

‘Secondary Transfer’ Effects of Intergroup Contact:
Alternative Accounts and Underlying Processes

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Abstract

Although intergroup contact is one of the most prominent interventions to reduce prejudice, the generalization of contact effects is still a contentious issue. This research further examined the rarely studied ‘secondary transfer effect’ (STE, Pettigrew, 2009), by which contact with a primary outgroup reduces prejudice toward secondary groups that are not directly involved in the contact. Across three cross-sectional studies conducted in Cyprus ($N = 1653$), Northern Ireland ($N = 1973$), and Texas, USA ($N = 275$) and one longitudinal study conducted in Northern Ireland ($N = 411$), the present research sought to systematically rule out alternative accounts of the STE and to investigate two potential mediating mechanisms (ingroup reappraisal and attitude generalization). Results indicated that, consistent with a STE, contact with a primary outgroup predicts attitudes towards secondary outgroups, over and above contact with the secondary outgroup, socially desirable responding, and prior attitudes. Mediation analyses found strong evidence for attitude generalization, but only limited evidence for ingroup reappraisal as an underlying process. Two out of three tests of a reverse model, where contact with the secondary outgroup predicts attitudes towards the primary outgroup, provide further evidence for an indirect effect through attitude generalization. Theoretical and practical implications of these results are discussed and directions for future research are identified.

Keywords: Intergroup contact; Prejudice reduction; Secondary Transfer Effect; Attitude generalization; Ingroup reappraisal

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One of the facts of which we are most certain is that people who reject one out-group will tend to reject other out-groups. If a person is anti-Jewish, he is likely to be anti-Catholic, anti-Negro, anti any out-group.

(Allport, 1954, p. 66)

The reduction of intergroup prejudice is of great importance in today’s increasingly multicultural societies and has been the focus of much social psychological research in recent decades. One of the most prominent and most widely studied approaches to improve intergroup attitudes is that of intergroup contact (Dovidio, Gaertner, & Kawakami, 2003; Pettigrew & Tropp, 2006).

According to the ‘contact hypothesis’ (Allport, 1954), prejudice between opposing groups can be reduced by bringing them together under optimal conditions that include equal status, cooperation toward a common goal, institutional support, and acquaintance or friendship potential (Allport, 1954; Cook, 1978; Pettigrew, 1998). The contact hypothesis has stimulated an enormous body of research and has received support across a variety of settings and social groups (see Brown & Hewstone, 2005; Pettigrew & Tropp, 2006). Pettigrew and Tropp’s (2006) meta-analytic findings, which were based on 515 studies with 713 independent samples, indicated that even unstructured contact is associated with reduced prejudice ($r = -.20$) and that this basic effect is enhanced in the presence of Allport’s optimal contact conditions ($r = -.29$).

A critical issue that has long concerned contact researchers, however, is whether the effects of intergroup contact generalize beyond the specific contact experience to new situations,

the entire outgroup, and other outgroups not directly involved in the contact (e.g., Amir, 1969, 1976; Ford, 1986; Hewstone & Brown, 1986; Pettigrew, 1997, 1998; Pettigrew & Tropp, 2006). These forms of generalization are crucial for the wider effectiveness and practical value of intergroup contact as an intervention to reduce prejudice. One type of generalization, whereby contact reduces prejudice toward groups that were not directly involved in the contact (Pettigrew, 1997, 2009), is the focus of the present article. Although there is some evidence for this recently-designated 'secondary transfer effect' (STE; Pettigrew, 2009) in the literature (Eller & Abrams, 2004; Pettigrew, 1997, 2009; Van Laar, Levin, Sinclair, & Sidanius, 2005; Weigert, 1976; Wilson, 1996), this type of generalization is still rarely investigated. This is evident from Pettigrew and Tropp's (2006) meta-analysis where, out of a total of 1,383 tests, only 18 tests examined the relation between contact and secondary outgroup attitudes. Overall, these suggested a small but reliable negative relationship ($r = -.19$). According to Pettigrew (2009), 14 out of these 18 tests were, however, derived from relatively loosely-controlled studies which could not rule out alternative explanations for their findings. Furthermore, although several theoretical explanations of STEs have been put forward (e.g., Brown & Hewstone, 2005; Pettigrew, 1997; Weigert, 1976), tests of the mediating processes are almost non-existent and the psychological mechanisms that can account for STEs are therefore not yet well understood.

The present research, which examined STEs across four studies conducted in three different intergroup contexts, set out to achieve two important goals. First, we attempted to rule out a number of potential alternative explanations of the STE that have been acknowledged but have rarely been fully addressed in previous studies (see Pettigrew, 1997, 2009). Specifically, we aimed to demonstrate the STE over and above contact with the secondary group, individual differences in socially desirable responding, and prior attitudes. Second, we sought to shed light

on the processes that underlie the STE, focusing on the two most prominent potential mediating mechanisms that have been put forward in the literature: ingroup reappraisal (Pettigrew, 1997, 1998) and attitude generalization (Brown & Hewstone, 2005; Weigert, 1976).

Empirical Evidence for the 'Secondary Transfer Effect'

Generalization from the immediate outgroup to other outgroups not directly involved in the contact, such that contact with members of one outgroup results in greater acceptance of many other outgroups, is a higher-order generalization that could reveal the most far-reaching effects of contact (see Brown & Hewstone 2005; Pettigrew, 1997). The few studies that have tested for this STE have generally found consistent evidence. In a first empirical test, Weigert (1976) examined whether contact between Black and White US soldiers stationed in Germany predicted Black soldiers' attitudes toward German civilians. Weigert demonstrated that Blacks' quantity of contact with White soldiers had a significant zero-order correlation (-.18) with attitudes toward Germans, which remained significant even after a number of variables, including contact with Germans, demographics, and ideological orientation, were controlled for. Also consistent with a STE, Wilson (1996) found that White, non-Jewish Americans' contact with Blacks correlated positively with their attitudes towards Jewish-, Latino-, and Asian-Americans.

Pettigrew (1997) examined the STE using large probability samples from four European countries. He demonstrated that respondents who had contact with members of nationally represented minority groups, in particular as friends, were also more accepting of other outgroups. This effect was obtained while controlling for a number of relevant variables, including demographics, political attitudes and orientations, relative deprivation, and national pride. The contact measures used in Pettigrew's (1997) research did not, however, specify the precise group involved in the contact (see Hamberger & Hewstone, 1997), nor did his analysis

control for the possibility that Europeans who had more contact with one outgroup might also have more contact with other outgroups. Nonetheless, the fact that contact also correlated with attitudes toward groups that were not present in respondents' home country is consistent with generalized contact effects (but also with socially desirable responding; see below).

Eller and Abrams (2004) showed in a longitudinal study that contact between British students and French exchange students predicted attitudes toward Algerians, in line with a STE. However, due to large attrition rates, their longitudinal analysis was based on a very small sample. Stronger evidence comes from a five-wave longitudinal study on the effects of having college roommates from one of four ethnic groups (Whites, African Americans, Asian Americans and Latinos) on ethnic attitudes (Van Laar et al., 2005). Van Laar et al. demonstrated that having roommates from one ethnic group predicted attitudes toward other ethnic groups, over and above the number of roommates from the secondary ethnic group. Finally, Pettigrew (2009) demonstrated through both cross-sectional and longitudinal analyses that German citizens' contact with foreigners predicted more positive attitudes toward homeless people and gays. However, this analysis did not control for contact with the secondary groups.

The Present Research

In the present research we sought to extend previous research by addressing a number of potential alternative accounts for the finding that contact with one outgroup correlates with attitudes toward secondary outgroups, and by shedding light on the processes underlying the STE. Concerning alternative explanations, there are three potential candidates. First, it could be argued that the positive association of outgroup contact with attitudes toward the secondary group is due to the fact that respondents who have more contact with one outgroup would also have more contact with other outgroups (the *secondary contact problem*). Most studies reporting

evidence for the STE (Eller & Abrams, 2004; Pettigrew, 1997, 2009; Wilson, 1996) did not directly control for contact with the secondary groups (but see Van Laar et al., 2005; Weigert, 1976, for exceptions). Studies 2-4 reported in this article thus include a measure of contact with the secondary outgroup as a control variable when examining the STE.

The second potential alternative explanation for the STE is that the positive relationship between outgroup contact and attitudes toward secondary outgroups could also be due to the fact that people who tend to respond in socially desirable ways may report both more contact and more positive outgroup attitudes (the *social desirability problem*). Pettigrew (1997) recognized the possibility of such an alternative account, but pointed out that prejudice towards European and non-European groups loaded on two distinct factors in his study. This was seen as unlikely under a general social desirability response set. Study 3 in this paper is the first study to examine this alternative account more directly by including a measure of tendency for socially desirable responding (SDR, Paulhus, 1984). In this study we examined both whether the STE still emerges when SDR is partialled out, and whether SDR moderates any of the relationships in our model.

Third, because the vast majority of studies reporting STEs relied on cross-sectional data, they cannot provide conclusive evidence whether primary contact effects do indeed generalize to secondary outgroups, or whether the relationship is due to generally more tolerant people engaging in more intergroup contact (the *causal sequence problem*; see also Pettigrew, 2009). This issue applies to most research on intergroup contact (see Binder et al., 2009; Pettigrew, 1998), which, when both directions are examined, generally points to a bi-directional relationship where contact reduces prejudice but prejudice also reduces contact (see Pettigrew, 1997; van Laar et al., 2005). Pettigrew (2009) addressed this issue in his cross-sectional analysis by showing that a mediated model of the STE (where primary outgroup contact predicted

secondary outgroup attitudes by improving outgroup attitudes and reducing national pride) fit the data better than a general prejudice model where attitudes towards the primary group predicted both contact and prejudice towards other groups. However, longitudinal designs allow stronger causal inferences because they explicitly build in the time dimension of a causal process (Finkel, 1995). Longitudinal studies are particularly useful in field settings where experimental tests are not easily implemented. Thus far, only three studies have investigated the STE longitudinally; however, the first study had a very small sample and did not control for secondary outgroup contact (Eller & Abrams, 2004), the second did not explore mediators (Van Laar et al., 2005), and the third neither controlled for secondary outgroup contact nor examined the mediating processes longitudinally (Pettigrew, 2009). Study 4 in this paper is the first large-scale longitudinal study of mediators of the STE and also controlled for primary outgroup contact.

Turning to our second main goal, the present research examined the two most prominent potential mediating mechanisms of the STE: ingroup reappraisal and attitude generalization. According to Pettigrew (1997, 1998), meaningful intergroup contact can result in more positive attitudes toward outgroups in general because it leads to a reappraisal of the ingroup, a process that entails the realization that ingroup norms, customs, and lifestyles are not inherently superior to those of outgroups. The fact that individuals typically value ingroups more than outgroups is one of the most well-established phenomena in social psychology (Brewer, 1999; Hewstone, Rubin & Willis, 2002). This bias is evident in many domains, including overall group evaluations, group attachment, trust, and conformity to group norms (Brewer, 1999). Ingroup bias is predicted by Social Identity Theory (Tajfel & Turner, 1987), which posits that group members positively differentiate their own group from relevant outgroups in order to achieve a sense of positive identity. Evolutionary accounts (e.g., Brewer, 1999, 2001) further suggest that

cooperative interdependence within groups, as a fundamental human survival strategy, necessitated trust and cooperation with ingroup members and wariness and constraint with outgroup members. Pettigrew (1997, 1998) argued that through contact with outgroup members individuals gain distance from their ingroup, which may, in turn, lead them to form a 'less provincial' perspective on other groups in general (see also Simmel, 1955). Such ingroup reappraisal could result, for example, from gaining greater knowledge about other cultures through outgroup contact (e.g., Stephan & Stephan, 1984; Triandis, 1984). It may also be a consequence of reduced ingroup contact that typically accompanies greater contact with outgroup members (see Van Laar et al., 2005) and that affects both ingroup identification and orientations toward outgroup members (Levin, Van Laar, & Sidanius, 2003; Sidanius, Van Laar, Levin, & Sinclair, 2004; Wilder & Thompson, 1980).

