ltd.*

In his famous song *Imagine*, John Lennon dreamt of a world without country divisions where people would be able to live life in peace, 'as one.' This kind of common group, though perhaps on a slightly less inclusive level, as a means of prejudice reduction, is precisely what Gaertner and Dovidio's (2000) Common Ingroup Identity Model (CIIM) advocates.

This paper presents two longitudinal field studies examining Pettigrew's (1998) reformulated model of the contact hypothesis and Gaertner and Dovidio's (2000) over two time points. In Study 1, participants were English university students who had contact with French students. In Study 2 participants were Mexican employees in multinational corporations who had contact with their American counterparts.

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## THE INTERGROUP CONTACT HYPOTHESIS

Allport (1954) postulated that intergroup contact only reduces prejudice, stereotyping, and other forms of intergroup bias if it is qualified by four conditions: equal status within the situation, common goals, intergroup cooperation, and support of the authorities. The intergroup contact hypothesis has been tested widely and with a myriad of participant populations, targets, and research methods, and has received much support over the past 50 years. The contact hypothesis has been criticized because, over time, researchers have proposed so many qualifying conditions for contact to render favourable effects that the hypothesis resembles a shopping list rather than a parsimonious, coherent model (see also Forbes, 1997; Ford, 1986). Hence it has become expandable *ad infinitum* and elusive to falsification (Pettigrew, 1986; Stephan, 1987). Pettigrew (1998) argued that it is necessary to distinguish between conditions that are essential as opposed to being merely facilitating for contact to have positive effects.

A further problem, which Allport himself acknowledged, is that the causal direction between contact and reduced intergroup bias may be equivocal. Most research on contact effects has been cross-sectional, and may be subject to selection bias such that nonprejudiced people may be most likely to seek intergroup contact. In addition, it is conceivable that effects of contact that may be strong in the very short term (e.g. within a cross-sectional survey or in the context of a laboratory experiment) may not prevail over time because other influences may intervene to mitigate their effects. Hence, longitudinal studies are necessary to provide more dependable tests of the contact hypothesis.

Finally, Pettigrew (1998) commented that although the original contact hypothesis predicted *when* contact educes positive change, it did not specify *how* and *why* it does so. Nor did it explain how contact effects generalize across situations, from individuals to the outgroup as a whole, or even to uninvolved outgroups.

Aiming to overcome these flaws, Pettigrew reformulated the contact hypothesis into a longitudinal model. This model is at a 'meso-level' of analysis that fits between the microlevel context of the participants' experiences and characteristics and the macrolevel context of the larger societal setting of the situation. Alongside various mere facilitating factors for positive intergroup outcomes Pettigrew (1998) specified that Allport's four conditions and a fifth one, *friendship potential*, are *essential* situational factors. Pettigrew also argued that four processes mediate attitude change through contact. These are learning about the outgroup, changing behaviour, generating affective ties, and ingroup reappraisal.

As a final aspect of his reformulation, Pettigrew incorporated the three chief models of generalization of contact effects: decategorization (Brewer & Miller, 1984), salient categorization (Hewstone & Brown, 1986), and recategorization (Gaertner, Mann, Murrell, & Dovidio, 1989). Pettigrew proposed that contact will have optimal effects if these levels of categorization are salient at different phases of contact. Early contact is best if there is *decategorization* of group members (i.e. people interact as individuals and get to know one another without being concerned about group memberships). Later, it may be beneficial to have *salient categorization* (i.e. intergroup level of categorization), in which interactants are fully aware that they belong to different groups and can come to appreciate the interesting differences. Finally, it is favourable to have *recategorization* (i.e. adopting a superordinate level of categorization), in which the interactants perceive themselves to share an overarching group membership with outgroup members. The superordinate level is assumed to induce a maximum reduction in prejudice. Pettigrew's model is silent as to whether different levels of categorization should be regarded as independent variables or as a second set of mediators.

Gaertner and Dovidio's (2000) CIIM provides a more comprehensive account of the role of the levels of categorization in the contact-prejudice relationship. In the CIIM, the three different levels of categorization considered by Pettigrew, plus a fourth form, *dual identity*, act as mediators between

antecedents (for example, Allport's ideal conditions) and consequences (cognitive, affective, and behavioural effects) of intergroup contact. Dual identity (Gaertner & Dovidio, 2000) constitutes an amalgam of salient categorization and recategorization, in which original group identities are maintained, but within the context of a superordinate identity (cf. González & Brown, 2003). In intergroup contexts involving relatively large group memberships, such as nationality, the presence of a single, inclusive group identity may not optimally satisfy people's concomitant needs for distinctiveness as well as inclusion (Brewer, 1996). In these cases, a dual identity may be more potent in eliciting positive outgroup evaluations.

In common with Pettigrew, Gaertner and Dovidio expect the superordinate level of categorization to be most beneficial in bringing about improved attitudes, emotions, and behaviour towards outgroup members present in the contact situation. When the dual identity is salient, the superordinate component should be slightly less effective in producing positive attitudes in the immediate contact situation, but the salient categorization component should facilitate the generalization of contact effects. Gaertner and Dovidio (2000) term this the 'trade-off hypothesis.' The dual identity level is not part of Pettigrew's model but its constituent two levels of categorization would both be expected to have more positive effects at later rather than earlier phases of intergroup contact.

## THE PRESENT RESEARCH

Pettigrew's model has not been examined longitudinally before, with the exception of our own research (Eller, 2002; Eller & Abrams, 2003). Most previous tests of the CIIM have also been cross-sectional and laboratory based. One issue we examine is whether contact may have different effects in the short term than over the longer term.

The two models share predictor variables (quantitative and qualitative contact) and criterion variables (intergroup anxiety, social distance, and general evaluations of the outgroup and of an uninvolved outgroup to test for wider generalization), but focus on different potential mediators. In Pettigrew's model, mediators of the contact-bias relation are (a) learning about the outgroup, (b) generating affective ties, (c) ingroup reappraisal, and (d) changing behaviour. Examination of the role of these variables should provide some answers to Pettigrew's questions of *how* and *why* contact brings about positive effects and how its effects generalize beyond the immediate situation and to other outgroup members. In the CIIM the four different cognitive representations of contact are the relevant mediators. We investigate how applications of different levels of social categorization during contact may affect intergroup bias.

In terms of Pettigrew's proposed *essential conditions* for positive outcomes of contact we focus here on friendship potential for theoretical and empirical reasons. It seems reasonable to expect that friendship should be interrelated with at least three of the other essential conditions. Friendship is probably contingent on equality of status, common goals, and a degree of cooperation (Eller & Abrams, 2003; also cf. Pettigrew & Tropp, 2000). Empirically, our previous research (Eller, 2002) showed Allport's crucial conditions and contact as friends to be multicollinear. Pettigrew (1997, 1998) accords a pivotal prejudice-reducing role to friendship potential. In his view, 'intergroup friendship is potent because it potentially invokes all four mediating processes' (1998, pp. 75–76). This is most obvious for *generating affective ties*. However, it is also quite plausible that people with outgroup friends learn more about customs and way of life of the outgroup, re-evaluate their ingroup as a result of this long-term contact, and change their behaviour vis-à-vis other outgroup members given their attitude change. In the present research, we examine the quantity of contact with outgroup members and its quality (contact as friends) as an indicator of contact under essential conditions.

## STUDY 1

The first study examines contact between English and French students. Relations between the French and the English have historically been marked by antagonism, distrust, and isolationism—despite, or perhaps, precisely *because* of their geographical proximity—continuing into the present time (Brown, Maras, Masser, Vivian, & Hewstone, 2000; Jeffery, 2002). In political and military terms, France constitutes Britain's oldest enemy, confronting her armies in such memorable and devastating battles as Agincourt and Waterloo. These ancient animosities notwithstanding, the late 20th century saw a transformation of European international relations, marked by milestones such as Churchill's call for a United States of Europe in 1946, the birth of the Council of Europe with the Treaty of Strasbourg (1949), the signing of the Maastricht Treaty on the European Union (E.U.) in 1992, and the formalization of the Schengen Agreement on the elimination of border checks in 1995. The institution of the E.U. has meant that the constituent countries have become increasingly interconnected in the realms of the political, the economic-financial, and the social (Europa, n.d.). This is particularly true for France and Britain, given their proximity and their recent physical connection through the Eurotunnel.

However, in 1999, the year this research was conducted, the attitudes of the British towards a united Europe in general—and France in particular—remained at best ambivalent, a pattern that was reflected on an institutional level by the Tory-Labour conflict on the topic of closer integration with Europe (White, 1999). 'Euro-scepticism' among the population was aggravated by events such as the Euro's unexpected decline in value shortly after its launch in January 1999, and 'the Continent's' handling of the British beef crisis—especially France's continued ban on British beef after the E.U. had officially lifted the ban (Massow, 1999).

Taking this situation into account, Anglo-French relations provided a real-life context within which to examine the effects of contact—generally sanctioned by the authorities—between traditional adversaries that are interdependent and approximately equal-status national groups. The specific case of university students is a well-suited setting within which to test Pettigrew's and Gaertner and Dovidio's models because there is moderately high contact and friendship potential through a cooperative learning environment, which is characterized by contact participants' equality of status and interdependence. Moreover, the postulated levels of categorization during contact—interpersonal,<sup>1</sup> intergroup, superordinate group, and dual identity—are of direct relevance given that the E.U. may constitute an *actual* superordinate group, or form part of a dual identity, in conjunction with a categorization on the basis of nationality.<sup>2</sup>

Participants were in their first year at university. With respect to the sequential nature of Pettigrew's model, contact with French people was likely to be at its *initial* stages. The University of Kent has a high percentage of foreign students and is the closest UK university to France. It therefore provided a social arena with much more opportunity for intercultural contact than the schools from which the UK students came from.<sup>3</sup> However, we acknowledge that some participants may have had more extensive contact for various reasons and thus we do not have the levels of control inherent in an experimental design using minimal, transitory or very remote groups.

<sup>1</sup>Interpersonal refers to contact between individual people, as opposed to groups, akin to Gaertner and Dovidio's (2000) 'separate individuals' condition. It does not necessarily denote more personalized contact in Brewer and Miller's (1984) terms.

<sup>2</sup>This potential for a dual identity is captured in Article 6 of the 1997 Amsterdam Treaty, 'The Union shall respect the national identities of its Member States,' and its concomitant resolve to 'establish a citizenship common to nationals of their countries' (Europa, n.d.).

<sup>3</sup>In 1999 10% of students at the University of Kent were from overseas. There were students from 119 different nationalities, with the French representing the third largest national group. Although all participants were in their first year of university, a minority of them were 'mature' students (i.e. usually anyone above the age of 21) who might have had more contact with French people in the past than their younger companions. It should be noted that all participants might have had some previous contact with French people, for example, on exchange visits during secondary school.

## Method

### *Participants and Procedure*

Time 1 (*T1*) questionnaires were distributed to 90 first-year undergraduate psychology students at a lecture at the University of Kent. The Time 2 (*T2*,  $N=76$ ) questionnaire was administered approximately six months later. All participants received course credit for research participation. Non-English participants were removed from the analyses in order to avoid potential confounding effects. Participants included in the analyses were 12 men and 61 women ( $N=73$ ) at *T1* and ten men and 51 women ( $N=61$ ) at *T2*. Their mean age was 21.0 years (range 18–42) at *T1* and 23.1 years (range 19–49) at *T2*. The longitudinally matched dataset included five men and 29 women ( $N=34$ ), with a mean age of 21.2 years (range 18–34).<sup>4</sup>

### *Measures*

Unless otherwise indicated, measures are taken from Eller and Abrams (2003).

