The Effects of Ingroup and Outgroup Friendships on Ethnic Attitudes in College: A Longitudinal Study

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Data for this longitudinal study were collected from over 2000 White, Asian, Latino, and African American college students. Results indicated that students who exhibited more ingroup bias and intergroup anxiety at the end of their first year of college had fewer outgroup friends and more ingroup friends during their second and third years of college, controlling for pre-college friendships and other background variables. In addition, beyond these effects of prior ethnic attitudes and orientations on friendship choices, those with more outgroup friendships and fewer ingroup friendships during their second and third years of college showed less ingroup bias and intergroup anxiety at the end of college, controlling for the prior attitudes, pre-college friendships, and background variables. Results are discussed in terms of the contact hypothesis.

keywords ingroup bias, intergroup anxiety, intergroup contact

For nearly fifty years, a great deal of social psychological research has been devoted to testing the basic tenets of the contact hypothesis. The contact hypothesis was originally formulated by Williams (1947) and later refined by Allport (1954) during the era of legalized school segregation, when a primary concern was how to reduce prejudice and hostility between members of segregated groups when they come into contact with one another in desegregated environments. The model specifies a number of critical conditions that must be present in order

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for intergroup contact to reduce prejudice and lead to positive intergroup relations: members of different groups must have equal status within the contact situation, work together cooperatively, pursue common goals, and the contact must be sanctioned by institutional supports (e.g. by school administrators and policies). More recent research has also pointed to the importance of personal, intimate interaction (Amir, 1976). In addition to these conditions, Pettigrew (1997, 1998) has argued that an additional condition must be met in order for intergroup contact to have its beneficial effects: cross-group friendships must be given time to develop.

The current study uses a longitudinal research design to examine the effects of ingroup and outgroup friendships formed during students’ college years on their ethnic attitudes at the end of college. In order to account for self-selection into these friendships on the basis of prior ethnic attitudes, we also examine the effects of students' ethnic attitudes at the beginning of their college career on their friendship choices during college, and control for these effects when we look at the effects of friendship choices on later ethnic attitudes. As a final step, we examine several aspects of the campus climate to see if we can identify factors in the college environment that may contribute to ingroup and outgroup friendship choices.

**Previous research on the contact hypothesis**

The contact hypothesis has received substantial support over the past half century, both in terms of the importance of contact for the improvement of intergroup relations, and in terms of the critical conditions for such positive effects of contact to occur (see Pettigrew, 1998 for a review and Pettigrew & Tropp, 2000, for a meta-analysis). More specifically, in line with Pettigrew’s (1998) recent theorizing, meta-analytic findings indicate that having outgroup friends is strongly associated with lower intergroup prejudice (Pettigrew & Tropp, 2000). In fact, when outgroup friendship is used as the contact measure, the negative relationship between contact and prejudice is significantly stronger than when the contact is not specified as being with outgroup friends.

Using data from seven national probability samples of majority group members in four Western European countries, Pettigrew (1997) conducted the most extensive test to date of the relationship between intergroup friendship and prejudice (see also Hamberger & Hewstone, 1997). He found that Europeans who had more friends of another nationality, race, religion, culture and social class were lower in prejudice toward the major minority groups in their country, even after controlling for political conservatism, group relative deprivation, political interest, national pride, urbanism, education, and age. Using a nonrecursive structural equation model, he also tested the opposite direction of causality and found that people who were more prejudiced were also more likely to avoid intergroup contact (see also Herek & Capitanio, 1996). However, consistent with the contact hypothesis, Pettigrew found that the causal path from more friendship to lower prejudice was larger than the reverse path from lower prejudice to more friendship. Powers and Ellison (1995) found similar results in their study of interracial contact and Black racial attitudes. Using endogenous switching regression models, they found that close interracial friendships lead to more positive racial attitudes among Black Americans, even when accounting for possible selection bias.

The advanced statistical procedures used by Pettigrew (1997) and Powers and Ellison (1995) offer one way of comparing the reciprocal paths between contact reducing prejudice and prejudice reducing contact, and address, to some degree, the issue of selection bias. However, the best way to solve the causal sequence problem is through longitudinal research designs (Pettigrew, 1996), which are rarely used in intergroup research. A second problem with previous research on the contact hypothesis is that most of this earlier work has examined the effects of contact between only two groups rather than multiple groups. Considerably more complexity is present when a contact situation includes several groups at once. As the proportion of
ethnic minorities in the United States grows, contact theory should be applied to contact in multiethnic contexts. A third problem with this earlier work is the dearth of research on the effects of ingroup contact in addition to outgroup contact. A notable exception is the work of Wilder and Thompson (1980), who measured the independent effects of ingroup and outgroup contact on intergroup bias. Using an experimental design, they found that intergroup bias decreased as both outgroup contact increased and ingroup contact decreased. In the real world, then, in which ingroup and outgroup contact may be negatively related, it is possible that the positive effects of outgroup contact on prejudice reduction are due to less ingroup contact rather than to more outgroup contact per se. Taking a look at the separate effects of both ingroup and outgroup contact would help to isolate the underlying mediating processes through which outgroup contact leads to a reduction in intergroup bias and ingroup contact leads to an increase in such bias.

The current study
In order to overcome the limitations of this previous research, our study uses a longitudinal research design, considers existing individual differences in ethnic attitudes and previous intergroup contacts, looks at the causes and consequences of ingroup friendships in addition to those of outgroup friendships, and measures these relationships among many different ethnic groups in a multicultural environment. One setting ideally suited for applying and extending the contact hypothesis is the ethnically diverse college campus environment. Because students are living, socializing, and taking classes with people of different ethnicities, the college experience provides many opportunities for cross-group friendships to develop. The current study examines whether more positive ethnic attitudes develop at the end of college as a result of cross-group friendships that students form during college.