Pettigrew (1997) argued that his finding that greater contact with minority groups is negatively related to national pride is consistent with the idea that outgroup contact can change individuals' views of their ingroups. However, he did not examine whether this process accounted for the relationship between contact and secondary outgroup attitudes. It was also evident from his analyses that the relationship between contact and attitudes toward secondary groups remained significant when national pride was partialled out, suggesting that additional processes must be at work. Pettigrew (2009) examined the mediating role of national pride more directly in his later cross-sectional analyses and demonstrated that reduced national pride was a significant partial mediator in the relationship between contact with foreigners and attitudes towards the homeless and gays. However, Eller and Abrams (2004) conceptualized ingroup reappraisal as a change in national identification (using items that assessed national pride, collective self-esteem and strength of ingroup ties) and found no evidence for this process as a

mediating mechanism of the STE. In their study, there was no effect of contact on changes in ingroup identification, nor an effect of identification on attitudes toward the uninvolved group. Thus, the evidence for the role of ingroup reappraisal is rather mixed and inconclusive.

The present series of studies further investigated whether ingroup reappraisal plays a role in generalized contact effects. In line with previous research (Eller & Abrams, 2004; Pettigrew, 1997, 2009), we operationalized ingroup reappraisal by assessing whether contact is related to the evaluative component of ingroup identity (measured as overall ingroup attitude and collective self-esteem; Luthanen & Crocker, 1992) and whether ingroup evaluation mediates the relationship between contact and attitudes toward secondary outgroups.

Furthermore, because intergroup contact does not necessarily reduce ingroup affect, as the recategorization approach to intergroup contact suggests (see Gaertner & Dovidio, 2000, for a review), and because ingroup attitude tends to be rather inconsistently related to outgroup attitudes (e.g., Brewer, 1999), the present research also evaluated an additional mediating mechanism: attitude generalization. This refers to a process by which attitudes toward one attitude object generalize to other, linked attitude objects (e.g., Walther, 2002). Such attitude generalization has been demonstrated in various domains, including judgments about abstract objects in a computer game (Fazio, Eiser, & Shook, 2004; Shook, Fazio, & Eiser, 2007), perceptions of consumer products (e.g., Roper, 1969), and evaluations of individuals (Ranganath & Nosek, 2008; Walther, 2002). At the level of social groups, attitudes toward one outgroup might become a basis for formulating attitudes toward other outgroups (Weigert, 1976; see also Brown & Hewstone, 2005). This is consistent with Allport's (1954) notion that attitudes toward specific outgroups form part of a generalized outgroup attitude. If outgroup attitudes generalize, the improved outgroup attitudes that result from contact with one group should result in

improved attitudes toward other outgroups. If this is the case, attitudes toward the encountered outgroup should mediate the relationship between contact and secondary outgroup attitudes.

Preliminary evidence for this mechanism comes from Pettigrew's (2009) recent study, where he demonstrated in his cross-sectional analyses that the relation between contact with foreigners and attitudes towards the homeless and gays was partially mediated by attitudes towards foreigners.

In sum, our hypotheses were as follows. We expected: (1) contact with a primary outgroup to be positively related to attitudes toward a secondary outgroup (*Hypothesis 1*, Studies 1-4); (2) this relationship to hold while controlling for contact with the secondary outgroup (*Hypothesis 1a*, Studies 2-4), individual differences in SDR (*Hypothesis 1b*, Study 3), and initial attitudes in a longitudinal analysis (*Hypothesis 1c*, Study 4); (3) this relationship to be mediated by more positive attitudes towards the primary outgroup (*Hypothesis 2*, attitude generalization, Studies 1-4) and reduced ingroup attitude (*Hypothesis 3*, ingroup reappraisal, Studies 1-4), and that, because of the inconsistent relationship between ingroup and outgroup attitudes (Brewer, 1999), attitudes towards the primary group would emerge as a stronger mediator than ingroup attitude (*Hypothesis 4*, Studies 1-4).

We report four studies that examined these hypotheses. Study 1 used survey data in the context of relations between Greek and Turkish Cypriots to examine the relationship of contact between members of these groups and attitudes toward mainland Turks and Greeks, and assessed both attitudes toward the Cypriot outgroup and collective self-esteem as potential mediators.

Study 2 investigated the relationship between contact among Catholics and Protestants in Northern Ireland and attitudes toward racial outgroups, while also controlling for contact with the secondary group. This study also examined the mediating roles of attitudes toward the ethno-religious outgroup and ingroup attitudes. Study 3 investigated the relationship between White

and Black American college students' friendships with Hispanics and attitudes toward immigrant groups (Vietnamese and Asian Indians), and the mediating roles of outgroup and ingroup attitude, while controlling for friendship with members of these groups. This study also controlled for individual differences in SDR, and tested whether this response tendency moderates any of the relations in our model. Study 4 examined the STE and its underlying mediating processes longitudinally, again in the context of cross-community contact in Northern Ireland.

Unlike previous studies, which typically examined the STE from one racial outgroup or national minority group to another, the present research is the first to examine such generalized contact effects in the context of contact between previously opposing groups with a history of protracted conflict and violence. Assessing the STE in a variety of different contexts, including two cases of protracted conflict (Cyprus and Northern Ireland), provides an especially strong test of the robustness of this effect and, if successful, of its importance for improving intergroup relations on a wider scale. Furthermore, as Studies 2, 3 and 4 contained measures of contact with the secondary outgroup, we also examined transfer effects in a series of reverse models where contact with the secondary group predicts primary outgroup attitudes. Such reverse effects have thus far been examined in only one study (Van Laar et al., 2005), which indicated that generalization works both ways. The present research presents three further tests of this idea. In contrast to Van Laar et al.'s (2005) study, however, which examined prominent, well-represented ethnic groups, the secondary groups in this research (racial minorities in Northern Ireland in Studies 2 and 4; Indians and Vietnamese people in Texas in Study 3) are relatively small, lesser known groups making up less than 1% of the population in each context. Whether contact with such outgroups is influential in shaping attitudes towards the primary outgroups (Catholics and

Protestants, the rival groups in Northern Irish conflict, and Hispanics, the most prominent minority, in Texas, respectively), which are likely to be strongly determined by socialization, politics and education, is an intriguing empirical question. It is also an unexplored theoretical question regarding the nature of Allport's (1954) generalized outgroup attitude concept.

Study 1

Our first study investigated the STE in the context of contact between Greek and Turkish Cypriots and its association with attitudes towards the mainland outgroups. The conflict in Cyprus goes back to the 1950s when Cyprus was still part of the British Empire. Greek Cypriots (82% of the population) began to seek a union with Greece, which was opposed by the Turkish minority (18 %) who embarked on their own struggle for partition. This conflict led to violent inter-communal clashes and increased segregation. A coup in 1974, aimed at the union of Cyprus with Greece, prompted a military intervention by Turkey that led to major displacement of the population and the division of the island into two ethnically homogeneous areas. This eventually resulted in the establishment of a breakaway state by the Turkish Cypriot leadership in the north, which is recognized only by Turkey (see Kitromilides, 1977; Papadakis, 2005).

Due to Turkey's aspirations to join the European Union, relations between the Greek-Cypriots and Turkish-Cypriots in Cyprus have changed quite dramatically in the recent years. The travel restrictions between north and south were lifted in 2003 and it is estimated that about 60% of the population from both communities have now visited the other side (Psaltis & Hewstone, 2007). Social-psychological work on the Cyprus conflict has only just begun to examine the mechanisms likely to engender reconciliation between Turkish and Greek Cypriots, and specifically to investigate the effects of cross-community contact on intergroup attitudes (see Psaltis, Hewstone, & Voci, 2008). The present study uses survey data from the general

population of Cyprus to examine whether the amount of contact with members of the other Cypriot community relates to attitudes toward the larger outgroups involved in the conflict, specifically Greeks from Greece (for Turkish Cypriot respondents) and Turks from Turkey (for Greek Cypriot respondents). This study also tested whether these effects were mediated by reappraisal of the ingroup (conceptualized as reduced private collective self-esteem; Luthanen & Crocker, 1992) and/or attitudes toward the Cypriot outgroup (attitude generalization).

Method

Procedure and Respondents

Participants were selected by random multi-stage sampling. Respondents were interviewed in their home by trained interviewers of the same ethnic origin as the respondent. All interviews were conducted face-to-face, in the respondents' mother tongue and cards with questions and response options were shown to supplement verbal statements. All data collection took place during February and March 2007. Respondents were 1,653 adults (mean age = 42.65 years, $SD = 14.51$, age range from 18 to 88 years; $N = 800$ Greek Cypriots, 398 male and 402 female; $N = 853$ Turkish Cypriots, 525 male and 328 female).

Measures

Among a number of questions about other aspects of intergroup relations in Cyprus (see Psaltis et al., 2008), the interviews included measures of contact with and attitudes toward the Cypriot outgroup (hereafter, this refers to Greek Cypriots for Turkish Cypriot respondents, and Turkish Cypriots for Greek Cypriot respondents), attitudes toward mainland Greeks/Turks, and a measure of private collective self-esteem (Luthanen & Crocker, 1992).

Contact measures. The amount of contact with the Cypriot outgroup was measured by five items (based on Islam & Hewstone, 1993). On 5-point scales ranging from 1 (*not at all*) to 5

(*very often*), respondents indicated how often they had contact with Greek/Turkish Cypriots: (a) at work, (b) in bi-communal meetings, (c) in the area where they lived, (d) at occasional meetings in the South, and (e) at occasional meetings in the North. The items were averaged to yield a scale of contact quantity ($\alpha = .68$).

Attitude measures. Outgroup attitudes were measured using feeling thermometers (Converse & Presser, 1986). Respondents indicated on thermometers that ran from zero (0) to a hundred (100) degrees the extent to which they felt cold/warm toward members of the other community (Greek/Turkish Cypriots) and toward mainland Greeks/Turks.

Private collective self-esteem. Private collective self-esteem was measured by two items (based on Luthanen & Crocker, 1992): ‘In general, I’m happy to be a Greek/Turkish Cypriot’ and ‘I’m proud to be a Greek/Turkish Cypriot’ ($r = .68, p < .001$).

Results and Discussion

Means, standard deviations, and intercorrelations of variables are shown in Table 1. First, we report tests of the STE and its mediators, and, second, we examine whether participant group moderated the strength of the STE or the mediating processes in our model.

Test of the Secondary Transfer Effect and its Mediators

Using multiple regression, our main analysis tested whether contact with the Cypriot outgroup predicted attitudes toward mainland Greeks/Turks, and whether the generalized contact effect was mediated by attitudes toward the Cypriot outgroup and ingroup reappraisal. We tested simultaneously the indirect effects of the predictor variable via the proposed mediators using the bootstrapping method (Preacher & Hayes, 2004, 2008)¹. This method has many advantages over other methods of testing mediation (see Preacher & Hayes, 2004). Importantly, it allows us to test whether the size of the indirect effects via different mediators in multiple mediation models

differs significantly from each other. Due to scattered missing values the sample size for this analysis was reduced to 1,576. Results of the analysis are summarized in Table 2. In line with a STE, contact with the Cypriot outgroup significantly predicted attitudes toward mainland Greeks/Turks ($B = 5.56, SE = .99, \beta = .14, p < .001$). Contact with the Cypriot outgroup also significantly predicted both more positive attitudes towards the Cypriot outgroup ($B = 9.99, SE = 1.14, \beta = .22, p < .001$) and reduced collective self-esteem ($B = -.12, SE = .03, \beta = -.09, p < .001$), fulfilling the precondition for mediation that the independent variable significantly predicts the mediator (Baron & Kenny, 1986). When both mediators were entered into the equation, the effect of outgroup contact on attitudes toward the secondary group was reduced but still significant ($B = 2.12, SE = .95, \beta = .05, p = .025$), consistent with partial mediation. Both outgroup attitudes ($B = .31, SE = .02, \beta = .36, p < .001$) and collective self-esteem ($B = -2.67, SE = .70, \beta = -.09, p < .001$) significantly predicted attitudes toward the mainland outgroup. Sobel tests (Sobel, 1982) indicated that both indirect paths, via outgroup attitudes ($z = 7.68, p < .001$) and via ingroup evaluation ($z = 2.76, p = .006$), were significant.

Results from the bootstrapping procedure using 5,000 re-samples corroborated these findings. The point estimate for the indirect effect via outgroup attitude equalled 3.11, with a 95% confidence interval of [2.29, 4.03], and the point estimate for the indirect effect via collective self-esteem equalled .32, with a 95% confidence interval of [.10, .78]. The fact that the confidence intervals exclude zero indicates significant indirect effects (Preacher & Hayes, 2008). Moreover, contrasting the two indirect effects from each other revealed that the indirect effect via outgroup attitude was significantly stronger than the indirect effect via collective self-esteem (point estimate of contrast = 2.79, with a 95% confidence interval of [1.85, 3.75]).

