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*Group Processes Intergroup Relations* 2003; 6; 55

DOI: 10.1177/1368430203006001012

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# 'Gringos' in Mexico: Cross-Sectional and Longitudinal Effects of Language School- Promoted Contact on Intergroup Bias

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A longitudinal field study examined Pettigrew's (1998) intergroup contact theory and Gaertner et al.'s (2000) Common Ingroup Identity Model (CIIM). In Pettigrew's model, the contact-prejudice relation is mediated by *changing behavior*, *ingroup reappraisal*, *generating affective ties*, and *learning about the outgroup*. Pettigrew's integration of the three chief models of contact generalization into a time-sequence holds that contact first elicits decategorization, then salient categorization, and finally recategorization. In CIIM, these three levels of categorization—plus a fourth, dual identity—are thought to be mediators in the contact-prejudice relation. Results underline the crucial mediating role of behavior modification in Pettigrew's model and interpersonal and superordinate levels in CIIM. An attempt to partially integrate the two models is presented.

**keywords** generalization of contact effects, intergroup relations, levels of categorization, reducing intergroup bias

THIS paper presents a two-wave longitudinal field study examining Pettigrew's (1998) reformulated model of the contact hypothesis and Gaertner and coworkers' (2000) Common Ingroup Identity Model (CIIM). Participants were American language school students spending a summer in Cuernavaca, Mexico, to learn Spanish. As sample attrition was rather high and *T2* sample size rather low, our main emphasis will be on the *T1* cross-sectional

analysis, while the longitudinal analysis is more exploratory.

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## Mexican-American relations

Mexican-American relations have been historically fraught with difficulties, despite, or perhaps, precisely *because* of the two nations' geographical proximity. 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 US after their 1846–1848 war (Loeza, 1994; Riding, 1985; Schmitt, 1974). There also exists a substantial asymmetry of power and status, for example, the US 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 terms between the two nations. This intertwining—particularly in the politico-economic realm—was formalized through the North American Free Trade Agreement (NAFTA) between Mexico, the US and Canada, which took effect in early 1994. NAFTA, which opened up the US-Mexico border to trade in services in the areas of finance, transportation, and telecommunications, has increased bilateral trade 113% since its implementation (US-Mexico Chamber of Commerce, 2000).

From an American vantage point, the focus of the current study, a positive relationship between Mexicans and Americans may be supported by potent norms of liberalism and political correctness, favoring affirmative action and civil rights (Conrad & Sharpe, 1996; Van Boven, 2000). However, a conservative backlash to the massive inflow of Hispanics during the last decade has formed, manifesting itself in the success of the much disputed Proposition 187 in the State of California, which curtailed affirmative action (Lee, Ottati, & Hussain, 2001; Suárez-Orozco, 1996).

## The intergroup contact hypothesis

The present research builds upon the *intergroup contact hypothesis*, tested widely and with a myriad

of participant populations, targets, and research methods, since its formalization by Williams (1947), and later, Allport (1954). Allport postulated that contact between social groups with contrasting ethnicity, nationality, religion, or other category memberships only produces positive effects (i.e. lessened intergroup bias) if qualified by the following four conditions: equal status within the situation, common goals, intergroup cooperation, and support of the authorities.

Despite generally corroborative evidence over the past half century, the contact hypothesis has been subject to criticism on the following counts. First, as Pettigrew (1986) and Stephan (1987) have stated, over the years theoreticians have advanced so many qualifying conditions for contact to render favorable effects that the hypothesis resembles a shopping list rather than a parsimonious, coherent model. Hence it has become expandable *ad infinitum* and elusive to falsification. On this matter, Pettigrew (1998) notes that there appears to be a widespread confusion between essential and merely facilitating conditions.

Second, as even Allport acknowledged, the causal direction between contact and reduced intergroup bias is somewhat equivocal. The frequently employed cross-sectional studies may be flawed by selection bias (i.e. the instance that solely the nonprejudiced actively seek intergroup contact), and therefore longitudinal designs are needed to provide more adequate tests of the contact hypothesis. Third, the original contact hypothesis merely predicted *when*, but not *how* and *why* contact educes positive change. Moreover, it did not specify in any way how contact effects generalize across situations, from individuals to the outgroup as a whole, or even to uninvolved outgroups (Pettigrew, 1998).

With the aim of overcoming these flaws, Pettigrew reformulated the contact hypothesis into a longitudinal model (see Figure 1). 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. Pettigrew designated Allport's four

conditions and a fifth one, *friendship potential*, to be essential situational factors—alongside various mere facilitating factors—for positive intergroup outcomes. Though not graphically represented, Pettigrew also conceived of four processes that mediate attitude change through contact: learning about the outgroup, changing behavior, generating affective ties, and ingroup reappraisal.

As a final aspect of his reformulation, Pettigrew incorporated the three chief models of generalization of contact effects (Brewer & Miller, 1984; Gaertner et al., 2000; Hewstone & Brown, 1986; also see Bettencourt, Brewer, Rogers-Croak, & Miller, 1992; Gaertner & Dovidio, 2000; Vivian, Hewstone, & Brown, 1997). He integrated them into a time-sequence, within which different phases of contact are likely to be characterized by different salient levels of categorization: contact should first elicit *decategorization* of group members (i.e. interpersonal level of categorization), then *salient categorization* (i.e. intergroup level of categorization), and further *recategorization* (i.e. superordinate level of

categorization), which is assumed to induce a maximum reduction in prejudice.

A further form of categorization, which Pettigrew did not incorporate into his model, is the *dual identity* level of categorization. Dual identity (Gaertner et al., 2000) constitutes an amalgam of salient categorization and recategorization, within which original group identities are maintained, though within the context of a superordinate identity (Hornsey & Hogg, 1999, 2000; cf. Mummendey & Wenzel, 1999). In certain 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, 1991, 1996). Thus, a dual identity may sometimes be more potent in educing both positive outgroup evaluations and a generalization of these.

Although it makes intuitive sense that at different stages of intergroup contact different cognitive representations of outgroup members should be most salient or most beneficial in terms of improving intergroup

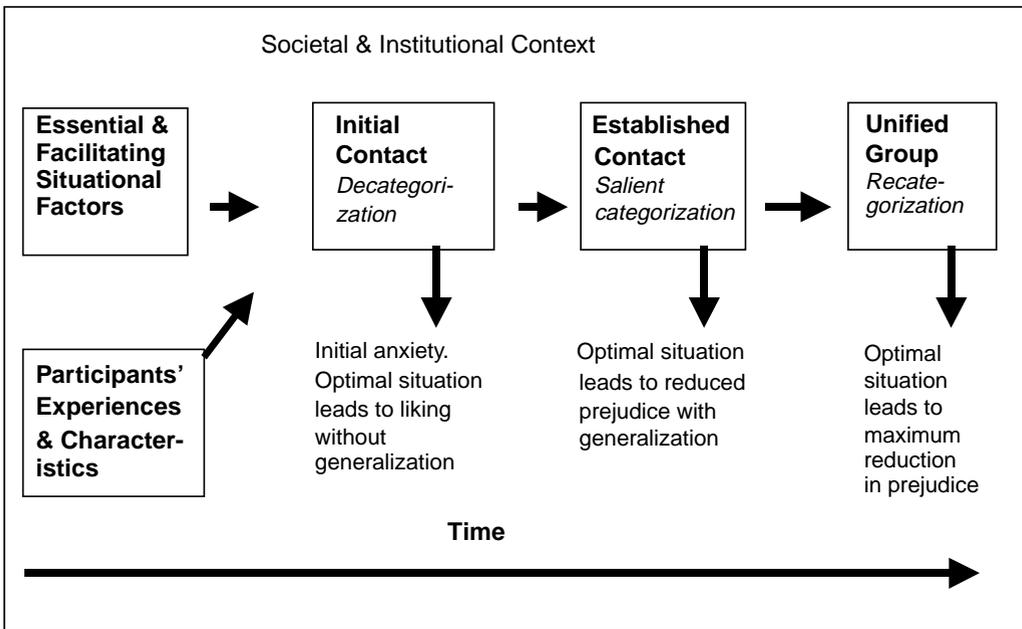


Figure 1. Pettigrew's (1998) reformulated intergroup contact model.

relations, Pettigrew did not specify in his model what *function* the different levels of categorization should perform (e.g. as independent variables or as a second set of mediators). Moreover, he did not specify whether the relationship between the contact, mediating, and criterion variables will differ depending on the salient level of categorization.