*Predictor Variables* Contact measures were single items adapted from Islam and Hewstone (1993). *Quantitative contact* was measured by asking about the amount of contact with French people at university. Participants in both studies were also asked about their amount of contact ‘as neighbours’ with outgroup members and how often and for how long (if ever) they had visited the outgroup country. Quantity of contact at university was chosen because it best represented the setting where most contact with outgroup members took place. Scaling ranged from *never* (1) to *always* (7), with higher scores denoting quantitatively more contact. We also measured the extent to which contact was ‘as close friends’ (*never—always*), which we treat as an index of *qualitative* contact. Higher scores denote qualitatively better contact. We also assessed pleasantness, intimacy, cooperation, equality, and voluntariness of contact (cf. Islam & Hewstone, 1993), but for reasons outlined in the Introduction, decided to use amount of ‘contact as friends’ as the qualitative contact item.

*Mediating Variables in Pettigrew’s Model* *Learning about the outgroup* was assessed by asking respondents how often they (a) watched French films (*never—always*), (b) watched television programmes produced in France, (c) listened to French music, (d) read French newspapers or magazines, and (e) whether they spoke French (*not at all—fluently*). Another question was ‘How much do you learn about French people and their culture every week by watching TV, reading the newspaper, listening to the radio, or surfing in the Internet?’ (*nothing—very much*). Cronbach’s  $\alpha$  reliability coefficients were  $T1=0.85$ ,  $T2=0.91$ . *Generating affective ties* was operationalized with the Inclusion of Other in the Self (IOS) Scale (Aron, Aron, & Smollan, 1992; Wright, Aron, McLaughlin-Volpe, & Ropp, 1997). The original IOS Scale was modified such that it consisted of five pairs of overlapping circles of increasing degrees of overlap. Participants were instructed to select the pair of circles that best described their relationship with the outgroup member they felt closest to (i.e. inclusion of outgroup member in self). Possible responses ranged from 1 to 5, with higher numbers indicating stronger affective ties. *Ingroup reappraisal* was conceptualized as a four-item national identification scale, for example, ‘I’m proud to be British’ (*strongly disagree—strongly agree*),  $\alpha$ s were  $T1=0.82$ ,  $T2=0.85$ . The ‘reappraisal’ part comes into being through *changes* in national identification over the course of the longitudinal study.

<sup>4</sup>In both studies some participants at *T2* did not provide sufficient identifying information (e.g. mother’s initials) to be linked longitudinally.



Lastly, *changing behaviour* (again, the *change* is thought to take place over the course of the study) was assessed by asking respondents whether various aspects of their behaviour were more prevalent toward the French or more prevalent towards the British. The aspects listed were kind, reserved, understanding, and open-minded (items 1, 3, and 4 were reversed). The items were scored on 7-point scales, such that lower scores indicated 'pro-British' behaviour, and higher scores denoted 'pro-French' behaviour ( $\alpha$ s were  $T1 = 0.69$ ,  $T2 = 0.76$ ).

*Mediating Variables in the CIIM* To assess the different levels of categorization during contact, we followed previous relevant research (e.g. Gaertner, Dovidio, & Bachman, 1996) that used single-item measures. We used four single-item measures following the question, 'When you have contact with French people, how often do you perceive them ...' (a) '... as unique individuals?' [interpersonal level], (b) '... as people from a group that is completely different from your own?' [intergroup level], (c) '... as people with whom you share a common group membership?' [superordinate group level], and (d) '... as people from a different group that, *at the same time*, share a common group membership with you?' [dual identity level]? Responses to each of these four questions were rated on 7-point scales (*never—always*), such that higher scores indicated stronger categorization on that particular level.

*Criterion Variables* We measured *intergroup anxiety* using a shortened version of Stephan, Diaz-Loving, and Duran's (2000) scale. In the present study, respondents were asked to 'indicate how you would feel when interacting with French people:' Comfortable, threatened, confident, anxious, at ease, and awkward. Items were scored on 7-point scales (*not at all—extremely*; three items were reverse scored), with higher scores indicating higher anxiety,  $\alpha$ s were  $T1 = 0.93$ ,  $T2 = 0.89$ .

A modified version of Bogardus' (1933) *Social Distance Scale* asks respondents to what extent they would like to have a French person as: (a) your fellow student, (b) your boss, (c) your best friend, (d) your partner. Responses were reverse-scored on 7-point scales (*not at all—very much*), such that higher scores indicated more social distance,  $\alpha$ s were  $T1 = 0.86$ ,  $T2 = 0.90$ .

The *General Evaluation Scale* (Wright et al., 1997) instructed respondents to 'indicate how you feel about the French in general' by using the following bipolar adjective pairs separated by a 7-point scale: *cold—warm*, *negative—positive*, *friendly—hostile*, *suspicious—trusting*, *respect—contempt*, *disgust—admiration* (pairs 3 and 5 were reversed). Responses were scored such that the more positive adjective received the higher score,  $\alpha$ s were  $T1 = 0.82$ ,  $T2 = 0.88$ . We used the same scale to measure general evaluations of the ingroup (British) to see whether these would differ significantly from those of the outgroup.

The *generalization of contact effects* towards other outgroups not present during the intergroup encounter was assessed employing exactly the same general evaluation scale, but using Algerians as the target group,  $\alpha$ s were  $T1 = 0.84$ ,  $T2 = 0.91$ . Algerians were used as the target group here because they are linguistically similar to the French, but they constitute a less 'neutral' outgroup than Belgian or Swiss people so that contact can produce more variability in responses. There are sizeable numbers of Algerians living in France, so it is possible that participants were conceiving of this group of people as opposed to Algerians living in Algeria. However, as both groups constitute outgroups with whom participants are unlikely to have much contact, the distinction is not crucial.

To establish that the multiple item measures included in the models were conceptually and empirically distinct, we used Nunnally's (1967, p. 211) criterion that the correlation between two variables should be at least 20 points lower than the reliabilities of those variables. This was the case for all measures included.

## Results and Discussion

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 both groups are from the same background population. We then examined change in scores between the two time points. Next, within the larger (*T1*) dataset, we examined evidence for the impact of contact on the criterion variables. At the same time, we looked at how the mediators specified by Pettigrew's model were related to the contact and criterion variables. We repeated this analysis but substituted the mediators specified by the CIIM. (The mediation analyses were not repeated within the *T2* because of relatively lower numbers of participants.) Finally, we conducted a longitudinal analysis to explore evidence for causal relationships between *T1* and *T2* for specific paths and hypothesis tests.

### *Panel Attrition and Comparison of Participants*

A MANOVA across the set of measures at *T1* confirmed 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 points, multivariate  $F(14, 54) = 1.32, p = 0.23$ .

### *Change over Time*

A repeated-measures MANOVA revealed that scores on the measures changed over time,  $F(11, 18) = 2.38, p = 0.05$ . Table 1 shows there were significant univariate effects of time for three variables. Intergroup anxiety decreased and general evaluations of the outgroup and the uninvolved outgroup became more positive. We also examined whether participants showed ingroup favouritism at *T1*. General evaluations of the French at *T1*,  $M = 4.18, SD = 0.75$ , were not significantly different from the midpoint of the scale,  $t(33) = 1.62, p = 0.11$ , and evaluations of the British were significantly more positive than those of the French,  $M = 4.60, SD = 0.74, t(34) = 3.19, p = 0.003$ .

We analyzed the four measures of level of categorization using a 2 (Time: *T1* vs. *T2*)  $\times$  4 (Level of Categorization: Interpersonal, Intergroup, Superordinate Group, Dual Identity) within-participants

Table 1. Changes of means over time

Measure	Study 1				Study 2			
	<i>T1</i> (N = 73)	<i>T2</i> (N = 61)	<i>F</i>	<i>p</i>	<i>T1</i> (N = 207)	<i>T2</i> (N = 87)	<i>F</i>	<i>p</i>
Quantitative contact	3.66 (1.47)	3.93 (1.71)	0.39	0.54	5.52 (1.27)	5.45 (1.42)	0.31	0.58
Contact as friends	2.48 (1.68)	2.83 (2.12)	0.59	0.45	3.26 (2.14)	3.10 (1.81)	0.47	0.50
Affective ties	2.21 (0.98)	2.17 (1.23)	0.01	0.91	2.81 (1.17)	2.52 (0.99)	3.30	0.08
Behaviour	3.51 (0.67)	3.83 (0.94)	2.41	0.13	3.47 (0.61)	3.39 (0.71)	0.57	0.45
Learning about outgroup	2.45 (1.11)	2.64 (1.34)	0.43	0.52	5.43 (0.81)	5.86 (0.86)	6.05	0.02
National identification	4.97 (1.39)	4.90 (1.22)	0.04	0.84	6.33 (1.04)	6.15 (0.82)	1.02	0.32
Intergroup anxiety	3.74 (0.97)	2.86 (1.18)	18.61	0.001	2.87 (1.06)	2.85 (1.08)	0.01	0.93
Social distance	3.61 (0.96)	3.20 (1.30)	1.56	0.22	3.89 (1.24)	3.75 (1.20)	1.04	0.31
Gen. evaluation ingroup	4.62 (0.78)	5.02 (1.14)	2.48	0.13	5.21 (0.86)	5.28 (0.76)	0.20	0.66
Gen. evaluation outgroup	4.18 (0.75)	4.99 (1.23)	8.04	0.01	4.26 (0.87)	4.25 (1.14)	0.01	0.94
Gen. eval. uninvolved outgroup	4.22 (0.59)	4.63 (0.80)	4.10	0.05	4.96 (1.01)	5.13 (0.84)	1.51	0.23

*Note:* Numbers are means, standard deviations are in parentheses. Gen. evaluation ingroup = general evaluation of ingroup; Gen. evaluation outgroup = general evaluation of outgroup; Gen. eval. uninvolved outgroup = general evaluation of uninvolved outgroup.

Table 2. Levels of categorization over time

Levels of categorization	Study 1		Study 2
	Time 1	Time 2	Averaged across time
Interpersonal	5.21 <sup>a</sup> (1.64)	5.85 <sup>c</sup> (1.20)	4.33 <sup>a</sup> (1.72)
Intergroup	3.55 <sup>b</sup> (1.48)	3.24 <sup>b</sup> (1.66)	4.04 <sup>a,b</sup> (1.32)
Superordinate group	3.79 <sup>b</sup> (1.59)	4.94 <sup>a</sup> (1.22)	3.83 <sup>b</sup> (1.33)
Dual identity	4.12 <sup>b</sup> (1.59)	5.15 <sup>a</sup> (1.35)	4.66 <sup>a</sup> (1.32)

Note: Numbers are means, standard deviations are in parentheses. Means were compared using pair-wise *t*-tests. Means with different superscripts (column-wise) differ significantly from each other within each study,  $p < 0.05$  (Study 1) and  $p < 0.03$  (Study 2).