Differences between Greek and Turkish Cypriots

Next, we examined whether participant group moderated any of the relationships in our model using the multiple regression procedure laid out by Aiken and West (1991). Due to the exploratory nature of these analyses and the number of tests involved we raised the accepted level of significance (here and in all subsequent studies) to $p < .01$. Only one significant interaction with group emerged: group moderated the relationship between attitude toward the Cypriot outgroup and attitudes toward the mainland outgroup ($B = -.11$, $SE = .02$, $p < .001$), such that the relation between attitude toward the Cypriot outgroup and attitude toward the mainland outgroup was somewhat stronger for Turkish ($B = .55$, $SE = .03$, $\beta = .56$, $p < .001$) than for Greek ($B = .33$, $SE = .03$, $\beta = .42$, $p < .001$) Cypriots, but significant for both. As this moderated path is part of the indirect path via primary outgroup attitude, we examined the size and significance of this indirect effect in the model separately for the two groups using bootstrapping. This analysis indicated that the indirect effect via attitude towards the Cypriot outgroup was significant for both Greek (point estimate = 2.17 [1.10, 3.47]) and Turkish (point estimate = 6.74 [4.84, 8.66]) Cypriots, and significantly stronger than the indirect effect via collective self-esteem in each group (point estimate for contrast = 1.97 [.81, 3.34] and 6.17 [4.08, 8.13], respectively).

Summary of Findings

Overall, our first study demonstrated the STE in the context of contact between Greek and Turkish Cypriots. Our findings suggest that both processes – attitude generalization and, to a lesser extent, ingroup reappraisal – play a role in the relationship between contact and attitudes toward the secondary outgroup. Nonetheless, it should be noted that, as this study did not control for direct contact with the secondary outgroup, it cannot rule out the alternative explanation that the positive association of outgroup contact with attitudes toward the secondary group is due to

the fact that respondents who have more contact with one outgroup would also have more contact with other outgroups. Study 2 addressed this potential alternative account directly.

Study 2

Our second study examined the STE in the context of intergroup relations in Northern Ireland. This region has a long history of intergroup conflict, which is, in essence, a struggle between those who want Northern Ireland to remain part of the United Kingdom (Unionists/Loyalists, generally supported by Protestants) and those who want Northern Ireland to be reunited with the Republic of Ireland (Republicans/Nationalists, generally supported by Catholics; see Cairns & Darby, 1998). Although recent developments and political advances indicate an end to this violent conflict, sectarian division is still psychologically real and Northern Ireland remains a deeply segregated society. Encouraging intergroup contact has thus been an important strategy adopted by policy makers to improve community relations (see Hughes, 2001). Although a number of recent studies have illustrated the beneficial effects of contact between Catholics and Protestants on intergroup attitudes (e.g., Paolini, Hewstone, Cairns, & Voci, 2004; Tausch, Tam, Hewstone, Kenworthy, & Cairns, 2007), there is thus far no research on the effects of cross-community contact on attitudes toward secondary outgroups.

While Northern Ireland is a relatively homogeneous society (compared to England and Wales) with less than 1% of the population belonging to an ethnic minority, increasing immigration in the last decade has led to a greater presence of non-White minority groups in the region (OFMDFM, 2005). This has been accompanied by a 900% increase in hate crimes since the Belfast Agreement in 1998, which is now double the rate of that of England and Wales (see BBC News, 2004; Gilligan & Lloyd, 2006; Jarman & Monaghan, 2003). The present study examined the relationship between contact with the ethno-religious outgroup (Catholics or

Protestants) and attitudes toward racial minorities in Northern Ireland, and further examined the potential underlying processes (attitude generalization and ingroup reappraisal) involved.

Expanding on Study 1, the present study also controlled for contact with the secondary outgroup.

Method

Procedure and Respondents

The data were collected as part of a survey on cross-community perceptions among the general population in Northern Ireland (Schmid, Hewstone, Tausch, Cairns, & Hughes, 2009). Respondents were randomly selected from six towns (other than Belfast) in Northern Ireland. They were interviewed in their own home by trained interviewers, using computer aided personal interviewing software. The data were collected between March and October 2007. The sample comprised 1,973 adults (mean age = 45.27 years, $SD = 17.35$, age range from 18 to 92 years; $N = 983$ Catholics, 358 male, 625 female; $N = 990$ Protestants, 395 male, 595 female).

Measures

Among a number of questions on other aspects of intergroup relations in Northern Ireland (see Schmid et al., 2009), the survey items included measures of contact with the ethno-religious outgroup (Catholics/Protestants) and with racial minorities in Northern Ireland as well as attitudes toward three targets: racial minorities (the criterion variable), the ethno-religious outgroup (to assess attitude generalization), and the ingroup (to assess ingroup reappraisal).

Contact measures. As neighborhood segregation was an important aspect of this survey, our measure of cross-community contact was specifically tailored toward contact in the neighborhood. On 5-point scales ranging from 1 (*never*) to 5 (*very often*), respondents indicated how often: (1) they greet people who are from the other community in their neighborhood, (2) they chat to people who are from the other community in their neighborhood, (3) they do

something social together with someone from the other community, (4) they visit people from the other community in their home, and (5) people from the other community visit them in their home. The items were averaged to yield a reliable index of amount of outgroup contact ($\alpha = .87$). Contact with racial minorities was measured by one item: ‘In the area where you live, how often do you have contact with people who are from racial minority backgrounds (e.g., Asian or Black people)?’ (1 = *never*; 7 = *very often*).

Attitude measures. Group attitudes were measured using feeling thermometers (0 to 100 degrees) to assess the extent to which respondents felt cold/warm toward members of their own ethno-religious community, toward members of the other ethno-religious community, and toward racial minorities in Northern Ireland.

Results and Discussion

Descriptives and intercorrelations of our key variables are shown in Table 3.

Test of the Secondary Transfer Effect and its Mediators

The sample for this analysis was reduced to 1, 854 due to scattered missing values. The results of this analysis are summarized in Table 2. Consistent with a generalized contact effect, contact with the ethno-religious outgroup significantly predicted attitudes toward racial minorities ($B = 2.49, SE = .50, \beta = .11, p < .001$), over and above contact with racial minorities ($B = 3.75, SE = .35, \beta = .24, p < .001$). Contact with the ethno-religious outgroup significantly predicted more positive outgroup attitudes ($B = 5.57, SE = .42, \beta = .30, p < .001$), but was not significantly associated with ingroup attitude ($B = .42, SE = .39, \beta = .03, p = .278$). Both outgroup attitudes ($B = .48, SE = .03, \beta = .40, p < .001$) and ingroup attitude ($B = .09, SE = .03, \beta = .07, p = .001$) significantly predicted attitudes toward racial minorities. The effect of outgroup contact on attitudes toward racial minorities ceased to be significant ($B = -.21, SE = .48, \beta = -.01,$

$p = .663$) when the potential mediators were entered into the equation, consistent with full mediation. Sobel tests indicated a significant indirect effect via attitudes toward the ethno-religious outgroup ($z = 10.21, p < .001$), but not via ingroup attitude ($z = 1.01, p = .311$). The point estimates and 95% confidence intervals obtained using bootstrapping similarly indicated that the indirect effect via outgroup (2.66 [2.18, 3.28]), but not ingroup (.039 [-.03, .14]), attitude was significant. Contrasting the two indirect effects from each other further demonstrated that the indirect effect via outgroup attitude was significantly stronger (2.63 [2.14, 3.18]).

Differences between Catholics and Protestants

There were several significant interactions between participant group and the paths in our model. First, contact with the ethno-religious outgroup interacted with group in predicting racial attitudes ($B = 2.59, SE = .49, p < .001$), such that this effect was significant among Protestants ($B = 5.08, SE = .70, \beta = .23, p < .001$), but not Catholics ($B = -.09, SE = .69, \beta = .00, p = .891$). Second, group moderated the relationship between contact with the ethno-religious outgroup and attitudes toward the ethno-religious outgroup ($B = 2.53, SE = .41, p < .001$). This effect was stronger among Protestants ($B = 8.13, SE = .59, \beta = .42; p < .001$) than among Catholics ($B = 3.06, SE = .57, \beta = .17; p < .001$). Moreover, group interacted with contact with the ethno-religious outgroup in predicting attitudes toward the ingroup ($B = 1.57, SE = .38, p < .001$), such that while there was a positive relation for Protestants ($B = 2.02, SE = .57, \beta = .12, p < .001$), there was a small negative relation between contact and ingroup attitude for Catholics ($B = -1.12, SE = .52, \beta = -.07, p = .031$). Finally, group interacted with ingroup attitude when predicting attitudes toward the secondary outgroup ($B = -.10, SE = .03, p = .001$). Ingroup attitude was a positive predictor of attitudes toward racial minorities in the model for Catholics ($B = .18, SE = .04, \beta = .13, p < .001$), but was unrelated for Protestants ($B = -.02, SE = .04, \beta = -.02, p = .625$).

Thus, overall, contact seems to be more strongly related to outgroup attitudes for Protestants than for Catholics. This may be due to the fact that attitudes were already (in line with previous research, see Cairns, Kenworthy, Campbell, & Hewstone, 2006; Tausch et al., 2007; Whyte, 1991) significantly more positive among Catholics ($M = 73.79$ vs. $M = 65.70$ for Protestants, $p < .001$), and thus there was less scope for positive change. Our findings also suggest that the direct STE was not present for Catholics. However, when the significance of indirect effects was tested separately for the two groups using bootstrapping, there was a significant indirect effect via attitude towards the ethno-religious outgroup for both Catholics (point estimate = 1.21 [.75, 1.76]) and Protestants (point estimate = 3.77 [2.80, 4.70]). There was also a significant indirect effect via ingroup attitude for Catholics (point estimate = -.20 [-.51, -.02]) but not for Protestants (point estimate = -.04 [-.24, .13]). The significant indirect effect for Catholics was, however, such that contact with Protestants was negatively related to ingroup attitude, but ingroup attitude was a *positive* predictor of attitudes towards racial minorities. This is inconsistent with the idea of ingroup reappraisal explaining the STE. Thus, the lack of an overall relationship between contact and attitudes towards the secondary group for Catholics might be due to the presence of two opposing effects, the generalization of primary outgroup attitudes to the secondary group and lessened ingroup attitudes which, for Catholics, were positively associated with secondary outgroup attitudes.

Why are the relations between ingroup and outgroup attitude different among Catholics and Protestants? Research on the ingroup-outgroup attitude link has suggested that a negative relationship between ingroup and outgroup attitude is likely to be present in contexts where intergroup relations are characterised by high levels of threat and competition (see Brewer, 1999). It is possible that Protestants are more likely to view racial minorities as a threat than are

Catholics. Whereas Catholics (the historically disadvantaged group) might view some immigrants (many of whom are also Catholics) as ‘allies’, Protestants (the historically dominant group which has been losing power) may view these minorities as an additional competitor in a changing social system. The fact that many new migrants, refugees and asylum seekers tended to move into the cheapest available housing which is disproportionately in Protestant working-class areas, may have further contributed to this view (see McVeigh & Rolston, 2007).

Reverse Secondary Transfer Model

As this study included a measure of contact with the secondary outgroup, we also examined a reverse model in which contact with racial minorities predicts attitudes towards the ethno-religious outgroup, and attitudes towards racial minorities and towards the ingroup act as potential mediators. Again, we used the bootstrapping procedure (Preacher & Hayes, 2004, 2008) to conduct this analysis. Our findings indicated that contact with racial minorities had a marginally significant *negative* direct relation with attitudes towards the ethno-religious outgroup, over and above contact with the ethno-religious outgroup ($B = -.54$, $SE = .29$, $\beta = -.04$, $p = .067$). Furthermore, contact with racial minorities significantly predicted more positive attitudes towards racial minorities ($B = 3.75$, $SE = .35$, $\beta = .24$, $p < .001$), and was marginally significantly associated with ingroup attitude ($B = -.48$, $SE = .27$, $\beta = -.04$, $p = .074$). Both attitudes towards racial minorities ($B = .31$, $SE = .02$, $\beta = .37$, $p < .001$) and ingroup attitude ($B = .28$, $SE = .02$, $\beta = .25$, $p < .001$) predicted attitudes toward the ethno-religious outgroup. Sobel tests indicated a significant indirect effect of contact with racial minorities on attitudes towards the ethno-religious outgroup via racial attitudes ($z = 8.80$, $p < .001$), and a marginally significant indirect effect via ingroup attitude ($z = -1.76$, $p = .078$). The point estimates and 95% confidence intervals obtained using bootstrapping with 5,000 re-samples indicated that the indirect effect via

outgroup attitude (1.16 [.92, 1.42]), but not via ingroup attitude (-.13 [-.29, .01]), was significant. Contrasting the two indirect effects from each other further demonstrated that the indirect effect via outgroup attitude was significantly stronger (1.30 [1.04, 1.56]).

