

Cross-Group Friendships and Intergroup Attitudes: A Meta-Analytic Review

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Kristin Davies¹, Linda R. Tropp², Arthur Aron¹, Thomas F. Pettigrew³, and Stephen C. Wright⁴

Abstract

This work identifies how cross-group friendships are conceptualized and measured in intergroup research, investigates which operationalizations yield the strongest effects on intergroup attitudes, explores potential moderators, and discusses the theoretical importance of the findings. Prior meta-analyses have provided initial evidence that cross-group friendships are especially powerful forms of intergroup contact. Although studies of cross-group friendship have grown considerably in recent years, varied assessments leave us without a clear understanding of how different operationalizations affect relationships between friendship and attitudes. With a greatly expanded database of relevant studies, the authors compared friendship–attitude associations across a wide range of specific conceptualizations. Time spent and self-disclosure with outgroup friends yielded significantly greater associations with attitudes than other friendship measures, suggesting that attitudes are most likely to improve when cross-group friendships involve behavioral engagement. Processes underlying cross-group friendships are discussed, as are implications for future research and application.

Keywords

intergroup relations, friendship, prejudice, stereotyping, attitudes, close relationships, group processes, interpersonal processes

Over the past several decades, the contact hypothesis (Allport, 1954; Williams, 1947), which posits that interactions between members of different groups can promote positive attitudes and reduce prejudice, has been investigated in various settings and locations, and among a wide range of social groups around the world. Studies in this area typically report improved intergroup relations (Pettigrew & Tropp, 2006). However, investigations of close cross-group interactions, specifically friendships, frequently report especially highly positive intergroup attitudes corresponding with such contact (Pettigrew, 1998; Pettigrew & Tropp, 2005).

Research on the association of cross-group friendships with intergroup attitudes has grown considerably over the past decade (e.g., Hewstone, Cairns, Voci, Hamberger, & Niens, 2006; Levin, van Laar, & Sidanius, 2003; McLaughlin-Volpe, Aron, Wright, & Reis, 2002; Page-Gould, Mendoza-Denton, & Tropp, 2008; Paolini, Hewstone, Cairns, & Voci, 2004; Turner, Hewstone, & Voci, 2007). At the same time, this growing body of research has also developed with very diverse operationalizations of the friendship variable itself, ranging from whether one simply has a friend in the target outgroup to highly specific measures of the nature of such friendships. For example, some researchers highlight subjective experiences such as felt closeness or reported self–other overlap (e.g., McLaughlin-Volpe et al., 2002), others seek to measure intensity of behavioral interaction with indicators of self-disclosure and amount of time spent with outgroup friends (e.g., Turner et al., 2007), and others assess more quantitative

aspects such as number or percentage of outgroup friends (e.g., Paolini et al., 2004; Tropp, 2003).

It now seems clear that cross-group friendships are associated with more positive intergroup attitudes, and there are sufficient experimental and longitudinal studies to be confident in a causal relationship whereby cross-group friendship improves attitudes. However, it is much less clear why. And precisely how friendship is operationalized bears directly on the question of how this friendship to improved attitude effect operates. Identifying the relative degree of association of different operationalizations of cross-group friendship with positive intergroup attitudes holds the potential to further our understanding of the mechanisms by which contact through friendship is effective, both advancing theory and guiding applied interventions.

It is in this context that we conducted a meta-analysis of the sizeable number of studies investigating the friendship–attitude relationship. Our major goal was to identify the most common approaches of operationalizing cross-group

¹State University of New York at Stony Brook, Stony Brook, NY, USA

²University of Massachusetts Amherst, Amherst, MA, USA

³University of California, Santa Cruz, Santa Cruz, CA, USA

⁴Simon Fraser University, Burnaby, BC, Canada

Corresponding Author:

Kristin Davies, Department of Behavioral Sciences, York College of The City University of New York, 94-20 Guy R. Brewer Boulevard, Jamaica, NY 11451
Email: kdavies@york.cuny.edu

friendships (and the associated underlying conceptions) and examine their relative effect sizes in relation to intergroup attitudes. This focus allows us to shed light on the fundamental issue of precisely *which* aspects of friendly contact may be more or less powerful in improving attitudes. Our present analysis includes more than 3 times the number of friendship studies than those examined in Pettigrew and Tropp's (2006) earlier analysis of general contact effects. Moreover, it is this larger number of relevant studies that makes it possible for us to extend this earlier work by moving beyond the general question of *whether* contact via friendship is associated with more positive attitudes to examining how different operationalizations of cross-group friendship may yield different associations with attitudes. We introduce some key themes guiding distinct operationalizations of friendship below. But rather than review various approaches at length here, we elaborate on the nature and function of different friendship measures in the discussion section, where we can review them in light of our research findings.

In a pioneering article, Pettigrew (1997) described friendship as having "special importance" because it involves contact over time and across many situations, through which group members develop meaningful, close relationships under conditions that facilitate improved attitudes (e.g., cooperation, equal status; see Allport, 1954). Pettigrew found strong support for this view in his multinational survey study in which cross-group friendships were more strongly associated with positive intergroup attitudes than were general acquaintances. A longitudinal study conducted by Levin and colleagues (2003) similarly found that students who had more cross-group friendships during their second and third years of college showed less ingroup bias and intergroup anxiety at the end of their fourth year, even after controlling for prior attitudes, precollege friendships, and other background variables. As part of their large-scale meta-analysis of general intergroup contact, Pettigrew and Tropp (2006) also conducted a subanalysis of the studies completed up to the time of their cutoff (December 2000) that focused specifically on contact as friends. Pooling data from these studies showed that contact in the form of cross-group friendships typically yields larger effects than other forms of contact. Over the past decade, the number of contact studies investigating the specific context of cross-group friendship has increased markedly, and this work consistently finds that friendship, as compared to general contact, is more strongly associated with more positive intergroup attitudes (e.g., Aberson, Shoemaker, & Tomolillo, 2004; Eller & Abrams, 2003; Herek & Capitanio, 1996; Jacobson & Johnson, 2006; Levin et al., 2003; McLaughlin-Volpe et al., 2002; Turner et al., 2007).

As the number of studies has grown, cross-group friendship studies have remained quite varied in terms of their operationalizations. Pettigrew (1997) noted that the role of cross-group friendship had been examined in "scattered studies using diverse methods" (p. 173). Friendship status is often assessed by asking whether the participant has a particular

number of friends in the target outgroup (e.g., Paolini, Hewstone, & Cairns, 2007), presenting it as a yes–no question (e.g., Simoni, 1996) or as a scale from *none* to *many* (e.g., Pettigrew, 1997). Some studies assess cross-group friendship in terms of time spent and activities with outgroup friends or self-disclosure (e.g., Turner et al., 2007), whereas others focus on subjective experiences in cross-group friendship such as felt closeness (e.g., Eller & Abrams, 2003) and perceived inclusion of other in the self (IOS; e.g., McLaughlin-Volpe, 2005).

The issue of how friendship is assessed is an important one. Identifying which operationalizations of cross-group friendship yield larger or smaller effects will increase our understanding of the friendship–attitude connection and can lead to new insights concerning likely mechanisms. Prior studies on friendship in the interpersonal relations literature suggests that shared activities and self-disclosure offer opportunities for developing emotional bonds and trust (e.g., Fehr, 1996), which may improve attitudes in the context of cross-group friendships (see Tropp, 2008). Related work on intergroup relations highlighting the role of positive affective processes (e.g., Eller & Abrams, 2003) suggests that feelings of closeness to outgroup members should yield strong effects of cross-group friendships. At the same time, research concerning normative influences in contact (e.g., De Tezanos-Pinto, Bratt, & Brown, 2010; Turner, Hewstone, Voci, & Vonofakou, 2008) intimates the importance of diverse social networks for improving attitudes through having greater numbers or proportions of cross-group friendships. Given the sharp rise of cross-group friendship studies within the past decade, we sought to conduct an analysis that would expand our understanding of how such varied assessments of cross-group friendship may differ in their ability to predict intergroup attitudes.

The Current Meta-Analysis

Thus, a primary goal of the current study was to identify how cross-group friendships are typically conceptualized and measured in intergroup research. In the current analysis, we focused on categories of friendship assessment that were the most numerous in the intergroup contact literature. These categories are (a) time spent in the company of outgroup friends or engaging in activities with outgroup friends, (b) one's self-disclosure to outgroup friends, (c) felt closeness to outgroup friend, (d) perceived inclusion of outgroup friend in one's sense of self, (e) number of outgroup friends, and (f) percentage of one's friendship circle who are outgroup members.