ANOVA. Owing to non-sphericity a Greenhouse-Geisser correction was applied to the degrees of freedom. There were significant effects of Time,  $F(1, 31) = 11.28$ ,  $p = 0.002$ ,  $MS$  error ( $MSe$ ) = 2.39, Level of Categorization,  $F(2, 63) = 22.33$ ,  $p < 0.001$ ,  $MSe = 2.90$ , and a significant Time  $\times$  Level interaction,  $F(2, 67) = 4.29$ ,  $p = 0.016$ ,  $MSe = 2.39$ . As summarized in Table 2 the relative predominance of each level remains similar at both time points but the range is more extreme at  $T2$ . Participants see each other mostly on an interpersonal level, followed by the dual identity level and the superordinate level. The intergroup level is endorsed the least. Paired-samples *t*-tests show that at  $T1$  the interpersonal level differs significantly from all other levels, in line with Pettigrew's (1998) predictions. At  $T2$  the interpersonal level has become significantly more prominent, while the intergroup level remained lowest, which is inconsistent with Pettigrew's model. However, the superordinate, and particularly, the dual identity levels have also increased significantly from  $T1$  to  $T2$ . As the dual identity is a combination of intergroup and superordinate levels, this could be interpreted as support for Pettigrew's model.

We can think of two possible explanations for the raised level of endorsement of the interpersonal level at  $T2$ . First, participants might have been guided—consciously or unconsciously—by norms of political correctness and social desirability, which might have prevented them from admitting that they saw their French interaction partners in terms of group memberships relative to seeing them as individuals. This might be particularly relevant in the relatively liberal context of a university environment. A second possibility is that Pettigrew's model underestimates the extent to which contact in a real-world context affects the levels of categorization in a non-orderly fashion; instead, levels of categorization may be sensitive to specific contextual features and it may be that more contact simply results in most levels of categorization being activated more frequently. Finally, it may be that as people encounter a larger number of outgroup members they can recall a larger number of individual exemplars, resulting in more categorization at the interpersonal level. However, assuming the conditions are conducive, the larger number of contact experiences also promotes the idea of a common superordinate group (students) of whom the outgroup constitutes a coherent subset (dual identity). Therefore, these changes over time might suggest that the group-related levels of categorization do increase over time, but these are in addition to, rather than instead of, the interpersonal level.

#### *Pettigrew's Model*

Pettigrew's model holds that contact as friends should lead to increased liking and learning about the outgroup, behaviour modification, and ingroup reappraisal. Moreover, it should reduce intergroup anxiety and intergroup bias, in general. These effects might then be generalized to other outgroups that are not involved in the contact situation.



*Cross-Sectional Analysis* Regression analyses were used to test mediation effects in Pettigrew's model at *T1*. Indicators of multicollinearity are a conditioning index  $>30$  and at least two variance proportions  $>0.50$  for a given root number (Tabachnick & Fidell, 1996). This was the case for none of the cross-sectional and longitudinal regression analyses performed.

Following Baron and Kenny's (1986) procedure, we regressed the dependent variables individually on the independent variables, then regressed the mediators individually on the independent variables, and finally, regressed the dependent variables individually on both the independent variables and the mediators. There is evidence of mediation if, once the potential mediator is included in the regression analysis, the relationship between an independent variable and criterion variable reduces in size, and particularly if it reduces to non-significance. A conservative test of the significance of mediation is the Sobel test (see Baron & Kenny, 1986). In all cases in which we observed mediation effects we report the changes in betas for the independent variable and the significance level for the Sobel test. We also calculated the percentage of the total effect that is mediated, following MacKinnon and Dwyer (1993).

All significant relationships are in line with the predictions: Contact as friends is associated with less social distance,  $\beta = -0.27$ ,  $t = -2.07$ ,  $p < 0.04$ , with more learning about the outgroup,  $\beta = 0.39$ ,  $t = 3.13$ ,  $p = 0.003$ , and with more 'pro-French' behaviour,  $\beta = 0.37$ ,  $t = 2.76$ ,  $p = 0.007$ . Furthermore, learning is significantly associated with social distance,  $\beta = -0.31$ ,  $t = -2.50$ ,  $p = 0.02$ . Contact as friends and learning together account for 23% of the variance in social distance, adjusted  $R^2 = 0.23$ ,  $F(2, 68) = 11.33$ ,  $p < 0.001$  and learning mediates 36% of the relationship between contact as friends and social distance. The Sobel test showed that this indirect effect of the independent variable (IV) on the dependent variable (DV) via the mediator is significantly different from zero,  $z = 1.99$ ,  $p = 0.05$ . Finally, quantitative contact is marginally significantly related to decreased social distance,  $\beta = -0.23$ ,  $t = -1.76$ ,  $p = 0.08^5$  and to more positive general evaluation of the outgroup,  $\beta = 0.29$ ,  $t = 2.18$ ,  $p = 0.03$ , but these effects are not mediated by other variables.

The finding that only one of the hypothetical mediators has any relationship with the criterion variables is somewhat unexpected and suggests that the potential mediating variables, particularly affective and self-evaluative measures such as generating affective ties and ingroup reappraisal, might need time to exert their full influence in promoting better intergroup relations. In contrast, mere learning/knowledge about the outgroup appears to have a more immediate role. Alternatively, the fact that affective ties were not predicted by contact as friends might indicate that the IOS Scale is a poor indicator of affect.

We were interested in assessing the overall predictive power of Pettigrew's mediators as a group of variables. Pettigrew's four mediators as a block accounted for 1% of variance in intergroup anxiety, adjusted  $R^2 = 0.01$ ,  $F(4, 64) = 0.79$ ,  $p = 0.53$ , 26% of variance in social distance, adjusted  $R^2 = 0.26$ ,  $F(4, 64) = 7.11$ ,  $p < 0.001$ , 2% of variance in general outgroup evaluation, adjusted  $R^2 = 0.02$ ,  $F(4, 64) = 1.34$ ,  $p = 0.26$ , and 2% of variance in general evaluations of the uninvolved outgroup, adjusted  $R^2 = 0.02$ ,  $F(4, 64) = 0.76$ ,  $p = 0.56$ . Hence, the only criterion variable predicted significantly by Pettigrew's mediators as a group is social distance.

*Longitudinal Analysis* We used multiple regression to examine the relationship between predictor variables at *T1* and the change from *T1-T2* in mediating variables (operationalized by subtracting the *T1* score from the *T2* score for each variable, following the method outlined by Judd, Kenny, & McClelland, 2001), and criterion variables at *T2*.

Figure 1 summarizes the results of these analyses. Contact as friends at *T1* was significantly associated with reduced anxiety,  $\beta = -0.49$ ,  $t = -3.05$ ,  $p = 0.005$ , more positive general evaluations of the outgroup,  $\beta = 0.39$ ,  $t = 2.19$ ,  $p = 0.04$ , and more positive evaluations of the uninvolved outgroup

<sup>5</sup>We decided to also report marginally significant effects in order not to overlook potentially important patterns of results.

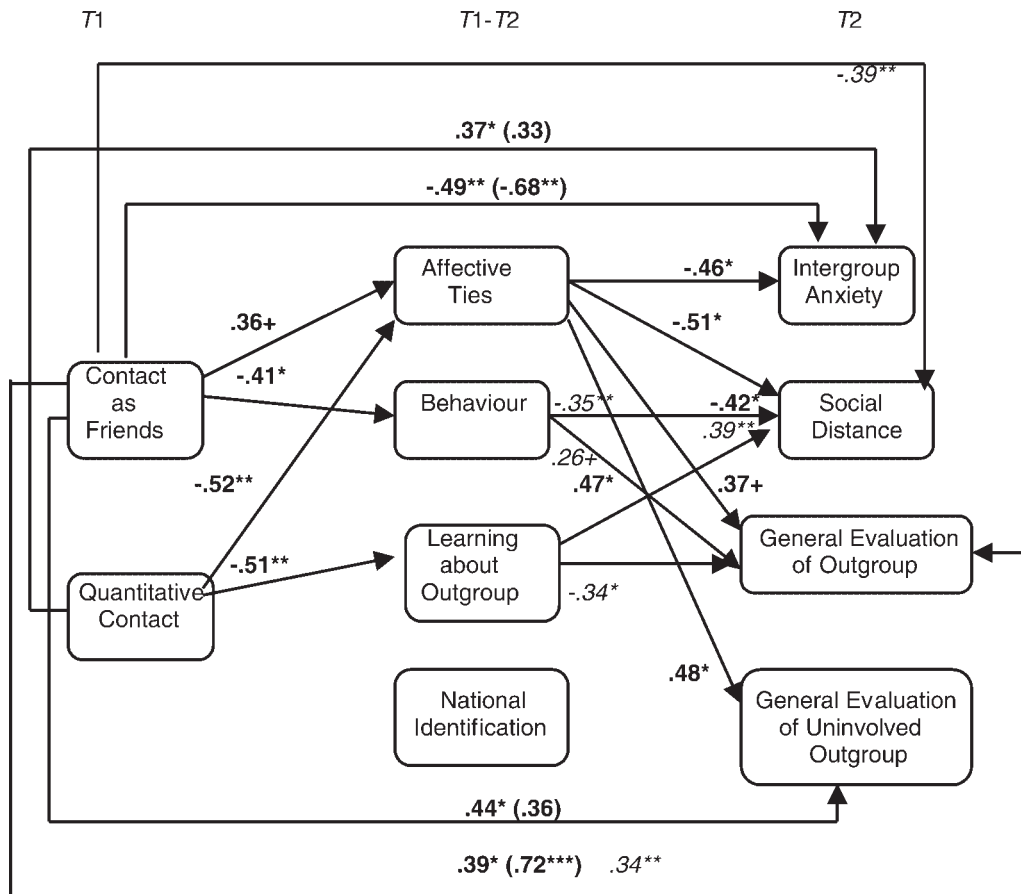


Figure 1. Path diagram to show a longitudinal analysis of Pettigrew's (1998) model of intergroup contact, using T1 and T2 Study 1 (Anglo-French) and Study 2 (Mexican-American) data. Significant paths only are shown; numbers are standardized partial regression coefficients ( $\beta$ ). Bold numbers describe effects found in Study 1, italicized numbers describe effects found in Study 2. Numbers in parentheses describe total effects. + $p < 0.08$ ; \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

(Algerians),  $\beta = 0.44$ ,  $t = 2.58$ ,  $p = 0.02$ , at T2. Contact as friends also affected two of the potential mediators. It led to increasingly 'pro-British' behaviour,  $\beta = -0.41$ ,  $t = -2.10$ ,  $p = 0.05$  and to a marginally significant increase in affective ties,  $\beta = 0.36$ ,  $t = 1.88$ ,  $p = 0.07$ , in the interval between T1 and T2. The former effect is highly unexpected and seems to defy any easy explanation.

T1 quantitative contact was associated with increased intergroup anxiety at T2,  $\beta = 0.37$ ,  $t = 2.26$ ,  $p = 0.03$ . Quantitative contact was also associated with diminished learning,  $\beta = -0.51$ ,  $t = -2.65$ ,  $p = 0.01$ , and reduced affective ties,  $\beta = -0.52$ ,  $t = -2.73$ ,  $p = 0.01$ ; adjusted  $R^2 = 0.17$ ,  $F(2, 27) = 3.96$ ,  $p = 0.03$ , from T1-T2. Thus, surprisingly, quantitative contact had exclusively bias-augmenting longitudinal effects, while this was not the case in the cross-sectional analysis nor for contact as friends.