Interestingly, and in line with a suppression effect, the negative direct relation between contact with racial minorities and attitudes toward the ethno-religious outgroup became significant ($B = -1.57$, $SE = .26$, $\beta = -.12$, $p < .001$) when the mediators were entered into the equation. This finding suggests that the lack of an overall direct effect in the reverse model could be due to the fact that contact with racial minorities has *two opposing* effects on attitudes towards the ethno-religious outgroup (see McKinnon & Fairchild, 2009, on reasons for a lack of direct effect when significant indirect effects are present): (1) the expected generalization effect by which contact with racial minorities is indirectly positively associated with attitudes towards the ethno-religious outgroup via more positive attitudes towards racial minorities, and (2) an additional direct *negative* relation between contact with racial minorities and attitudes towards the ethno-religious outgroup.

We can only speculate about the nature of the latter effect. Possibly, third groups may, under certain circumstances, come to be viewed as potential allies in a conflict. In this case contact with a third group can have a mobilizing effect against the rival outgroup and may therefore be negatively associated with outgroup attitudes. This puzzling effect could also be due to an unknown third variable like deprivation in the area where people live. For example, people who live in deprived areas may be more likely to have more contact with racial minorities (who also live in these areas) and also tend to have more negative outgroup attitudes. There were no differences between Catholics and Protestants on this path. It is conceivable, however, that the former mechanism plays a role for Catholics, who are more likely to perceive racial minorities as

allies, whereas the latter mechanism may play a role for Protestants, as new migrants tend to move into Protestant working-class areas.

When we tested for moderation effects of participant group (Catholic vs. Protestant) in this model, group interacted only with the path from ingroup attitude to attitude towards the ethno-religious outgroup ($B = -.09$, $SE = .02$, $p < .001$), as in our original model. There was a stronger relation between ingroup attitude and attitudes towards the ethno-religious outgroup among Catholics compared to Protestants ($B = .36$, $SE = .03$, $\beta = .33$, $p < .001$ vs. $B = .17$, $SE = .03$, $\beta = .15$, $p < .001$). Separate bootstrapping analyses indicated, however, that there was no significant indirect effect via ingroup attitude among either Catholics (point estimate = $-.15$ [$-.41$, $.11$]; Sobel test: $z = -1.17$, $p = .243$) or Protestants (point estimate = $-.09$ [$-.24$, $.04$]; Sobel test: $z = -1.22$, $p = .222$).

Summary of Findings

Our second study provided further evidence for the STE, this time while controlling for contact with the secondary group. This rules out the alternative explanation that the relationship between contact with one group and attitudes toward other, uninvolved groups is due to the fact that people who have more contact with one outgroup also have more contact with other outgroups. Replicating the findings of Study 1, attitudes toward the primary outgroup significantly mediated the relationship between primary outgroup contact and attitudes toward the secondary outgroup. Unlike in Study 1, there was no evidence for ingroup reappraisal as a mediating process. In fact, the small indirect effect found for Catholic respondents suggests that, while contact is associated with less positive ingroup attitudes, ingroup attitudes are *positively* related to attitudes towards the secondary outgroup, inconsistent with the idea of ingroup reappraisal as a mechanism underlying the STE.

In this study we were also able to assess a reverse STE model, by which contact with the secondary outgroup (racial minorities) predicts attitudes towards the primary group (Catholics/Protestants). Although there was no significant overall relation between contact with racial minorities and attitudes towards the ethno-religious outgroup, there was a significant indirect effect via racial attitudes, consistent with attitude generalization. There was also a marginally significant indirect effect via ingroup attitude in the reverse model, but this was not consistent with the ingroup reappraisal idea (ingroup attitude was positively related to outgroup attitudes). The lack of a significant overall effect of contact with racial minorities on attitudes towards the ethno-religious outgroup was due to the presence of an additional opposing effect, whereby contact with racial minorities was negatively related to attitudes towards Catholics/Protestants.

Study 3

The primary aim of our third study was to rule out a potential alternative account explaining a positive relation between primary outgroup contact and secondary outgroup attitudes, namely that people who tend to respond in socially desirable ways report both more contact and more positive outgroup attitudes. We thus included an established measure of tendency for SDR (Paulhus, 1984) in our model. In addition to examining whether generalized contact effects emerge when SDR is partialled out, we examined whether the tendency to provide socially desirable responses moderates any of the relationships in our model. Evidence for SDR as an alternative explanation would consist of its moderation of the STE, such that the indirect effect of contact with the outgroup is significantly stronger, or only existent, for participants with high social desirability scores.

The current study was conducted in an ethnically diverse area of North Texas and examined the relationship between White (non-Hispanic) and Black American college students'

contact with Hispanics, the most populous minority group in the state (U.S. Census, 2000), and attitudes toward Vietnamese and Asian Indian people, who are relatively recent immigrant groups to the state (see Ingram & Girod, 2004; Rutledge, 1992). Because of the very low numbers of Vietnamese and Asian Indian people relative to the general population (< 1%, U.S. Census, 2000) and their tendency to form cultural enclaves, direct contact experiences with these groups are relatively uncommon, making them fitting target groups to investigate the STE. Unlike the previous studies, which assessed the amount of everyday contacts, the present study examined the role of friendship contact as a predictor of attitudes. Friendship contact is regarded as one of the most potent forms of intergroup contact and has repeatedly been shown to exert the strongest effects on outgroup attitudes (Pettigrew, 1997; Pettigrew & Tropp, 2006).

In the present study we assessed both friendship with Hispanics as well as friendship with Vietnamese people/Asian Indians to serve as a control variable. Again we measured both attitudes toward the primary outgroup and attitudes toward the ingroup to evaluate attitude generalization and ingroup reappraisal as potential mediating mechanisms. As we had a measure of contact with the secondary groups we also again examined the reverse STE model.

Method

Procedure and Respondents

Respondents were 275 students (201 female, 74 male, Mean age = 21.53, SD = 5.34) at the University of Texas at Arlington who self-identified as White ($N = 199$) or Black ($N = 76$). The survey was administered online as part of a larger online survey of intergroup friendship and attitudes among ethnic groups, and respondents received partial course credit for their participation. Participants who did not identify as White or Black were excluded from the present study because they were either potential members of the target groups or they reported mixed

ethnic backgrounds. Participants were randomly allocated to a secondary group condition (Vietnamese or Asian Indian, $N = 146$ and 129 , respectively). This was done primarily to keep the survey at a manageable length while also making it possible to test contact generalization toward more than one group in this setting.

Measures

Contact measures. Intergroup contact was conceptualized as number of close outgroup friends. Respondents indicated how many of their closest friends were Hispanic, and how many of their closest friends were either Vietnamese (in the Vietnamese as secondary group condition) or Indian (in the Indian as secondary group condition; 1 = *none*, 2 = *one to five*, 3 = *six to ten*, 4 = *eleven to twenty*, 5 = *more than twenty*).

Attitude measures. Group attitudes were again measured using feeling thermometers. Respondents indicated on thermometers that ran from zero (0) to a hundred (100) degrees the extent to which they felt cold/warm, toward Hispanics, toward Vietnamese/Indians, and toward members of their own ethnic group.

Social desirability. Tendency for socially desirable responding (SDR) was operationalized using the Balanced Inventory of Desirable Responding (BIDR, Paulhus, 1984). This measure has demonstrated concurrent validity as a measure of SDR, and correlates highly with alternative measures of SDR (Paulhus, 1991). The BIDR contains 40 items (e.g., ‘I never take things that don’t belong to me’; ‘When I hear people talking privately, I avoid listening’)². Items were presented with a 7-point answer scale ranging from 1 (*not true*) to 7 (*very true*). The continuous scoring method was used (see Stöber, Dette, & Musch, 2002) to create an index of socially desirable responding (Cronbach’s $\alpha = .83$).

Results and Discussion

Means, standard deviations, and intercorrelations of variables are shown in Table 4.

Testing the Secondary Transfer Effect and its Mediators

Again we used a multiple regression approach with bootstrapping to examine our hypotheses, this time controlling for both number of friends from the secondary group and tendency for socially desirable responding (see Table 2 for a summary of results). Due to scattered missing values the sample size for this analysis was reduced to 246. In line with the STE, number of close Hispanic friends significantly predicted attitudes toward the secondary group (Vietnamese/Indian; $B = 5.11$, $SE = 1.55$, $\beta = .21$, $p = .001$), over and above number of close friends from the secondary group ($B = 5.43$, $SE = 2.14$, $\beta = .16$, $p = .012$), and SDR ($B = .69$, $SE = .22$, $\beta = .19$, $p = .002$). Number of Hispanic friends also significantly predicted more positive attitudes toward Hispanics ($B = 6.89$, $SE = 1.65$, $\beta = .27$, $p < .001$), but did not predict ingroup attitude ($B = 1.61$, $SE = 1.48$, $\beta = .07$, $p = .276$). When the potential mediators were entered into the equation, the effect of number of Hispanic friends on attitudes toward the secondary group ceased to be significant ($B = 1.49$, $SE = 1.30$, $\beta = .06$, $p = .251$), consistent with full mediation. Both attitudes toward Hispanics ($B = .49$, $SE = .06$, $\beta = .52$, $p < .001$) and ingroup attitude ($B = .13$, $SE = .06$, $\beta = .12$, $p = .035$) significantly predicted attitudes toward the secondary group. Sobel tests indicated that the indirect path via attitudes toward Hispanics ($z = 3.72$, $p < .001$), but not via ingroup evaluation ($z = .97$, $p = .331$), was significant. Results from the bootstrapping procedure are in line with these findings. The point estimate for the indirect effect via attitude toward Hispanics equalled 3.40 [1.56, 5.51], and the point estimate for indirect effect via ingroup attitude equalled .21 [-.15, 1.05]. The contrast between the indirect effects was significant (point estimate = 3.19, with a 95% confidence interval of [1.51, 5.45]).

We then examined whether individual differences in SDR moderated any of the relationships in our model. First, we tested whether SDR moderated the relationship between contact with Hispanics and attitudes toward the secondary group. To do this we regressed attitudes toward the secondary group on mean-centred scores for contact with Hispanics, mean-centred SDR scores, contact with the secondary group (the control variable) and the product term of contact with Hispanics and SDR. The interaction term was not significant ($B = .11$, $SE = .24$, $p = .653$). Second, we examined whether SDR moderated the relation between contact with Hispanics and the potential mediators (attitudes toward Hispanics and ingroup attitude) by regressing attitudes toward Hispanics and ingroup attitude on the centred scores for contact with Hispanics, centred SDR scores, contact with the secondary group, and the product term of contact with Hispanics and SDR. The interaction between contact and SDR was not significant in either case ($B = -.34$, $SE = .26$, $p = .191$ and $B = -.17$, $SE = .23$, $p = .468$, respectively). Third, we examined whether SDR moderated the paths from the mediators to the criterion variable in the full model, regressing attitudes toward the secondary group on the centered scores for contact with Hispanics, centred SDR scores, contact with the secondary group, centered scores for attitudes toward Hispanics, centred scores for ingroup attitude and the product terms for interactions between contact with Hispanics and SDR, attitudes toward Hispanics and SDR, and ingroup attitude and SDR. None of the interaction terms was significant ($B = .10$, $SE = .24$, $p = .682$, $B = .01$, $SE = .01$, $p = .501$ and $B = .00$, $SE = .01$, $p = .933$, respectively).