We explore the effects of intergroup friendships on two different ethnic attitudes: ingroup bias and intergroup anxiety. A measure of affect is used to assess ingroup bias; specifically, ingroup bias is calculated as the difference between the degree of positive feelings toward one’s own group and the degree of positive feelings toward ethnic outgroups. In their meta-analysis, Pettigrew and Tropp (2000) found strong negative effects of contact on affective measures of prejudice. Stephan and Stephan (1992, 2000) found similar negative effects of contact on intergroup anxiety (see also Islam & Hewstone, 1993). We expect to find similar results in our study of White, Asian American, Latino, and Black college students. Specifically, we expect to find that students who have more ingroup bias and more intergroup anxiety at the end of their first year will have fewer outgroup friends and more ingroup friends during their second and third years of college. We also expect that beyond these effects of prior ethnic attitudes and orientations on friendship choices, those with more outgroup contact and less ingroup contact during their second and third years of college will show less ingroup bias and less anxiety interacting with members of different ethnic groups at the end of college. We will examine whether these effects vary by ethnic group. In their meta-analysis of intergroup contact effects, Pettigrew and Tropp (2000) found that the negative relationship between contact and prejudice was significantly smaller among low-status minority groups than high-status majority groups. The authors speculate that these asymmetrical effects of contact for majority and minority groups may be due to divergent perceptions of some of the critical conditions of contact, such as equal status. We therefore will examine the possibility that contact has asymmetrical effects for majority and minority groups on our measures of ethnic attitudes as well, and will consider some of the reasons why this might occur.

Lastly, we examine whether perceptions of the campus climate affect the likelihood of friendship formation with ingroup and outgroup members. According to Pettigrew (1998), the development of outgroup friendships is facilitated by positive conditions of contact. On a college campus, positive conditions of contact are exemplified by perceptions of minimal
ethnic conflict and discrimination on campus and perceptions of institutional support for diversity. Also, work by Gaertner and Dovidio (2000) suggests that thinking about members of different groups as belonging to one common ingroup may be important for outgroup friendships to develop. Therefore, we will examine four aspects of the campus climate for their effects on ingroup and outgroup friendship choices: perceived ethnic discrimination on campus, perceived conflict between different ethnic groups on campus, perceived institutional support for positive intergroup relations, and one-group representations of the student body. An examination of the effects of these climate variables on ingroup and outgroup friendship choices will help us understand why people might have more ingroup or outgroup friends, and what can be done to facilitate the positive effects of intergroup contact on students’ ethnic attitudes in college.

**Method**

**Participants**

Data for this longitudinal study were collected among students who were beginning their freshman year of college at UCLA in 1996. The incoming freshman class was composed of 3877 students. Of these students, 32% were White, 36% Asian American, 18% Latino, 6% African American, and 8% were of another ethnicity or did not report their ethnicity. Data were collected during five different time periods between 1996 and 2000: in the summer before college entry (1996), and during the spring quarter in each subsequent college year (1997–2000).\(^1\) The first wave of data was collected through the mass administration of a survey at the beginning of the summer orientation program. Subsequent data collection was through telephone surveys during the spring quarter of each academic year. These interviews averaged 20 minutes in length and were conducted using the Computer-Assisted Telephone Interview (CATI) system run by the Institute for Social Science Research at UCLA. Response rates were as follows: 78% at the pre-college wave (\(N = 2156\)), 82% at the end of Year 1 (\(N = 2016\)), 82% at the end of Year 2 (\(N = 1667\)), 66% at the end of Year 3 (\(N = 1360\)), and 59% at the end of Year 4 (\(N = 1215\)).\(^2\) The ethnic and gender breakdowns of the White, Asian, Latino, and African American participants in each year of data collection can be found in Table 1.

**Measures**

In this study, we examine the effects of students’ levels of ingroup bias and intergroup anxiety at the end of their first year of college on the ingroup and outgroup friendships they form during their second and third years of college. Then, controlling for these selection effects and the influence of other background variables (gender, religion, country of origin, language spoken at home, socioeconomic status, political conservatism, and pre-college ingroup and

<table>
<thead>
<tr>
<th>Year in college</th>
<th>Pre-college</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whites</td>
<td>748</td>
<td>550</td>
<td>426</td>
<td>351</td>
<td>311</td>
</tr>
<tr>
<td>Asians</td>
<td>753</td>
<td>603</td>
<td>519</td>
<td>419</td>
<td>389</td>
</tr>
<tr>
<td>Latinos</td>
<td>255</td>
<td>430</td>
<td>356</td>
<td>295</td>
<td>252</td>
</tr>
<tr>
<td>Blacks</td>
<td>68</td>
<td>130</td>
<td>102</td>
<td>84</td>
<td>67</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Males</td>
<td>1022</td>
<td>776</td>
<td>647</td>
<td>539</td>
<td>445</td>
</tr>
<tr>
<td>Females</td>
<td>801</td>
<td>937</td>
<td>756</td>
<td>610</td>
<td>574</td>
</tr>
<tr>
<td><strong>Total (4 ethnic groups)</strong></td>
<td>1824</td>
<td>1713</td>
<td>1403</td>
<td>1149</td>
<td>1019</td>
</tr>
<tr>
<td><strong>Total (entire sample)</strong></td>
<td>2156</td>
<td>2016</td>
<td>1667</td>
<td>1360</td>
<td>1215</td>
</tr>
</tbody>
</table>
outgroup friendships), we examine the effects of these ingroup and outgroup friendships on levels of ingroup bias and intergroup anxiety at the end of the students’ fourth year of college.