Gaertner and coworkers (2000) specifically addressed the role of the levels of categorization in the contact-prejudice relationship in their

CIIM, such that the latter can be regarded as expanding one aspect of Pettigrew's model (see Figure 2). In the CIIM, the four levels of categorization—Pettigrew's three plus the dual identity—act as mediators between antecedents (e.g. Allport's ideal conditions) and consequences (cognitive, affective, and behavioral effects). According to Gaertner and colleagues, the superordinate level of categorization will be most beneficial in bringing about improved attitudes, emotions, and behavior toward outgroup

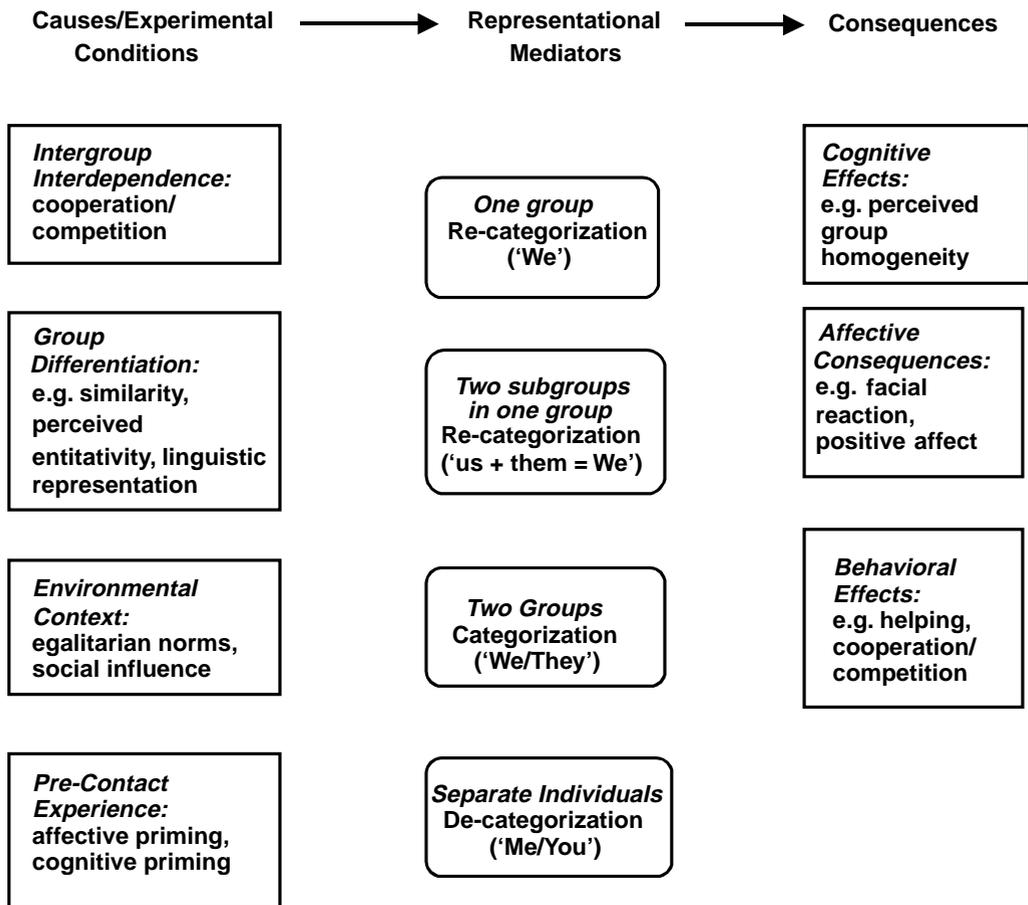


Figure 2. The Common Ingroup Identity Model (Gaertner et al., 2000).

members present in the contact situation. In contrast, the dual identity should be slightly less effective in the immediate contact situation, but its salient categorization component should induce widespread generalization of contact effects, as already recognized by Hewstone and Brown (1986).

## The present research

As outlined above, the current research examines two important models of intergroup contact. Predictors (quantitative and qualitative contact) and criterion variables (prejudice, intergroup anxiety, social distance, and general outgroup evaluation) were identical for both models. However, the models emphasize different mediating processes. First, we assess Pettigrew's longitudinal model by examining the effects of contact onto intergroup bias over time and to see to what extent the effects are mediated by (a) learning about the outgroup, (b) generating affective ties, (c) ingroup re-appraisal, and (d) changing behavior. This should provide some answers to Pettigrew's question of *how* and *why* contact brings about positive effects. We also consider another question raised by Pettigrew's work, that of how contact effects generalize beyond the immediate situation and to other outgroup members. Second, the present research examines Gaertner et al.'s (2000) CIIM by investigating how applications of different levels of social categorization during contact may affect intergroup relations.

As concerns the predictor variables in the present research, we consider both the quantity of contact (at the language school) and its quality (contact as friends). Hence, in terms of Pettigrew's proposed *essential conditions*, we focus on friendship potential. This is done for theoretical and empirical reasons. 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 behavior vis-à-vis other outgroup members given their attitude change. Empirically, our previous research (Eller, 2002) showed Allport's crucial conditions and contact as friends to be multicollinear. It is obvious how friendship can be interrelated with at least three of the other essential conditions: friendship would probably not develop or would terminate soon if it was not characterized by equality of status, common goals, and cooperation to some extent (also see Pettigrew & Tropp, 2000).

Friendships between members of different groups naturally involve a host of *interpersonal* processes. Hewstone and Brown (1986; also see Brewer & Gaertner, 2001; Rose, 1981) advocated 'intergroup contact works, if and when it does, because it changes the nature and structure of the intergroup relationship—not because it permits and encourages interpersonal friendships between members of different groups' (pp. 34–35). However, it is quite probable that friends also perceive each other on intergroup, superordinate group, or dual identity levels of categorization. This indeed seems to underpin the extended contact effect (Wright, Aron, McLaughlin-Volpe, & Ropp, 1997). So, although friendships exist interpersonally, that does not automatically entail that friends perceive each other exclusively on a decategorized level.

As described above, Mexican-American relations provide a unique, real-life context within which to test contact effects between national groups that are traditionally adversary and asymmetrical in status, yet economically and socio-politically interdependent. This contact is strongly supported by the incumbent presidents of the two nations, Vicente Fox and George Bush, who have even been discussing an amnesty program for millions of Mexicans who are living illegally in the US (Duffy, 2001). Although Americans are obviously in a numerical minority in Mexico, they enjoy higher status and power than Mexicans, internationally and within NAFTA. Moreover, in the present language school context students rely to some degree on the Mexican locals to provide them

with accommodation and opportunities to learn Spanish. Similarly, the Mexicans are dependent on the Americans to provide important revenue by means of their 'linguistic tourism'. Thus, Mexicans can be considered to be the minority group, whereas Americans are the majority group, constituting the macrosocietal context within which intergroup contact occurs.

Language school students provide an ideal setting within which to test Pettigrew's and Gaertner and coworkers' models: most of the American students visiting Mexico had little intergroup contact at the outset of the study. However, there is high contact and friendship potential through staying with Mexican families and meeting locals, and participants are highly motivated to learn Spanish and engage in intergroup contact. Moreover, 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 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. *Interpersonal* refers to contact between individual people, as opposed to groups, akin to Gaertner and colleagues' (2000) 'separate individuals' condition. It does not denote more personalized contact, in Brewer and Miller's (1984) terms.

With respect to Allport's crucial conditions, despite substantial macrosocietal status differences, participants within the present context engaged in contact on a relatively equal status basis. Moreover, the context promotes high degrees of intergroup cooperation. American language school students visit Mexico to learn Spanish and this also provides important revenue for the local economy such that, to some extent, contact is likely to be characterized by common goals. Finally, as mentioned, contact is strongly sanctioned by authorities, and contact is voluntary. Americans going to Mexico to study Spanish could be expected to hold initial attitudes toward Mexicans that are more favorable than those of other Americans. Hence, the present research is conducted within a context that is probably more conducive to the

generation of positive intergroup relations than many other contact situations.