In conducting the current meta-analysis, we based our methodology primarily on Pettigrew and Tropp's (2006) overall meta-analysis of relationships between *general* intergroup contact and prejudice. Pettigrew and Tropp found that when looking specifically at the 154 individual tests (61 samples) available in 2000 in which contact was assessed using some measure of friendship, these cases yielded a significantly stronger effect size (mean $r = -.246$) than the remaining 1,211 tests assessing *all types* of contact (mean $r = -.212$). However, no further analyses were undertaken to specify

effects associated with different operationalizations of cross-group friendship. Also, our data set of relevant samples (gathered through August 2009) is more than 3 times larger than that included in Pettigrew and Tropp (208 vs. 61 samples; 501 vs. 154 tests).

The main thrust of the current investigation is to identify potential differences in effect sizes for the relation of friendship with intergroup attitudes as a function of the specific ways in which friendship has been conceptualized and assessed. As noted earlier, we have sought to specify, for the first time, which features of cross-group friendships appear to have the greatest effects in predicting intergroup attitudes. We expected the general, *overall effect size* for friendship and intergroup attitudes to be comparable to the mean effect reported in the original Pettigrew and Tropp (2006) analysis (mean $r = -.246$) that was based on a substantially smaller number of cases. We also expected significant variability in relationships between friendship and attitude depending on the precise operationalizations used to define cross-group friendships. In addition to exploring differences in effects across these operationalizations, we also investigated a variety of subsidiary issues (e.g., research design and sample characteristics), to further examine the nature of friendship contact studies and to test their comparability to those included in the Pettigrew and Tropp analysis.

Method

Inclusion Criteria. As stated above, the overarching goal of this research was to extend earlier meta-analytic work by focusing specifically on cross-group friendship and taking advantage of the much larger number of studies now available on this topic. Our first inclusion rule reflects this focus. For the purposes of the current meta-analysis, friendships were defined as cases where the participant reported having at least one ongoing, meaningful relationship with a specific outgroup member or members that was closer than that of a mere acquaintance (in which the relationship is based solely on familiarity). We considered relationships labeled generally as “friendships” or “close/best friends” as meeting this requirement.¹

Remaining inclusion criteria were adopted directly from the Pettigrew and Tropp (2006) general contact meta-analysis. Specifically, the cross-group contact (in our case, cross-group friendships) had to be between members of clearly distinguishable groups and had to be treated as a correlate or predictor of intergroup attitudes. Also, the attitude variables had to be collected on individuals rather than be presented as aggregate measures or observations of group change.

Finally, because the vast majority of the studies were cross-sectional or short-term experimental and because time-related designs (longitudinal and related methods) are not directly comparable, studies using time-related designs were excluded from the main analyses. However, we briefly report results for the 25 time-related samples at the end of the results section. For experimental designs (i.e., friendship manipulation),

studies using a pretest–posttest analytic strategy were included in the analysis of longitudinal data; those reporting a postintervention comparison between participants in the experimental group versus a control group were included in the larger meta-analysis of cross-sectional data. Some studies reported both analysis types and were therefore included in both the cross-sectional and longitudinal data sets.

Locating Relevant Studies. We employed several strategies to locate relevant data and began with the set of friendship-relevant studies collected by Pettigrew and Tropp (2006). We then extended this data set by conducting multiple searches of research databases including PsycINFO (psychology), ERIC (education), Social Sciences Citation Index, and Web of Science, through August 2009. We entered 36 combinations of relevant keywords in the searches, including single words (e.g., *contact, attitudes, group, friendship, relationship, close, intimate, prejudice*) and phrases (e.g., *close relationships, interpersonal relationships, intergroup contact, cross-group friendships*).

In addition to these searches, we contacted many authors who are known to conduct relevant research.² We also posted requests for relevant studies on various social science electronic listservers, such as those for the Society for Personality and Social Psychology, the Society for the Psychological Study of Social Issues, and the International Association for Relationship Research.

Our search yielded a total of 135 individual studies, with 208 individual samples, which in turn included 501 individual tests (effects).³

Variables Coded From Each Study, Sample, and Test. Altogether, we coded each study and sample in relation to 14 variables. Our chief interest was in coding for friendship assessment categories most commonly found in the research literature; these were (a) time spent with outgroup friends or engaging in activities with outgroup friends, (b) one’s self-disclosure to outgroup friends,⁴ (c) felt closeness to outgroup friend, (d) perceived inclusion of outgroup friend in one’s sense of self, (e) number of outgroup friends, and (f) percentage of friendship circle who are outgroup members.

We also identified 51 tests of friendship assessments that did not fit into these major categories (e.g., a scale assessing “perceived social support” given by one’s friend) and 23 tests of friendship assessments composed of some mixture of multiple categories (e.g., a scale assessing both time spent with outgroup friend and closeness felt toward outgroup friend). These assessments were included in analyses of both overall effects and moderator effects at all levels but were not included in analyses comparing effect sizes for the main six categories of friendship assessment.

In addition, we coded for a number of research and sample characteristics. As in the Pettigrew and Tropp (2006) meta-analysis, we coded for several methodological moderators, including reliability of both the friendship and attitude measures

(single item, multi-item low reliability, or multi-item high reliability) and whether the outcome measure assessed either an affective or cognitive dimension of intergroup attitudes (see Tropp & Pettigrew, 2005a). We also coded for level of attitude generalization by noting whether each outcome measure assessed attitudes toward (a) a single outgroup member (e.g., "How warmly do you feel toward your Asian friend?"), (b) an outgroup as a whole (e.g., "How warmly do you feel toward Asians?"), (c) multiple specific outgroups (e.g., "How warmly do you feel toward Asians? Latinos?"), (d) unspecified outgroups or non-ingroups (e.g., "How warmly do you feel toward ethnic groups that are different from your own?"), or (e) other outgroups not involved in the contact situation (see Pettigrew, 1997, 2008; Pettigrew & Tropp, 2006). In addition, we coded for research characteristics including type of study design (correlational or experimental), publication source (published or unpublished), location of study (United States/Canada, Europe, or other), and year of study (pre-2000 and post-2000). Ratings for sample characteristics included gender, age, and whether participants were members of a historically dominant group (i.e., "majority" group) or disadvantaged group (i.e., "minority" group; see Tropp & Pettigrew, 2005b).

Finally, in a study of friendship measurement, Smith (2002) found that people tend to estimate a higher number of cross-group friends when asked directly as compared to when they are first asked to list the names of their friends and then asked to identify each friend's group membership. Thus, we coded all relevant studies for whether the outgroup status of the friend was assessed directly (e.g., "How many Asian friends do you have?") or if names were listed before group membership was assessed (e.g., "Of the friends you've mentioned, how many are Asian?").

Across all coded variables, two independent judges achieved a median kappa of .92 (ranging from .77 to 1.00) in their ratings of a random half of the sample. Any discrepancies in ratings between the judges were subsequently resolved through further discussion.

Calculation and Combination of Effect Sizes. Given the great diversity among studies, we adopted a random effects model for the analyses. The rationale for this decision is described in Pettigrew and Tropp's (2006) original work, and the same reasoning applies here. Essentially, a fixed effect model assumes that studies are all estimations of one true effect size that vary only because of sampling error, whereas a random effects model assumes that there is a *distribution* of true effect sizes and thus takes into account additional, unidentifiable variance related to the unique natures of the studies (Borenstein, Hedges, & Rothstein, 2007; Lipsey & Wilson, 2001). The random effects model is advantageous because it allows for generalization to studies beyond those in the current analysis. In addition, because it is more conservative, there can be greater confidence in results that are found to be significant using this model.

The studies reviewed were quite diverse in terms of operationalization of both key variables, friendship with an

outgroup member and intergroup attitudes. Given the nature of these data, most analyses were conducted at either the sample or test (i.e., individual effect size) level to ensure that diversity of operationalization would be taken into account.⁵

We employed the Comprehensive Meta-Analysis program (Borenstein et al., 2007), which allows researchers to enter many single tests for a particular sample. This program also allows researchers to choose whether samples with multiple comparisons and/or outcomes should be averaged or treated independently, depending on the nature of the data and the goals of the analysis. In the current investigation, at the sample level of analysis, aggregates among all effects were calculated, whereas individual effects were employed at the effect or "test" level of analysis. The current meta-analysis used effect sizes expressed as correlation coefficients (r). The majority (more than 70%) of the studies reported their findings in this form. The remainder reported various mean effect size statistics. In these cases, effect sizes were transformed to the required r statistic automatically by the Comprehensive Meta-Analysis program. Furthermore, raw r s, as well as r s converted from other statistical procedures, were recomputed automatically using Fisher's Z transformation (to correct for problems in standard error formulation typical in this effect size family) and then converted back to r . Inverse variance weights (giving more weight to reliable effect size calculations; Hedges & Olkin, 1985) were also calculated automatically by the program for each effect.⁶ Following the procedures used in Pettigrew and Tropp's (2006) meta-analysis, we also capped extremely large sample sizes at 5,000 participants at the study level, 3,000 participants at the sample level, and 2,000 participants at the test or effect level.