We conclude with an examination of several aspects of the campus climate to see if we can identify factors in the college environment that may contribute to ingroup and outgroup friendship choices. Our measures can therefore be divided into four clusters: background variables (measured pre-college and in Year 1), college friendship variables (measured in Years 2 and 3), ethnic attitudes (measured in both Year 1 and Year 4), and college campus climate variables (measured in Year 1).

**Background variables**

Political conservatism was measured in Year 1 for all respondents. All of the other background variables were measured either on the pre-college survey (for those who participated in this wave of data collection) or in Year 1 (for those who did not complete the pre-college survey).

Gender and religion Students indicated their gender and religion on single items. Religion was broken down into seven categories: Protestant, Catholic, Jewish, Muslim, Buddhist, other, and none.

Foreign cultural closeness Foreign cultural closeness was computed as the average of four items standardized on a 0–1 scale ($\alpha = .87$): ‘Were you born in the US?’ ‘How many of your parents were born in the US?’ ‘How many of your grandparents were born in the US?’ and ‘What language is spoken by your family at home?’ (1 = English only, 2 = primarily English, but another language also, 3 = primarily a language other than English, 4 = only a language other than English). Higher numbers indicate that a person was not born in the US, had fewer parents and grandparents born in the US, and was less likely to speak English at home.

Socio-economic status Socioeconomic status was computed as the average of three standardized items ($\alpha = .83$): ‘How would you describe your family’s social class position?’ (1 = poor, 2 = working class, 3 = lower middle class, 4 = middle class, 5 = upper middle class, 6 = lower upper class, 7 = upper class), ‘What is the highest level of education your father completed?’ and ‘What is the highest level of education your mother completed?’ (1 = elementary school, 2 = some high school, 3 = completed high school, 4 = trade school, 5 = some college, 6 = completed degree (BA/BS degree), 7 = some graduate or professional school, 8 = completed graduate or professional degree).

Political conservatism Political conservatism was computed as the average of two items on a 7-point scale ($\alpha = .61$): ‘How would you describe your own political party preference?’ (1 = strong Democrat, 2 = weak Democrat, 3 = Independent, leaning more Democrat, 4 = Independent, 5 = Independent, leaning more Republican, 6 = weak Republican, 7 = strong Republican) and ‘How would you describe your general political outlook?’ (1 = very liberal, 7 = very conservative).

Pre-college friendships Pre-college friendships were measured by four items. The stem question read: ‘In high school, how many of your closest friends were . . .’ and the individual items were: ‘. . . Asian American?’, ‘. . . African American?’, ‘. . . Latino?’, and ‘. . . Caucasian?’ (1 = none, 2 = few, 3 = many, 4 = most, 5 = all).

**College friendship variables**

The friendship variables were measured by the same four items in Years 2 and 3. The stem question read: ‘At UCLA, how many of your closest friends are . . .’ and the individual items were ‘. . . Asian American?’, ‘. . . African American?’, ‘. . . Latino?’ and ‘. . . Caucasian?’ (1 = none, 2 = few, 3 = many, 4 = most, 5 = all). In each year, the measure of ingroup friends is the single item for friends of one’s own ethnic group and the measure of outgroup friends is the average of the three items for friends of the other ethnic groups. The composite measure of contact with ingroup friends is the average of the ingroup friends items measured in Years 2 and 3, and the composite measure of contact with outgroup friends is the average of the outgroup friends scales measured in Years 2 and 3.
Ethnic attitudes

Two ethnic attitudes were measured in Year 1 and Year 4: ingroup bias and intergroup anxiety.

Ingroup bias

Ingroup bias was measured by the same four items in Years 1 and 4. The item question read: ‘How positively or negatively do you feel toward the following groups?’ and the individual items were ‘Caucasians/Whites’, ‘Latinos/Hispanics’, ‘Asians/Asian Americans’, and ‘African Americans/Blacks’ (1 = very negatively, 7 = very positively). In each year, ingroup bias was computed as the item measuring ingroup affect minus the average of the three items measuring outgroup affect.

Intergroup anxiety

Intergroup anxiety was measured by two items: ‘I feel competent interacting with people from different ethnic groups’ (reverse-coded) and ‘I feel uneasy being around people of different ethnicities’ (1 = strongly disagree, 7 = strongly agree; $r = .50$).

College campus climate variables

Four climate variables were measured in Year 1: one-group representation, institutional support, perceived intergroup conflict on campus, and perceived ethnic discrimination on campus. All items were measured on 7-point scales (1 = strongly disagree, 7 = strongly agree).

One-group representation

This cognitive representation was computed as the average of two items ($\alpha = .67$): ‘Despite the different groups at UCLA, there is frequently the sense that we are all just one group’ and ‘At UCLA, it usually feels as though we belong to different groups’ (reverse-coded). Gaertner and Dovidio (2000) have typically examined these two items separately. In the current study, because we were interested in their joint impact on ingroup and outgroup friendship choices. Because they were so highly correlated ($r = .77, p < .001$), we combined them to form a single scale.

Institutional support

Institutional support was measured by a single item: ‘UCLA promotes positive interaction between individual students of different ethnic groups’.

Results

Preliminary analyses

We begin with descriptive statistics for the college friendship variables. As can be seen in Table 2, one-way analyses of variance and additional pairwise comparisons showed that students had the highest number of closest friends among members of their own ethnic groups. Thus, Whites had the most White friends on campus ($F(3, 1544) = 313.32, p < .001, \eta^2 = .38$), Asian Americans had the most Asian friends ($F(3, 1544) = 328.83, p < .001, \eta^2 = .39$), Latinos had the most Latino friends ($F(3, 1544) = 347.31, p < .001, \eta^2 = .40$), and Blacks had the most Black friends ($F(3, 1544) = 286.45, p < .001, \eta^2 = .36$). In addition to these findings for ingroup friends, Blacks were least likely to have White and Asian friends on campus, and Asian
Americans were least likely to have Latino and Black friends on campus.