Condition and Group Differences

We first examined whether any of the model relationships were moderated by target group condition (Indian vs. Vietnamese). Two significant interactions emerged. First, there was a significant interaction between attitude toward Hispanics and condition predicting attitude

toward the secondary group ($B = -.14$, $SE = .54$, $p = .009$). The relationship between attitudes toward Hispanics and attitudes toward the secondary group was stronger when the target group was Indian ($B = .64$, $SE = .07$, $\beta = .67$, $p < .001$) compared to Vietnamese ($B = .35$, $SE = .08$, $\beta = .37$, $p < .001$), but significant for both. Second, condition interacted with ingroup attitude ($B = .20$, $SE = .06$, $p = .002$), such that ingroup attitude predicted attitudes toward the secondary group only in the Vietnamese ($B = .29$, $SE = .08$, $\beta = .28$, $p < .001$) but not in the Indian ($B = -.10$, $SE = .09$, $\beta = -.08$, $p = .271$) target condition. Because interactions emerged on paths relevant for our mediation model, we also tested for the significance of indirect effects separately for the Vietnamese and Indian target group conditions. Sobel tests conducted separately for the two conditions indicated that there was a significant indirect effect via outgroup attitude in both the Vietnamese ($z = 2.89$, $p = .004$) and the Indian ($z = 2.15$, $p = .032$) condition, and no significant indirect effect via ingroup attitude in either condition ($z = 1.34$, $p = .178$ and $z = -.37$, $p = .709$, respectively). Although in both conditions contact with the primary group predicted attitudes towards the primary group ($B = 7.93$, $SE = 2.06$, $\beta = .32$, $p < .001$ and $B = 6.26$, $SE = 2.83$, $\beta = .23$, $p = .029$, respectively), and attitudes towards the primary group significantly predicted attitudes towards the secondary group, the bootstrapping analysis yielded a significant indirect effect of attitude toward Hispanics only in the Vietnamese (point estimate = 2.79 [1.00, 5.00]) and not the Indian (point estimate = 3.99 [-.73, 8.43]) target group condition. For both groups there was no significant indirect effect via ingroup attitude. There were no significant interactions of respondents' ethnic group (Black vs. White) with any paths pertaining to the STE.

Reverse Secondary Transfer Model

Next, we tested a reverse mediation model where contact with the secondary outgroups predicted attitudes towards Hispanics. Our findings indicated that contact with the secondary

outgroups was not directly related to attitudes towards Hispanics ($B = -.02$, $SE = 2.28$, $\beta = -.00$, $p = .992$), over and above the control variables. Contact with the Indians/Vietnamese significantly predicted more positive attitudes towards these groups ($B = 5.43$, $SE = 2.14$, $\beta = .16$, $p = .012$), but was unrelated to ingroup attitude ($B = 1.07$, $SE = 2.05$, $\beta = .04$, $p = .600$). Both attitudes towards Indians/Vietnamese ($B = .51$, $SE = .06$, $\beta = .49$, $p < .001$) and ingroup attitude ($B = .32$, $SE = .06$, $\beta = .28$, $p < .001$) significantly predicted attitudes towards Hispanics. Sobel tests indicated a significant indirect effect of contact with Indians/Vietnamese on attitudes towards Hispanics via attitudes towards Indians/Vietnamese ($z = 2.43$, $p = .015$), but no indirect effect via ingroup attitude ($z = .52$, $p = .600$). The point estimates and 95% confidence intervals obtained using bootstrapping indicated that the indirect effect via attitudes towards Indians/Vietnamese (2.82 [.69, 4.99]), but not via ingroup attitude (.28 [-1.02, 1.45]), was significant. Contrasting the two indirect effects from each other further demonstrated that the indirect effect via outgroup attitude was significantly stronger (2.42 [.40, 4.64]).

Interestingly, and similarly to Study 2, there was a negative (albeit marginally significant) direct relation between contact with the secondary groups and attitudes toward Hispanics ($B = -3.13$, $SE = 1.78$, $\beta = -.09$, $p = .081$) once the mediators were entered into the equation. Again, it seems that there are two opposing effects present, the expected generalization of attitudes as well as a negative relation between contact with the secondary groups and attitudes towards the primary outgroup. As in our original model, SDR did not moderate any paths in the model. Moreover, there were no significant moderation effects of condition (Indian vs. Vietnamese as secondary group) or participant group (Black vs. White participants) in this reverse model.

Summary of Findings

This study again demonstrated the STE of intergroup contact, this time controlling for SDR and ruling out the alternative explanation that the STE is due to a response set. Replicating the previous studies, our findings indicate that attitude generalization, but not ingroup reappraisal, is the likely process underlying this effect. However, although Sobel tests indicated a significant indirect effect via outgroup attitude in both target group conditions (Indian vs. Vietnamese), the bootstrapping analysis conducted separately by condition found that the indirect effect via primary outgroup attitude was significant only in the Vietnamese target group condition. This finding is unexpected and might be due to the reduced sample size for this test. Finally, analyses examining a reverse model where contact with the secondary group predicts attitudes towards the primary outgroup again indicated a significant indirect effect via outgroup attitude, consistent with attitude generalization, but did not demonstrate a direct effect of secondary outgroup contact on primary outgroup attitudes. As in Study 2, this lack of a direct effect seems to have been due to an additional negative effect of contact on primary outgroup attitudes. This further underlines the complexity of contact effects in multi-group settings.

Study 4

Although the contact hypothesis (Allport, 1954) is implicitly longitudinal, the vast majority of contact research (including the three previous studies reported in this paper) has tended to employ cross-sectional designs and therefore demonstrates an association between contact and attitudes rather than a causal effect of contact on attitudes (see Brown & Hewstone, 2005; Hewstone, 2009; Pettigrew & Tropp, 2006; for exceptions see Binder et al., 2009; Eller & Abrams, 2003, 2004; Van Laar et al., 2005). Thus, most studies cannot rule out the possibility of a selection bias, namely, that prejudiced people are less likely to engage in intergroup contact (see Allport, 1954; Pettigrew, 1997, 1998). To address this issue at least partly, our final study

used a two-wave longitudinal design to examine the STE. To address the ‘causal sequence problem’ of intergroup contact (Pettigrew, 1998), the study examined both possible causal directions, from contact with the primary outgroup at time 1 to attitudes toward the secondary group at time 2, while controlling for attitudes toward the secondary group at time 1 (contact effects), and the reverse order from attitudes at time 1 to contact at time 2 while controlling for contact at time 1 (prejudice effects; see Binder et al., 2009; Brown, Eller, Leeds, & Stance, 2006). In addition, this study tested whether the relationship between contact at time 1 and attitudes toward the secondary group at time 2 was mediated by ingroup attitude (ingroup reappraisal) or attitudes toward the ethno-religious outgroup (attitude generalization) in a longitudinal model. Like Study 2 this study was conducted in the context of intergroup relations in Northern Ireland.

It should be noted that Study 1 and Studies 2 and 3 employed different measures to assess ingroup reappraisal. While Study 1 used a collective self-esteem measure and found a small significant indirect effect, Studies 2 and 3 relied on feeling thermometers and found no significant indirect effect. This difference in measurement may partly account for these somewhat diverging results. This study thus employed both collective self-esteem measure and a feeling thermometer and we conducted two separate analyses (one using collective self-esteem and one using the feeling thermometer) to assess the mediating role of ingroup reappraisal.

Method

Procedure and Respondents

Respondents were drawn at random from four areas of Belfast, Northern Ireland by a professional survey organization. All interviews were conducted face-to-face, and cards with questions and response options were shown to supplement verbal statements. The first wave of

interviews was conducted between March and July 2006. Respondents were 984 adults (mean age = 51.83 years, $SD = 17.48$; $N = 439$ Catholics, 158 male, 281 female; $N = 545$ Protestants, 223 male, 322 female). The second wave of interviews was conducted between May and August 2007. Respondents were 811 adults (mean age = 50.66 years, $SD = 17.53$; $N = 429$ Catholics, 157 male, 272 female; $N = 382$ Protestants, 149 male, 233 female). Of the overall sample, 411 individuals (mean age = 52.59 years, $SD = 16.74$; $N = 185$ Catholics, 62 male, 123 female; $N = 226$ Protestants, 83 male, 143 female) completed the survey at both time points and constituted the sample for our longitudinal analyses. Note that the current sample is independent of that described in Study 2.

Measures

Among a number of questions on other aspects of intergroup relations in Northern Ireland, the interviews included measures of contact with the ethno-religious outgroup (Catholics or Protestants) and with racial minorities in Northern Ireland, attitudes toward the ingroup, the rival outgroup, and racial minorities, as well as a measure of collective self-esteem.

Contact measures. As in Study 2, our measure of amount of cross-community contact was specifically tailored toward contact in the neighbourhood. On 5-point scales ranging from 1 (*never*) to 5 (*very often*), respondents indicated how often: (1) they greet people who are from the other community in their neighbourhood, (2) they chat to people who are from the other community in their neighbourhood, (3) they do something social together with people from the other community, (4) they visit people from the other community in their home, and (5) people from the other community visit them in their home. The items were averaged to yield reliable indices of amount of intergroup contact at time 1 ($\alpha = .93$) and time 2 ($\alpha = .92$). Contact with

racial minorities at time 1 and time 2 was measured by one item: ‘Overall, how frequently do you have contact with members of racial minorities?’ (1 = *never*; 5 = *very often*).

Attitude measures. Group attitudes were measured using feeling thermometers. Respondents indicated on thermometers that ran from zero (0) to a hundred (100) degrees the extent to which they felt cold/warm toward members of their own ethno-religious community, toward members of the other community, and toward racial minorities in Northern Ireland.

Private collective self-esteem. Private collective self-esteem was measured by three items (based on Luthanen & Crocker, 1992): ‘In general, I’m happy to be a Catholic/Protestant’; ‘I’m proud to be a Catholic/Protestant’; ‘I often wish that I wasn’t a Catholic/Protestant’ (reverse-coded). The items were averaged to yield indices of collective self-esteem at time 1 ($\alpha = .79$) and time 2 ($\alpha = .77$).

Results and Discussion

Descriptives and intercorrelations of all variables for our longitudinal sample are shown in Table 5. Below we report four sets of analyses. First, preliminary analyses checked for selective attrition and assessed changes over time. Second, we examined the reverse causal orders from attitudes to contact. Third, our main analysis tested for the STE and the mediating roles of primary outgroup attitudes and ingroup attitude longitudinally using a multiple regression analysis in which the indirect effects of the predictor variable via the proposed mediators were simultaneously tested with the bootstrapping method. Fourth, we examined interaction effects with respondents’ group membership. Finally, we examined a reverse STE model in which contact with the secondary group predicted primary outgroup attitudes.

Preliminary Analyses

A multivariate analysis of variance (MANOVA) comparing respondents who completed the survey at both time points with those who completed only the time 1 survey, across the set of variables at time 1, revealed that there were no significant differences between the respondents who later dropped out of the study and those who responded at both time points, $F(6, 966) = 1.07, p = .376$. Univariate analyses of all measures confirmed this conclusion. These findings indicate that there was no selective attrition of respondents. Significant differences over time were found only for racial attitudes, $t(409) = 3.74, p < .001$, which were somewhat reduced over time ($M = 69.26$ at time 1 and 65.52 at time 2) and for ingroup attitude, $t(408) = 4.79, p < .001$, and collective self-esteem, $t(410) = 5.53, p < .001$, which increased over time ($M = 69.65$ at time 1 and 74.87 at time 2 and $M = 3.98$ at time 1 and 4.20 at time 2, respectively). It should be noted that these scores represent average changes and give no indication about individual changes.

Reverse Causal Order

Next, to examine alternatives to the hypothesis that contact precedes attitudes, we tested the reverse causal order, assessing attitudes at time 1 as predictors of contact with members of the ethno-religious outgroup at time 2, over and above contact at time 1 (as in Brown et al., 2006). These analyses yielded no significant effects of attitudes toward racial minorities ($B = .00, SE = .00, p = .221$), attitudes toward the ethno-religious outgroup ($B = .00, SE = .00, p = .910$), attitudes toward the ethno-religious ingroup ($B = -.00, SE = .00, p = .287$), or collective self-esteem ($B = .01, SE = .05, p = .824$) on contact with the ethno-religious outgroup at time 2.

Similar findings were obtained when predicting contact with racial minorities at time 2. There were no significant effects of racial attitudes ($B = -.03, SE = .00, p = .457$), attitudes toward the ethno-religious outgroup ($B = .00, SE = .00, p = .361$), ingroup attitudes ($B = .00, SE$

= .00, $p = .523$), or collective self-esteem ($B = -.06$, $SE = .06$, $p = .365$) on contact at time 2.

These findings are not consistent with a causal order in which attitudes precede contact.