## Method

### *Participants and procedure*

Three hundred questionnaires were distributed to Americans studying Spanish at one of six language institutes in Cuernavaca, Mexico, at Time 1 (*T1*), of which 33.3% were returned. Thus, participants were 79 women and 21 men ( $N = 100$ ), with ages ranging from 13 to 75 ( $M = 33.6$ ,  $SD = 15.4$ ). At Time 2 (*T2*) we distributed 150 questionnaires,<sup>1</sup> of which 16.6% were returned, such that there were 25 of the 100 original respondents (18 women and 7 men), with an age range of 15 to 75 ( $M = 35.6$ ,  $SD = 15.5$ ). Participation in this study was on a voluntary basis; however, there was a prize draw of US\$50 in which 61.8% of respondents wished to be included. *T1* took place within the first week of participants' arrival in Cuernavaca and *T2* was assessed two weeks after arrival.

### *Measures*

**Predictor variables** *Quantitative contact* was measured by asking about the amount of contact with Mexicans at the language school. Scaling ranged from *never* (1) to *always* (7), with higher scores denoting quantitatively more contact. We also measured the quantity of contact 'as close friends' (*never — always*), which, with reference to Pettigrew (1998), we regard as a *qualitative item* despite assessing its quantity. Higher scores denote qualitatively better contact.

**Mediating variables in Pettigrew's model** *Learning about the outgroup* was assessed by asking respondents how often they (a) watched Mexican movies (*never — always*), (b) watched television programs produced in Mexico, (c) listened to Mexican music, (d) read Mexican newspapers or magazines, and (e) how well they spoke Spanish (*not at all — fluently*). Another question was 'How much do you learn about Mexicans and Mexican culture every week by watching TV, reading the newspaper, listening to the radio, or surfing in the Internet?' (*nothing — very much*).

*Generating affective ties* was conceptualized as

increasing interpersonal closeness, measured with the Inclusion of Other in the Self (IOS) Scale (Aron, Aron, & Smollan, 1992). The IOS scale was modified slightly: participants were first instructed to think of a Mexican person close to them and then select the pair of circles that 'best describes your relationship with that person'. *Ingroup reappraisal* was conceptualized as comprising changes in national identification, for example, 'I'm proud to be an American' (*strongly disagree — strongly agree*). Lastly, *changing behavior* was assessed by asking respondents if they behaved differently toward their fellow Americans than toward Mexicans with respect to the following characteristics: kind, reserved, cautious, understanding, and patient (items 1, 4, and 5 were reversed). The items were scored on 7-point scales, such that lower scores indicated 'pro-American' behavior, and higher scores denoted 'pro-Mexican' behavior.

**Mediating variables in the CIIM** To assess interpersonal, intergroup, superordinate group, and dual identity levels of categorization during contact, we asked, 'When you have contact with Mexicans, how often do you perceive them (a) as unique individuals, (b) as people from a group that is completely different from your own, (c) as people with whom you share a common group membership, and (d) as people from a different group that, *at the same time*, share a common group membership with you?' Responses to each of these four questions were rated on 7-point Likert-type scales (*never—always*), such that higher scores indicated stronger categorization on that particular level.

**Criterion variables** We measured *prejudice* with the following items: 'Some people are disturbed by the opinions, customs, and way of life of people different from themselves. Do you personally, in your daily life, find the presence of Mexicans in the US disturbing?' (Pettigrew, 1997); 'It is unfair to the people of one country if the immigrants take jobs and resources'; 'Given the present high level of unemployment, foreigners should go back to their countries' (Lepore & Brown, 1997); 'How different or similar do you think Mexicans are to Americans

like yourself (a) . . . in how honest they are?, (b) . . . in the values that they teach their children?, (c) . . . in their religious beliefs and practices?' (Pettigrew & Meertens, 1995). All items were scored on 7-point scales such that higher scores indicated higher prejudice. Bogardus' (1933) *Social Distance Scale* asks respondents to what extent they would like to have a Mexican as a clerk, colleague, boss, neighbor, best friend, in-law, and partner, respectively. Responses were reverse-scored on 7-point scales (*not at all—very much*), such that higher scores indicated more social distance.

The *General Evaluation Scale* (Wright et al., 1997) instructed respondents to 'indicate how you feel about Mexicans in general' by using the following bipolar adjective pairs separated by a 7-point scale: *cold — warm, negative — positive, hostile — friendly, suspicious — trusting, contempt — respect, disgust — admiration*. Responses were scored such that the more positive adjective received the higher score. *Intergroup anxiety* was measured using Stephan, Diaz-Loving, and Duran's (2000) scale: 'Indicate how you would feel when interacting with Mexicans': apprehensive, friendly, uncertain, comfortable, worried, trusting, threatened, confident, awkward, safe, anxious, at ease (items 2, 4, 6, 8, 10, and 12 were reversed). Items were scored on 7-point scales (*not at all — extremely*), with higher scores indicating higher anxiety.

## Results

Contact at school, contact as friends, the IOS scale, and the four different levels of categorization are all single-item measures. The reliability coefficients of multiple-item measures are as follows: behavior  $T1 = .74$ ,  $T2 = .75$ ; knowledge  $T1 = .82$ ,  $T2 = .69$ ; identification  $T1 = .73$ ,  $T2 = .81$ ; intergroup anxiety  $T1 = .87$ ,  $T2 = .90$ ; social distance  $T1 = .96$ ,  $T2 = .93$ ; prejudice  $T1 = .71$ ,  $T2 = .68$ ; general evaluation  $T1 = .79$ ,  $T2 = .78$ . To maximize reliability of the Prejudice scale, we excluded the 'honesty' and 'values' items at  $T1$  and the 'religious beliefs and practices' item at  $T2$ . To establish that the measures included in the models are conceptually and empirically distinct, we used Nunnally's (1967)

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.

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 compared the extent that each level of categorization prevailed. Next we examined evidence for Pettigrew’s model and for the CIIM within the larger (T1) dataset. (This was not repeated for T2 because of insufficient numbers of participants.) Finally, we examined the causal relationships from T1 to T2 conducting a longitudinal analysis for specific paths and hypothesis tests.<sup>2</sup>

**Panel attrition and comparison of participants**

Given our rather high T1-T2 attrition rate, it seemed wise to check that those people that dropped out of the study after T1 were not different from those who stayed in the sample. A multivariate analysis of variance (MANOVA) across the set of measures confirmed that there were no significant differences between the two groups (multivariate  $F(14, 72) = .96, p = .51$ ). The analyses further revealed that there were no significant differences between the samples on these measures at the univariate level.

**Changes over time**

Planned comparisons were conducted to examine whether the measures of interest

varied over time. Table 1 shows that three effects changed significantly: interpersonal closeness and knowledge increased from T1 to T2, but so did prejudice. We analyzed the four measures of levels of categorization using a 2 (Time: T1 vs. T2)  $\times$  4 (Level of Categorization: Interpersonal, Intergroup, Superordinate Group, Dual Identity) within-participants ANOVA. The effect of Time was nonsignificant ( $F(1,24) = .24, p = .63, MSe = 1.33$ ), but there was a significant effect of Level of Categorization ( $F(3,72) = 30.65, p < .001, MSe = 2.06$ ) and a marginally significant Time  $\times$  Level interaction ( $F(3,72) = 2.35, p < .08, MSe = 1.07$ ).