In Pettigrew and Tropp's (2006) analysis, *negative* contact-attitude associations were examined, such that greater contact (treated as the IV) was predicted to correspond with lower levels of prejudice (treated as the DV). In the present analysis, however, we have organized our data to examine relationships between friendship (IV) and positive intergroup attitudes (DV). Thus, we expect to observe positive friendship-attitude associations, such that greater friendship will correspond with more positive intergroup attitudes.

Results

Overall Patterns of Effects: Do Friendships Predict Positive Intergroup Attitudes? We first examined the overall relation of friendship with attitudes at the study, sample, and test levels (see Table 1). As predicted, effect sizes at all levels (mean $r = .258$ at the study level, .236 at the sample level, and .236 at the test level using random effects) were very similar to those found for cases assessing friendship in the original Pettigrew and Tropp (2006) meta-analysis (e.g., mean r of .246 at the test level). At each level of analysis, we also found consistent patterns of results regardless of whether we used the random or fixed effects model, whether estimates of reported "nonsignificant" effects were included (i.e., in which we fixed r to .00), or whether caps on sample sizes were

Table 1. Summary of Overall Effect Sizes for Friendship and Intergroup Attitudes

Level of analysis	<i>r</i>	95% CL	<i>Z</i>	<i>k</i>
Studies				
Fixed	.242	.24/.25	71.70***	135
Random	.258	.24/.28	22.17***	135
Excluding <i>ns</i> estimates	.261	.24/.28	22.39***	134
Without <i>n</i> caps	.258	.24/.28	23.22***	135
Samples				
Fixed	.232	.23/.24	77.21***	208
Random	.236	.22/.25	25.00***	208
Excluding <i>ns</i> estimates	.240	.22/.26	25.25***	206
Without <i>n</i> caps	.236	.22/.25	25.02***	208
Test				
Fixed	.233	.23/.24	96.21***	501
Random	.236	.22/.25	33.94***	501
Excluding <i>ns</i> estimates	.239	.26/.25	34.15***	494
Without <i>n</i> caps	.236	.22/.25	34.39***	501

r = correlation coefficient representing the mean effect size; 95% CL = the 95% confidence limits of *r*; *Z* = *z* test for the mean effect sizes; *p* = probability of *z* test; *k* = number of samples associated with the mean effect size. These analyses were conducted using Fisher's *z*-transformed *r* values. Mean effects and confidence limits listed in this table have been transformed back to the *r*-metric from the *z*-transformed estimates obtained in these analyses. Intergroup attitudes were coded so that higher numbers represent more positive attitudes.

****p* < .001.

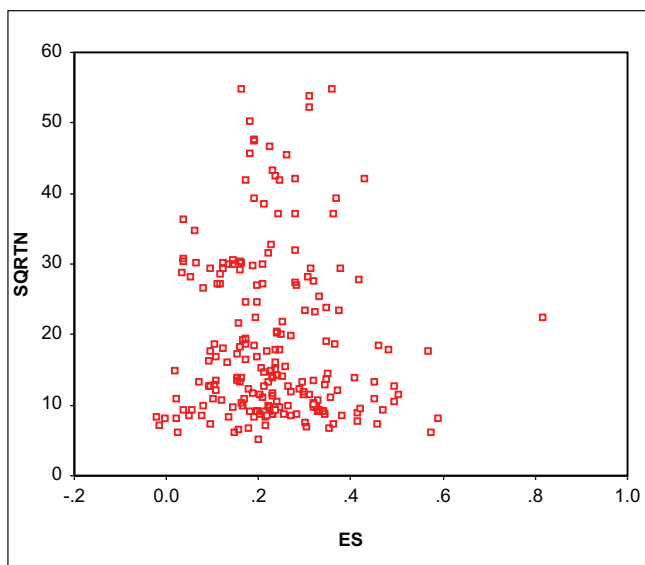


Figure 1. Scatterplot of effect size *r* (ES) as a function of the square root of sample size (SQRTN)

dropped. All remaining analyses employed the random effects model for reasons outlined previously. In addition, we created a scatterplot to observe the overall relationship between sample size and effect size and found that, as expected, the majority of samples converged around the mean (see Figure 1).

We found considerable heterogeneity in effect sizes among the samples, $Q(208) = 1601.60$, $p < .01$, which encouraged us to examine potential moderators of the overall effect.

Samples were used as the unit of analysis whenever possible, but analyses at the test level were employed when the relevant moderator could be measured only at that level. Following this analytic approach, as described previously, comparisons of friendship assessments and intergroup attitude measures were conducted at the *test* level. Factors relating to the measurement of friendship and intergroup attitudes (e.g., reliability, generalization of effect) were also conducted at the *test* level; comparisons involving sample characteristics were conducted at the *sample* level.

Research Study Characteristics. We first examined potential variability in effects associated with study characteristics. Analyses for measure reliability and research design variables are summarized in Table 2. For indicators of friendship, multiple item measures with high reliability (mean $r = .307$) yielded significantly stronger effects than measures low in reliability and single-item measures (mean $r = .223$), $Q_b(1) = 25.82$, $p = .01$. Likewise, for indicators of intergroup attitudes, multiple item measures with high reliability (mean $r = .280$) yielded significantly larger effect sizes than those observed with less reliable measures and single-item measures (mean $r = .206$), $Q_b(1) = 32.56$, $p < .01$.

No significant differences in mean effects were observed between studies employing different measurement approaches, such as those using all questionnaires ($r = .261$) or an implicit dependent variable such as the Implicit Association Test ($r = .267$), $Q_b(1) = 0.02$, $p = .44$. We also examined how studies of experimentally manipulated friendships using procedures such as those created by Aron, Melinat, Aron, Vallone, and Bator

Table 2. Summary of Effect Sizes for Friendship and Intergroup Attitudes as Moderated by Research Design Characteristics

Variable	<i>r</i>	95% CL	<i>Z</i>	<i>k</i>	Q_B
Friendship measure reliability (test level)					
Single-item/multi-item, low reliability	.223	.21/.24	29.72***	409	
Multi-item, high reliability	.307	.28/.34	19.64***	82	
Between-groups effect					25.82***
Attitude measure reliability (test level)					
Single-item/multi-item, low reliability	.206	.19/.22	21.56***	238	
Multi-item, high reliability	.280	.26/.30	29.09***	231	
Between-groups effect					32.55***
Measurement approach (study level)					
Only survey/questionnaire	.261	.24/.28	21.39***	119	
Implicit attitude measure	.267	.18/.35	5.77***	12	
Between-groups effect					0.02, <i>ns</i>
Friendship manipulation (study level)					
Experimental friendship	.163	.01/.31	2.07*	4	
Natural friendship	.260	.24/.28	22.13***	131	
Between-groups effect					1.61, <i>ns</i>

r = correlation coefficient representing the mean effect size; 95% CL = the 95% confidence limits of *r*; *Z* = *z* test for the mean effect sizes; *p* = probability of *z* test; *k* = number of samples associated with the mean effect size. These analyses were conducted using Fisher's *z*-transformed *r* values. Mean effects and confidence limits listed in this table have been transformed back to the *r*-metric from the *z*-transformed estimates obtained in these analyses. Intergroup attitudes were coded so that higher numbers represent more positive attitudes.

p* < .05. **p* < .001.

(1997) compared to studies assessing naturally occurring friendships. The few samples involving experimentally generated friendships on average yielded lower effect sizes (mean *r* = .163) than naturally occurring friendships (mean *r* = .260). However, given the small number of experimental cases, this difference was not statistically significant, $Q_B(1) = 1.61, p = .20$.