Scrutinizing the effects of the mediating variables, T1-T2 increases in affective ties affected all four criterion variables. It resulted in decreased intergroup anxiety,  $\beta = -0.46$ ,  $t = -2.16$ ,  $p = 0.04$ , decreased social distance,  $\beta = -0.51$ ,  $t = -2.69$ ,  $p = 0.01$ , marginally significantly more positive general evaluations of the outgroup,  $\beta = 0.37$ ,  $t = 1.85$ ,  $p = 0.08$ , and more positive evaluations of the related outgroup,  $\beta = 0.48$ ,  $t = 2.51$ ,  $p = 0.02$ , at T2. Increased 'pro-French' behaviour resulted in

reduced social distance,  $\beta = -0.42$ ,  $t = -2.37$ ,  $p = 0.03$ , and led to more positive general evaluation of the outgroup,  $\beta = 0.47$ ,  $t = 2.51$ ,  $p = 0.02$ , at  $T2$ .

The mediators as a group accounted for 11% of variance in intergroup anxiety, adjusted  $R^2 = 0.11$ ,  $F(4, 24) = 1.90$ ,  $p = 0.14$ , 31% of variance in social distance, adjusted  $R^2 = 0.31$ ,  $F(4, 24) = 4.07$ ,  $p = 0.01$ , 23% of variance in general outgroup evaluation, adjusted  $R^2 = 0.23$ ,  $F(4, 24) = 3.07$ ,  $p = 0.04$ , and 28% of variance in general evaluations of the uninvolved outgroup, adjusted  $R^2 = 0.28$ ,  $F(4, 24) = 3.73$ ,  $p = 0.02$ . Interestingly, these amounts of variance explained are much higher than those in the cross-sectional analyses.

Behaviour significantly mediated 33% of the relationship between contact as friends and general evaluation of the outgroup; Sobel test:  $z = -1.95$ ,  $p = 0.05$ . Changes in affective ties mediated 25% of the contact as friends—intergroup anxiety relationship, 40% of the quantitative contact—intergroup anxiety relationship, 25% of the contact as friends—general evaluation of the outgroup relationship, and 28% of the contact as friends—general evaluation of the related outgroup relationship. However, despite fulfilling most of the Baron and Kenny conditions for mediators, none of these mediating effects associated with changes in affective ties were significantly different from zero; all  $z$ s  $< 1.5$ , all  $p$ s  $> 0.13$ .

In fact, instead of partial redundancy, we can observe *suppression effects* here. Suppression indicates that ‘the relationship between the independent or causal variables is hiding or suppressing their real relationships with  $Y$  [criterion variable], which would be larger or possibly of opposite sign were they not correlated’ (Cohen & Cohen, 1983, p. 95). This process can be observed in the contact as friends—intergroup anxiety and contact as friends—general outgroup evaluation relationships (see Figure 2). Both affective ties and behaviour are correlated with general outgroup evaluation and the

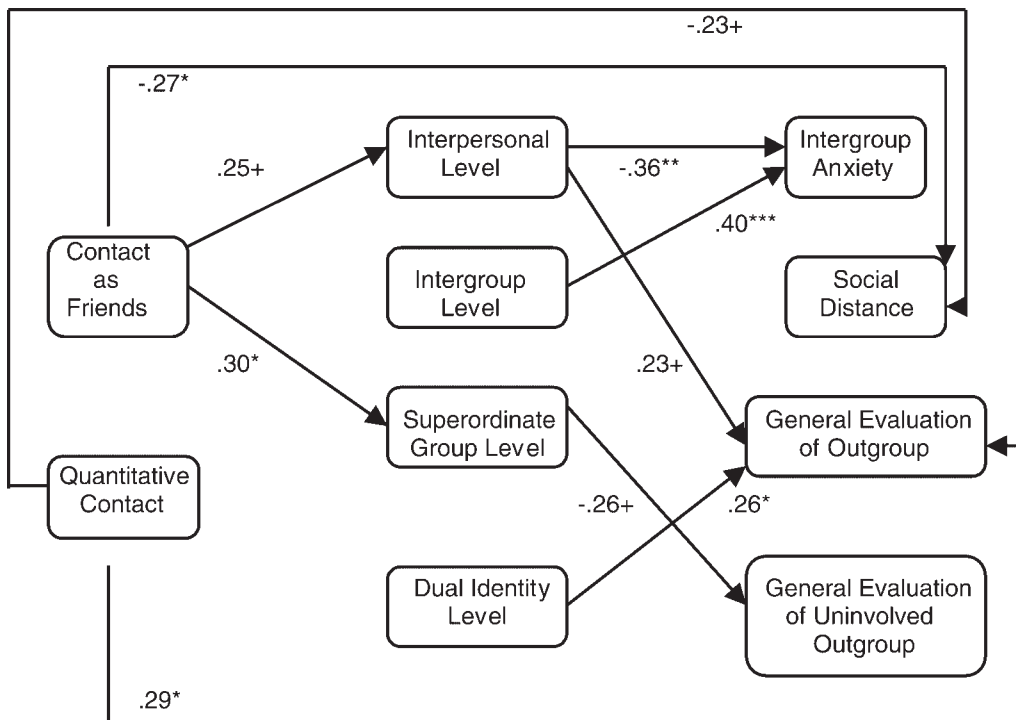


Figure 2. Path diagram to show a cross-sectional analysis of the CIIM, using  $T1$  Study 1 (Anglo-French) data. Significant paths only are shown; numbers are standardized partial regression coefficients ( $\beta$ ).  $+p < 0.085$ ;  $*p < 0.05$ ;  $**p < 0.01$ ;  $***p < 0.001$

former mediator is also correlated with intergroup anxiety; moreover, the bivariate correlation between contact as friends and affective ties is small and non-significant. However, the correlation between contact as friends and behaviour is  $r = -0.40$ ,  $p < 0.05$ , which suggests that behaviour modification acts as a suppressor variable in this model.

The fact that contact affected changes in the potential mediators and that changes in two of the mediators had pervasive effects on the criterion variables suggests that both sets of variables make an important contribution to the criterion variables. However, the absence of statistically significant mediation effects (other than suppression) suggests that the impact of contact and the potential mediators may be cumulative. Positive effects of contact on the potential mediators may be augmented by other factors that affect the potential mediators in Pettigrew's model. Moreover, contact appears to have effects that are direct or may be mediated by variables not specified by Pettigrew.

The finding that quantitative contact was associated with improved attitudes to the outgroup in the cross-sectional analysis but worsened attitudes in the longitudinal analysis underlines the importance of longitudinal designs to reveal these kinds of unexpected long-term effects of contact. This pattern of findings confirms Allport's original proposition that mere contact, when unaccompanied by certain conditions, can lead to deterioration in intergroup relations. In this case, it was associated with reduced learning about the outgroup, reduced affective ties and increased intergroup anxiety.<sup>6</sup>

### *The CIIM*

An examination of the interrelationships among the levels of categorization at *T1* (see Table 3) shows that the superordinate level is significantly correlated with all other levels—positively with the interpersonal and dual identity ones and negatively with the intergroup level. However, none of the other levels are significantly correlated with one another.

The CIIM predicts that high quantity of friendly contact will promote the superordinate level of categorization, and to a lesser degree, the dual identity level. These in turn should reduce intergroup bias, and additionally, the dual identity should aid generalization of contact effects. The effects of interpersonal level, if any, should be to reduce intergroup bias, whereas the pattern should be opposite for the intergroup level.

*Cross-Sectional Analysis* Using the same procedure as we did for Pettigrew's mediators, we tested the CIIM. This was done completely independently from the test of Pettigrew's model. The significant relationships between the predictor and criterion variables have been described previously. Therefore we only report the additional relationships involving the potential mediators in this section. As shown

<sup>6</sup>To investigate the causal direction of the variables in the longitudinal model, we reversed the roles of predictor and criterion variables. The measures of contact and intergroup attitudes are different from the previous analyses because we employ the *T2* measures of contact (as outcomes) and the *T1* measures of attitudes (as predictors). More positive general evaluations of the uninvolved outgroup at *T1* were associated with lower contact as friends and at university at *T2*. Positive general evaluation of the uninvolved outgroup and intergroup anxiety at *T1* tended to predict less affective ties from *T1*–*T2*. Intergroup anxiety also decreased learning over the time span and more positive general outgroup evaluations led to increases in national identification. Increased affective ties over time were associated with more *T2* contact as friends and at university. The affective ties-contact link is stronger in the reversed than the original longitudinal model, questioning the direction of causality between these variables. It makes intuitive sense that affect can be a precursor of intergroup friendship and even willingness to engage in more contact, rather than the other way around (cf. Levin, van Laar, & Sidanius, 2003). Overall, however, there are fewer significant relationships in this 'reversed longitudinal model' than in the forward model and some of these effects are in unexpected directions. In contrast to the original model, both mediating effects are significant.

Table 3. Interrelationships of variables at T1 for Study 1 (above the diagonal) and Study 2 (below the diagonal)

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Quantitative contact		0.54***	0.25*	0.19	0.37***	-0.17	0.25*	-0.21	0.26*	0.23	-0.22	-0.37***	0.33**	0.21
2. Contact as friends	0.31**		0.29*	0.36**	0.47***	-0.25*	0.31**	-0.19	0.35**	0.20	-0.22	-0.39***	0.22	0.13
3. Affective ties	0.17*	0.47***		0.22	0.35**	0.05	0.30**	-0.05	0.20	0.21	-0.10	-0.33**	0.18	0.16
4. Behaviour	0.13	0.37***	0.29***		0.21	-0.38***	0.23*	-0.06	0.27*	0.14	-0.11	-0.31**	0.23*	-0.04
5. Learning	0.36***	0.42***	0.22**	0.26***		0.04	0.19	-0.08	0.14	0.02	-0.19	-0.46***	0.27*	0.16
6. Identification	0.01	0.12	0.08	0.07	-0.08		-0.10	0.09	-0.10	0.03	-0.06	0.18	-0.02	0.10
7. Interpersonal	0.08	0.10	0.23**	0.12	0.15*	0.14		-0.08	0.32**	0.16	-0.39***	-0.33**	0.32**	0.23
8. Intergroup	0.13	-0.03	-0.12	-0.15*	-0.06	-0.00	0.09		-0.26*	0.05	0.40***	0.01	-0.09	-0.14
9. Superordinate	0.10	0.30***	0.30***	0.26***	0.14	0.13	0.17*	-0.33***		0.42***	-0.12	-0.18	0.16	-0.10
10. Dual identity	0.17*	0.17*	0.21**	0.10	0.28***	0.04	0.23***	0.01	0.24***		-0.05	-0.13	0.30**	0.07
11. Anxiety	-0.09	-0.16*	-0.14	-0.20**	-0.20**	-0.06	-0.24***	0.12	-0.15*	-0.25***	0.34**		-0.24*	-0.29*
12. Social distance	-0.10	-0.23***	-0.20*	-0.30***	-0.21**	-0.05	-0.25***	0.10	-0.40***	-0.28***	0.28***	-0.44***		-0.25*
13. Gen. eval. outgroup	0.09	0.23***	0.28***	0.24***	0.23***	0.05	0.33***	-0.13	0.33***	0.29***	-0.33***	-0.50***	-0.44***	
14. Gen. ev. uninv. outgr.	-0.00	0.10	0.03	0.03	0.16*	0.16*	0.28***	0.02	0.13	0.14	-0.40***	-0.25***	0.30***	0.45***

Note: Numbers are Pearson's correlations (*r*).  
 \**p* < 0.05; \*\**p* < 0.01; \*\*\**p* < 0.001.

in Figure 2, within *T1*, virtually all significant relationships were in predicted directions. Contact as friends was associated with significantly higher superordinate,  $\beta = 0.30$ ,  $t = 2.25$ ,  $p < 0.03$ , and marginally significantly higher interpersonal,  $\beta = 0.25$ ,  $t = 1.82$ ,  $p = 0.07$ , levels of categorization. Moreover, the levels of categorization affected all four criterion variables.