As summarized in Table 2 the relative predominance of each level remains similar at both time points but the differences are slightly more extreme at T2. Contact is characterized mostly by the interpersonal and dual identity levels, less by a superordinate level, and least by an intergroup level. Simple main effects show that at T1 the interpersonal and dual identity levels differ significantly from the other two levels. This is in line with Pettigrew’s predictions, but also underlines the importance of the dual identity level in this particular context. At T2 the interpersonal level has become even stronger (nonsignificant difference), while the dual identity decreased markedly, but nonsignificantly, and is not significantly higher than the superordinate or intergroup levels, and these other two levels remained practically the same. This is inconsistent with Pettigrew’s model, which would predict the intergroup level (or perhaps the

Table 1. Changes of means over time

Measure	Time 1	Time 2	t	p
Contact at school	6.43 (0.98)	6.43 (0.79)	0.00	1.00
Contact as friends	4.00 (2.16)	3.43 (1.90)	0.57	.59
IOS scale	2.80 (0.87)	2.96 (0.89)	-2.14	.04
Behavior	3.76 (0.61)	3.82 (0.50)	-0.64	.53
Knowledge	2.97 (1.31)	3.54 (0.89)	-2.92	.01
Identification	5.60 (1.21)	5.71 (1.22)	-0.71	.49
Intergroup anxiety	3.43 (0.93)	3.17 (0.90)	1.39	.18
Social distance	2.50 (1.36)	2.65 (1.23)	-0.81	.43
Prejudice	2.64 (1.05)	3.11 (0.65)	-2.51	.02
General evaluation	5.42 (0.77)	5.30 (0.75)	0.93	.36

Note: Numbers are means and standard deviations.

Table 2. Characterization of contact at T1 and T2

Levels of categorization	Time 1	Time 2
Interpersonal	5.84 <sup>a</sup> (1.43)	6.44 <sup>a</sup> (0.82)
Intergroup	3.60 <sup>b</sup> (1.53)	3.60 <sup>b</sup> (1.53)
Superordinate group	4.32 <sup>b</sup> (1.41)	4.52 <sup>b</sup> (1.33)
Dual identity	5.72 <sup>a</sup> (1.10)	5.24 <sup>a,b</sup> (1.16)

Notes: Numbers are means and standard deviations. Means with different superscripts differ significantly from each other.

dual identity) to be more strongly endorsed at T2.

**Pettigrew’s model** Pettigrew’s model holds that contact as friends should lead to increased liking and knowledge of the outgroup, behavior modification, and ingroup reappraisal. Moreover, it should reduce intergroup anxiety, and intergroup bias in general.

**Cross-sectional analysis** Figure 3 shows the results of the cross-sectional test of Pettigrew’s model at T1, using a series of regression analyses to test mediation effects. Following Baron and Kenny’s (1986) procedure, standard multiple regression was used to, first, regress the mediators on the independent variables, second, regress the dependent variables on the independent variables, and third, regress the dependent variables on both the independent variables and the mediators. All significant relationships are in line with the predictions: contact as friends is associated with significantly more interpersonal closeness (IOS scale;  $\beta = .49$ ,  $t = 5.15$ ,  $p < .001$ ), more knowledge about the outgroup ( $\beta = .35$ ,  $t = 3.43$ ,  $p < .001$ ), more ‘pro-Mexican’ behavior ( $\beta = .32$ ,  $t = 3.15$ ,  $p < .003$ ), less intergroup anxiety ( $\beta = -.26$ ,  $t = -2.28$ ,  $p < .001$ ), and marginally significantly, less social distance ( $\beta = -.20$ ,  $t = -1.79$ ,  $p < .08$ ). Furthermore, there is one indirect effect: changing behavior mediates between contact as friends and anxiety. Contact as friends induces more pro-Mexican behavior, which in turn lowers intergroup anxiety ( $R^2 = .19$ ,  $F(2, 92) = 10.95$ ,  $p < .001$ ). The Sobel test showed that this indirect effect of the IV on the DV via the mediator

is significantly different from zero at  $p = .02$ . Finally, more knowledge about the outgroup is marginally significantly associated with more positive outgroup evaluations ( $\beta = .21$ ,  $t = 1.85$ ,  $p < .07$ ).

**Longitudinal analysis** We used multiple regression to examine the relationship between variable X at T1 on variable Y at T2, controlling for variable Y at T1. Specifically, we first looked at the effects of T1 contact as friends and contact at school, respectively, on the individual T2 mediators, having partialled out the effects of the T1 mediators. We then investigated the effects of the individual T1 mediators on the T2 criterion variables, having controlled for the T1 criterion variables.

Figure 4 summarizes the results of these analyses testing Pettigrew’s model.<sup>3</sup> Once the T1 mediating and criterion variables were accounted for, contact as friends at T1 did not significantly affect any of the T2 mediating or T2 criterion variables. These findings suggest that the impact of the mediating variables may happen very close to the contact experience (i.e. within T1), and that these effects do not increase over time. However, T1 quantity of contact at the language school had a direct, marginally significant, effect on prejudice reduction at T2 ( $\beta = -.34$ ,  $t = -1.91$ ,  $p = .07$ ). Scrutinizing the effects of the mediating variables, interpersonal closeness at T1 was associated with diminished intergroup anxiety at T2 ( $\beta = -.36$ ,  $t = -2.08$ ,  $p < .05$ ) and lower identification at T1 was associated with less social distance at T2 ( $\beta = .37$ ,  $t = 2.95$ ,  $p = .008$ ). These analyses reveal that contact may result in increased interpersonal

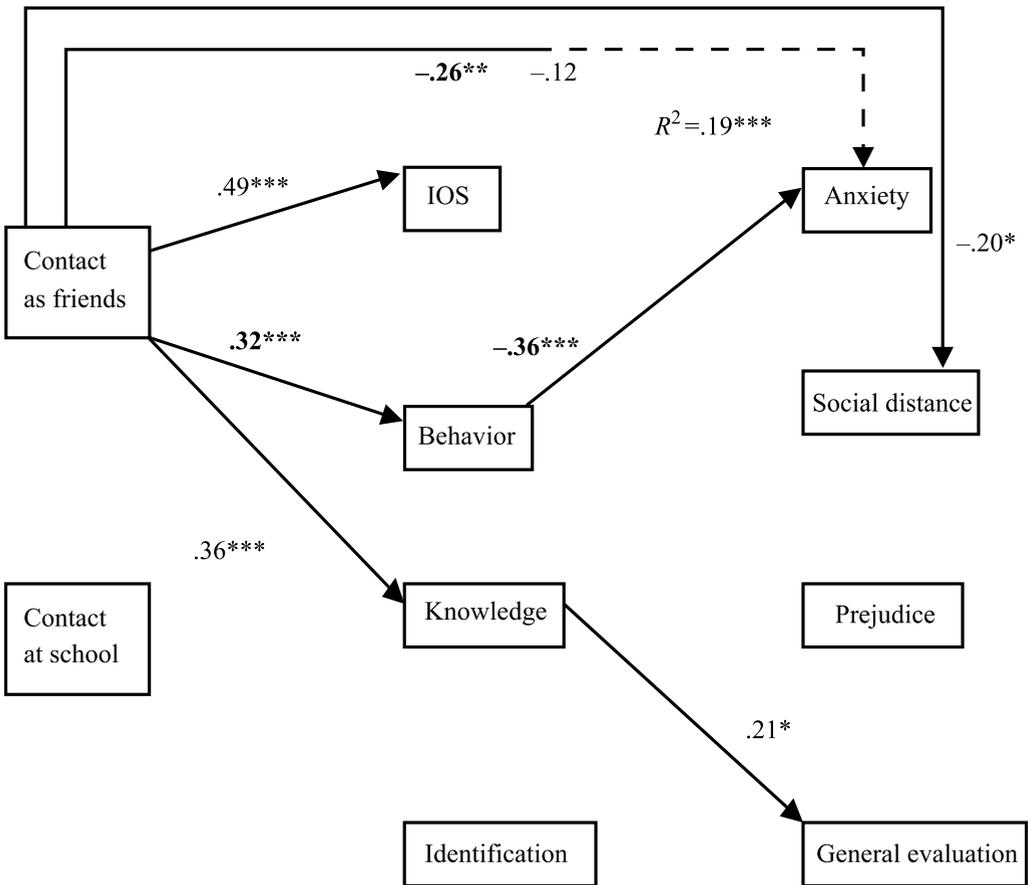


Figure 3. Path diagram, using T1 data, relating to contact as friends, contact at school, Inclusion of Other in Self, behavior towards in- and outgroup members, knowledge about outgroup, identification with ingroup, intergroup anxiety, social distance, prejudice, and general evaluation.