Table 3 shows the correlations among the college friendship variables. These correlations indicate that as the number of ingroup friends increases, the number of outgroup friends decreases, with two exceptions: for Latinos, the number of ingroup friends is not associated with the number of Black friends, and for Blacks, the number of ingroup friends is not associated with the number of Latino friends. For all groups, however, there are consistently positive correlations among the outgroup friends variables indicating that as the number

Table 2. Descriptive statistics for college friendship variables by ethnic group

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>White friends M (SD)</th>
<th>Asian friends M (SD)</th>
<th>Latino friends M (SD)</th>
<th>Black friends M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whites</td>
<td>3.42 (.70)</td>
<td>2.27 (.65)</td>
<td>1.98 (.58)</td>
<td>1.75 (.52)</td>
</tr>
<tr>
<td>Asians</td>
<td>2.21 (.67)</td>
<td>3.36 (.82)</td>
<td>1.72 (.56)</td>
<td>1.61 (.50)</td>
</tr>
<tr>
<td>Latinos</td>
<td>2.34 (.79)</td>
<td>2.15 (.68)</td>
<td>3.12 (.90)</td>
<td>1.87 (.57)</td>
</tr>
<tr>
<td>Blacks</td>
<td>2.03 (.66)</td>
<td>1.94 (.60)</td>
<td>2.22 (.71)</td>
<td>3.30 (.97)</td>
</tr>
</tbody>
</table>

Notes: For each friendship variable in each column, superscripted letters that are the same across ethnic groups indicate that the groups do not significantly differ from one another in terms of how many of their closest friends in college are from this particular ethnic group, \( p > .05 \). The means range from 1 to 5, with higher numbers indicating that more of one’s closest friends are from this particular ethnic group \( (1 = \text{none}, \ 2 = \text{few}, \ 3 = \text{many}, \ 4 = \text{most}, \ 5 = \text{all}) \).

Table 3. Correlations among college friendship variables by ethnic group

<table>
<thead>
<tr>
<th></th>
<th>White friends</th>
<th>Asian friends</th>
<th>Latino friends</th>
<th>Black friends</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whites</td>
<td></td>
<td>-.36***</td>
<td>-.23***</td>
<td>-.19***</td>
</tr>
<tr>
<td>Asian</td>
<td>-.37***</td>
<td>-.23***</td>
<td>-.20***</td>
<td>.36***</td>
</tr>
<tr>
<td>Latinos</td>
<td>-.41***</td>
<td>-.27***</td>
<td>-.02</td>
<td>.13**</td>
</tr>
<tr>
<td>Blacks</td>
<td>-.25**</td>
<td>-.19*</td>
<td>.06</td>
<td>.37***</td>
</tr>
</tbody>
</table>

* \( p \leq .05 \), ** \( p \leq .01 \), *** \( p \leq .001 \).

Note: Correlations between ingroup and outgroup friends are in italics and correlations between friends in one outgroup and friends in another outgroup are in bold.
of friends in one outgroup increases, the number of friends in each of the two other outgroups increases as well.

**Main analyses**

Our main goals in this study were to examine the effects of students’ levels of ingroup bias and intergroup anxiety at the end of their first year of college on the ingroup and outgroup friendships they form during their second and third years of college, and then measure the subsequent effects of these friendship choices on ingroup bias and intergroup anxiety at the end of their fourth year of college. Table 4 shows the correlations between Year 1 and Year 4 ethnic attitudes on the one hand, and Year 2–3 friendship variables on the other. Figure 1 shows the overall model we test in a series of hierarchical regression equations, first using outgroup friendships as our college friendship variable and then using ingroup friendships.

**Effects of prior ethnic attitudes on college friendships**

In the first block of hierarchical regression analyses, we use the composite measure of outgroup friends in Years 2 and 3 as our dependent variable. At the first step we enter pre-college friendships and the other background variables (gender, religion, foreign cultural closeness, socioeconomic status, and political conservatism) into the equation, along with Year 1 ingroup bias and intergroup anxiety. This allows us to see if the selection of outgroup friends on the basis of prior ethnic attitudes occurs even when we take into account other reasons why people might select outgroup friends. Because we are interested in examining the unique contribution of the Year 1 ethnic attitudes in predicting friendships, we report the standardized regression coefficient (β coefficient) for these variables. In the next step, we enter the main effects of ethnicity into the equation, coded as dummy variables with Whites as the comparison group. That is, one dummy variable contrasts Asians and Whites (coded as Asians = 1, others = 0), a second variable contrasts Latinos and Whites (coded as Latinos = 1, others = 0), and a third contrasts Blacks and Whites (coded as Blacks = 1, others = 0). Finally, in the last step we enter the interactions between ethnicity and the Year 1 ethnic attitudes to see if the effects of Year 1 ingroup bias and intergroup anxiety on outgroup friendships vary by ethnic group. Then we conduct the same set of analyses for ingroup friendships.