The interpersonal level predicted less intergroup anxiety,  $\beta = -0.36$ ,  $t = -3.10$ ,  $p = 0.003$ , and marginally significantly, more positive general evaluation of French people,  $\beta = 0.23$ ,  $t = 1.86$ ,  $p < 0.07$ . In contrast, the intergroup level was associated with higher levels of anxiety,  $\beta = 0.40$ ,  $t = 3.58$ ,  $p = 0.001$ . The dual identity level was associated with more positive outgroup evaluations,  $\beta = 0.26$ ,  $t = 2.10$ ,  $p = 0.04$ . The superordinate level was associated with marginally significantly less positive evaluations of the uninvolved outgroup,  $\beta = -0.26$ ,  $t = -1.76$ ,  $p = 0.08$ . Although unexpected, this link is not wholly surprising: If participants cognitively include French outgroup members into a common group, this category is likely to be Europe or the E.U. The present 'uninvolved outgroup', Algerians, are not part of this category so it appears plausible that its members are evaluated more negatively the more the participant perceives the contact partner to be a member of a common ingroup (see Kessler & Mummendey, 2001). However, none of the levels of categorization mediated significantly between contact and the criterion variables to which contact was related (intergroup anxiety, social distance and general evaluation of the outgroup).

Examining the predictive power of the levels of categorization as a block, they accounted for 25% of variance in intergroup anxiety, adjusted  $R^2 = 0.25$ ,  $F(4, 63) = 6.52$ ,  $p < 0.001$ , 11% of variance in social distance, adjusted  $R^2 = 0.11$ ,  $F(4, 63) = 2.98$ ,  $p = 0.03$ , 14% of variance in general outgroup evaluation, adjusted  $R^2 = 0.14$ ,  $F(4, 63) = 3.81$ ,  $p < 0.01$ , and 6% of variance in general evaluations of the uninvolved outgroup, adjusted  $R^2 = 0.06$ ,  $F(4, 63) = 1.98$ ,  $p = 0.11$ . Overall then, cross-sectionally the levels of categorization explain higher amounts of variance in the criterion variables than Pettigrew's mediators, save for social distance.

*Longitudinal Analysis* Figure 3 summarizes the longitudinal test of the CIIM. Apart from the effects of *T1* contact variables on *T2* criterion variables, which were described in the longitudinal test of Pettigrew's model, there were only two (marginally) significant effects. *T1-T2* increases in the intergroup level of categorization tended to heighten intergroup anxiety,  $\beta = 0.34$ ,  $t = 1.88$ ,  $p = 0.07$ , and social distance,  $\beta = 0.33$ ,  $t = 1.79$ ,  $p = 0.09$  at *T2*. These relationships are consistent with the predictions, but a number of expected relationships are not present, particularly the central role of the superordinate level of categorization. The paucity of significant effects in the longitudinal model of the CIIM is surprising when compared with the longitudinal analysis of Pettigrew's model.<sup>7</sup>

The mediators as a block accounted for 6% of variance in intergroup anxiety, adjusted  $R^2 = 0.06$ ,  $F(4, 26) = 1.46$ ,  $p = 0.24$ , 3% of variance in social distance, adjusted  $R^2 = 0.03$ ,  $F(4, 26) = 1.26$ ,  $p = 0.31$ , 3% of variance in general outgroup evaluation, adjusted  $R^2 = 0.03$ ,  $F(4, 26) = 0.80$ ,  $p = 0.54$ , and 6% of variance in general evaluations of the uninvolved outgroup, adjusted  $R^2 = 0.06$ ,  $F(4, 26) = 0.55$ ,  $p = 0.70$ . These amounts of variance explained are substantially lower than those in the longitudinal analysis of Pettigrew's model. Moreover, none of the regression models is significant.

<sup>7</sup>Regression analyses of the reversed causal direction of the CIIM revealed larger effect sizes than the original model and two significant effects, apart from the ones outlined in the reversed test of Pettigrew's model. *T1* more positive general evaluations of the outgroup led to lower endorsement of the dual identity level over time and increases in the intergroup level from *T1-T2* reduced contact as friends at *T2*. The first effect is unexpected, but the second is not and shows that seeing the outgroup members purely in terms of group membership impedes later friendship formation, just as increasing affective ties in Pettigrew's model aids this process. These findings confirm that the levels of categorization are related to intergroup contact, but suggests that the causal direction between the two requires further investigation.



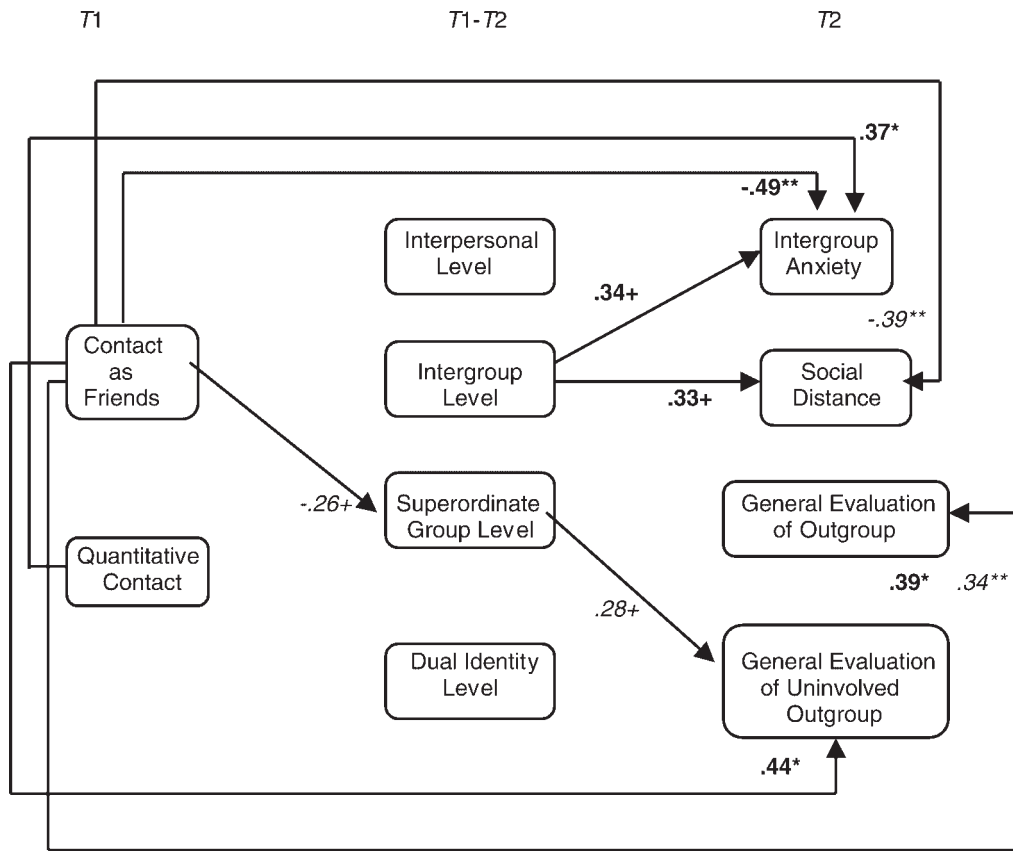


Figure 3. Path diagram to show a longitudinal analysis of the CIIM, using T1 and T2 Study 1 (Anglo-French) and Study 2 (Mexican-American) data. Significant paths only are shown; numbers are standardized partial regression coefficients ( $\beta$ ). Bold numbers describe effects found in Study 1, italicized numbers describe effects found in Study 2. + $p < 0.09$ ; \* $p < 0.05$ ; \*\* $p < 0.01$

### STUDY 2

Study 2 examines the Pettigrew and CIIM models in a different country, culture, participant population, intergroup relationship, and time frame. As well as providing a conceptual replication, this study includes a larger number of participants, providing greater statistical power, and allows us to examine whether the mediating processes within each model generalize to a different contact context from that in Study 1. The focus of Study 2 is contact between Mexican and American employees of multinational corporations over a period of time. Similar to the Anglo-French intergroup context, Mexican-American relations have been historically fraught with difficulties. These problematic relations have been exacerbated by differences of history, religion, ethnic origin, and language, and the fact that Mexico lost half of its territory to the U.S. after their 1846–48 war (Riding, 1985; Schmitt, 1974). There also exists a substantial asymmetry of power and status, if only because the U.S. economy is about 20 times the size of the Mexican economy (United States-Mexico Chamber of Commerce, 2000), which invariably impinges on specific intercultural contact settings.

These traditional animosities notwithstanding, there are multiple interactions in political, economic-financial, and social spheres between the two nations. This intertwining—particularly

in the politico-economic realm—was formalized through the North American Free Trade Agreement (NAFTA) among Mexico, the U.S. and Canada, which took effect in early 1994. NAFTA, which opened up the U.S.-Mexico border to trade in services in the areas of finance, transportation, and telecommunications, had increased bilateral trade 113% five years after its implementation, when the current study commenced (United States-Mexico Chamber of Commerce, 2000). Mexicans' attitudes towards the U.S. remain deeply ambivalent, characterized by distrust, resentment, and even xenophobia on the one hand (Shabat, 1993), and enthusiastic adoption of American consumerism and materialism, and mass emigration on the lookout for employment to the U.S., on the other hand (Bustamente, 1997).

Mexican-American relations constitute a unique, real-world context within which to test contact effects between national groups that are traditional adversaries and asymmetrical in status, yet economically and socio-politically interdependent (Gilmer, 2002). This contact is strongly supported by the incumbent presidents of the two nations, Vicente Fox and George Bush, despite their sometimes divergent views about the priorities in the bilateral agenda after the events of 9/11. Although Mexicans are obviously in a numerical majority in Mexico, where the present research took place, they enjoy lower status and power than Americans, within NAFTA and more globally. Thus, Mexicans can be considered to be the (status) minority group, whereas Americans are the (status) majority group, constituting the macro-societal context within which intergroup contact occurs. The present research setting is particularly interesting as it examines the vantage point of Mexicans living in Mexico, whereas the bulk of studies have investigated Americans' attitudes toward Mexican or Hispanic immigrants, or at times Hispanic immigrants' attitudes toward Americans (a notable exception is Stephan et al. (2000)).

With respect to Allport's and Pettigrew's crucial conditions, although there are substantial macro-societal status differences between Mexico and the U.S., participants within the present context should have contact on a relatively equal status basis as they are bound to have similar status positions within the companies. Moreover, there should be high degrees of intergroup cooperation as contact takes place within rather structured settings at the workplace or during business trips abroad. The nature of contact also makes it likely to be characterized by common goals and interdependence, though not by high intimacy. The language used during contact will be sometimes Spanish, but most often English. As in Study 1, the postulated levels of categorization during contact—interpersonal, intergroup, superordinate group, and dual identity—are of direct relevance given that, through the ratification of NAFTA, *North America* has become a stronger basis for categorization on either a superordinate group level, or instead a dual identity level, in conjunction with a categorization on the basis of nationality. It is noteworthy that in this study, a further potential superordinate category is constituted by the company participants work for.