Note: Significant paths only are shown; indirect effects are in bold face. Unless otherwise indicated, numbers are standardized partial regression coefficients (β). \*p < .07; \*\*p < .01; \*\*\*p < .003.

closeness and subsequently reduced anxiety. However, social distance will be further improved the less group members identify with their own group.

In comparison to the cross-sectional analysis, there were fewer significant effects in the longitudinal analysis. The limited T2 sample size reduces the power of the longitudinal analysis, and it is possible that small or medium-size effects exist that are not statistically reliable. To check this possibility we examined the beta weights of the paths that were significant in the

cross-sectional, but not the longitudinal model. In the former, the beta values for the relationships between contact as friends and interpersonal closeness, behavior, knowledge, anxiety, and social distance were .49, -.32, .36, -.26, and -.20, respectively, while in the latter they were -.14, -.15, .17, .21, and -.11. Hence, effects were consistently smaller in the longitudinal model, and they were also in unpredicted directions in two cases. On the other hand, the three significant effects present in the longitudinal model are absent in the cross-sectional one.

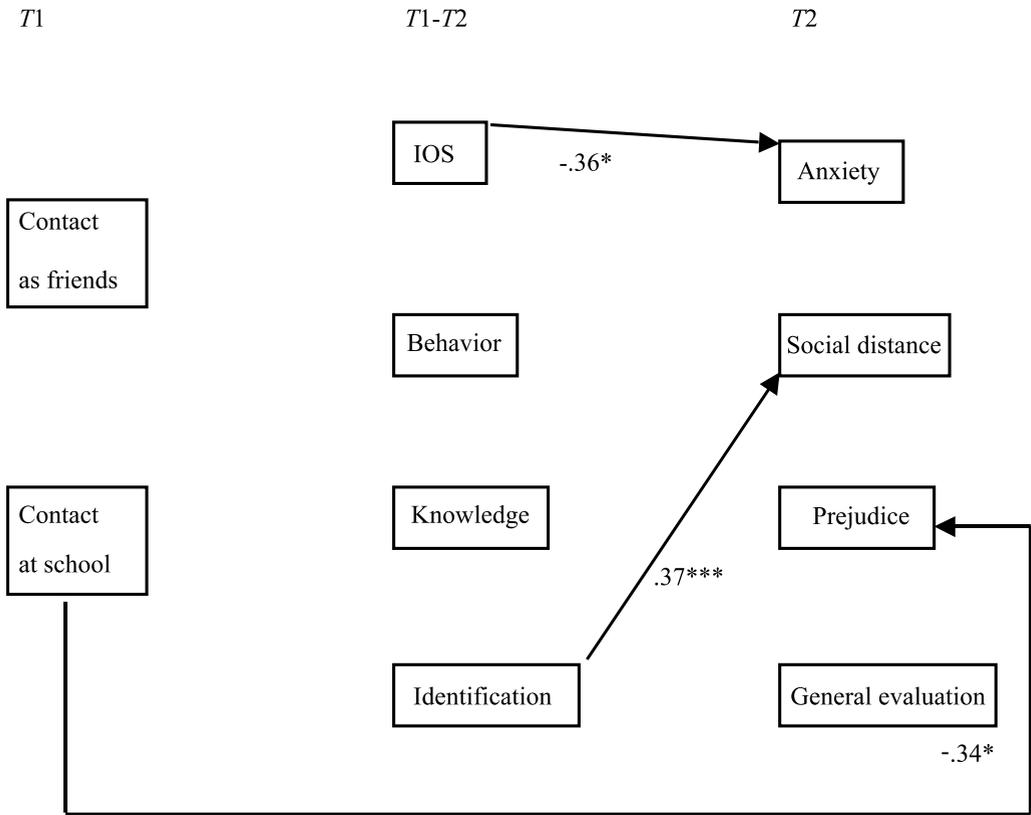


Figure 4. Path diagram, using T1 and T2 data, relating to contact as friends, contact at school, Inclusion of Other in Self, behavior towards in- and outgroup members, knowledge about outgroup, identification with ingroup, intergroup anxiety, social distance, prejudice, and general evaluation. Note. Significant paths only are shown. Paths are based on individual regression analyses to test causal effects. Numbers are standardized partial regression coefficients ( $\beta$ ). \* $p = .07$ ; \*\* $p = .05$ ; \*\*\* $p = .008$ .

**Causal direction** To investigate the causal direction of the variables in the longitudinal model, we employed an identical strategy to the one described above, but reversed the roles of predictor and criterion variables (see Kessler & Mummendey, 2001). These regression analyses revealed that T1 intergroup anxiety unexpectedly predicted higher T2 interpersonal closeness ( $\beta = .20, t = 2.30, p = .03$ ), and that higher prejudice ( $\beta = -.39, t = -2.54, p = .02$ ) and higher social distance ( $\beta = -.31, t = -1.97, p = .06$ ) predicted more 'pro-American' behavior. As for the mediating variables, only T1 interpersonal closeness had any effects: It predicted more T2 contact as friends ( $\beta = .82, t = 2.60, p = .06$ ), but

also less contact at school ( $\beta = -1.19, t = -3.62, p = .02$ ). Hence, there are more significant relationships in this 'reversed longitudinal model' than in the original one, but some are in unexpected directions.

**The Common Ingroup Identity Model**

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. None of the other levels are significantly correlated with one another.

Table 3. Interrelationships of variables at T1

Measure	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Contact at school	-	.26*	.08	-.02	.06	.11	.34***	-.01	.14	.11	.05	-.01	.08	.02
2. Contact as friends	-	-	.49***	.30**	.35***	-.13	.13	-.19	.18	-.06	-.23*	-.18	.18	-.05
3. IOS	-	-	-	.27**	.26*	-.00	-.02	-.28**	.32**	.03	-.10	.05	.12	.08
4. Behavior	-	-	-	-	.30**	-.13	.04	-.11	.32***	-.04	-.42***	-.08	.06	.13
5. Knowledge	-	-	-	-	-	-.14	-.06	-.20*	.04	.10	-.30**	-.17	.10	.16
6. Identification	-	-	-	-	-	-	-.12	.11	-.05	.03	.13	.23*	-.07	-.07
7. Interpersonal level	-	-	-	-	-	-	-	-.14	.34***	.18	.02	-.22*	-.19	.30**
8. Intergroup level	-	-	-	-	-	-	-	-	-.33***	-.15	.16	.19	.25*	-.22*
9. Superordinate level	-	-	-	-	-	-	-	-	-	.32**	-.30**	-.11	-.22*	.38***
10. Dual identity level	-	-	-	-	-	-	-	-	-	-	-.17	-.05	-.16	.30**
11. Anxiety	-	-	-	-	-	-	-	-	-	-	-	.22*	-.07	-.38***
12. Social distance	-	-	-	-	-	-	-	-	-	-	-	-	.20*	-.30**
13. Prejudice	-	-	-	-	-	-	-	-	-	-	-	-	-	-.20*
14. General evaluation	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

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

The CIIM predicts that high quality of friendly contact will promote the superordinate level, and to a lesser degree, dual identity level of categorization. These in turn should reduce intergroup bias, and additionally, the dual identity should aid generalization of contact effects. The effects of the interpersonal level, if any, should be to reduce intergroup bias, whereas the pattern should be opposite for the intergroup level. Using the same procedure as we did for Pettigrew's mediators we tested the CIIM.

**Cross-sectional analysis** As shown in Figure 5, within *T1*, all significant relationships were again in predicted directions. Contact as friends was marginally significantly associated with a lower intergroup level of categorization ( $\beta = -.19, t = -1.87, p < .07$ ), whereas contact at school was significantly related to higher levels of the interpersonal level ( $\beta = .34, t = 3.50, p < .001$ ). In turn, the interpersonal level marginally significantly predicted less social distance<sup>4</sup> ( $\beta = -.21, t = -1.76, p = .08; R^2 = .07, F(2,90) = 3.29, p < .05$ ) and a more positive general evaluation of Mexicans ( $\beta = .21, t = 2.01, p < .05$ ). The superordinate level was associated with lowered intergroup anxiety ( $\beta = -.27, t = -2.38, p < .02; R^2 = .17, F(2,92) = 6.50, p < .01$ ) and a more positive evaluation ( $\beta = .26, t = 2.39, p < .02; R^2 = .18, F(2,94) = 10.25, p < .001$ ). The intergroup level related to higher prejudice ( $\beta = .23, t = 2.22, p < .03$ ). However, the dual identity was not significantly related to any of the criterion variables. There was no evidence of mediation effects in this model.