Longitudinal Tests of the Secondary Transfer Effect and its Mediators

For our longitudinal analysis, we extended Baron and Kenny's (1986) classic mediation model. To estimate the direct path from contact with the primary group to attitudes towards the secondary group (c -path), we regressed attitudes towards the secondary group at time 2 on contact with the primary group at time 1, controlling for contact with and attitudes towards the secondary group at time 1. To examine whether the change in attitudes towards the secondary group was mediated by changes in attitudes towards the ethno-religious outgroup or ingroup attitude, we entered residualized scores (i.e., partialling out time 1 scores) of these variables into the equation. The a -paths were thus estimated by regressing the residualized mediating variables on contact with the primary outgroup at time 1, while controlling for contact with and attitudes towards the secondary group at time 1. The b -paths were obtained by regressing attitudes towards the secondary outgroups on the residualized mediating variables, again controlling for contact with and attitudes towards the secondary group at time 1. The analysis was performed twice, once using the feeling thermometer to assess ingroup reappraisal and once using collective self-esteem. All subsequent references to the mediators refer to residualized scores.

In our first analysis we specified contact with the ethno-religious outgroup at time 1 as the independent variable, attitudes toward racial minorities at time 2 as the criterion variable, and attitudes toward the ethno-religious outgroup and attitudes toward the ethno-religious ingroup as mediating variables. Contact with racial minorities at time 1 and attitudes toward the racial minorities at time 1 were covariates. Due to scattered missing values the sample size for this analysis was reduced to 405. Results of the analysis are summarized in Table 2.

Consistent with a generalized contact effect, contact with the ethno-religious outgroup at time 1 significantly predicted racial attitudes at time 2 ($B = 1.94, SE = .73, \beta = .12, p = .009$), over and above the control variables. Contact with the ethno-religious outgroup at time 1 also significantly predicted (over and above the control variables) attitudes toward the ethno-religious outgroup ($B = .42, SE = .05, \beta = .11, p = .040$), but was not significantly associated with ingroup attitude ($B = .00, SE = .72, \beta = .00, p = .995$). Attitudes toward the ethno-religious outgroup ($B = .42, SE = .05, \beta = .38, p < .001$), but not ingroup attitude ($B = .07, SE = .05, \beta = .06, p = .132$), significantly predicted attitudes toward racial minorities at time 2, over and above the control variables. The effect of contact with the ethno-religious outgroup at time 1 on racial attitudes at time 2 became marginally significant ($B = 1.28, SE = .65, \beta = .08, p = .051$) when the mediators were entered into the equation. Sobel tests indicated a significant indirect effect of contact with the ethno-religious outgroup at time 1 on racial attitudes at time 2 via attitudes toward the ethno-religious outgroup ($z = 2.03, p = .043$), but not via ingroup attitude ($z < 1, n.s.$). The point estimates and 95% confidence intervals obtained using bootstrapping similarly indicated that the indirect effect via outgroup attitude (.66 [.03, 1.37]), but not via ingroup attitude (.00 [-.13, .15]), was significant. Contrasting the two indirect effects from each other further demonstrated that the indirect effect via outgroup attitude was significantly stronger (.66 [.05, 1.35]).

We repeated this analysis using the collective self-esteem measure to assess ingroup reappraisal as a potential mediator (see also Table 2). Due to scattered missing values the sample size for this analysis was 406. Again, contact with the ethno-religious outgroup at time 1 significantly predicted attitudes toward racial minorities at time 2 ($B = 2.01, SE = .73, \beta = .13, p = .006$), over and above the control variables. Contact with the ethno-religious outgroup at time 1 also significantly predicted (over and above the control variables) attitudes toward the ethno-

religious outgroup ($B = 1.50, SE = .75, \beta = .10, p = .045$), but was not significantly associated with collective self-esteem ($B = -.04, SE = .03, \beta = -.07, p = .183$). Attitudes toward the ethno-religious outgroup ($B = .45, SE = .04, \beta = .40, p < .001$), but not collective self-esteem ($B = -.09, SE = 1.13, \beta = -.00, p = .935$), significantly predicted attitudes toward racial minorities at time 2, over and above the control variables. The effect of contact with members of the ethno-religious outgroup at time 1 on racial attitudes at time 2 remained significant ($B = 1.33, SE = .65, \beta = .08, p = .041$) when the potential mediators were entered into the equation, consistent with partial mediation. Sobel tests indicated a significant indirect effect of contact with the ethno-religious outgroup at time 1 on racial attitudes at time 2 via attitudes toward the ethno-religious outgroup ($z = 1.97, p = .049$), but not via collective self-esteem ($z < 1, n.s.$). The bootstrapping analysis however indicated that neither the indirect effect via outgroup attitude (.68 [-0.02, 1.39]), nor via collective self-esteem (.00 [-0.09, .14]), were significant in this model.

Group Differences

Unlike in Study 2, group of respondent did not moderate any of the paths in the model. The lack of interaction effects might be due to the fact that such effects, which are already difficult to detect in non-experimental contexts (see McClelland & Judd, 1993), are even more difficult to detect in a restrictive longitudinal model where there is less variance to explain.

Reverse Secondary Transfer Model

Next, we examined the reverse mediation model whereby contact with the secondary outgroup predicts attitudes towards the primary outgroup (see Table 2 for an overview of results). In our first analysis we specified contact with racial minorities at time 1 as the independent variable, attitudes toward the ethno-religious outgroup at time 2 as the criterion variable, and residualized attitudes toward racial minorities and residualized ingroup attitude as

mediating variables. Contact with the ethno-religious outgroup at time 1 and attitudes toward the ethno-religious outgroup at time 1 were entered as covariates.

There was no overall effect of contact with racial minorities on attitudes towards the ethno-religious outgroup over and above the control variables ($B = -.43$, $SE = .76$, $\beta = -.03$, $p = .574$). Moreover, there was also no significant relation between contact with racial minorities and attitudes towards racial minorities ($B = .11$, $SE = .73$, $\beta = .01$, $p = .884$) or towards the ingroup ($B = .19$, $SE = .72$, $\beta = .01$, $p = .789$) in this model. Both attitude towards racial minorities ($B = .40$, $SE = .05$, $\beta = .08$, $\beta = .37$, $p < .001$) and ingroup attitude ($B = .28$, $SE = .05$, $\beta = .25$, $p < .001$) did, however, predict attitudes towards the ethno-religious outgroup. Both the Sobel test ($z < 1$, n.s.) and the bootstrapping analysis (.04 [-.57, .63] and .06 [-.34, .49], respectively), indicated that neither the indirect effect via outgroup attitude nor via ingroup attitude was significant.

Similar results were obtained in our second analysis where we used the collective self-esteem measure to assess ingroup reappraisal as a potential mediator. Again there was no overall effect of contact with racial minorities on attitudes towards the ethno-religious outgroup over and above the control variables ($B = -.46$, $SE = .76$, $\beta = -.03$, $p = .544$). There was also no significant relation between contact with racial minorities and attitudes towards racial minorities ($B = .14$, $SE = .73$, $\beta = .01$, $p = .844$), but a significant negative relation with collective self-esteem ($B = -.07$, $SE = .03$, $\beta = -.13$, $p = .011$). Moreover, attitude towards racial minorities ($B = .46$, $SE = .05$, $\beta = .42$, $p < .001$), but not collective self-esteem ($B = -1.48$, $SE = 1.17$, $\beta = -.05$, $p = .209$) predicted attitudes towards the ethno-religious outgroup. Both the Sobel test ($z = .19$ and 1.12 , respectively) and the bootstrapping analysis (.07 [-.63, .77] and .11 [-.04, .38], respectively), indicated that neither the indirect effect via outgroup nor via ingroup attitude was significant.

Group of respondent moderated only the path from ingroup attitude to the criterion variable (in our analysis using collective self-esteem; $B = -.13$, $SE = .05$, $p = .006$) in these reverse STE models. This path was stronger for Catholics ($B = .41$, $SE = .06$, $\beta = .41$, $p < .001$) than for Protestants ($B = .15$, $SE = .07$, $\beta = .13$, $p = .022$). However, this did not affect our finding that ingroup attitude was not a significant mediator, as confirmed by Sobel tests and bootstrapping analyses conducted separately for Catholics and Protestants.

Summary of Findings

The present study replicated the STE of intergroup contact, again while controlling for contact with the secondary group, but this time using a longitudinal design. We found no evidence for a reverse causal order in which attitudes predict future contact, ruling out the alternative explanation that the STE is due to more tolerant respondents engaging in more intergroup contact. Attitude toward the primary outgroup was a significant mediator in the relationship between contact with the primary outgroup and attitudes toward the secondary outgroup, consistent with attitude generalization. There was no evidence for ingroup reappraisal as a mediating process, neither when operationalized as general feelings toward the ingroup nor when operationalized as collective self-esteem.

We also examined a reverse secondary transfer model in which contact with racial minorities predicted attitudes towards the ethno-religious outgroup. However, unlike in Study 2, where contact with racial minorities had an indirect effect on attitudes towards the ethno-religious outgroup, there was no evidence for an effect of contact with racial minorities on attitudes towards Catholics/Protestants in the present study. This was due to the fact that contact with racial minorities did not predict attitudes towards racial minorities over and above the control variables. Zero-order correlations (see Table 5) suggest that contact with racial minorities

at time 1 was significantly related to attitudes towards racial minorities at time 2. It is possible that the lack of a significant relation in our model is due to the restrictiveness of the longitudinal model, which leaves less variance to be explained. Moreover, it should be noted that our measure of contact with racial minorities was only a single-item measure that assessed the overall amount of contact with racial minorities. It is possible that such a measure is less powerful as a predictor of attitudes approximately 1 year later, in particular in a restrictive longitudinal model. However, inspection of the path from attitudes towards racial minorities in this model (see Table 2) indicates that, in line with Allport's idea of generalized outgroup attitudes, attitudes toward racial minorities and attitudes towards the ethno-religious outgroup are linked.

General Discussion

This research adds to a meager literature on secondary transfer effects of intergroup contact (Pettigrew, 1997, 2009). In the following sections we will, first, evaluate our findings in relation to evidence for the STE; second, we address the evidence for alternative accounts of the STE; and, third, we consider the evidence for ingroup reappraisal and attitude generalization as processes underlying the STE. We will then turn to strengths and potential limitations of our research, and finally highlight the theoretical and practical implications of our findings.

Evidence for the Secondary Transfer Effect

Across four studies, we consistently found evidence that contact with a primary outgroup predicts attitudes toward secondary outgroups that are not directly involved in the contact. This result replicated across diverse settings and different types of contact, specifically cross-community contact between Greek and Turkish Cypriots across the dividing UN Buffer Zone and attitudes toward the mainland outgroups (Study 1), neighbourhood contact between Catholics and Protestants in Northern Ireland and attitudes toward racial minority groups in the

region (Studies 2 and 4), and Black and White American university students' friendship contact with Hispanics and attitudes toward recent immigrant groups (Study 3).

Because three of our studies contained measures of contact with the secondary outgroup as control variables, we were also able to assess reverse models of the STE whereby contact with the secondary outgroup predicts primary outgroup attitudes. The findings for these reverse models were somewhat more complex. The direct relation between secondary outgroup contact and primary outgroup attitude was significant in none of our three tests. Closer inspection of the data indicated, however, that this lack of an effect was not due to a lack of generalization. Rather, in Studies 2 and 3, it seems that *two opposing* effects were present: the expected generalization effect by which contact with the secondary group was indirectly positively associated with primary outgroup attitudes via secondary outgroup attitudes, and an additional direct *negative* relation between secondary outgroup contact and primary outgroup attitudes. We attribute this finding to either the presence of a third variable, or to the possibility that secondary groups come to be viewed as allies, which can have a mobilizing effect against a rival outgroup. Overall, these findings underline the complexities of examining contact effects in multi-group settings and open up interesting avenues for future research, which should further examine the nature of contact in multi-group contexts and take into account the functional relations (see Dovidio et al., 2003) between multiple groups.

Unexpectedly, there was no evidence for an indirect effect from secondary outgroup contact to primary outgroup attitude in Study 4. This was due to the fact that contact with racial minorities at time 1 did not significantly predict racial attitudes at time 2, over and above the control variables. It is possible that this is due to the limited nature of the contact measure in this study and the restrictiveness of the longitudinal model, which leaves less variance to be

explained. Note, however, that secondary outgroup attitudes still predicted primary outgroup attitudes, consistent with Allport's (1954) idea of generalized outgroup attitudes.