In examining potential moderation by other design characteristics (see Table 3), we found no significant difference in mean effects between tests assessing attitudes toward the entire outgroup versus many outgroups or any "non-ingroup," $Q_B(1) = 0.27, p = .60$; this result suggests comparable friendship-attitude effects at different levels of generalization. Similar to Tropp and Pettigrew (2005a), we observed stronger mean effects when the dependent measures tapped affective dimensions of intergroup attitudes (mean *r* = .263) as compared to those tapping cognitive dimensions of intergroup attitudes (mean *r* = .177), $Q_B(1) = 22.78, p < .01$.⁷

We also examined other study-level variables that could potentially moderate the friendship-attitude effect (see Table 3). No significant difference in mean effect size was found between published and unpublished studies, $Q_B(1) = 0.72, p = .40$, and there was no significant difference between studies conducted prior to 2000 and after 2000, $Q_B(1) = 0.09, p = .76$.

Sample Characteristics. We also examined potential variability in effects associated with additional sample characteristics (see Table 4). We found no significant differences in mean friendship effects associated with participant age, $Q_B(3) = 3.51, p = .32$,⁸ nor regarding participant gender, $Q_B(1) = 0.09, ns$.⁹ For the group status variable, we found no significant difference in friendship effects between members of dominant groups (mean *r* = .235) and members of stigmatized groups

(mean *r* = .227), $Q_B(1) = 0.07, p = .79$. However, significant differences were observed at the sample level of analysis regarding the type of target outgroup described, $Q_B(3) = 18.64, p < .01$. Samples involving friendships between racial or ethnic groups yielded a significantly smaller effect size (mean *r* = .208) than friendships between other types of target groups, including those based on nationality, mean *r* = .273, $Q_B(1) = 10.62, p < .01$, sexual orientation, mean *r* = .268, $Q_B(1) = 8.48, p < .01$, and religious affiliation, mean *r* = .301, $Q_B(1) = 13.09, p < .01$. We also found that studies conducted in Europe yielded significantly larger effects (mean *r* = .306) than studies conducted in North America (mean *r* = .238), $Q_B(1) = 7.96, p < .05$. We observed that effects from European studies were significantly less likely to use race or ethnicity as the basis for group categories (47%), as compared to effects from studies conducted elsewhere (64%), $\chi^2(1) = 12.42, p < .01$, and thought that perhaps target group type was truly responsible for this result. However, an ANOVA investigating both the effect of target group type and study location on effect size revealed that there was no interaction between these factors, $F(1, 170) = 0.52, p = .67$, but that main effects were significant for *both* target group type, $F(1, 170) = 2.76, p < .05$, and study location, $F(1, 170) = 4.06, p < .05$, indicating a unique contribution from each.

Friendship Effects Across Different Modes of Friendship Assessment.

At the test level of analysis, we then addressed our primary research question, concerning whether different assessments of friendship yield different patterns of effects on attitudes. Results from these analyses are summarized in Table 5. When comparing effects across all six categories of friendship assessment, we found significant differences in mean

Table 3. Summary of Effect Sizes for Friendship and Intergroup Attitudes as Moderated by Research Design and Study Characteristics

Variable	<i>r</i>	95% CL	<i>Z</i>	<i>k</i>	<i>Q_B</i>
Type of generalization (test level) ^a					
Entire outgroup	.245	.23/.26	27.43***	323	
Many/nonspecific outgroups	.236	.21/.26	15.28***	93	
Between-groups effect					0.27, ns
Type of attitude measure (test level)					
Cognitive	.177	.15/.20	13.02***	141	
Affective	.263	.24/.29	21.01***	178	
Between-groups effect					22.78***
Publication source (study level)					
Published	.262	.24/.29	20.41***	111	
Unpublished	.237	.18/.29	8.41***	24	
Between-groups effect					0.72, ns
Year of study (study level)					
Prior to 2000	.253	.21/.29	12.27***	41	
2000 and later	.260	.23/.29	18.65***	94	
Between-groups effect					0.09, ns

r = correlation coefficient representing the mean effect size; 95% CL = the 95% confidence limits of *r*; *Z* = *z* test for the mean effect sizes; *p* = probability of *z* test; *k* = number of samples associated with the mean effect size. These analyses were conducted using Fisher's *z*-transformed *r* values. Mean effects and confidence limits listed in this table have been transformed back to the *r*-metric from the *z*-transformed estimates obtained in these analyses.

Intergroup attitudes were coded so that higher numbers represent more positive attitudes.

a. One test assessing attitude at the "individual" level (i.e., attitude about the specific outgroup friend) was excluded because one case is not sufficient for a meaningful comparison.

****p* < .001.

Table 4. Summary of Effect Sizes for Friendship and Prejudice as Moderated by Participant and Sample Characteristics (All Analyses at Sample Level)

Variable	<i>r</i>	95% CL	<i>Z</i>	<i>k</i>	<i>Q_B</i>
Age of participants					
Children	.195	.12/.26	5.29***	17	
Adolescents	.230	.19/.27	10.24***	30	
College students	.257	.23/.28	18.24***	104	
Adults	.257	.21/.30	11.47***	34	
Between-groups effect					3.51, ns
Gender of participants					
Male	.206	.15/.26	7.89***	13	
Female	.238	.20/.28	10.95***	10	
Between-groups effect					0.92, ns
Dominant/stigmatized status of participants					
Dominant	.235	.21/.26	17.35***	121	
Stigmatized	.227	.18/.28	8.39***	35	
Between-groups effect					0.07, ns
Target outgroup assessed					
Racial/ethnic outgroups	.208	.19/.23	17.78***	118	
Nationality	.273	.22/.32	10.13***	21	
Sexual orientation	.268	.22/.31	11.70***	32	
Religious affiliation	.301	.26/.34	12.97***	27	
Between-groups effect					18.64***
Location of study					
North America	.238	.21/.27	15.38***	76	
Europe	.306	.27/.34	15.19***	41	
Other	.253	.19/.32	7.21***	14	
Between-groups effect					7.95*

r = correlation coefficient representing the mean effect size; 95% CL = the 95% confidence limits of *r*; *Z* = *z* test for the mean effect sizes; *p* = probability of *z* test; *k* = number of samples associated with the mean effect size. These analyses were conducted using Fisher's *z*-transformed *r* values. Mean effects and confidence limits listed in this table have been transformed back to the *r*-metric from the *z*-transformed estimates obtained in these analyses. Intergroup attitudes were coded so that higher numbers represent more positive attitudes.

p* < .05. **p* < .001.

Table 5. Summary of Effect Sizes for Friendship and Intergroup Attitudes as Moderated by Friendship Assessment

Variable	<i>r</i>	95% CL	Z	<i>k</i>	Q_b
All assessment types (test level)					
Time/activities with friend	.271	.23/.31	13.63***	59	
Self-disclosure	.255	.20/.31	8.06***	27	
Closeness	.184	.14/.23	7.30***	43	
Inclusion of other in self	.195	.14/.24	13.63***	42	
Number of friendships	.220	.20/.24	18.83***	155	
Percentage of friendship circle	.236	.21/.26	15.47***	89	
Between-groups effect					11.63*
Time/self-disclosure vs. others (test level)					
Time or self-disclosure	.267	.24/.30	15.88***	86	
Other assessment types	.218	.20/.23	26.48***	329	
Between-groups effect					7.23**
Assessment of outgroup friend status					
Directly asked about outgroup friends	.247	.23/.27	25.04***	180	
Outgroup status asked after friends listed	.158	.10/.21	5.55***	23	
Between-groups effect					9.42**

r = correlation coefficient representing the mean effect size; 95% CL = the 95% confidence limits of *r*; Z = z test for the mean effect sizes; *p* = probability of z test; *k* = number of samples associated with the mean effect size. These analyses were conducted using Fisher's z-transformed *r* values. Mean effects and confidence limits listed in this table have been transformed back to the *r*-metric from the z-transformed estimates obtained in these analyses. Intergroup attitudes were coded so that higher numbers represent more positive attitudes.

p* < .05. *p* < .01. ****p* < .001.

effects across the six categories, $Q_b(5) = 11.63, p < .05$. Those cases that assessed friendship in terms of either *time spent* with outgroup friend or *self-disclosure* (combining these two categories, mean *r* = .267) yielded significantly larger effects than the average of the cases in the other four categories (mean *r* = .218), $Q_b(1) = 7.23, p < .01$. Time spent with outgroup friend considered by itself yielded a significantly stronger association to positive intergroup attitudes (mean *r* = .271) than measures assessing number of friends, proportion of friendship circle, closeness, and inclusion of other in self combined (mean *r* = .218), $Q_b(1) = 6.72, p < .01$. Self-disclosure by itself did not yield an effect size significantly larger (mean *r* = .255) than the four categories identified above combined (mean *r* = .218), $Q_b(1) = 1.47, p = .24$; however, time spent and self-disclosure did not differ significantly from each other, $Q_b(1) = 0.19, p = .67$.