**Longitudinal analysis** Figure 6 summarizes the longitudinal test of the CIIM. *T1* contact as friends significantly increased the superordinate level of categorization at *T2* ( $\beta = .39, t = 2.18, p < .05$ ), but, surprisingly, it did not affect the interpersonal level. More *T1* contact at school led to higher interpersonal ( $\beta = .39, t = 2.22, p < .04$ ), and especially, dual identity levels of categorization ( $\beta = .63, t = 3.69, p < .001$ ), and it reduces prejudice at *T2* ( $\beta = -.34, t = -1.91, p = .07$ ). Of the levels of categorization, only the interpersonal level at *T1* marginally significantly predicts less prejudice at *T2* ( $\beta = .32, t = 1.83, p = .08$ ).

Although the difference in the number of significant effects between cross-sectional and longitudinal models was not as great for the test of the CIIM as for that of Pettigrew's model, the levels of categorization still had more effects on criterion variables in the cross-sectional than the longitudinal model. Comparing effect sizes, in the cross-sectional model the beta values for the interpersonal level — social distance, interpersonal — general evaluation, intergroup — prejudice, superordinate — anxiety, and superordinate — general evaluation relations were  $-.21, .21, .23, -.27$ , and  $.26$ , respectively, and  $-.09, .13, .13, -.07$ , and  $-.21$  in the longitudinal model. As in the tests of Pettigrew's model, effects were consistently smaller in the longitudinal model, and one was in an unexpected direction.

**Causal direction** Examining the causal direction of the variables in the longitudinal model, we again conducted regression analyses reversing the roles of predictor and criterion variables. There was only one (marginally) significant relationship: *T1* general outgroup evaluation predicted a *T2* diminished intergroup level of categorization ( $\beta = -.36, t = -1.99, p = .06$ ).

#### *Integrating Pettigrew's model and the CIIM*

As outlined in the introduction, the CIIM expands that part of Pettigrew's model that deals with the levels of categorization and generalization of contact effects. A larger sample size would allow for the creation of structural equation models to examine precisely how the two models fit together and could be combined, especially with regard to their proposed mediating processes. This is not possible here, owing to sample size. However, inspection of the correlations among variables at *T1* (see Table 3) shows that 'pro-Mexican' behavior is positively correlated with a superordinate level of categorization, higher interpersonal closeness is correlated with a lower intergroup level and a higher superordinate level, and higher knowledge about the outgroup is correlated with a lower intergroup level. In order to investigate which of the mediators proposed by Pettigrew's model and the CIIM might have the largest

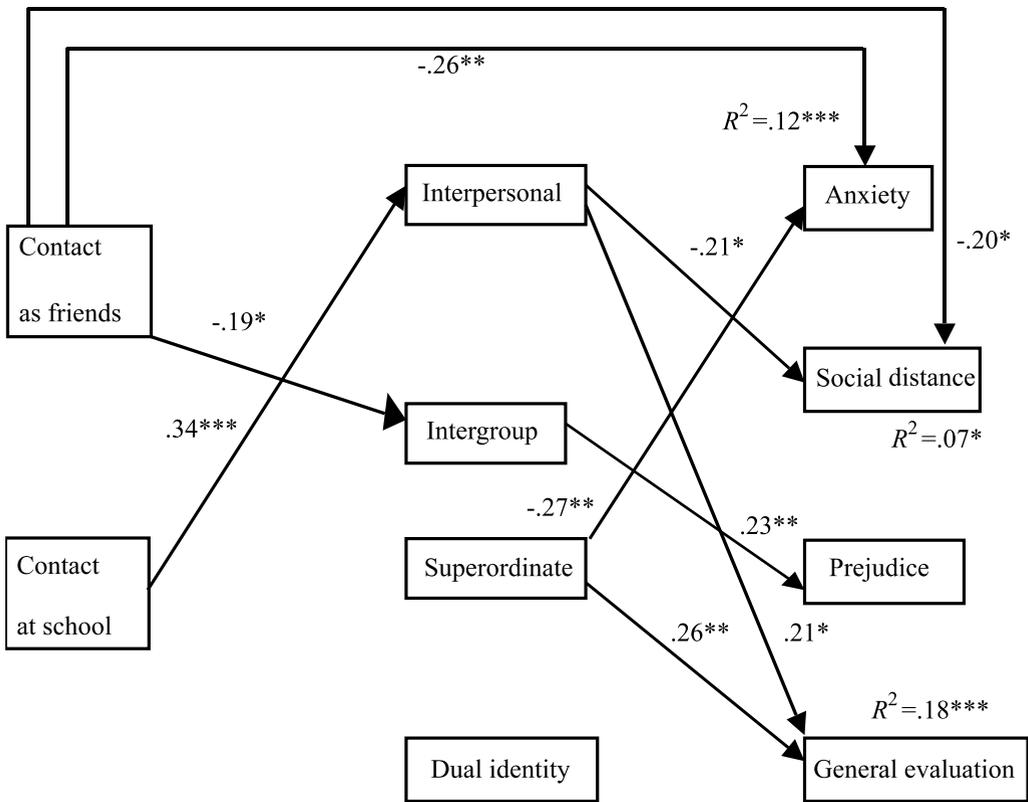


Figure 5. Path diagram, using T1 data, relating to contact as friends, contact at school, interpersonal, intergroup, superordinate group, and dual identity levels of categorization, intergroup anxiety, social distance, prejudice, and general evaluation.

Note. Significant paths only are shown. Unless otherwise indicated, numbers are standardized partial regression coefficients ( $\beta$ ). \* $p < .085$ ; \*\* $p < .03$ ; \*\*\* $p < .003$ .

effects on the criterion variables we conducted a post-hoc analysis using stepwise regressions. In these we first used both contact variables and all eight potential mediators to predict each of the four criterion variables. Reduced anxiety was significantly predicted by 'pro-Mexican' behavior ( $\beta = -.35, t = -3.49, p = .008$ ) and more knowledge ( $\beta = -.21, t = -2.03, p = .046; R^2 = .27, F(2,83) = 10.83, p < .001$ ). Diminished social distance was predicted by an interpersonal level ( $\beta = -.22, t = -2.04, p = .044$ ). Prejudice was predicted by an intergroup level ( $\beta = .24, t = 2.31, p = .024$ ), and more positive outgroup evaluations were predicted by the superordinate level ( $\beta = .34, t = 3.36, p = .001$ ) and higher knowledge ( $\beta$

$= .21, t = 2.09, p = .04; R^2 = .17, F(2,83) = 8.61, p = .0004$ ). These results suggest that the different mediators may play distinct roles in the impact of contact on different outcome variables.

Next we examined which of Pettigrew's mediators could best be used to predict each level of categorization. This revealed that interpersonal and dual identity levels were not predicted by any of Pettigrew's mediators, whereas interpersonal closeness was associated with a reduced intergroup level ( $\beta = -.29, t = -2.83, p = .006$ ). The superordinate level was predicted by both interpersonal closeness ( $\beta = .23, t = 2.37, p = .02$ ) and by 'pro-Mexican' behavior ( $\beta = .34, t = 3.46, p < .001; R^2 = .21, F(2,88) = 11.87, p < .001$ ).