Regarding outgroup friendships, results indicate that students who were more biased in favor of their ethnic group (β = −.12, p < .001) and higher in intergroup anxiety (β = −.11, p < .001) at the end of their first year in college had fewer outgroup friends in Years 2–3, even when controlling for pre-college friendships and the background variables (overall model: \( F(14, 1496) = 21.04, p < .001, \ R^2_{adj} = .16 \)). After ethnicity was entered into the equation, the Ethnicity × Ingroup Bias and Ethnicity × Intergroup Anxiety interaction terms did not add a significant amount of explained variance (\( R^2_{change} = .003, p > .05 \)). Regarding ingroup friendships, results indicate that students who were more biased in favor of their ethnic group (β = .17, p < .001) and had higher levels of intergroup

<table>
<thead>
<tr>
<th>Ethnic attitude</th>
<th>Year 2–3 friendship variable</th>
<th>Year 1</th>
<th>Year 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ingroup friends</td>
<td>Outgroup friends</td>
<td>Ingroup friends</td>
</tr>
<tr>
<td>Year 1 Ingroup bias</td>
<td>.20***</td>
<td>−.17***</td>
<td>.19***</td>
</tr>
<tr>
<td>Year 1 Intergroup anxiety</td>
<td>.16***</td>
<td>−.17***</td>
<td>.20***</td>
</tr>
</tbody>
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*** p < .001.
anxiety ($\beta = .15, p < .001$) at the end of their first year in college had more ingroup friends in Years 2–3, even when controlling for pre-college friendships and the background variables (overall model: $F(14, 1496) = 11.56, p < .001, R^2_{adj} = .09$). The interactions with ethnicity were not significant ($R^2_{change} = .006, p > .05$).

Overall, these results indicate that White, Asian American, Latino, and Black students select outgroup and ingroup friends during their second and third years of college on the basis of the ethnic attitudes they hold at the end of their first year. Specifically, students from these four ethnic groups have fewer outgroup friends and more ingroup friends when they are more biased in favor of their ingroup and when they feel more uneasy and less competent interacting with members of different ethnic groups.

**Effects of college friendships on ethnic attitudes**

We turn now to measure the subsequent effects of these friendship choices on ingroup bias and intergroup anxiety at the end of the fourth year of college. Here we seek to answer the question of whether students become less biased, and less anxious interacting with members of different ethnic groups when they have more outgroup friendships and fewer ingroup friendships during their second and third years in college, even when controlling for previous ethnic attitudes, pre-college friendships, and a number of other background variables. This allows us to see if Year 4 ethnic attitudes are influenced by having outgroup and ingroup friends in Years 2–3 even when we take into account already existing individual differences between people in these attitudes and in background variables related to these attitudes. We then examine whether these relationships vary across the different ethnic groups.

In this series of hierarchical regression analyses, we use ingroup bias and intergroup anxiety measured in Year 4 as our dependent variables (one in each analysis). At the first step we enter the composite measure of outgroup friends in
Years 2 and 3 into the equation, along with both ethnic attitudes measured in Year 1, pre-college friendships, and the other background variables. In the next step, we enter the main effects of ethnicity, and in the last step, we enter the interaction between ethnicity and the measure of outgroup friends to see if the effect of outgroup friendships on each ethnic attitude varies by ethnic group. We then repeat the series of analyses for ingroup friendships. Because ingroup and outgroup friendships tend to be significantly negatively correlated with one another (see Table 3), and therefore could mask the effects of one another when entered simultaneously into a regression analysis, we first conduct these analyses separately for each friendship variable. In a final analysis, we then examine whether the effect of one friendship variable cancels out the effect of the other friendship variable when the effects of both variables on each ethnic attitude are examined simultaneously. In this analysis, we enter both ingroup and outgroup friendship variables into a regression equation simultaneously with the previous ethnic attitudes, pre-college friendships, and the background variables in order to examine the unique contribution of each friendship variable to the explanation of each ethnic attitude variable.

Regarding outgroup friendships, the results indicate that students who had more outgroup friends in Years 2-3 were less biased in favor of their ethnic group at the end of their fourth year in college (β = -.11, p < .001), even when controlling for the ethnic attitudes in Year 1, pre-college friendships, and the other background variables (overall model: F(15, 942) = 15.15, p < .001, R²adj = .18). The Ethnicity × Outgroup Friends interaction was not significant (R²change = .003, p > .05).3

Regarding ingroup friendships, results indicate that students who had more ingroup friends in Years 2-3 were more biased in favor of their ethnic group at the end of their fourth year in college (β = .07, p < .05), even when controlling for the ethnic attitudes in Year 1, pre-college friendships, and the background variables (overall model: F(15, 935) = 18.07, p < .001, R²adj = .21). The Ethnicity × Ingroup Friends interaction was not significant (R²change = .003, p > .05). Similar results were found for intergroup anxiety. Specifically, students who had more ingroup friends in Years 2-3 felt more anxious being around people of different ethnicities at the end of their fourth year in college (β = .12, p < .001), even when controlling for the ethnic attitudes in Year 1, pre-college friendships, and the background variables (overall model: F(15, 942) = 14.80, p < .001, R²adj = .18). The Ethnicity × Ingroup Friends interaction was not significant (R²change = .001, p > .05).

Overall, these results demonstrate the positive effects of outgroup contact and the negative effects of ingroup contact over the college years. Specifically, students who have more friends from different ethnic groups and fewer friends from their own ethnic group during their second and third years of college are less biased in favor of their ingroup, and feel less anxious interacting with members of different ethnic groups at the end of their fourth year in college, even when controlling for previous ethnic attitudes, pre-college friendships, and a number of other background variables. Furthermore, together with the results in the previous section, these findings indicate that the causal paths from more outgroup friendships to lower ingroup bias (β = -.11, p < .001) and intergroup anxiety (β = -.14, p < .001) were approximately the same size as the reverse paths from lower ingroup bias (β = -.12, p < .001) and intergroup anxiety (β = -.11, p < .001) to more outgroup friendships.