In addition, for the 203 samples in which a questionnaire was used, we tested whether studies asking participants directly about friendships with outgroup members yielded different effects than samples first asking participants to list friendships and subsequently report on their group membership (see Table 5). In line with Smith's (2002) contentions, asking participants directly about whether they had outgroup friends yielded larger effect sizes (mean *r* = .247) than asking about group membership after an initial listing of one's friends (mean *r* = .158), $Q_b(1) = 9.42, p < .01$.

Examining Characteristics of Strong Effects. In addition to investigating how effect size is influenced by study characteristics, we used chi-square analyses in a reverse strategy to examine characteristics of studies with the strongest effect

sizes. We compared the strongest 30% of effects (*r* of .30 or higher) to the weakest 70% of effects. Effects of .30 or higher tended to have more reliable measures of friendship assessment (31% compared to 12% among effects less than .30), $\chi^2(1) = 26.88, p < .01$. Effects of .30 or greater also had significantly more reliable assessments of intergroup attitudes (63% compared to 43%), $\chi^2(1) = 17.39, p < .01$. Furthermore, effects of .30 and greater more often employed affective rather than cognitive measures of intergroup attitude (69% compared to 50% among effects less than .30), $\chi^2(1) = 9.63, p < .01$, and less often employed implicit measures of intergroup attitude (1% compared to 6%), $\chi^2(1) = 5.12, p < .05$. Effects of .30 or greater were less likely to involve racial groups (50% compared to 63%), $\chi^2(1) = 7.25, p < .01$, and were more likely to involve religious groups (26% compared to 15%), $\chi^2(1) = 8.08, p < .01$. Finally, effects of .30 or larger were more likely to assess friend's outgroup status directly rather than asking for a list of friends first (1% compared to 11%), $\chi^2(1) = 13.16, p < .01$.

Examining Longitudinal Studies. A number of studies took the passage of time into account in their statistical analysis (i.e., longitudinal designs) by examining change in scores between pretest and posttest, relationships between friendship at an earlier time point and attitudes at a later time point, or relationships between current friendship and current attitudes controlling for earlier assessment of attitudes. These cases were not included in the overall meta-analysis because of the theoretical basis (and meaning of the effect size) of these procedures being quite different from methods of analyzing cross-sectional data. The 49 longitudinal effects (from

25 independent samples) yielded an overall effect size of $r = .231$.

Discussion

The major aim of the current study was to investigate whether different operationalizations of cross-group friendship yield different patterns of relationships with intergroup attitudes. This issue is important to explore not only because of the growing number of such studies but also because there are various features of friendship that may be responsible for any observed improvement in intergroup attitudes. Furthermore, the increased number of friendship contact studies conducted during the past decade now makes it possible to examine this topic comprehensively and systematically using meta-analysis. Although many researchers contend that intimate relationships provide an ideal condition for intergroup contact, thus resulting in improved intergroup attitudes (see Brown & Hewstone, 2005; Paolini et al., 2004; Pettigrew, 1997), actual measures of friendship can vary greatly from study to study within the intergroup literature, making it unclear as to which aspects of friendship have the greatest influence. Thus, employing a meta-analytic approach, we sought to determine whether various assessments of friendship differentially predict positive attitudes toward outgroups to provide insight regarding likely mechanisms through which friendship affects intergroup attitudes.

We first assessed the overall effect size between friendship and attitudes with a considerably larger and updated sample of relevant studies than those included in an earlier meta-analysis of general contact effects by Pettigrew and Tropp (2006). We found that mean effect sizes closely matched those observed in the analysis examining a smaller subset of friendship studies. The overall effect we identified varied little in relation to research design or level of generalization, yet as in Pettigrew and Tropp, we found that more reliable friendship and attitude measures typically yielded stronger effects.

Variability in Friendship Effects. After identifying the overall association between cross-group friendship and intergroup attitudes, we examined our chief research question: whether effect sizes vary depending on the type of friendship assessment employed. We found that *all* measures of cross-group friendship (i.e., time spent with outgroup friends, self-disclosure to outgroup friends, closeness to outgroup friend, perceived inclusion of outgroup friend in self, number of outgroup friends, and percentage of friendship circle who are outgroup members) typically yield significant associations with intergroup attitudes. However, our investigation revealed that more specifically, assessments of time spent with one's outgroup friend and self-disclosure to outgroup friends tended to yield the largest effects. When these categories were combined, the resulting effect size was significantly greater than the combined effect of the remaining four assessment categories.¹⁰

Why might spending time with and self-disclosing to one's outgroup friend be especially likely to correspond with

positive intergroup attitudes? Of all the assessments of friendship observed in the intergroup research literature, time spent together and self-disclosure best capture the degree of one's *actual engagement* in the relationship. Prior work on friendship development and maintenance in interpersonal contexts similarly suggests that these behavioral assessments may be better indicators of the current, *active* state of friendship. Spending time with one's friend has been identified as a principal strategy for building and maintaining a meaningful personal relationship (e.g., Fehr, 1996; Hays, 1984). For example, in his longitudinal study of interpersonal friendship formation, Hays (1985) assessed not only attitudinal but also *behavioral* trends between stranger dyads leading to successful friendships, measuring occurrences ranging from attending a movie together to sharing an important personal problem. More recent research on interpersonal relations by Oswald, Clark, and Kelly (2004) also suggests that behaviors encompassing positivity, supportiveness, openness, and interaction are central for friendship maintenance. Intergroup researchers have similarly found that interaction behaviors such as visiting friends at home and vice versa (e.g., Tausch et al., under review, 2010), spending time "doing things" and "outside of school" together (e.g., Turner et al., 2007), and completing homework together (e.g., Wagner, van Dick, Pettigrew & Christ, 2003) are typically associated with more positive intergroup attitudes. Moreover, such interaction behaviors imply not only that the individual is motivated to engage in the friend relationship but also that the individual highly values the friendship (see van Dick et al., 2004).

In addition, individuals who are actively building and maintaining their friendships typically engage in self-disclosure (Fehr, 1996). Indeed, self-disclosure has been conceptualized as "the primary route through which people develop intimacy in their relationships" (Fehr, 2004, p. 16) and which can be achieved only through spending time with the other (also see Altman & Taylor, 1973; Reis & Shaver, 1988). And once personal details are disclosed, the trust that is likely to develop as a result seems likely to encourage further interactions and positive regard for the outgroup individual, which may then be extended to the outgroup as a whole. Pettigrew (1997) posited that as people repeatedly interact and self-disclose personal information, they forge *emotional bonds* with individual outgroup members that in turn generalize to the larger outgroup. In other words, improvements in attitude for the larger outgroup are likely to be in part the result of the affective processes occurring in close personal relationships with individual outgroup members.

In support of this notion, Wright, Aron, and their colleagues successfully used an experimental procedure for generating closeness via structured self-disclosure (Aron et al., 1997), which can be applied to improving intergroup attitudes through interactions between cross-group dyads (Davies, Aron, Wright, Brody, & McLaughlin-Volpe, 2010; Wright et al., 1999; also see Page-Gould et al., 2008). In addition to these experimental

studies, questionnaires have examined the relation of self-disclosure to outgroup attitudes (e.g., Ensari & Miller, 2006; Harwood, Hewstone, Paolini, & Voci, 2005; Tam, Hewstone, Harwood, Voci, & Kenworthy, 2006). For example, Turner et al. (2007) found that self-disclosure in cross-group friendships was associated with positive intergroup attitudes, and this likely occurs because self-disclosure generates empathy and trust for the outgroup (see Swart, Turner, Hewstone, & Voci, in press) as well as the belief that contact with the outgroup is important (van Dick et al., 2004).