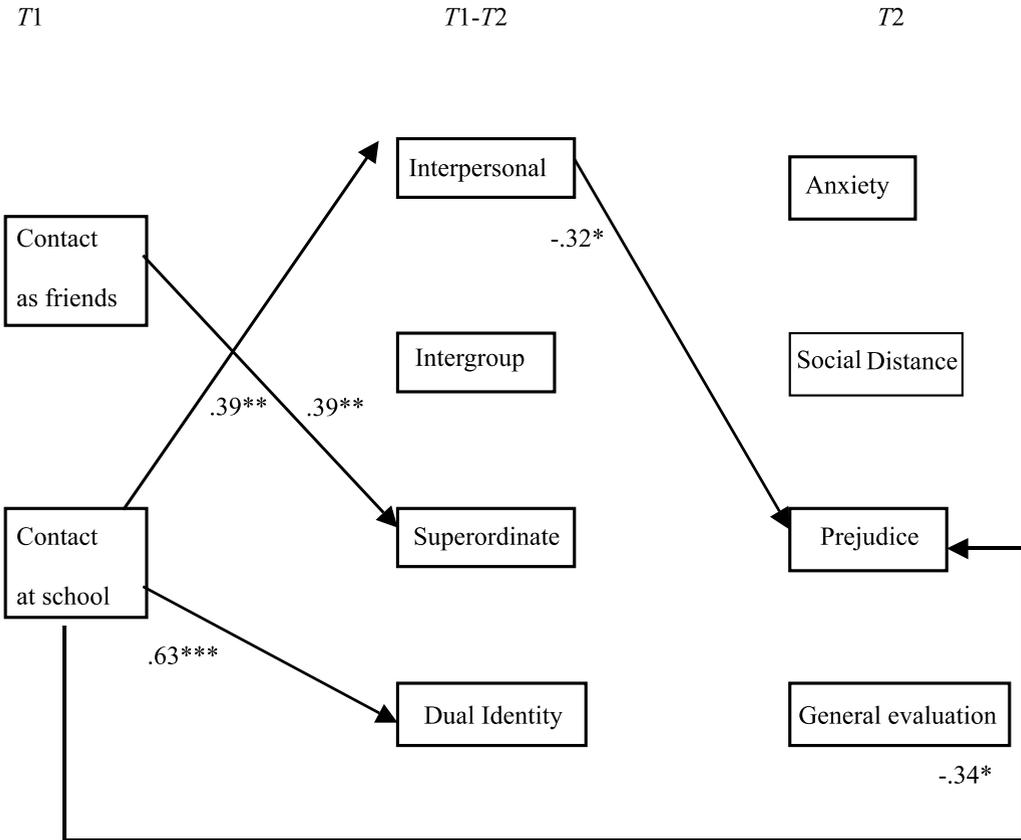


Figure 6. Path diagram, using T1 and T2 data, relating to contact as friends, contact at school, interpersonal, intergroup, superordinate group, and dual identity levels of categorization, intergroup anxiety, social distance, prejudice, and general evaluation. Note. Significant paths only are shown. Paths are based on individual regression analyses to test causal effects. Numbers are standardized partial regression coefficients (β). \* $p < .085$ ; \*\* $p < .05$ ; \*\*\* $p < .001$ .

We then conducted the reverse analysis to see which levels of categorization predicted each of Pettigrew’s mediators. This showed that ‘pro-Mexican’ behavior was predicted by the superordinate level ( $\beta = .40, t = 4.15, p < .001$ ), that knowledge was predicted by a diminished intergroup level ( $\beta = -.27, t = -2.87, p < .001$ ), and that higher interpersonal closeness was predicted by both a lower intergroup ( $\beta = -.22, t = -2.10, p = .038$ ) and a higher superordinate level ( $\beta = .26, t = 2.59, p = .011; R^2 = .15, F(2,88) = 7.61, p < .001$ ). However, identification was not predicted by any of the levels of categorization.

These analyses suggest that social distance, prejudice, and outgroup evaluations were affected by the interpersonal, intergroup, and superordinate levels of categorization. In turn, the intergroup and superordinate levels appear to be predicted by interpersonal closeness and behavior. By contrast, intergroup anxiety is primarily affected by behavior and knowledge, and these in turn may reflect the increased application of superordinate, and decreased application of the intergroup, level of categorization. Thus, it is likely that the levels of categorization during contact, particularly intergroup and

superordinate ones, are also linked to Pettigrew's mediators and their effects might be additive and cumulative.

## Discussion

The present field study tested Pettigrew's reformulated model of the intergroup contact hypothesis and Gaertner and coworkers' CIIM of the effects of different cognitive representations during contact. The study enabled us to complement the usual cross-sectional assessment of these models (e.g. Gaertner et al., 1999; Mottola, Bachman, Gaertner, & Dovidio, 1997) with a longitudinal analysis. Moreover, the study examined contact within a relatively constrained context and a set of participants engaging in contact for a common purpose. The study also exposes interesting analytic problems and questions for both models, such as when and whether the specified causal directions might change, and how the two models could be integrated parsimoniously. This study 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 US, which is likely to differ qualitatively from contact taking place *within* the US, in terms of differences in language and macrosocietal status.

### *Pettigrew's model*

Pettigrew's model was largely supported, and rarely contradicted, by the cross-sectional analysis at *T1*. Contact as friends was positively related to interpersonal closeness, behavior, and knowledge, and negatively related to intergroup anxiety and social distance. The fact that the quantitative contact at school did not have any impact when assessed in conjunction with qualitative contact (as friends) corroborates Allport's, and later Pettigrew's, proposition that quality as opposed to mere quantity of contact is pivotal in reducing intergroup bias. However, we note that there is a significant effect of quantitative contact on the interpersonal level of categorization in our test of the CIIM.

There was also evidence for one indirect

effect. The relationship between contact as friends and intergroup anxiety was mediated by changing behavior. The more contact participants had with Mexicans as friends, the more 'pro-Mexican' was their behavior, and consequently, the less anxiety they felt interacting with Mexicans. Moreover, greater outgroup knowledge was related to more positive outgroup evaluations. It is perhaps surprising that we found no other mediating effects or relationships between the other two mediators and any of the criterion variables. This might be due to the fact that the mediating variables need time to exert their full influence in promoting better intergroup relations, particularly affective and self-evaluative measures, such as the IOS scale and ingroup reappraisal.

In the longitudinal analysis, *T1* contact as friends did not significantly affect the mediating and criterion variables at *T2*, but *T1* quantitative contact predicted *T2* reduction in prejudice. Moreover, we did find some evidence of the impact of mediators on criterion variables. *T1* interpersonal closeness predicted *T2* reduced intergroup anxiety and higher national identification led to higher social distance. One might conclude from this pattern of results that in the present setting, in which all participants have at least some contact with outgroup members, the role of the mediators becomes more important over time.

When we investigated different possible causal directions for the longitudinal data it emerged that there were more significant relationships in the 'reversed longitudinal model' than in the original. Most strikingly, and in line with traditional approaches to attitude-behavior relations, one mediator, differential behavior toward Americans and Mexicans, was predicted by social distance and prejudice. Furthermore, another mediator, interpersonal closeness, predicted less contact at school, but more contact as friends. These results highlight that contact should not always be regarded as the starting point in a causal sequence that ends with prejudice and other intergroup bias measures. It seems that contact itself is influenced by other (e.g. affective) factors. Moreover, behavior may sometimes function as an

outcome variable, rather than a mediator. Hence, the contact–mediator–prejudice relation should be seen as a reciprocal, ongoing process, rather than a unidirectional one. This has implications for intervention strategies because it seems reasonable that in some situations it is desirable to change perceptions and attitudes in order to facilitate contact, and in others it may be desirable to bring about contact in order to promote more positive relationships. Pettigrew suggested that contact is likely to be characterized by different levels of categorization over time. We found that contact at *T1* was characterized most by the interpersonal and dual identity levels of categorization and least by the intergroup level. This pattern persisted at *T2*, when the interpersonal level remained strongest. This is not in line with Pettigrew's model, which predicts that the more inclusive level of categorization should be endorsed more strongly as contact continues. One possible reason for this is that the lag between *T1* and *T2*, which averaged roughly 10 days, might have been too brief to allow a transition from stage 1 to stage 2 within Pettigrew's model—we might have inadvertently assessed effects of early contact on levels of categorization at both time points. A second possibility is that participants might have been guided—consciously or unconsciously—by norms of political correctness and social desirability (Conrad & Sharpe, 1996; Van Boven, 2000), which might have prevented them from admitting that they see their Mexican interaction partners in intergroup, as opposed to, interpersonal terms. These norms might have been especially strong for our present sample, given that these people were engaging in contact with the host community, not a guest community, and thus might have been eager to 'do the right thing' (Gaertner & Dovidio, 2000).