In contrast to Study 1, which focused on intergroup contact in its initial stages, Study 2 involves a less controlled setting in which participants may vary considerably in their amount of prior contact with Americans. Overall, however, it seems likely that, in terms of Pettigrew's model, participants should have proceeded to more advanced stages of intergroup contact. If this is the case, relative to the results from Study 1, we might expect greater prominence in the intergroup and superordinate levels of categorization, both in absolute terms and in terms of their impact on the criterion variables.

## **Method**

### *Participants and Procedure*

Participants at *T1* (August 1999) were 207 Mexicans (69 women and 138 men), working for multinational corporations (mostly, telecommunications) and one national newspaper in Mexico.

These companies were mostly located in the capital, Mexico City, but also in Monterrey, Guadalajara, and León. Seventeen respondents' highest level of education was the Mexican equivalent of high school (*secundaria*), 142 had a university degree, while 48 had completed postgraduate study. Participants' mean age was 31.0 years (range 21–54). They completed questionnaires mostly via electronic mail, but also in paper-and-pencil format at their workplaces. At *T2* (some two years later) 87 Mexicans (28 women and 56 men; three missing) participated, with a mean age of 33.0 years (range 16–49). The longitudinally matched dataset included 21 women and 46 men ( $N = 67$ ), with a mean age of 31.7 years (range 23–47). Participation in this study was on a voluntary basis; however, there was a draw of \$50 to be won by one person in which 69.1% of respondents wished to be included.

### Measures

The translation of the questionnaire from English into Spanish was conducted by two native speakers of Spanish who were fluent in English, and it was back-translated by a bilingual person living in Mexico (Brislin, 1976).

*Quantitative contact* was measured by asking about the amount of contact with Americans at the workplace. *Qualitative contact* assessed the amount of contact as close friends (*never—always*). Remaining measures generally were the same as were used in Study 1, and we therefore only describe those that differed. The measure of *changing behaviour* included the additional attributes *cautious* and *relaxed*. The measure of *intergroup anxiety* included two additional items, *apprehensive* and *trusting*. The *Social Distance Scale* replaced the item 'fellow student' with 'co-worker', and added two further items, that had been irrelevant for use in Study 1, 'your neighbour', and 'your in-law'. Finally, the measure of *generalization of contact effects* towards another outgroup not present during the intergroup encounter was assessed using Canadians as the target group.

The reliability coefficients of the multiple item scales were as follows: Behaviour  $\alpha T1 = 0.65$ ,  $T2 = 0.73$ ; learning  $\alpha T1 = 0.72$ ,  $T2 = 0.74$ ; national identification  $\alpha T1 = 0.73$ ,  $T2 = 0.69$ ; intergroup anxiety  $\alpha T1 = 0.77$ ,  $T2 = 0.83$ ; social distance  $\alpha T1 = 0.86$ ,  $T2 = 0.88$ ; general evaluation of the outgroup  $\alpha T1 = 0.79$ ,  $T2 = 0.77$ ; and general evaluation of the uninvolved outgroup  $\alpha T1 = 0.81$ ,  $T2 = 0.73$ . Nunnally's (1967) criterion was fulfilled for all measures.

## Results and Discussion

The sequence of analyses follows that adopted for Study 1.

### Panel Attrition and Comparison of Participants

A MANOVA across the set of measures confirmed that there were no significant differences between the two groups, multivariate  $F(14, 112) = 1.02$ ,  $p = 0.44$ .

### Changes over Time

A repeated-measures MANOVA showed that scores on the measures did not change significantly over time,  $F(11, 31) = 1.37$ ,  $p = 0.24$ . Examining the level of outgroup bias at *T1* shown in Table 1, participants' general evaluations of Americans were not particularly negative,  $M = 4.26$ ,  $SD = 0.87$ , and were significantly above the midpoint of the scale,  $t(66) = 2.81$ ,  $p < 0.01$ , but they were significantly less positive than those for the ingroup,  $M = 5.21$ ,  $SD = 0.91$ ,  $t(67) = -7.33$ ,  $p < 0.001$ .

We analysed the four measures of level of categorization using a 2 (Time:  $T1$  vs.  $T2$ )  $\times$  4 (Level of Categorization: Interpersonal, Intergroup, Superordinate Group, Dual Identity) within-participants ANOVA. There was a significant effect of Level of Categorization,  $F(3, 52) = 7.21$ ,  $p < 0.001$ ,  $MSe = 3.56$ , but not of Time,  $F(1, 54) = 0.37$ ,  $p = 0.55$ ,  $MSe = 2.49$ , or the Time  $\times$  Level interaction,  $F(3, 52) = 0.09$ ,  $p = 0.96$ ,  $MSe = 1.88$ . Table 2 shows that, across the two time points, dual identity is significantly more prominent than superordinate and intergroup levels of categorization, and the mean for the interpersonal level is also significantly higher than that for the superordinate level.

As outlined in the Introduction to this study,  $T1$  probably does not assess initial stages of contact, but more advanced ones. Thus, this pattern of results does not contradict Pettigrew's model and could be interpreted as indicating the second stage of contact. The high endorsement of the dual identity and low endorsement of the superordinate level might reflect the macro-societal minority status of the Mexican participants, despite predominantly being 'hosts' in the contact settings. More specifically, previous research suggests that majority members may favour the superordinate level of categorization whereas minority members prefer the dual identity level (cf. van Oudenhoven, Prins, & Buunk, 1998).

### Pettigrew's Model

*Cross-Sectional Analysis* Figure 4 shows the results of the cross-sectional test of Pettigrew's model at  $T1$ , using regression analyses to test mediation effects, as in Study 1. There was no indication of

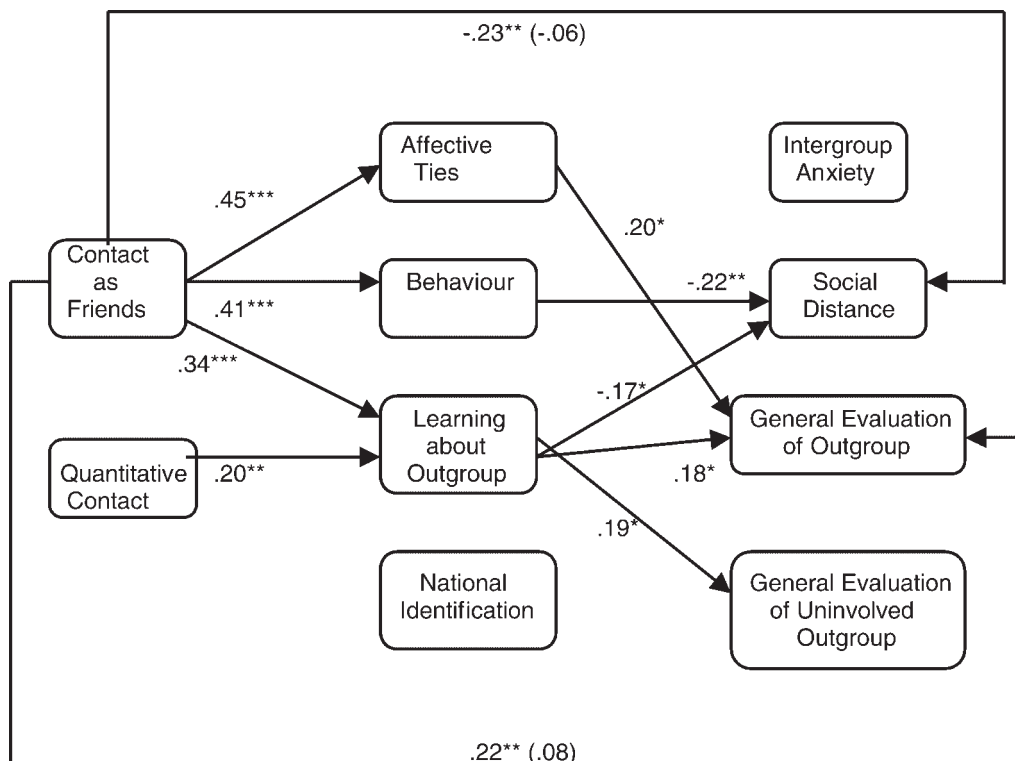


Figure 4. Path diagram to show a cross-sectional analysis of Pettigrew's (1998) model of intergroup contact, using  $T1$  Study 2 (Mexican-American) data. Significant paths only are shown; numbers are standardized partial regression coefficients ( $\beta$ ). Numbers in parentheses describe total effects.  $*p < 0.05$ ;  $**p < 0.01$ ;  $***p < 0.001$

multicollinearity for any of the cross-sectional and longitudinal regression analyses performed. As in Study 1, all significant relationships are in line with the predictions. Contact as friends relates to significantly less social distance,  $\beta = -0.23$ ,  $t = -3.06$ ,  $p = 0.003$ , more positive general outgroup evaluations,  $\beta = 0.22$ ,  $t = 2.93$ ,  $p = 0.004$ , closer affective ties,  $\beta = 0.45$ ,  $t = 5.90$ ,  $p < 0.001$ , more learning about the outgroup,  $\beta = 0.34$ ,  $t = 4.37$ ,  $p < 0.001$ , and more 'pro-American' behaviour,  $\beta = 0.41$ ,  $t = 5.17$ ,  $p < 0.001$ . Quantitative contact, in contrast, only relates to increased learning,  $\beta = 0.20$ ,  $t = 2.58$ ,  $p = 0.01$ . The two contact variables together account for 18% of the variance in increased learning about the outgroup, adjusted  $R^2 = 0.18$ ,  $F(2, 141) = 17.10$ ,  $p < 0.001$ .

The potential mediators also have significant effects on the criterion variables. Closer affective ties are associated with more positive general outgroup evaluation,  $\beta = 0.20$ ,  $t = 2.35$ ,  $p = 0.02$ . More 'pro-American' behaviour is associated with reduced social distance,  $\beta = -0.22$ ,  $t = -2.67$ ,  $p = 0.009$ , as is more learning,  $\beta = -0.17$ ,  $t = -2.05$ ,  $p = 0.04$ . Furthermore, increased learning predicts more positive general evaluations of the outgroup,  $\beta = 0.18$ ,  $t = 2.11$ ,  $p = 0.04$ , as well as of the uninvolved outgroup,  $\beta = 0.19$ ,  $t = 2.19$ ,  $p = 0.03$ .

Contact as friends and behaviour together account for 10% of the variance in social distance, adjusted  $R^2 = 0.10$ ,  $F(2, 196) = 11.99$ ,  $p < 0.001$ . More 'pro-American' behaviour mediates significantly 29% of the contact as friends—social distance relationship, Sobel test:  $z = 2.22$ ,  $p = 0.03$ . Contact as friends and learning about the outgroup together account for 6% of the variance in evaluations of the outgroup, adjusted  $R^2 = 0.06$ ,  $F(2, 194) = 7.33$ ,  $p = 0.001$ . However, although the beta weight for contact was reduced to non-significance by inclusion of the mediators, the Sobel test is non-significant.

In contrast to Study 1, there is an abundance of significant effects associated with the potential mediating variables. Given that the current study most likely examines advanced rather than initial stages of intergroup contact and the mediating variables have had time to exert their full influence, this is not surprising and complements the findings of Study 1, which examined initial stages of contact.