Furthermore, time spent and self-disclosure may have yielded large effect sizes because they necessarily imply some level of engagement *on the part of the outgroup friend*. Research on close relationships suggests that processes such as self-disclosure, trust, and closeness are *transactional*; as such, we need to investigate not only one's own feelings of closeness and willingness to self-disclose to the contact partner but also how the partner responds to one's advances and how one in turn interprets the partner's responsiveness (e.g., Reis & Shaver, 1988). Therefore, the transactional nature of friendships across group boundaries may be another key area for further investigation (see Aboud, Mendelson, & Purdy, 2003, for a related discussion). For example, in their study of experimentally manipulated friendships, Page-Gould and colleagues (2008) found significant associations between partners' reported prior contact experiences and participants' own stress responses. Partners' prior contact did not significantly correspond to stress responses among participants in the same-group condition or among participants low in sensitivity to being rejected on the basis of race. However, among participants highly sensitive to race-based rejection, those who interacted with a cross-group partner with high prior contact experience showed greater decreases in stress reactivity over the course of the three friendship meetings than those paired with a cross-group partner with little prior contact experience. Furthermore, in a recent diary study of friendship development, Shelton, Trail, West, and Bergsieker (2010) found that the level of perceived partner responsiveness of a potential outgroup friend mediated the relationship between both own and friend's reported amount of disclosure and intimacy. Together, these lines of research point to the importance of assessing how members of friendship dyads respond to each other rather than assessing the perspective of only one party within the cross-group relationship.

Another potential reason why larger effect sizes were found for time spent and self-disclosure to outgroup friends can be gleaned from theories of how general contact with individual outgroup members generalizes to the outgroup as a whole. Research on group salience in intergroup contact suggests that attitudes about individual group members are more likely to generalize to the entire outgroup when group memberships are salient (e.g., *categorization*; see Brown, Vivian, & Hewstone, 1999; Hewstone & Brown, 1986). However, other work suggests that the personal nature of individualized contact encourages reductions in intergroup bias (e.g., *decategorization*; see

Brewer & Miller, 1984); inclusive superordinate categories that encompass the original, distinct group memberships can also serve to improve intergroup attitudes (e.g., *recategorization*; see Gaertner et al., 1999; Urban & Miller, 1998). Rather than necessarily opposing each other, it is conceivable that these processes can work to reinforce and facilitate each other over time through ongoing cross-group relationships (see Gaertner et al., 2000; Pettigrew, 1998). In an active, transactional friendship, where partners see each other often and frequently disclose information, more visual and verbal cues signaling group differences are likely to emerge over time, making group categories salient even as such close friendship experiences are also likely to provide very personalized experiences of contact. Simply put, the more actual interactions that take place between cross-group friends over the course of the relationship, the more opportunities exist for friends both to be reminded of their differing group memberships as well as to learn that they are each unique individuals who may share some meaningful commonalities.

A surprising finding in the current analysis was that closeness to outgroup members and IOS, although significant, yielded lower than anticipated effect sizes when compared to other dependent variables. IOS has been hypothesized as a major mechanism by which friendship works to improve intergroup attitudes (e.g., Wright, Aron, McLaughlin-Volpe, & Ropp, 1997), and there is some support for this notion (e.g., Brody, 2003; Davies et al., 2010; McLaughlin-Volpe et al., 2002; Wright et al., 2009). One explanation for the relatively weaker effects found for closeness and IOS may be the more subjective nature of the measures, and thus how they are understood by respondents, and not necessarily the constructs themselves. What is "close" according to one individual may not necessarily be so for another. Furthermore, the friendship indicators yielding the highest effects, spending time and self-disclosure, are likely to occur more frequently in *active* friendships. People may subjectively *feel* close to a distant or old friend; however, if the relationship is not currently in an active state of development or maintenance, its cross-group nature—and the corresponding empathy and concern that can grow from cross-group relationships—may be less salient and thus less likely to have an impact on intergroup attitudes. In addition, both closeness and IOS are often measured with a single item, as was true in all cases of both assessment types in the current study. Thus, some of the observed difference in effect size between these friendship assessment categories may be the result of differences in reliability between single- and multiple-item measures.

In summary, we found that operationalizations of time spent with outgroup members and self-disclosure to outgroup members yielded the largest cross-group friendship effects. This may be the result of these measures assessing behavioral aspects of relationships, and therefore possibly being the best indicators of active, transactional engagement between friends. Indeed, self-disclosure and spending time with individuals are both well established as key elements in the development

and maintenance of friendships. This suggests that intergroup attitudes may be most influenced when indicators suggest that individuals are committed to and actively involved in the cross-group relationship.

Developmental Processes in Cross-Group Friendships. Although these results suggest that positive effects may be obtained through cross-group friendships with high levels of engagement, barriers can also limit the development of close, positive, cross-group relationships. For example, longitudinal work by Binder and colleagues (2009), addressing the long-debated issue of causality between intergroup contact and intergroup attitudes, observed that although cross-group friendships predicted reductions in prejudice, higher levels of prejudice also predicted less cross-group friendship. In addition, factors such as fears about being a target of prejudice or appearing prejudiced (e.g., Devine & Vasquez, 1998; Plant, 2004; Stephan & Stephan, 1985) and miscommunication and misunderstanding between groups (e.g., Vorauer & Sakamoto, 2006) may make individuals hesitant to engage in cross-group interactions, thereby curbing the development of cross-group friendships.

Still, cross-group interactions may take place despite these barriers. As one example, Omarzu (2000) outlined a “disclosure decision” model in which individuals initially share personal information to achieve a specific goal (i.e., social approval, intimacy, relief of distress, social control, or identity clarification). Although people from different backgrounds may initially disclose for reasons other than necessarily becoming friends, the self-disclosure process may encourage the development of closeness. In addition, research on self-expansion suggests that some individuals are particularly motivated to seek contact with outgroup members (Brody, Wright, Aron, & McLaughlin-Volpe, 2008; Davies, 2009; Davies, Wright, & Aron, in press). Thus, although some individuals may be initially hesitant to interact with outgroup members, others are actually driven to search for such meetings, and cross-group encounters may occur regardless of whether an individual fears or desires such an interaction and may serve purposes other than the building of a meaningful personal relationship.

Once cross-group interactions begin to take place, positive contact experiences may alleviate initial anxieties (Binder et al., 2009; Page-Gould et al., 2008), which can fuel more positive attitudes toward outgroup members in general (Paolini et al., 2004; Pettigrew & Tropp, 2008) and a greater willingness to trust and befriend outgroup members (Tropp, 2008). In line with this view, Page-Gould and colleagues (2008) showed that experimental manipulations of cross-race friendship with structured self-disclosures (see Aron et al., 1997) led to significant decreases in anxiety (as measured by cortisol reactivity) as well as increases in the *initiation* of cross-group interactions.

These considerations suggest that the formation of a cross-group friendship entails a gradual process. Deep levels of self-disclosure and other forms of intimacy do not typically occur

at once. Rather, these *grow* over the course of developing relationships (Altman & Taylor, 1973) and should become increasingly likely to the extent that people experience reduced anxiety and increased comfort with their cross-group friends (see Tropp, 2008). In the early stages of a relationship, individuals reveal personal information about themselves, which presents opportunities for interaction partners to express concern and validation for each other (Reis & Shaver, 1988), thus creating a basis on which mutual trust can be built. Shelton and colleagues (2010), for example, found that perceived partner responsiveness plays a key role in the trajectory of developing cross-group friendships. As the relationship deepens, greater levels of trust are likely to develop (Roberto & Kimboko, 1989), and intimate interactions become more frequent. Therefore, intimate processes are likely to cycle, with meaningful transactions reoccurring and reaching deeper levels as the friendship grows.

Intergroup research has identified a variety of factors that may be important for the development and maintenance of cross-group friendships. Variables such as anxiety reduction, closeness, IOS, and empathy have recently been identified in the intergroup relations literature as having significant roles in the contact–prejudice relationship (e.g., Aron & McLaughlin-Volpe, 2001; Batson et al., 1997; Hewstone et al., 2006; Paolini et al., 2004; Pettigrew & Tropp, 2008; Wright, Aron, & Tropp, 2002). Yet research has yet to elucidate the roles each may play as cross-group friendships develop. Anxiety reduction may well be most important during the initial stages of intergroup contact (Page-Gould et al., 2008), whereas enhancing empathy may become more important with continued contact and lowered anxiety, as group members begin to develop closer relationships through which they disclose more to each other and share experiences and perspectives (see Pettigrew & Tropp, in press; Tropp & Molina, in press). Regarding practical applications, then, our findings suggest that to enhance the positive effects of cross-group friendships, we should first work to reduce anxieties as people initially approach cross-group interactions. We should also promote strategies that foster meaningful interactions with outgroup members over time, such as self-disclosure and other friendship-building activities that involve spending time together, to nurture greater empathy and closeness between members of different groups.