A different interpretation of our results is that Pettigrew's model may underestimate the possibility that contact in a real-world context affects the levels of categorization in a nonorderly fashion. Levels of categorization may be sensitive to specific contextual features. For example, intergroup contact between a Mexican and an American on a one-to-one basis in a language

school environment might always be perceived as taking place mostly on an interpersonal level, thereby rendering intergroup or superordinate group levels less salient. If a specific context makes a particular level acutely accessible, it may be that chronic changes in the application of particular levels only happen over an extended time period (e.g. as a result of conscious reflection about the relationships and once the situationally dominant level becomes more familiar). Be it as it may, it is also informative to examine the mediating potential of the levels of categorization within the CIIM.

### ***The Common Ingroup Identity Model***

Cross-sectionally, both the interpersonal and intergroup levels were affected by contact. Contact at school promoted an interpersonal level, and contact as friends reduced endorsement of the intergroup level. This suggests that contact tended to result in decategorization. Three of the four levels affected the criterion variables, with the interpersonal and superordinate levels having most impact. Hence, despite the strong presence of the interpersonal level, the superordinate level emerged as equally influential on criterion variables. However, although the criterion variables relate to the 'outgroup as a whole', and thus measure the *generalization* of contact effects, the dual identity level was not significantly associated with any of the criterion measures. This is not in line with Gaertner and coworkers' predictions, which emphasize the potential of dual identity to effect a generalization of contact effects to outgroup members that are not present in the contact situation.

It is interesting that the superordinate level was significantly correlated with all other levels while none of the remaining three levels are correlated with one another. It may be that even if the dual identity level is influential, it might be multicollinear with respect to both the superordinate and the intergroup levels. However, an intriguing question is whether the distinct impact of each level varies over an extended time frame. For example, it seems possible that the dual identity categorization is conceptually rather fuzzy at first, but later in a contact context

it becomes more meaningful and hence begins to have more powerful effects. Finally, the intergroup level is the only one that is *negatively* affected by contact and *positively* related to intergroup bias, which is consistent with the predictions of the CIIM.

The longitudinal analysis of the CIIM revealed that *T1* contact as friends predicted a higher superordinate level at *T2*; whereas *T1* contact at school led to higher interpersonal and dual identity levels during contact and to diminished prejudice at *T2*. It is worth mentioning that contact as friends entailed a superordinate level, as opposed to the interpersonal level that one might expect. However, this is consistent with Gaertner, Mann, Murrell, & Dovidio (1989; also see Gaertner & Dovidio, 2000), who showed that decategorization reduces bias against former outgroup members by decreasing the attractiveness of former ingroup members, while recategorization lowers bias by increasing the attractiveness of former outgroup members. Thus, the superordinate level represents higher degrees of interpersonal closeness as (former) outgroup members are perceived not merely as disconnected individuals, but as members of a common group, thereby heightening similarity with them.

Recent research by Hewstone, Cairns, Judd, McLernon, & Voci (2001) showed that an interpersonal level of categorization during contact is especially beneficial if it involves discussion of salient group differences. Given that the participants in the present research were motivated to learn the outgroup language it seems highly plausible that the contact at school involved both a superordinate cooperative level and a salient intergroup level, resulting in a dual categorization.

Lastly, the longitudinal analysis of the CIIM also shows that application of the interpersonal level at *T1* led to reduction in prejudice at *T2*, as would be expected. However, the other levels did not have a significant impact in the longitudinal analysis, which is inconsistent with Gaertner and coworkers' (2000) predictions. Effect sizes were consistently smaller in the longitudinal than the cross-sectional model, which suggests that the absence of significant

relationships is not simply due to limited power because of the small sample size. Hence, these findings raise the question of under what conditions each of the mediators is necessary, and how pivotal each may be for promoting more positive intergroup relations.

Considering the causal direction of the longitudinal relationships for the CIIM, there was no evidence that the levels of categorization caused contact. Indeed, the 'reversed longitudinal model' only revealed one significant effect: more positive general outgroup evaluations led to a reduced intergroup level. Thus, the CIIM was largely supported by the data.

### Conclusions and questions for future research

The present study examined two current models of the effects of intergroup contact. The results showed that contact, in particular within the socio-political context of NAFTA, can have positive effects on relationships and attitudes between North American and Mexican people. The longitudinal design allowed an examination of causal relations in a naturalistic setting. It also provided one of the few longitudinal field tests of Pettigrew's model. The results give further insight into (a) the causal direction between contact and outgroup bias, (b) how and why contact leads to change (through the mediating variables), and (c) how contact effects are generalized beyond the immediate situation.

The statistically reliable relationships among the variables largely corroborate Pettigrew's model and point to the crucial role of contact as friends and the hypothesized mediating variables, particularly behavior modification. Intriguingly and unexpectedly, in the longitudinal tests of Pettigrew's model and the CIIM, (quantitative) contact at school was more effective than qualitative contact as friends. Although contact affected the mediators, and the mediators in turn affected criterion variables, there was also some evidence that the mediators had independent effects on criterion variables, particularly in the longitudinal test of Pettigrew's model. This raises the interesting

possibility that intergroup relations could be improved by noncontact variables that promote positive effects on knowledge, behavior, affect, and intergroup reappraisal by other means.

The CIIM was developed in a laboratory context and the majority of studies testing it have been laboratory-based. The present study provided an examination of the CIIM in a natural setting. We found that contact affected the levels of categorization as expected. The interpersonal and superordinate levels emerged as most influential in inducing positive change in the cross-sectional model, while the interpersonal level alone had most impact in the longitudinal model. In addition, findings supported the importance of the superordinate level in reducing prejudice, but not that of the dual identity. This difference might reflect the macrosocietal majority status of the Northern American participants, despite being guests in Mexico. More specifically, previous research suggests that majority members may favor the superordinate level of categorization whereas minority members prefer the dual identity level (Gaertner & Dovidio, 2000; Gaertner, Rust, Dovidio, Bachman, & Anastasio, 1996; Gonzalez & Brown, 1999; Wittig & Molina, 2000). This is an issue that should be investigated more thoroughly in future research.

Given the theoretical overlap and connections between Pettigrew's model and the CIIM, it is clearly important to establish how well each model can account for changes in intergroup relations and prejudice. We have attempted to outline some empirical links involving the mediating processes tapped by the four mediators proposed by Pettigrew and the four levels of categorization in the CIIM. Moreover, our post hoc analysis points to an eventual integration of the two models. In particular, it suggests that each of the mediators may be relevant for different types of outcome, and also that there may be interesting causal connections among the mediators themselves. Future research and analysis will need to develop theory to provide predictions that specify conditions under which the different potential mediators from Pettigrew's model and from the CIIM are necessary

and sufficient to enable positive contact experiences to result in positive intergroup relationships. Research is also required to address the question of whether, and why, some aspects of intergroup contact may affect intergroup relations without the involvement of these mediating variables.

## Notes

1. We distributed more questionnaires at T2 than the total *N* at T1 because the original sample was rather difficult to locate and could only be cross-checked by means of identification numbers provided in the questionnaires.
2. These tests reflect that it is only feasible to test for mediation if the independent variable is correlated significantly with both the mediator and the dependent variable, and the mediator is significantly correlated with the dependent variable.
3. Ideally, we would have included all variables simultaneously in a structural equation model, but our relatively low *N* did not allow for this.
4. Before conducting the mediation analyses, we assessed each level of categorization individually for its potential to mediate. Each level showed the potential to mediate between the predictor variables and at least two criterion variables, such that we included all of them in the final analyses.

## Acknowledgements

We are grateful to Rupert Brown, Sam Gaertner, and two anonymous reviewers for their comments on an earlier version of this article. This research was supported by a University of Kent Studentship and is part of the doctoral research of the first author, who now holds a British Academy Post-Doctoral Fellowship. Parts of this paper have been presented at the International Society of Political Psychology 24th Annual Scientific Meeting, Cuernavaca, Mexico, July 15–18, 2001, and at the third annual meeting of the Society for Personality and Social Psychology, Savannah, GA, January 31–February 2, 2002.

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