Alternative Accounts of the 'Secondary Transfer Effect'

As noted by Pettigrew (2009), the vast majority of tests of the STE were derived from relatively loosely-controlled studies which could not rule out alternative explanations for their findings. The present research thus set out to examine a number of alternative accounts of the STE directly. To rule out the possibility that the positive association of outgroup contact with attitudes toward the secondary group is due to the fact that respondents who have more contact with one outgroup would also have more contact with other outgroups (the *secondary contact problem*), Studies 2, 3, and 4 included contact with the secondary group as a control variable. In all three studies, the relationship between contact with the primary outgroup and attitudes towards the secondary outgroup emerged when secondary outgroup contact was controlled for, as did the indirect relation between contact with the secondary groups and primary outgroup attitudes in Studies 2 and 3, thus ruling out this potential alternative explanation of the STE.

Study 3 was designed to address the *social desirability problem*, namely that the relation between contact and attitudes toward secondary outgroups is due to the possibility that people who tend to respond in socially desirable ways report both more contact and more positive attitudes (see Pettigrew, 1997). This study demonstrated that contact with the primary outgroup was positively (directly in the original model and indirectly in the reverse model) related to secondary outgroup attitudes while SDR was controlled for, and that SDR did not moderate any relations in the model, ruling out social desirability as an alternative account. Nonetheless, this finding needs to be replicated in other contexts involving other types of contact.

Finally, using a longitudinal design, Study 4 addressed the *causal sequence problem*. This study demonstrated the STE in a model that controlled for time 1 attitudes and also found no evidence for a reverse causal order in which attitudes precede contact, thus ruling out the possibility that the positive relation between contact and attitudes towards secondary groups was due to more tolerant people engaging in more contact. By eliminating these alternative explanations, the present studies confirm the reliability of the STE in intergroup contact.

Mediating Mechanisms: Ingroup Reappraisal or Attitude Generalization?

Although several theoretical explanations of STEs have been put forward (e.g., Brown & Hewstone, 2005; Pettigrew, 1997; Weigert, 1976), tests of the mediating processes have thus far been almost non-existent (see Eller & Abrams, 2004, and Pettigrew, 2009, for exceptions). The present research thus sought to shed light on the processes that underlie the STE, focusing specifically on ingroup reappraisal and attitude generalization as mediating mechanisms.

Ingroup Reappraisal

Pettigrew (1997, 1998) suggested that contact results in more positive attitudes toward outgroups in general in part because it leads to a reappraisal of the ingroup, a process by which individuals realize that ingroup norms, customs, and lifestyles are not the only acceptable ways to manage the social world. Pettigrew argued that through contact with outgroup members individuals gain distance from their ingroup, which will lead them to adopt a less provincial perspective on other groups in general. There has thus far been only mixed evidence for this process as a mediating mechanism of the STE (Eller & Abrams, 2004; Pettigrew, 1997, 2009). We further investigated the role of ingroup reappraisal, operationalizing this process similarly to previous studies as the evaluative component of ingroup identity (measured as collective self-esteem and overall ingroup attitude). There was overall little evidence for ingroup reappraisal

across our studies. Specifically, there were mixed results in terms of the relationship between contact and ingroup attitude, and between ingroup and outgroup attitude. While contact was negatively related to collective self-esteem, and partially mediated the relationship between contact and attitudes toward the secondary outgroup in Study 1, contact was unrelated to ingroup evaluation and collective self-esteem in our main analyses in Studies 2-4 and these variables were therefore not mediators. Moreover, ingroup attitude and collective self-esteem did not predict attitudes toward the secondary outgroup in Study 4, and findings from Studies 2 and 3 indicate that ingroup attitude was positively related to attitudes toward the secondary outgroup.

Although inconsistent with the idea that ingroup reappraisal (when conceptualized as reduced evaluation of the ingroup) would result in more positive outgroup attitudes, these findings are not surprising when evaluated in the light of research that systematically examined the link between ingroup and outgroup attitudes. Going back to Sumner's (1906) theory of ethnocentrism, it has long been assumed that ingroup favouritism goes hand in hand with negativity toward outgroups. This link has, however, been called into question (see Brewer, 1999). In fact, empirical findings indicate that the relation between ingroup and outgroup evaluations can be negative, zero, or positive (see Brewer & Campbell, 1976; Duckitt, Callahan, & Wagner, 2005; Hinkle & Brown, 1990; Jackson & Smith, 1999; Kosterman & Feshbach, 1989; Levin & Sidanius, 1999). It has been suggested that a negative relationship is likely to be present only in contexts where intergroup relations are highly competitive and characterised by high levels of threat (Brewer, 1999), for groups with a strong collectivist orientation (Hinkle & Brown, 1990), and when social comparisons are salient (Mummendey, Klink, & Brown, 2001).

Future research on the role of ingroup reappraisal should therefore identify the conditions under which ingroup evaluation is likely to operate as a mediator of the STE, and also

distinguish positive from negative aspects of ingroup attitude, such as nationalism (i.e., feelings of ingroup superiority) and patriotism (i.e., positive feelings toward one's country without outgroup derogation; Kosterman & Feshbach, 1989). We would expect that contact is more likely to be negatively related to aspects of ingroup attitude that encompass a comparative dimension and feelings of ingroup superiority, and these aspects should be more strongly and consistently linked to attitudes toward a variety of outgroups (Schatz & Staub, 1997). In Pettigrew's (1997, 2009) studies ingroup reappraisal was assessed as feelings of pride. Possibly, this has tapped into the nationalism factor of ingroup attitude.

Ingroup reappraisal may also be more important as a mediator of the STE in contexts of active conflict where ingroup identity is defined in strong opposition to an outgroup identity (see Kelman, 2001). In this case positive contact would result in changes in how the ingroup is conceived, and when the secondary group is in some way linked to the conflict, as was the case in Study 1 in Cyprus. Although efforts to resolve the conflict in Cyprus have had some success in recent years, many issues, such as disputes over land, remain highly contentious. This tension is evident from the negative intergroup attitudes in Study 1. Such negative interdependence makes a negative association between ingroup and outgroup attitudes more likely (Brewer, 1999).

An interesting issue for future research would be to examine how intergroup contact shapes conceptions of the ingroup. In some cases, where intergroup relations have been characterized by conflict and tension, where segregation is pronounced, and views of the outgroup have been shaped by ingroup propaganda, positive intergroup contact may promote perspective taking, and reduce the ethnocentric view that the ingroup is in the right and is morally superior to the outgroup (Skitka & Baumen, 2008). In such cases, contact may also induce feelings of guilt for the ingroup's past behaviour and more negative ingroup evaluations

(Doosje, Branscombe, Spears & Manstead, 1998). Contact can also result in more positive views of the ingroup (Studies 2 and 3). This may be the case, in particular, for members of high status groups or groups with a secure social identity (Moscovici & Paicheler, 1978), who may come to see their group as 'tolerant' or 'egalitarian' when engaging in contact. Furthermore, if contact leads to recategorization, it may leave ingroup affect unchanged (Gaertner & Dovidio, 2000).

It should also be noted that the conceptualization of ingroup reappraisal as ingroup evaluation is quite narrow, and 'distancing' from the ingroup may occur in different ways. Ingroup identity has many other elements, including importance, attachment and sense of interdependence, social embeddedness, and behavioral involvement (see Ashmore, Deaux, & McLaughlin-Volpe, 2004) that might be affected by contact and predict attitudes toward other outgroups. Generalized contact effects may also come about through a change in the content and meaning of an ingroup identity (e.g., Livingstone & Haslam, 2008) in a way that promotes tolerance of other groups in general, and through identification with a superordinate identity (e.g., 'Northern Irish', 'American') that includes minority groups (Gaertner & Dovidio, 2000).

Furthermore, the process described by Pettigrew (1997, 1998) encompasses more than changes in the way individuals view their ingroups. Specifically, he alludes to a transformation in how individuals deal with the world in general ('deprovincialization'). This process could involve a variety of changes such as increased Openness to Experience (see Sibley & Duckitt, 2008), increased personal importance of having positive cross-group relations (van Dick et al., 2004), reduced Social Dominance Orientation (Pratto, Sidanius, Stallworth, & Malle et al., 1999), and the acquisition of new skills such as cultural sensitivity (Triandis, 1984) and general cross-group role-taking ability (Reich & Purbhoo, 1975). Thus, while there is relatively little evidence for ingroup reappraisal if it is conceptualized as a change in ingroup evaluation, other

aspects of Pettigrew's hypothesis still await an empirical test. We recommend that future research broadens the conceptualization of ingroup reappraisal to include other aspects of collective identity and assesses individual transformations to gauge 'deprovincialization'.

Attitude Generalization

The second potential mediating mechanism that we investigated is that of attitude generalization. This is a common process by which attitudes toward one attitude object generalize to other, linked but less familiar objects, that has been demonstrated in many different domains (e.g., Fazio et al., 2004; Roper, 1969; Ranganath & Nosek, 2008; Schook et al., 2007; Walther, 2002). Based on Allport's (1954) notion that attitudes toward specific outgroups form part of a generalized outgroup attitude, early researchers assumed that (but never tested whether) attitude generalization drives generalized contact effects (Weigert, 1976). This process has thus far only been evaluated once as a mediator (Pettigrew, 2009). By demonstrating the mediating role of this process consistently across four studies, and by presenting the first large-scale longitudinal test of this process that also included relevant controls, the present research presents the strongest evidence to date for the importance of attitude generalization.

The finding that attitude generalization is a key process underlying the STE has important implications for further research, which should identify factors that facilitate or impede generalization. A number of testable hypotheses can be derived from the literature on attitude generalization, which indicates, for example, that generalization is greater when the attitude objects are similar (Fazio et al., 2004). Thus, we would expect the STE to be more likely and stronger if the two outgroups are more similar to one another, than if they are different (see also Brown & Hewstone, 2005; Pettigrew, 2009). While the attitude generalization literature looked at semantic association (Roman, 1969) as well visual resemblance (Fazio et al., 2004) between

attitude objects, dimensions such as cultural and ethnic similarity, and similarity in status and power positions might be relevant for social groups. Generalization may also be stronger if there is a prior association of the groups in a person's experience (Pettigrew, 2009; Walther, 2002).

Some evidence for this proposition comes from Van Laar et al.'s (2005) study. These authors found no significant generalization of contact with Whites (the dominant group) to attitudes toward any of the minority groups (African Americans, Asian Americans and Latinos). Significant generalization emerged, however, from contact with a minority group to attitudes towards the other two minority groups, but not to Whites. A comparison of the extent of attitude generalization across our studies however seems not quite consistent with this idea. While we could assume the strongest similarity between the primary and secondary outgroups in Study 1 (Greek/Turkish Cypriots and mainland Greeks/Turks) the link between primary and secondary outgroups in this study is among the weakest ($\beta = .37$, compared to, for example, $\beta = .52$ in Study 3). These findings seem inconsistent with the idea of similarity as a moderator. It should be noted though that the secondary group in Study 1 differed substantially from the secondary groups in the other studies. Mainland Greeks and Turks are powerful players in the Cypriot conflict and it is likely that attitudes towards these groups are determined by many variables other than attitudes towards the Cypriot outgroup, such as historical relations between the mainland outgroup and the ingroup (e.g., Greek Cypriots' attitudes towards Turks may be influenced by experiences with and knowledge of the 1974 Turkish military intervention/invasion) as well as the extent to which the mainland outgroups are seen to undermine ingroup gains in the resolution of the conflict.

It is possible that attitude generalization happens in particular to groups that are less known or relevant. Interestingly, and consistent with this point, the strongest link between

primary and secondary attitudes was found in Study 3 ($\beta = .52$) where the secondary groups were small, relatively unknown groups. Future research should further examine these issues and also test the similarity hypothesis directly by including measures of group similarity as potential moderators or under more controlled conditions where group similarities are manipulated.

The attitude generalization literature further indicates that generalization is stronger (and thus less similarity is required) for negative and extreme attitudes (Shook et al., 2007). Thus groups toward which individuals have particularly strong and/or negative attitudes are likely to shape attitudes toward many other outgroups, even if they are dissimilar. This also indicates that negative contact experiences could generalize strongly to a wide range of other outgroups.

Future research could also examine generalization of implicit attitudes, for which generalization seems to happen much more quickly and automatically (see Ranganath & Nosek, 2008), and also explore the generalization of trust (Kramer & Carnevale, 2001) and emotions (Mackie, Devos, & Smith, 2000). Furthermore, as generalized attitudes are not based on direct contact experiences, it might be worth exploring whether they are less strong than attitudes acquired through actual contact (see Fazio & Zanna, 1981; Vonofakou, Hewstone, & Voci, 2007) and therefore less stable, less resistant to change, and less consequential for actual behaviour. This would provide important insights about the wider effectiveness of contact.