Other Findings

Order of asking about friendships. Inspired by the work of Smith (2002), an additional analysis showed that measures asking participants about their cross-group friendships directly yielded significantly stronger effect sizes than those measures asking participants to first generate a list of friends and then report the group membership of those friends. Smith has contended that this occurs when participants list a larger than accurate number of outgroup friendships, and also report a more positive attitude toward outgroups, thus creating an inflated effect. This is certainly a valid concern and possibility. Another explanation involves the role of category salience.

By having participants report specifically on their cross-group friendships, rather than listing their general friendships, they call to mind those friends whom they think of in terms of their group memberships. Brown and colleagues found that attitudes about individual group members are more likely to generalize to the outgroup as a whole when group membership is salient (e.g., Brown et al., 1999; Brown & Hewstone, 2005). In addition, research by Page-Gould, Mendoza-Denton, Alegre, and Siy (2010) suggested that positive effects of cross-group friendships are more likely to generalize to unknown outgroup members to the extent that those friendships are cognitively accessible. Another potential explanation for this finding is that cross-group friendships are often less close than one's same-group friendships and may therefore come to mind less readily when one is asked to list their friends. Thus, using this method of assessment, those having moderately close relationships with outgroup friends are treated as having no friendships at all. When these individuals are grouped with those who actually do not have cross-group friendships, the resulting effect size becomes lower and level of friendship appears to have less impact on intergroup attitudes.

Experimentally manipulated cross-group friendships. Although no significant differences were observed—likely because of the small number of cases involved—the four studies testing experimentally manipulated friendships yielded substantially lower effect sizes than studies of “naturally occurring” friendships. This finding is not necessarily surprising given what we know about the gradual process that underlies the development of meaningful friendships (e.g., Hays, 1985). By contrast, the experimental studies employed closeness-generating procedures with people who were strangers to each other, with the intention of creating *initial* feelings of closeness and trust; it is thus not surprising that the impact on intergroup attitudes, although significant, is less than that observed among well-established friendships.

Furthermore, by manipulating outgroup friendships, these studies are likely capturing only the variance that comes from the friendship to improved attitudes pathway of the friendship–attitudes relationship. In cross-sectional research, variance may also be explained by the positive attitudes to friendship path (and possible third variable forces such as individual and cultural differences), resulting in larger effect sizes. In addition, the larger effects observed among cross-sectional studies could be the result of “self-selection” bias, with those reporting cross-group friendships possibly having positive attitudes prior to the relationship. This is especially likely to be the case when experimental studies do not provide ample opportunity for those having negative attitudes to build a meaningful relationship; theoretically, these individuals have the largest room for improvement and should yield the largest effects. Finally, social desirability effects may arise in cross-sectional studies where individuals report both many outgroup friends and favorable intergroup attitudes. We discuss this possibility in the Order of Asking About Friendships section above.

Affective processes in cross-group friendships. We found that affective indicators of intergroup attitudes, such as emotions and positive/negative evaluations, yielded significantly stronger relationships with cross-group friendships than did cognitive indicators such as beliefs and stereotypes. This pattern of results was in line with previous research investigating the potential differences between affective and cognitive dimensions of intergroup attitudes and their relationships with intergroup contact generally. For example, in their meta-analytic work, Tropp and Pettigrew (2005a) also found that affectively oriented prejudice measures yielded stronger relationships with contact than cognitive-oriented prejudice measures. The authors explained that this effect may occur because people are better able to act as “detached observers” during cognitive evaluations of outgroups but when rating outgroups on emotions and feelings are more likely to think of their own personal experiences and relationships (also see Esses & Dovidio, 2002). Tropp and Pettigrew further stated that the impact of contact on prejudice depends on the nature of the particular experience and that affective aspects of interactions seem to be especially important (also see Paolini et al., 2007). The current findings underscore the notion that close, meaningful cross-group friendships are especially likely to encourage positive emotional responses toward outgroup members and their groups.

Effect of target outgroup type. In addition, we found differences in mean effect sizes in relation to various target outgroups, with racial/ethnic target outgroups yielding significantly smaller effects than groups based in nationality, religion, and sexual orientation. This finding underscores the importance of examining specific contexts and unique intergroup histories when testing the ability of intergroup-theory-based interventions to improve intergroup attitudes (Liu & Hilton, 2005). These findings suggest that despite the progress made in bridging the racial/ethnic divide in many cultural contexts, there still exists considerable room for improvement with regard to interpersonal race relations even in Europe and North America. In addition, although differences in effect sizes between target outgroup categories were significant, the aggregate effect sizes within each category were all significant and, with the exception of racial/ethnic outgroups, were markedly larger than the effects that are typically observed for general contact (cf. Pettigrew & Tropp, 2006).

Effect of study location. Studies conducted in Europe generated significantly larger effects than those being conducted in the United States or Canada. This finding could reflect a cultural difference in what it means to be a “friend.” For example, within the United States, the word *friend* is often used to identify a wide range of relationships, including anything from casual acquaintances to extremely intimate relationships parallel to one's own kin (Hays, 1988). Perhaps people in Europe generally reserve the term for more intimate relationships, yet comparative studies across national contexts would be needed to examine this issue more directly. Nonetheless, overall, our

findings indicate that friendship appears to have positive effects on intergroup attitudes across a wide range of groups and contexts.

Longitudinal studies of cross-group friendship. We conducted a separate analysis of longitudinal studies investigating the impact of friendship over time. These studies are important because they speak to the question of the direction of causality: Does friendship influence attitudes, or do attitudes influence friendship? Experiments of course also speak to this issue, with even more control. But as noted, experiments typically have the limitation of not being able to examine friendship development beyond its early stages. In the current analysis, we found that samples ($n = 25$) investigating the longitudinal effect of friendship on intergroup attitudes yielded an average effect size of .231, which was comparable to the effect size .236 observed among the cross-sectional samples ($n = 208$). This finding lends support to the notion that friendship can improve intergroup attitudes. However, this finding does not necessarily mean that the reverse order of causality is not also possible (see Binder et al., 2009). As we describe in our discussion of processes in friendship development, individuals may have doubts about the probability of developing a friendship with an outgroup member during initial cross-group interactions. However, recent work (e.g., Shelton et al., 2010) suggests that, to the degree that cross-group interactions are perceived to be positive, initial trust might develop that could pave the way to more meaningful cross-group relationships.

Patterns among larger effects. We also analyzed differences between effects yielding r s of .30 or greater and the remainder of effects yielding smaller effect sizes. The pattern of results of these chi-square analyses was quite similar to the pattern observed in the current meta-analysis; effects of .30 or greater were *more* likely to involve more reliable measures of friendship and intergroup attitudes, employ affective rather than cognitive measures of intergroup attitude, involve religious groups, and assess friend's outgroup status directly rather than asking for a list of friends first.

Some Best Examples. In addition to these general patterns among studies with larger effects, certain research deserves special mention. Several studies yielded large effects (of .35 or greater) while also employing sound indicators of friendship and related intergroup factors, suggesting that these designs may serve as good benchmarks for future cross-group friendship research, particularly if seeking to identify effect mediators and moderators. For example, in a longitudinal investigation of cross-ethnic contact (mean $r = .363$), Binder and colleagues (2009) recruited a large sample ($n = 1655$) composed of both majority and minority group members and employed reliable measures of cross-group friendship and intergroup attitudes. Not only was the methodology of the study impressive, but it also employed comprehensive assessments of both friendship and intergroup attitudes relevant to recent theory; multiple assessments of friendship were employed, including

number of friends, time spent with friends, closeness, equality, and relationship fit (i.e., working "together" versus "against each other"), whereas assessments of emotions for outgroup (e.g., anger, admiration, trust) and desire for social distance with outgroup members served as outcome variables. In addition, assessments of potential moderators and mediators included intergroup anxiety and typicality of outgroup friends. With such a rich variety of measures to assess friendship and attitudes, this study serves as an excellent example of a methodologically sound and comprehensive study of cross-group friendship.

In a second example, Cehajic, Brown, and Castano (2008) investigated the impact of cross-group friendship in a very serious context for intergroup reconciliation: the War in Bosnia and Herzegovina (mean $r = .491$). We highlight this study because, in addition to having strong internal reliability, it assessed a number of factors particularly relevant to cross-group friendship and extremely important to resolving situations of real-world conflict. The study assessed different aspects of cross-group friendship, including number of friends, closeness and perceived similarity, and very importantly, a wide variety of factors relating to intergroup attitudes. Emotion-based assessments of trust for the outgroup and empathy for the outgroup and the cognitively based assessment of perceived outgroup heterogeneity served as important mediators of the observed positive association between cross-group friendship and the chief outcome variable of interest, forgiveness for previous outgroup transgressions during times of war.