Regarding the simultaneous effects of ingroup and outgroup friendships on ingroup bias, the most important influence was outgroup friends...
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Effects of campus climate perceptions on college friendships. We conclude with an examination of several aspects of the campus climate to see if, as Pettigrew (1998) suggested, the development of outgroup friendships is facilitated by more positive perceptions of the conditions for intergroup contact and, furthermore, if the development of ingroup friendships is facilitated by more negative perceptions of the contact conditions. Specifically, we examine the effects of students’ perceptions of four different aspects of the campus climate at the end of Year 1 on their ingroup and outgroup friendships in Years 2–3. We again control for pre-college ingroup and outgroup friendships and the other background variables. The four campus climate variables are cognitive representations of the student body as being composed of just one group (instead of different groups), perceptions that the university promotes positive interaction between individual students of different ethnic groups, perceptions that there is conflict between different ethnic groups on campus, and perceptions that oneself and other members of one’s ethnic group experience discrimination on campus. We conduct four regression analyses with ingroup friendships as the dependent variable, and four regression analyses with outgroup friendships as the dependent variable. In each analysis, we enter one of the campus climate perceptions into a regression equation simultaneously with pre-college friendships and the background variables. We then enter the main effect of ethnicity followed by the interaction between ethnicity and the campus climate variable to see if the effect of the campus climate variable on ingroup and outgroup friendships varies by ethnic group.

Results indicated that students with a one-group representation of the student body had fewer ingroup friends (β = –.10, p < .001; overall model: F(16, 934) = 17.57, p < .001, R^2 = .22). By contrast, both ingroup friends (β = .08, p < .05) and outgroup friends (β = –.11, p = .001) influenced intergroup anxiety (overall model: F(16, 941) = 14.67, p < .001, R^2 = .19). These results demonstrate that although having more outgroup friends has a positive effect on reducing ingroup bias and intergroup anxiety, having more ingroup friends also has an independent negative effect on increasing intergroup anxiety, over and above the positive effect of having more outgroup friends.

Results for the main effect of perceived conflict and discrimination on campus. Overall, students who perceived more conflict on campus did not have more ingroup friends (β = –.10, p < .001; overall model: F(13, 1505) = 6.48, p < .001, R^2 = .05) and more outgroup friends (β = .10, p < .001; overall model: F(13, 1505) = 19.92, p < .001, R^2 = .14), even when controlling for pre-college friendships and the background variables. The Ethnicity × One-group Representation interaction was not significant for either ingroup friends or outgroup friends (both ps > .05). Students who perceived more institutional support for positive intergroup interaction also had fewer ingroup friends (β = –.06, p = .01; overall model: F(13, 1499) = 5.78, p < .001, R^2 = .04), but institutional support did not influence the number of outgroup friends one had (β = .02, p > .05; overall model: F(13, 1499) = 18.53, p < .001, R^2 = .13). Again, the Ethnicity × Institutional Support interaction was not significant for either ingroup friends or outgroup friends (both ps > .05).

Slightly different results were found for the effects of perceived conflict and discrimination on campus. Overall, students who perceived more conflict on campus did not have more ingroup friends (β = .02, p > .05; overall model: F(13, 1490) = 5.32, p < .001, R^2 = .04). However, there was a significant interaction between ethnicity and this campus climate variable (R^2 change = .01, p = .004), indicating that Black students who perceived more conflict on campus were especially likely to have more ingroup friends (Blacks: b = .13, p = .03; Asian Americans: b = –.002, p > .05; Latinos: b = .01, p > .05; Whites: b = .04, p = .05). On the other hand, perceptions of conflict on campus did not significantly influence the number of outgroup friends one had (β = .02, p > .05; overall model: F(13, 1490) = 18.05, p < .001, R^2 = .13), and the Ethnicity × Perceived Conflict interaction term was not significant (p > .05). Similar results were found for perceived ethnic discrimination. Students who perceived more discrimination on campus
also had more ingroup friends ($\beta = .13, p < .001$; overall model: $F(13, 1503) = 7.41, p < .001, R^2_{adj} = .05$). Moreover, a significant interaction between ethnicity and this campus climate variable ($R^2_{change} = .01, p = .002$) indicated that Black students who perceived more discrimination were especially likely to have more ingroup friends (Blacks: $b = .17, p = .002$; Asian Americans: $b = .07, p = .01$; Latinos: $b = .07, p = .01$; Whites: $b = .02, p > .05$). On the other hand, perceptions of discrimination on campus did not significantly influence the number of outgroup friends one had ($\beta = -.03, p > .05$; overall model: $F(13, 1503) = 18.40, p < .001, R^2_{adj} = .13$), and the Ethnicity $\times$ Perceived Discrimination interaction was not significant ($p > .05$).

Taken together, these findings indicate that negative perceptions of the campus climate lead members of different ethnic groups, especially Blacks, to have more ingroup friends. Specifically, perceptions that the student body is composed of different groups (instead of just one group), that the university is not supportive of positive intergroup relations, and that there is intergroup conflict and discrimination on campus lead students to form more ingroup friendships. The finding that these relationships hold even when controlling for pre-college friendships and the other background variables indicates that negative perceptions of the campus climate have independent effects on ingroup and outgroup friendships. The finding that these relationships hold even when controlling for pre-college friendships and the other background variables indicates that negative perceptions of the campus climate have independent effects on ingroup friendship choices, over and above other reasons why people might select ingroup friends (see Levin & Van Laar, 2002, for an analysis of the reverse effects of ingroup friendships on negative perceptions of the campus climate).

Discussion

The purpose of this study was to examine the effects of friendships with members of one's own and other ethnic groups on the ethnic attitudes of White, Asian American, Latino, and Black undergraduate students at a large multiethnic university over a period of five years. We were interested in three primary relationships: the net effects of early ethnic attitudes on the ingroup and outgroup friendships that students develop in college, the net effects of college ingroup and outgroup friendships on students' ethnic attitudes at the end of college, and the net effects of perceptions of the campus climate on college friendships.