Strengths and Limitations of the Present Research

The present work contributes substantially to our understanding of both the extent of the STE and its underlying processes. We highlight especially the contribution of this research in: (1) assessing neglected control variables, (2) identifying mediating processes, (3) testing them with both cross-sectional and longitudinal data, (4) using not just student samples or samples of convenience but large samples drawn from the general population, and (5) accumulating

evidence from several very different intergroup contexts, including two different contexts of protracted intergroup conflict. Together this research strategy increases our confidence in the effect, our understanding of it, and the generalizability of our findings. This contribution is most marked in the case of Study 4, the most sophisticated longitudinal study of mediators of the STE. Longitudinal designs allow stronger causal inferences (Finkel, 1995) and rule out the possibility of a selection bias, namely, that prejudiced people are less likely to engage in contact.

Nonetheless, the remaining studies in this article relied on cross-sectional designs and therefore are only able to demonstrate an association between contact and attitudes. Moreover, although longitudinal designs can address the causal sequence problem, they still do not present strictly causal data as they cannot rule out the possibility that relationships between constructs are due to their association with a third variable. It can also be argued that (although used frequently in the literature) mediation can never be fully established in correlational designs because there is no way to decide which variable is the independent variable whose effect is mediated, which is the mediator, and which is the outcome (Muller, Judd, & Yzerbyt, 2005). We acknowledge this limitation, which applies to most field research, and recommend that future research follows up the present findings using experimental designs.

Finally, we note that, because attitudes toward the different groups were measured with identical scales, one might wonder whether the relation between primary and secondary outgroup attitudes is due to shared method variance (see Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Although it is possible that the relation between these variables is somewhat inflated due to the common methods used, three findings render this unlikely in our view. First, ingroup attitude, which was measured using an identical scale in Studies 2-4, did not mediate the relation between contact and attitudes. Second, ingroup attitude was not a predictor of secondary outgroup

attitudes in Study 4. Third, ingroup attitude was a much weaker predictor than attitudes toward the primary outgroup in Studies 2 and 3. Current research that demonstrates the STE and its mediators using a multi-method approach (Lolliot, Schmid, Hewstone, Swart, & Tausch, in prep.) further suggests that our findings are unlikely to be due to shared method variance.

Contributions and Implications

The studies presented in this paper constitute the most detailed investigation yet of secondary transfer effects in intergroup contact. Across four studies conducted in three unique and diverse intergroup settings, we demonstrated that contact with a primary outgroup predicts attitudes toward secondary outgroups that are not directly involved in the contact. This relationship was found while controlling for direct contact with the secondary groups, individual differences in socially desirable responding, and initial attitudes, ruling out various alternative explanations for this link. Furthermore, the studies reported in this article also offer the most rigorous test of processes underlying generalized contact effects to date.

Our findings have important implications for future research, which should further examine the moderators of attitude generalization, but also for our understanding of the effects of intergroup contact on wider community relations and its potential policy implications. The promise of contact is even greater than Allport (1954) originally conceived, since we have conclusively demonstrated that contact effects generalize from experience with one outgroup to attitudes towards other outgroups. This secondary transfer effect could thus have the most far-reaching implications for the importance of intergroup contact. Current interest across a number of social and behavioural sciences in ‘cosmopolitanism’ concerns its ethical or philosophical dimensions, especially regarding questions of how to live as a ‘citizen of the world’, with open acceptance of diversity, and a willingness to engage with diverse others (e.g., Appiah, 2006; see

Vertovec, in press). Intergroup contact appears to be a key ingredient for living peacefully in a multicultural world, and moving comfortably in social environments characterised by diversity.

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Footnotes

¹The SPSS macro for conducting such analyses is available at <http://www.quantpsy.org> (see Preacher & Hayes, 2008).

²It should be noted that the BDIR scale consists of two subscales: impression management (IM) and self-deceptive enhancement (SDE). However, since similar results were obtained when the two subscales were examined separately, we only report findings using the overall score here.

Table 1

Descriptives and Correlations among Key Variables (Study 1)

	<i>M</i>	<i>SD</i>	1	2	3	4
1 Contact with Cypriot outgroup	1.37	.57	-	.14***	.21***	-.09***
2. Attitude toward National outgroup	18.65	22.92		-	.37***	-.11***
3. Attitude toward Cypriot outgroup	36.79	26.32			-	-.03
4. Collective self-esteem	4.42	.76				-

Note: *** $p < .001$; ** $p < .01$; * $p < .05$.

Table 2

Results of Mediation Analyses Studies 1-4

Mediators	Effect of contact on secondary group attitude group before/after mediators entered (<i>c/c'</i>) <i>B (SE), β</i>	Effect of contact on mediator (a) <i>B (SE), β</i>	Effect of mediator on attitude toward secondary group (b) <i>B (SE), β</i>	Sobel test of indirect effect <i>z</i>	Bootstrap point estimate of indirect effect	95% confidence interval
STUDY 1	5.56 (1.00), .14***/2.12 (.95), .05*					
<i>Attitude to Cypriot outgroup</i>		9.99 (1.13), .22***	.31 (.02), .36***	7.68***	3.11 ^a	[2.29, 4.03]
<i>Collective self-esteem</i>		-.12 (.03), -.09***	-2.67 (.70), -.09***	2.76**	.32 ^a	[.10, .78]
STUDY 2 [^]	2.49 (.50), .11***/- .21 (.48), -.01					
<i>Attitude to ethno-religious outgroup</i>		5.57 (.42), .30***	.48 (.03), .40***	10.21***	2.66 ^b	[2.18, 3.28]
<i>Ingroup attitude</i>		.42 (.39), .03	.09 (.03), .07**	1.01	.04 ^b	[-.03, .14]
STUDY 2 [^] - Reverse model	-.54 (.29), -.04/-1.57 (.26), -.12***					
<i>Attitude to racial outgroups</i>		3.75 (.35), .24***	.31 (.02), .37***	8.80***	1.16 ^c	[.92, 1.42]
<i>Ingroup attitude</i>		-.48 (.27), -.04 ⁺	.28 (.02), .25***	-1.76 ⁺	-.13 ^c	[-.29, .01]
STUDY 3 ^{&}	5.11 (1.55), .21**/1.49 (1.30), .06					
<i>Attitude to Hispanics</i>		6.89 (1.65), .27***	.49 (.06), .52***	3.72***	3.40 ^d	[1.56, 5.51]
<i>Ingroup attitude</i>		1.61 (1.48), .07	.13 (.06), .12*	.97	.21 ^d	[-.15, 1.05]
STUDY 3 ^{&} - Reverse model	-.02 (2.28), -.00/-3.13 (1.78), -.09 ⁺					
<i>Attitude to Indian/Vietnamese outgroup</i>		5.43 (2.14), .16*	.51 (.06), .49***	2.43*	2.82 ^e	[.69, 4.99]
<i>Ingroup attitude</i>		1.07 (2.05), .04	.32(.06), .28***	.52	.28 ^e	[-1.02, 1.45]

Mediators	Effect of contact on secondary group attitude group before/after mediators entered (c/c') <i>B (SE), β</i>	Effect of contact on mediator (a) <i>B (SE), β</i>	Effect of mediator on attitude toward secondary group (b) <i>B (SE), β</i>	Sobel test of indirect effect <i>z</i>	Bootstrap point estimate of indirect effect	95% confidence interval
STUDY 4 [§] (Analysis 1)	1.94 (.73), .12** / 1.28 (.65), .08 ⁺					
<i>Attitude to ethno-religious outgroup</i>		.42 (.05), .11*	.42 (.05), .38***	2.03*	.66 ^f	[.03, 1.37]
<i>Ingroup attitude</i>		.00 (.72), .00	.07 (.05), .06	.00	.00 ^f	[-.13, .15]
STUDY 4 [§] (Analysis 2)	2.01 (.73), .13** / 1.33 (.65), .08*					
<i>Attitude to ethno-religious outgroup</i>		1.50 (.75), .10*	.45 (.04), .40***	1.97*	.68 ^g	[-.02, 1.39]
<i>Collective self-esteem</i>		-.04 (.03), -.07	-.09 (1.13), .00	.08	.00 ^g	[-.09, .14]
STUDY 4 [§] (Analysis 1) – Reverse model	-.43 (.76), -.03 / -.53 (.65), -.03					
<i>Attitude to racial outgroups</i>		.11 (.73), .01	.40 (.05), .37***	.15	.04	[-.57, .63]
<i>Ingroup attitude</i>		.19 (.72), .01	.28 (.05), .25***	.26	.06	[-.34, .49]
STUDY 4 [§] (Analysis 2) – Reverse model	-.46 (.76), -.03 / -.64 (.69), -.04					
<i>Attitude to racial outgroups</i>		.14 (.73), .01	.46 (.05), .42***	.19	.07	[-.63, .77]
<i>Collective self-esteem</i>		-.07 (.03), -.13*	1.48 (1.17), -.05	1.11	.11	[-.04, .38]

Note. Regression weights are unstandardized values. Standard errors are in parentheses. Bootstrap estimates are based on 5,000 re-samples. Confidence intervals are bias corrected and accelerated (see Preacher & Hayes, 2008). ^{a-g}Contrast between mediators is significant ($p < .05$). [^]Analysis controls for contact with secondary outgroup. [&]Analysis controls for contact with secondary outgroup and tendency for socially desirable responding. [§]Longitudinal analysis controls for contact with the secondary outgroup (time 1) and attitudes towards the secondary outgroup (time 1); mediators are residualized (partialling out time 1 scores).
*** $p < .001$; ** $p < .01$; * $p < .05$, ⁺ $p < .10$.

Table 3

Descriptives and Correlations among Key Variables (Study 2)

	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Contact with ethno-religious outgroup	2.33	1.07	-	.08***	.13***	.29***	.02
2. Contact with racial minorities	2.15	1.55		-	.24***	-.01	-.04
3. Attitude toward racial minorities	64.79	24.07			-	.42***	.19***
4. Attitude toward ethno-religious outgroup	69.73	20.21				-	.31***
5. Ingroup attitudes	77.69	17.91					-

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

Table 4

Descriptives and Correlations among Key Variables (Study 3)

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. Hispanic friends	2.07	.86	-	.19**	-.02	.23***	.28***	.08
2. Indian/Vietnamese friends	1.33	.67		-	-.09	.19**	.06	.04
3. BIDR	11.11	.62			-	.17**	.09	.03
4. Attitude toward Indians/Vietnamese	64.32	21.41				-	.61***	.37***
5. Attitude toward Hispanics	65.79	22.45					-	.45***
6. Ingroup attitude	79.80	19.26						-

*** $p < .001$; ** $p < .01$; * $p < .05$. *Note.* BIDR denotes Biased Inventory of Desirable Responding (Paulhus, 1984).

Table 5
Descriptives and Correlations among Key Variables (Study 4)

	<i>M</i>	<i>SD</i>	2	3	4	5	6	7	8	9	10	11	12
1. Contact with ethno-religious outgroup (T1)	2.17	1.22	.23***	.29***	.28***	-.15**	.00	.77***	.17***	.26***	.21***	-.03	-.10*
2. Contact with racial minorities (T1)	2.57	1.17	-	.22***	.08	-.20***	-.17**	.23***	.51***	.15**	.03	-.04	-.21***
3. Attitude to racial minorities (T1)	69.26	20.86		-	.54***	.14**	.01	.18***	.08	.51***	.33***	.03	-.08
4. Attitude to ethno-religious outgroup (T1)	66.83	18.46			-	.13**	.05	.21***	.00	.29***	.30***	.00	-.02
5. Attitude to ingroup (T1)	69.65	18.20				-	.41***	-.08	-.13**	.02	-.01	.25***	.42***
6. Collective Self-esteem (T1)	3.98	.81					-	.00	-.12*	-.08	-.02	.23***	.47***
7. Contact with ethno-religious outgroup (T2)	2.14	1.16						-	.25***	.20***	.17**	-.09	-.10*
8. Contact with racial minorities (T2)	2.65	1.21							-	.16**	-.03	-.14**	-.15**
9. Attitude to racial minorities (T2)	65.52	19.59								-	.55***	.19***	-.12*
10. Attitude to ethno-religious outgroup (T2)	67.68	18.42									-	.32***	-.09
11. Attitude to ingroup (Time 2)	74.87	17.02										-	.39***
12. Collective Self-esteem (Time 2)	4.20	.76											-

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