Finally, another kind of study that deserves mention is exemplified in work by Aday and colleagues (Aday, Aday, Arnold, & Bendix, 1996; Aday, Sims, McDuffie, & Evans, 1996), who created a procedure encouraging "age-integrated friendship" between elementary school children and senior citizens and involved many procedures that could be applied to real-world intergroup settings (mean $r = .354$). In the Intergenerational Partners Project, students and seniors were paired based on similar interests (e.g., favorite food, hobbies, pets) and participated in eight monthly meetings. Early meetings were concerned with introductions and building an initial interpersonal relationship, later meetings concerned an introduction of music/art from the 1930s and discussions of the values of both groups, and final meetings centered on deepening the established interpersonal bonds and discussions of the impact of the program. Although a close personal relationship between senior citizens and young children is not, in many regards, a typical friendship, the issues concerning cross-group interactions in this context are not dissimilar from those plaguing many situations of intergroup relations, including limited contact, misinformation and belief in stereotypes, and contact anxiety. Aday and colleagues provided a rich collection of potential strategies that could be applied to make improvements in situations of real-world cross-group contact. For example, their procedure provides ample opportunities

for attitude improvement that is initially rooted in interpersonal connections and emotion but is likely to improve further based on the later information learned about the outgroup via the new outgroup friend.

Conclusions

The current study employed a meta-analytic strategy to investigate relationships between cross-group friendships and intergroup attitudes. Using effect size data from 208 individual samples, we tested whether different modes of friendship operationalizations yield stronger or weaker effects. The current work confirms that overall, cross-group friendships appear to promote positive intergroup attitudes, yet there is considerable variation in effects concerning how “friendship” is assessed. Specifically, two behavioral indicators involving active interaction—time spent with and self-disclosure to one’s outgroup friend—were most closely related to intergroup attitudes. Therefore, although all types of friendship measures were significantly related to positive intergroup attitudes to some degree, our findings suggest that researchers should not equate all types of friendship assessment, or the mechanisms that such different types of measures imply. In particular, as noted, *behavioral measures* assessing active, transactional engagement between friends appear to be most effective for predicting shifts in intergroup attitudes.

Some other clear findings with important implications for future research and theory development include the finding that friendship effects (as had been found for contact effects more generally) are strongest for affective indicators of outgroup attitudes, that implicit measures yield effect sizes of about the same size as explicit measures, that experiments but not longitudinal studies tend to yield weaker effect sizes than cross-sectional studies, that target outgroups based on racial or ethnic background tend to yield weaker effects as compared to outgroups based on other categories such as religious background, and that samples from North America tend to generate smaller effects than those from studies conducted in other parts of the world. In addition, we identified situations that are likely to foster the development of a cross-group friendship, and described potential processes involved, including anxiety reduction and the building of trust.

Future research should not only employ behavioral measures but also assess the meaningful intimate factors (e.g., empathy, trust, etc.) that occur on a *personal level* between individuals and that are hypothesized to underlie the effect. Many articles included in our review made the argument that friendship is a key context for improving intergroup attitudes. However, this seemingly important variable has typically been assessed in a relatively simplistic manner, without truly getting at the interpersonal processes involved in the relationship. We know now that friendship works to improve intergroup attitudes and what we believe is still needed is a greater understanding of *why* this is the case, with more diverse and precise assessments of process variables in cross-group friendship.

Finally, researchers should assess some of the subjective factors using more robust methods than the typical self-report, such as implicit measures of including other in the self. Furthermore, future research should examine several measures at once to identify both unique contributions of each aspect of friendship controlling for the others as well as potential patterns of interaction among processes and of mediation in which one aspect of friendship leads to another, which in turn affects attitudes.

Authors’ Note

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Notes

1. A minority of studies included measures assessing some element of friendship and also close contact with other outgroup members. These studies fell into three general categories: measures of cross-group friendship as part of a larger scale that also assessed close contact with other outgroup members (17 tests), measures that asked about friendship but were phrased in terms of closeness to outgroup members in general or to the closest outgroup member known (22 tests), and measures of contact as “friends or” some other type of close relationship, typically family members (18 tests). Of these three categories, only tests assessing “friendship or” some other type of relationship yielded effects that were significantly different from more pure assessments of friendship (462 tests); these 18 tests were excluded from further analysis, whereas the other 17 and 22 tests were included.
2. The following authors were contacted directly via email: C. Aberson, F. Aboud, D. Abrams, M. Brewer, R. Brown, L. Cameron, O. Christ, J. Dovidio, A. Eller, S. Gaertner, G. Herek, M. Hewstone, A. Kruglanski, S. Levin, K. Liebkind, D. Mackie, P. Maras, L. McLaren, J. Mohr, S. Paolini, J. Richeson, A. Rutland, N. Shelton, J. Sidanius, J. Simoni, R. Slavin, E. Smith, R. Turner, R. van Dick, C. Van Laar, A. Voci, J. Vorauer, and U. Wagner.
3. These figures for total numbers of cases do not include time-related designs, as noted previously in the text.
4. Of the 27 tests of self-disclosure, we include both assessments of past self-disclosures ($k = 11$) and tests assessing willingness to self-disclose ($k = 16$). The issue of whether willingness to self-disclose in the future is similar to “actual” self-disclosure in the past was addressed by Miller, Berg, and Archer (1983) in their research detailing their well-established self-disclosure scale. They note that they administered two versions of their scale and found that “willingness to disclose” and “extent of past disclosure” were highly

correlated ($r = .63$ for men, $r = .65$ for women) and were therefore considered as assessments of the same concept.

5. We recognize that analyses at the test level can violate statistical assumptions of independence. However, comparisons of specific friendship and attitude measures can be differentiated only at that level (also see Tropp & Pettigrew, 2005b). We therefore conducted our key analyses both at the test level (to maximize differentiation of friendship and attitude measures) and at the sample level (where only the most common friendship or attitude measure for the sample was used). In all cases, we found virtually identical patterns of results at the test level and the sample level. However, because comparisons of specific measures are of central importance to this research, we report analyses at the test level for comparisons between different types of friendship and attitude measures.
6. Only 9 studies (yielding 14 samples and 18 individual tests) reported multiple group data. For these cases, we conducted t tests between the "no friends" group and each of the other groups representing some level of friendship (e.g., "less than 5" or "many") and then calculated the average effect.
7. More fine-grained analyses examined mean effects in relation to different types of affective indicators (i.e., emotions, favorability) and cognitive indicators (i.e., stereotypes, beliefs), using the categories of prejudice indicators identified by Tropp and Pettigrew (2005b). Mean effects for the two affective indicators were comparable in magnitude: Mean $r = .254$ and $.243$ for emotions and favorability, respectively, $Q_B(1) = 0.19, p = .66$. Similarly, among the cognitive indicators, the mean effect for stereotypes was comparable (mean $r = .171$) to the mean effect for beliefs (mean $r = .195$), $Q_B(1) = 0.77, p = .38$. These patterns of findings suggest that cognitively based measures are much less responsive to friendship than other outcome measures typically used in contact research.
8. Given that children's friendships can operate quite differently than those of older individuals (e.g., Fehr, 1996), we ran a separate analysis comparing the effects sizes from child participants compared to all other age groups combined. Although the friendships of children yielded a smaller mean effect size, this difference was not significant, $Q_B(1) = 1.87, p = .17$.
9. The failure to find a significant gender difference may have resulted from low power because of there being very few samples composed of either entirely male or entirely female participants ($k = 13, r = .206$, and $k = 10, r = .238$, respectively).
10. The combined category of time spent with outgroup friend or self-disclosure was compared to the combined category of all other friendship assessment types at the sample level of analysis. Although we do not wish to be redundant, we wish to note explicitly that this result was also observed at the sample level of analysis. For samples having multiple assessments of friendship, the Comprehensive Meta-Analysis program selected only one assessment type for inclusion in the analysis, and the order of selection was least frequently occurring to most frequently occurring assessment types within the current study sample. This order was self-disclosure, inclusion or other in self, closeness, time spent with friends, percentage of outgroup members in friendship circle, and

number of outgroup friends. We found that, as at the test level of analysis, samples employing assessments of time spent with outgroup friends or self-disclosure to outgroup friends yielded significantly larger effects compared to other types of friendship assessment (.284 compared to .226), $Q_B(1) = 4.31, p < .05$.

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