To rule out selection effects masquerading for effects of contact, we used a longitudinal research design, and took into consideration existing individual differences in ethnic attitudes as well as previous interethnic friendships when examining the effects of college friendships on ethnic attitudes. We also examined the causes and consequences of ingroup friendships in addition to those of outgroup friendships, and measured these relationships among many different ethnic groups in a multicultural environment. Because we measured intergroup attitudes and behaviors across several years and controlled for many other potentially contaminating influences—including the individual's prior attitudes and friendships, and various other factors such as socioeconomic status, gender, religion, foreign cultural closeness, and political conservatism—we believe that we have been able to isolate some of the causes and effects of ingroup and outgroup friendships in college.

Effects of prior ethnic attitudes on college friendships

As expected, we found that students who exhibited more ingroup bias and more anxiety interacting with people from different ethnic groups at the end of their first year of college had fewer outgroup friends and more ingroup friends during their second and third years of college, controlling for pre-college friendships and other background variables. Once formed, then, ethnic attitudes become causal factors affecting ingroup and outgroup friendships in college.

Effects of college friendships on ethnic attitudes

Our results also support earlier contact research suggesting the importance of outgroup contact, and friendships in particular, for improving ethnic attitudes (Allport, 1954; Hamberger & Hewstone, 1997; Pettigrew, 1997, 1998; Pettigrew & Tropp, 2000; Powers & Ellison, 1995;
Stephan & Stephan, 1992, 2000). Specifically, we found that students who had more outgroup friends in college were more likely to have positive ethnic attitudes at the end of college, even when controlling for other factors that make people more likely to have positive ethnic attitudes (such as having positive ethnic attitudes at the beginning of college and more outgroup contact prior to college entry). Because our data are longitudinal in nature, we are able to make stronger claims about the direction of causality than previous studies have been able to make. Specifically, being able to examine the positive effects of outgroup contact controlling for previous ethnic attitudes, pre-college friendships, and a number of other background variables allows us to eliminate the possibility that the positive effects of contact are due to other things that are associated with contact rather than to contact itself. The longitudinal nature of the design also enables us to directly compare the size of the causal paths from more outgroup friendships to lower ingroup bias and intergroup anxiety to the size of the reverse paths from lower ingroup bias and intergroup anxiety to more outgroup friendships. Contrary to Pettigrew (1997), who found that the causal path from more friendship to lower prejudice was larger than the reverse path from lower prejudice to more friendship, we found that the two causal paths were approximately equal in magnitude for both ingroup bias and intergroup anxiety.

Our results also demonstrate the negative effects of ingroup contact over the college years. Specifically, students who had more ingroup friends in college had more negative ethnic attitudes at the end of college, even when controlling for other factors that make people more likely to have negative ethnic attitudes (like having negative ethnic attitudes at the beginning of college and more ingroup contact prior to college entry). These results are interesting because they are not obvious from a strict contact-theory perspective. Although contact theory has a ready explanation for why outgroup contact should improve ethnic attitudes, it does not have a good explanation for why ingroup contact should have negative effects on these attitudes. Peer socialization studies might help us understand how ingroup contact has its effects. These studies indicate that students are likely to change their attitudes and behaviors to be consistent with those of their ingroup (Feldman & Newcomb, 1969). Four key conditions help to determine a peer group’s influence: size of the group, homogeneity of the group, isolation of the group, and importance to individuals of group-supported attitudes (Newcomb, 1966). Ethnic-group homogeneity is especially relevant here: people with similar backgrounds and experiences are more likely to share (or perceive themselves as sharing) similar attitudes and ideas. When people share similar views and attitudes, and are isolated from other groups with different attitudes and ideas, this isolation strengthens beliefs that the group’s views are correct and these views are reinforced, thus leading to more negative ethnic attitudes if these attitudes are viewed as normative within the group.

Effects of campus climate perceptions on college friendships

A third question we assessed was whether the tendency to form friendships with members of other ethnic groups is responsive to perceptions of the campus climate. Consistent with Pettigrew’s (1998) prediction that positive conditions of contact would facilitate the development of outgroup friendships, we found that students with one-group (rather than different-groups) representations of the student body have more outgroup friends. In addition to this positive condition of contact facilitating outgroup friendships, we found that negative conditions of contact facilitated ingroup friendships: when students had different-groups representations of the student body, perceived a lack of institutional support for diversity, and perceived discrimination and conflict on campus they were more likely to have ingroup friends. The finding that these relationships held even when controlling for pre-college friendships and the other background variables indicates that perceptions of the campus climate have an independent effect on friendship choices, over and above other reasons why
people might select friends from particular ethnic groups. It remains unclear, however, what factors influence these campus perceptions. Both on-campus and off-campus issues within the larger society are likely to play a role in how students perceive the campus climate (Hurtado, Millem, Clayton-Pedersen, & Allen, 1998). For example, negative perceptions of the campus racial climate may be due to race-related events in society at large (e.g., accusations of police brutality against minorities, affirmative action debates), as well as to more local forces on campus. Future research will allow us to distinguish on-campus from off-campus influences by comparing this sample to local and national probability samples collected during the same time period. In addition to examining the factors that contribute to negative perceptions of the campus climate, we hope to uncover the processes by which these perceptions foster ingroup friendships among members of different ethnic groups.