Pettigrew's mediators together explain 1% of variance in intergroup anxiety, adjusted  $R^2 = 0.01$ ,  $F(4, 140) = 1.46$ ,  $p = 0.22$ , 11% of variance in social distance, adjusted  $R^2 = 0.11$ ,  $F(4, 140) = 5.54$ ,  $p < 0.001$ , 10% of variance in general outgroup evaluation, adjusted  $R^2 = 0.10$ ,  $F(4, 140) = 4.76$ ,  $p < 0.001$ , and 2% of variance in general evaluations of the uninvolved outgroup, adjusted  $R^2 = 0.02$ ,  $F(4, 140) = 1.59$ ,  $p = 0.18$ . Overall, these numbers are comparable to the cross-sectional analysis of Pettigrew's model in Study 1.

*Longitudinal Analysis* Figure 1 summarizes the results of the longitudinal analyses using  $T2-T1$  difference scores for the mediators specified by Pettigrew's model. Quantitative contact had no significant longitudinal effects whereas contact as friends at  $T1$  predicted reduced social distance,  $\beta = -0.39$ ,  $t = -3.08$ ,  $p = 0.003$ , and more positive outgroup evaluations,  $\beta = 0.34$ ,  $t = 2.58$ ,  $p = 0.01$ , at  $T2$ . Similar to Study 1, the cross-sectional and longitudinal analyses of the current study underscore the importance of essential contact conditions: Quantitative contact only had one significant effect at  $T1$  and none in the longitudinal analysis whereas contact as friends had five such effects at  $T1$  and two in the longitudinal analysis.

Examining the effects involving the mediating variables,  $T1-T2$  increases in 'pro-American' behaviour resulted in decreased social distance,  $\beta = -0.35$ ,  $t = -2.61$ ,  $p = 0.01$ , and marginally significantly more positive outgroup evaluation,  $\beta = 0.26$ ,  $t = 1.79$ ,  $p = 0.08$ , at  $T2$ . Increased learning over time had two unexpected effects, heightened social distance,  $\beta = 0.39$ ,  $t = 2.87$ ,  $p = 0.007$ , and less positive general outgroup evaluation,  $\beta = -0.34$ ,  $t = -2.33$ ,  $p = 0.03$ . The combined effects of contact as friends, pro-American behaviour and increased learning on social distance accounted for 26% of the variance in social distance, adjusted  $R^2 = 0.26$ ,  $F(3, 60) = 8.50$ ,  $p < 0.001$ . The combined effect of these three variables also accounted for 16% of the variance in outgroup evaluation, adjusted

$R^2 = 0.16$ ,  $F(3, 58) = 5.00$ ,  $p = 0.004$ . However, these effects were entirely additive and there was no evidence for significant mediation.

In contrast to the results of Study 1, there were actually fewer significant effects associated with the mediating variables in this study's longitudinal than the cross-sectional analysis. This is particularly the case for the relationships between contact and mediating variables, none of which were significant in the longitudinal model. Hence, over time the mediating variables affected criterion variables independently from the contact variables. Most surprisingly, learning about the outgroup had exclusively bias-reducing effects in the cross-sectional analysis, but only bias-augmenting effects in the longitudinal analysis, mirroring the pattern of findings related to quantitative contact in Study 1. The present result might reflect some kind of cultural resentment, which might apply specifically to macro-societal minorities: The more participants are exposed to (and hence, learn about) U.S. culture in terms of films, newspapers, the Internet, and so on, the less they seem to like the objects of these portrayals (see the Introduction to this study on Mexicans' ambivalence towards Americans).<sup>8</sup>

As a set the mediating variables explained 4% of variance in intergroup anxiety, adjusted  $R^2 = 0.04$ ,  $F(4, 40) = 0.53$ ,  $p = 0.71$ , 24% of variance in social distance, adjusted  $R^2 = 0.24$ ,  $F(4, 40) = 4.47$ ,  $p = 0.004$ , 13% of variance in general outgroup evaluation, adjusted  $R^2 = 0.13$ ,  $F(4, 40) = 2.71$ ,  $p = 0.04$ , and 1% of variance in general evaluations of the uninvolved outgroup, adjusted  $R^2 = 0.01$ ,  $F(4, 40) = 1.05$ ,  $p = 0.39$ . It should be noted that these regression models are significant only for social distance and outgroup evaluation.

### *The CIIM*

At T1 interpersonal, dual identity, and superordinate levels of categorization are positively related with one another. However, the intergroup level is unrelated to interpersonal and dual categorization and negatively related to superordinate categorization (see Table 3).

*Cross-Sectional Analysis* As shown in Figure 5, at T1, virtually all significant relationships were in predicted directions. Contact as friends was associated with higher superordinate,  $\beta = 0.30$ ,  $t = 3.96$ ,  $p < 0.001$ , and marginally higher dual identity levels of categorization,  $\beta = 0.14$ ,  $t = 1.85$ ,  $p = 0.07$ . Quantitative contact was related to a higher dual identity level,  $\beta = 0.17$ ,  $t = 2.23$ ,  $p = 0.03$ . Together, both forms of contact accounted for 5% of the variance in dual identity level, adjusted  $R^2 = 0.05$ ,  $F(2, 175) = 5.97$ ,  $p = 0.003$ . Quantitative contact was also, unexpectedly, associated with a higher intergroup level,  $\beta = 0.17$ ,  $t = 2.15$ ,  $p = 0.03$ .

The interpersonal level of categorization was related to reduced anxiety,  $\beta = -0.24$ ,  $t = -3.35$ ,  $p = 0.001$ , and social distance,  $\beta = -0.19$ ,  $t = -2.70$ ,  $p = 0.008$ , and to more positive general evaluations of the outgroup,  $\beta = 0.30$ ,  $t = 4.32$ ,  $p < 0.001$ , and the uninvolved outgroup,  $\beta = 0.27$ ,  $t = 3.64$ ,  $p < 0.001$ . The intergroup level was associated only with heightened anxiety,  $\beta = 0.16$ ,  $t = 2.10$ ,  $p = 0.04$ .

The dual identity level related to reduced intergroup anxiety,  $\beta = -0.24$ ,  $t = -3.24$ ,  $p = 0.001$ , lowered social distance,  $\beta = -0.20$ ,  $t = -2.94$ ,  $p = 0.004$ , and more positive general outgroup evaluation,  $\beta = 0.20$ ,  $t = 2.86$ ,  $p = 0.005$ . Although the beta weights for the effect of contact as friends on social distance and outgroup evaluation were both reduced to non-significance when the dual

<sup>8</sup>Regression analyses revealed only three, marginally significant effects for the reversed causal model. More learning from T1 to T2 tended to decrease contact at work and as friends at T2. More 'pro-American' behaviour over time tended to predict less quantitative contact at T2.



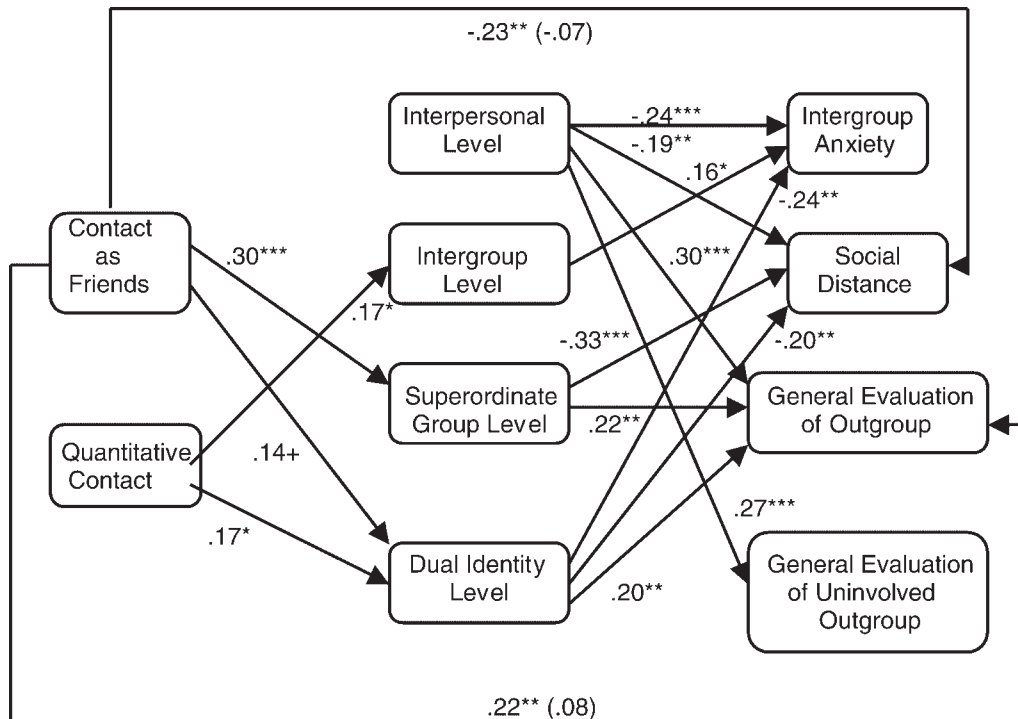


Figure 5. Path diagram to show a cross-sectional analysis of the CIIM, using T1 Study 2 (Mexican-American) data. Significant paths only are shown; numbers are standardized partial regression coefficients ( $\beta$ ). Numbers in parentheses describe total effects. + $p < 0.07$ ; \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

identity level was included in the regression, neither Sobel test was significant,  $z = 1.52$ ,  $p = 0.13$ , 11% of the relationship mediated, and  $z = 1.53$ ,  $p = 0.13$ , 13% of the relationship mediated, respectively.

The superordinate level was significantly associated with social distance,  $\beta = -0.33$ ,  $t = -4.42$ ,  $p < 0.001$ , and with outgroup evaluations,  $\beta = 0.22$ ,  $t = 3.03$ ,  $p = 0.003$ . The superordinate level also mediated significantly between contact as friends and these two outcomes,  $z = 2.75$ ,  $p = 0.006$ , 30% of relationship mediated, and  $z = 2.14$ ,  $p = 0.03$ , 24% of the relationship mediated, respectively.

For the CIIM, similar to the pattern for Pettigrew's model, there are more significant relationships in Study 2 than in Study 1. The dual identity level shows most significant relationships with contact and criterion variables, while the superordinate group level mediates most substantially between contact as friends and outcome variables. Surprisingly, the only level of categorization to significantly predict general evaluations of the uninvolved outgroup is the interpersonal one. This seems inconsistent with the idea that generalization should depend on use of the intergroup and dual identity levels of categorization. The relationship with interpersonal categorization is especially surprising because general evaluation of an uninvolved outgroup is the most remote type of generalization of contact effects. A further unexpected result was that quantitative contact heightened the intergroup level of categorization, although this may indirectly illuminate the importance of friendship potential during contact.

The levels of categorization as a block explain 14% of variance in intergroup anxiety, adjusted  $R^2 = 0.14$ ,  $F(4, 170) = 7.98$ ,  $p < 0.001$ , 23% of variance in social distance, adjusted  $R^2 = 0.23$ ,  $F(4, 170) = 13.77$ ,  $p < 0.001$ , 23% of variance in general outgroup evaluation, adjusted  $R^2 = 0.23$ ,

$F(4, 170) = 14.04$ ,  $p < 0.001$ , and 9% of variance in general evaluations of the uninvolved outgroup, adjusted  $R^2 = 0.09$ ,  $F(4, 170) = 5.14$ ,  $p = 0.001$ . As in Study 1, these proportions are clearly higher than those of the cross-sectional analysis of Pettigrew's model.

*Longitudinal Analysis* Figure 3 summarizes the longitudinal test of the CIIM. Apart from the effects of  $T1$  contact variables on  $T2$  criterion variables, which were described in the test of Pettigrew's model, there were only two marginally significant effects.  $T1$  contact as friends tended to decrease the endorsement of the superordinate level over time,  $\beta = -0.26$ ,  $t = -1.82$ ,  $p = 0.08$ . Increases in the superordinate level were associated with marginally more positive evaluations of the uninvolved outgroup at  $T2$ ,  $\beta = 0.28$ ,  $t = 1.74$ ,  $p = 0.09$ . This scarcity of significant effects contrasts with the cross-sectional evidence from  $T1$ , and closely mirrors the longitudinal results of the CIIM in Study 1.<sup>9</sup>

The mediators as a block explained 2% of variance in intergroup anxiety, adjusted  $R^2 = 0.02$ ,  $F(4, 48) = 1.23$ ,  $p = 0.31$ , 7% of variance in social distance, adjusted  $R^2 = 0.07$ ,  $F(4, 48) = 0.13$ ,  $p = 0.97$ , 5% of variance in general outgroup evaluation, adjusted  $R^2 = 0.05$ ,  $F(4, 48) = 0.40$ ,  $p = 0.81$ , and 2% of variance in general evaluations of the uninvolved outgroup, adjusted  $R^2 = 0.02$ ,  $F(4, 48) = 1.32$ ,  $p = 0.28$ . As in Study 1, these amounts of variance explained are substantially lower than those in the longitudinal analysis of Pettigrew's model and none of the regression models is significant.

## GENERAL DISCUSSION

These two field studies tested Pettigrew's reformulated model of the intergroup contact hypothesis and Gaertner and Dovidio's CIIM of the effects of different cognitive representations during contact. These longitudinal designs, difficult to implement in practical terms and a rarity in the field (for a recent exception, see Levin et al., 2003), allowed for an examination of causal relations in the context of real-world and historical intergroup contexts. Our general finding is that contact in two different intergroup settings—the Anglo-French and the Mexican-American context—can have beneficial effects on certain mediating and outcome variables, provided contact is characterized by friendship.

### Limitations and Strengths

Both studies, particularly Study 1, had a rather low  $T2$  sample size. Both consisted of only two time points rather than the three Pettigrew's model would call for. The latter limitation may appear to be quite serious as it precludes a complete examination of Pettigrew's model, specifically the time sequence of the mediators and levels of categorization and the functional relationships between variables as contact progresses. Moreover, these field studies presented us with relatively little control or certainty over the contact stage participants were at (particularly Study 2), rendering a strict test of Pettigrew's model more difficult. However, the different time frames of the two studies (six months vs. two years) might mitigate this weakness somewhat by allowing two opportunities to observe whether different levels of categorization are more closely related to outcomes at different time points. We are also aware of the fact that several measures (e.g. levels of categorization) consisted of one item only, which might account for some of the anomalous findings within and across these two studies.

<sup>9</sup>The reversed causal analysis of the CIIM revealed two effects.  $T1$  intergroup anxiety predicted higher endorsement of the interpersonal level over time, and increases in the interpersonal level from  $T1$ - $T2$  resulted in marginally significantly heightened contact as friends at  $T2$ .

Nonetheless, the current research represents one of the few longitudinal field examinations of the CIIM and one of the first tests ever of Pettigrew's influential model. Hence, this research had the advantage of supplementing the often-used cross-sectional designs (e.g. Mottola, Bachman, Gaertner, & Dovidio, 1997) with a longitudinal analysis. This choice of design allowed us to detect certain patterns in the data (the roles of quantitative contact and learning about the outgroup in Pettigrew's model, and the veracity of the proposed causal directions of Pettigrew's model and the CIIM) that would have remained opaque with a purely cross-sectional approach.

Lastly, Study 2 contributed to an under-researched setting of contact effects, that between Mexicans and Americans (also see Stephan et al., 2000). This is particularly the case for contact between Mexicans and Americans *outside* the U.S., which is likely to differ qualitatively from contact taking place *within* the U.S.

### Comparison of Findings

It is instructive to note the similarities and differences among the present findings and those from the study by Eller and Abrams (2003), which examined Mexican-American intergroup contact from an American point of view (see Table 4). In all three studies the role of intergroup friendship was central, although this pattern was clearer in the current research. In the cross-sectional analysis of Pettigrew's model, learning about the outgroup and behaviour were the most important mediating variables in all three studies, with the addition of affective ties in the current Study 2. This is quite a positive result and highly relevant to social policy. It is much simpler and more straightforward to provide people with information about an outgroup and to produce behaviour change by means of anti-discrimination laws than to arrive at people's changes in affective ties and national identification. The fact that precisely these two variables are also the most effective ones in leading to reduced intergroup bias is highly promising. In the longitudinal analysis of Pettigrew's model, affective ties was the most central mediator/suppressor in Study 1 and Eller and Abrams (2003), where national identification was equally important, whereas behaviour and learning about the outgroup (the latter variable, negatively so) were most crucial in Study 2.

A finding that is pervasive throughout the cross-sectional and longitudinal analyses of both present studies is that national identification was neither related to contact nor criterion variables. It thus appears that the level of participants' national identification is impervious to being influenced by the quantity or quality of contact and that its level, in turn, cannot ameliorate or deteriorate intergroup relations. However, it should be pointed out that participants' level of national identification was rather high, particularly that of the Mexicans (see Table 1), and results might have been different with lower levels.

Examining the different cognitive representations during contact, the same picture emerges for Eller and Abrams (2003) and Study 1. At both time points the outgroup member was seen predominantly on an interpersonal level and least on an intergroup level, with the dual identity and superordinate group levels in between. Moreover, in the cross-sectional analyses of both studies the interpersonal level had most significant relationships with criterion variables, though in Eller and Abrams (2003), the superordinate group level had equal impact. In contrast, at both time points of Study 2 the dual identity level was most strongly endorsed and the superordinate group level was most weakly endorsed. Somewhat surprisingly, superordinate and dual identity levels were most potently related to reduced intergroup bias in the cross-sectional analysis. As concerns the longitudinal analysis, the intergroup level was most salient in Study 1, the superordinate group level in Study 2, and the interpersonal level in Eller and Abrams (2003). These differences may reflect diverging intergroup contexts or differential status relations between groups (see below).

Table 4. Comparison of key results in three studies

Result	Eller and Abrams (2003) <sup>1</sup>	Study 1 <sup>2</sup>	Study 2 <sup>3</sup>
Role of quantitative versus qualitative contact	Qual. = more important than quan.; both have pos. effects	Qual. = central role Quan. = pos. in cross-sect. analysis; neg. in long. analysis	Qual. = central role Quan. = some pos., some neg. effects
Most important mediators in cross-sectional Pettigrew model	Behaviour, followed by learning	Learning, followed by behaviour	Affective ties, behaviour, learning
Most important mediators in longitudinal Pettigrew model	Affective ties and national identification	Affective ties, followed by behaviour	Behaviour and learning (neg.)
Endorsement of levels of categorization	IP = strongest, IG = weakest (both times)	IP = strongest, IG = weakest (both times)	DI = strongest, SO = weakest (both times)
Most important mediators in cross-sectional CIIM	IP and SO levels	IP and SO levels, (SO level neg.)	SO and DI levels
Most important mediators in longitudinal CIIM	IP level	IG level	SO level
Causal direction of Pettigrew's model	Not supported	Partially supported	Largely supported
Causal direction of CIIM	Supported	Not supported	Not supported

Note: <sup>1</sup>Mexican-American intergroup context from high-status perspective (Americans). <sup>2</sup>English-French intergroup context from equal-status perspective (English). <sup>3</sup>Mexican-American intergroup context from low-status perspective (Mexicans). Qual. = qualitative contact; Quan. = quantitative contact; pos. = positive; neg. = negative; sect. = sectional; long. = longitudinal, IP = interpersonal; IG = intergroup; SO = superordinate group; DI = dual identity.

Finally, although the causal direction of Pettigrew's model was generally supported in Studies 1 and 2, it was not supported in Eller and Abrams (2003), where there was stronger evidence for reversed causality. The proposed causal direction of the CIIM was not supported in Studies 1 and 2 and supported in Eller and Abrams (2003). Although these findings contradict the theoretical basis of these models, which in the case of Pettigrew's model, reflects decades of intergroup contact research, the implications are not wholly negative. As pointed out in Eller and Abrams (2003), contact should not always be regarded as the starting point in a causal sequence that ends with prejudice. Rather, the contact-mediator-prejudice link should be seen as a reciprocal, fluid process, not as a unidirectional relationship.

The comparison of the results of these three studies demonstrates that despite different contact contexts (university vs. multinationals vs. language schools), different status relations between groups, different time frames (six months vs. two years vs. two weeks), and groups of different nationalities, some of the findings were remarkably similar, revealing some common, possibly pan-cultural processes. However, some of the findings of Study 2 diverged from those of Study 1 and Eller and Abrams (2003), particularly the mediators in the longitudinal analysis of Pettigrew's model and the role of the levels of categorization. This might be due to differences in status relations between the groups: Participants in Study 1 were neither in the status majority nor minority, those in Eller and Abrams (2003) were in the status majority, whereas respondents in Study 2 were in the minority. This idea is corroborated by previous research, which has found that minority members prefer the dual identity level and integration (as opposed to assimilation) into the majority group culture (cf. Dovidio, Gaertner, & Kafati, 2000; van Oudenhoven et al., 1998).

With a view to conceptually integrating Pettigrew's model and the CIIM, the present results point to the following. Quality of contact (i.e. friendship potential) appears to be pivotal; indeed, mere quantity of contact unaccompanied by certain conditions may sometimes even have detrimental effects (longitudinal analysis, Study 1). Moreover, learning about the outgroup and behaviour modification seem to be important at initial stages of contact, whereas the generation of affective ties gains importance over time. In general, we found more significant relationships between levels of categorization and outcome variables than contact variables and levels of categorization. This suggests that the role of levels of categorization may not be merely as mediators but that they characterize contact *as it happens*.

This idea is corroborated by the fact that the levels of categorization as a block explained substantially more variance in the criterion variables in the cross-sectional than the longitudinal analyses (in both studies reported here). The reverse is true for Pettigrew's mediators, which had more impact on criterion variables in the longitudinal analyses. In fact, in the cross-sectional analyses Pettigrew's mediators as a group significantly predicted only one criterion variable in Study 1 (social distance) and two criterion variables in Study 2 (social distance and outgroup evaluation). In contrast, the levels of categorization as a group did not significantly predict any of the criterion variables in either longitudinal analysis. Nonetheless, rather than pitting the CIIM and Pettigrew's model against one another—something their proponents never intended to do—they should be regarded as complementing one another. The present findings point to an integrative model in which high quality contact, which is characterized by interpersonal or superordinate levels of categorization, leads to closer affective ties, more positive behaviour towards the outgroup, and learning about the outgroup, which then affects prejudice over time.

Future research also needs to further investigate and consolidate the potentially different mediating and/or moderating processes for majority versus minority groups. This would also help to ascertain whether the effects of different levels of categorization on prejudice reduction are context- or status-dependent or whether they are more or less invariant. This would not only be of theoretical interest, but it would carry practical implications as well. Applying it to the current research, specifically in settings

of international contact within the E.U. or NAFTA, a dual identity level of categorization would seem to be most beneficial in producing positive, generalized, and long-lasting intergroup attitudes and emotions. So perhaps country divisions will not be dissolved, as Lennon had hoped for, but the dual identity should be the most effective and realistic strategy to allow people to live life in peace and to make the world 'as one.'

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