**Differences between ethnic groups**

Most of the effects of ethnic attitudes on friendships and the effects of friendships on attitudes were similar for the different ethnic groups. There was, however, one major difference in the pattern of results found for African American students. Despite the very low representation of African American students on campus (6%), Black students on average indicated that many to most of their closest friends in college are African American. They also showed the strongest links between their perceptions of the university environment and their tendency to form ingroup friends, controlling for earlier friendships and background variables. That is, greater perceptions of conflict and discrimination on campus lead Black students in particular to have more ingroup friends. Interestingly, these perceptions did not lead Black students to restrict their friendships with outgroup others. These findings are consistent with previous research suggesting that Black students who face a negative racial climate may seek out ingroup others for support, and that this may protect their psychological well-being (Branscombe, Schmitt, & Harvey, 1999). Moreover, in other research we have found that, in addition to protecting psychological well-being, ingroup contact increases the importance that Black students place on getting a high GPA (Grade Point Average) and lowers the likelihood that they would consider dropping out of college before earning a degree (Levin & Van Laar, 2002). Therefore, such tendencies to form ingroup friendships, although potentially harmful for feelings of ingroup bias and intergroup anxiety, may be particularly adaptive for protecting the psychological well-being and academic motivation and commitment of members of disadvantaged ethnic groups. These findings emphasize the need to consider the causes of ingroup contact separately for members of majority and particularly vulnerable minority groups. Ingroup contact may fulfill important psychological needs for social support among ethnic minority students who perceive a hostile racial climate on campus. Such needs may have been heightened among African American students in our sample because of their low representation on campus compared to students from other ethnic groups.

**Implications for campus intergroup relations**

These results lead to a number of conclusions. The most reassuring story is that of the positive effects of outgroup friendships. Students who had more outgroup friends developed more positive feelings toward outgroups relative to their ingroup, and felt less anxious interacting with members of other ethnic groups. These effects occurred even when we took into account other reasons why these ethnic attitudes may have developed. Such results suggest that further actions taken by the university to encourage cross-ethnic friendships should have positive results. These conclusions are bolstered by other findings for this same sample showing that contact with randomly assigned roommates of other ethnic groups has positive effects on later intergroup attitudes and patterns of friendships and dating (Van Laar, Levin, Sinclair, & Sidanius, 2002).

Furthermore, the results of this study suggest that the university need not be restrictive in preventing students from associating with other
members of their ethnic group. In most cases, friendships with ingroup members do not have independent negative effects above the positive effects of outgroup friendships. However, in the case of intergroup anxiety, there are independent negative effects of friendships with ingroup members above the positive effects of friendships with outgroup members. Although we have found here that having ingroup friends has negative effects, other research has found that having ingroup friends has positive effects as well. Specifically, having ingroup friends, in particular among minority group members, has been shown to protect psychological well-being when students perceive that they are disadvantaged (Branscombe et al., 1999). Therefore, having ingroup friends has both negative effects in increasing intergroup anxiety, and positive effects in protecting psychological well-being. In the short term, then, stimulating intergroup ease through heterogeneous outgroup contacts and combining these contacts with opportunities to find understanding and social support in the company of one’s ethnic ingroup may be the most viable and effective strategy for campus intergroup policy. However, in the long term, improving the racial climate will help to eliminate the need for students to have more ingroup friends in the first place. Therefore, if the university can maximize the positive conditions of contact by showing clear support for diversity, encouraging a common ingroup identity, and managing conflict and discrimination on campus, such efforts should attenuate the negative effects of ingroup contact and facilitate the positive effects of outgroup contact on the development of students’ ethnic attitudes over the college years.

Notes

1. A sixth wave of data was also collected at the end of the fifth year for students who had not graduated by the end of their fourth year, but will not be analyzed here.

2. Our sampling frame during the pre-college wave consisted of the 2749 summer orientation attendees who were at least 18 years of age or who had written parental consent to participate in the study. Our sampling frame at the end of the freshman year consisted of all the students who returned the summer survey, except for 179 White and Asian American students with incomplete data and/or missing contact information. Due to the low number of Latinos and African Americans who attended summer orientation (whereas 97% of White students participated in the generic orientation for all students, only 31% of Black students and 42% of Latino students attended this orientation), we kept all Black and Latino students who did participate in the summer wave of data collection in our sampling frame and obtained contact information for 471 additional Latino and Black students who had not participated in the summer wave and added them to our sampling frame. Latino and Black students present in the sample at summer orientation differed significantly from those added at the end of the freshman year on a number of demographic variables. For example, there were significantly more males among the Latino and Black students added at the end of the freshman year than among those who participated in the pre-college wave of data collection. However, this sampling bias did not influence our results because we did not exclude the non-participants in the pre-college wave from our longitudinal analyses. Rather, our sampling frames at the end of the sophomore through senior years consisted of all the students who completed the interview at the end of the freshman year (in addition to 51 Black and biracial students who were added at the end of the junior year).

3. Following the tradition of other researchers in this area (e.g. Gaertner & Dovidio, 2000), we were primarily interested in the effects of ingroup and outgroup friendships on ingroup bias, not in the effects of friendships with any one specific group on affect toward a specific group. However, we did conduct additional regression analyses in order to examine the separate and unique effects of friendships with Whites, Asians, Latinos, and Blacks in Years 2–3 on affect toward each of the groups separately in Year 4, controlling for affect toward each of the groups in Year 1, pre-college friendships, and the background variables. Separate analyses were run for White, Asian, Latino, and Black participants. Results indicated that Latinos who had more Asian friends in Years 2–3 felt more positively toward Asians ($\beta = .18, p < .05$) and Whites ($\beta = .15, p < .05$) at the end of
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Year 4; Latinos who had more White friends felt more positively toward Whites at the end of Year 4 (β = .17; p < .05), and Latinos who had more Black friends felt more positively toward Blacks (β = .13; p = .05). Asians who had more Black friends in Years 2–3 also felt more positively toward Blacks at the end of Year 4 (β = .11; p < .05). There were no other significant relationships between the friendship and affect variables among members of any ethnic group.


Biographical notes

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