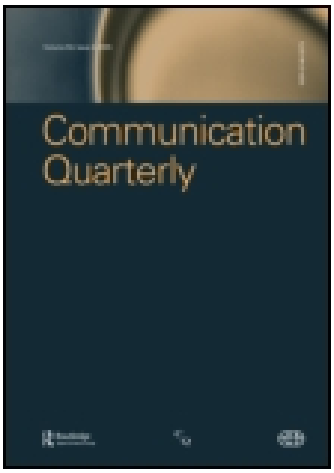

Communication Quarterly
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/rcqu20

Necessary and Sufficient Conditions for Positive Intergroup Contact: A Fuzzy Set Qualitative Comparative Analysis Approach to Understanding Intergroup Attitudes

Anita Atwell Seate[a], Nicholas Joyce[b], Jake Harwood[b] & Analisa Arroyo[b]
[a] Department of Communication, University of Maryland
[b] Department of Communication, University of Arizona
Published online: 06 Apr 2015.

To cite this article: Anita Atwell Seate, Nicholas Joyce, Jake Harwood & Analisa Arroyo (2015) Necessary and Sufficient Conditions for Positive Intergroup Contact: A Fuzzy Set Qualitative Comparative Analysis Approach to Understanding Intergroup Attitudes, Communication Quarterly, 63:2, 135-155, DOI: 10.1080/01463373.2015.1012215

To link to this article: http://dx.doi.org/10.1080/01463373.2015.1012215

Communication Quarterly
Vol. 63, No. 2, April–June 2015, pp. 135–155

Routledge
Taylor & Francis Group

Necessary and Sufficient Conditions for Positive Intergroup Contact: A Fuzzy Set Qualitative Comparative Analysis Approach to Understanding Intergroup Attitudes

Anita Atwell Seate, Nicholas Joyce, Jake Harwood, & Analisa Arroyo

Intergroup contact theory has suggested that interpersonal, and even imagined, communication between members of different social groups is one of the most effective ways to promote positive intergroup attitudes. Researchers have examined various elements and conditions of the communication that may be related to the impact of intergroup contact. However, due to methodological limitations, the extent to which these conditions are necessary or sufficient to produce positive intergroup outcomes has been unclear. We used fuzzy set qualitative comparative analysis (fs/QCA) to analyze how several communicative and psychological variables might be necessary and/or sufficient to produce positive intergroup attitudes toward "illegal" immigrants within an imagined intergroup contact experience. Findings suggest that certain combinations of conditions for contact are sufficient for producing positive attitudes toward social group members but that there are no necessary causes. The discussion emphasizes the implications for intergroup contact and the utility of fs/QCA.

Anita Atwell Seate (Ph.D., University of Arizona, 2012) is an Assistant Professor in the Department of Communication at the University of Maryland. Nicholas Joyce (Ph.D., University of Arizona, 2014) is an Assistant Professor in the Department of Communication at the University of Arizona. Jake Harwood (Ph.D., University of California, Santa Barbara, 1994) is a Professor in the Department of Communication at the University of Arizona. Analisa Arroyo (Ph.D., University of Arizona, 2013) is an Assistant Professor in the Department of Communication at the University of Arizona. The authors wish to thank Charles Ragin for his thoughts and suggestions during the course of this project. *Correspondence:* Anita Atwell Seate, Department of Communication, University of Maryland, 2130 Skinner Building, College Park, MD 20742; E-mail: aseate@umd.edu

ISSN 0146-3373 print/1746-4102 online
DOI: 10.1080/01463373.2015.1012215

Keywords: Immigration; Intergroup Contact Theory; Fuzzy Set Qualitative Comparative Analysis (FS/QCA); Imagined Contact

In the struggle against separatism and prejudice, getting people from both sides to the table to talk is often a good first step. In fact, intergroup contact theory suggests that the mere act of communicating with another group is often enough to improve intergroup relations (Allport, 1954). However, contact researchers are still trying to specify what needs to happen during intergroup communication to make it most effective. Research on this topic has met with mixed results over the years, and many conditions once thought necessary to improve intergroup attitudes have now been shown not to be required (Pettigrew & Tropp, 2006). In this article, we will use new empirical methods to tackle the issue of what is *necessary* or *sufficient* in making intergroup contact an effective prejudice reduction technique.

To begin, we must first define the terms *necessary* and *sufficient*. A cause is necessary when the causal variable (X) *must* be present to produce the outcome (Y), but the cause's presence does not ensure the outcome's presence. In other words, if X is absent, Y is absent. On the other hand, a cause is sufficient when X produces Y, but Y can also be produced by other causes. These theoretical relations are not linear, meaning that these causal patterns might not be indicated by an increase in X being associated with an increase (or decrease) in Y.

To illustrate, imagine an experiment where there is a treatment group (X is present) and a control group (X is absent). In traditional hypothesis testing, we assume that the relationship between X and Y is symmetrical, meaning that the presence or absence of X always predicts the presence or absence of Y (i.e., X and Y are correlated, see Campbell & Stanley, 1963). However, if X were necessary (but not sufficient) in producing the outcome, there may not be a difference between the treatment and control groups. In a necessary relationship, an *absence* of X causes an absence of Y, but the presence of X does not always cause Y to occur. In our experiment, X could be a necessary cause of Y, but in both cells, Y could be absent. The researcher may dismiss X's role in producing Y, though X is necessary for Y to occur.

The reverse logic applies to sufficient causes. Again, consider our experiment. If X is a sufficient cause of Y, there may not be a difference in Y between the two groups because an absence of X does not ensure an absence of Y. In other words, in this experiment X could be a sufficient cause of Y, but in both cells, Y could be present (e.g., because of the presence of another sufficient cause for Y in the experimental context). Henceforth, we will use the general term "asymmetrical relationships" to refer to patterns such as these, wherein: (a) presence might trigger presence, but absence does not preclude presence, or (b) where absence might trigger absence, but presence does not trigger presence.

Although previous research has attempted to use moderating and mediating statistical models in an attempt to describe variable relationships in intergroup contact, we argue that these techniques are not ideal as they fail to adequately account for the asymmetrical relationships found in communication processes. For

example, the intergroup contact literature suggests that communication between members of various social groups improves attitudes through a variety of processes (e.g., liking, perspective taking, anxiety reduction, etc.). Whereas some researchers might attempt to test for these relationships through the general linear model, including moderator analyses in regression and structural equation models, even the most advanced techniques would not get at how specific combinations of asymmetrical relationships together create an outcome. In other words, these traditional statistical models have a hard time explaining how multiple paths can get us to the same place. This idea echoes Allport's (1954) original theorizing, as he suggests that, "[i]n order to predict the effect of contact upon attitudes we should ideally study the consequences of each of the following variables acting both separately and in combination" (p. 262). Similarly, Pettigrew and Tropp (2006) note, "Allport advanced his four conditions as a necessary package for positive contact effects rather than as a listing of variables that must be considered individually" (p. 757). In short, it is imperative to consider multiple combinations of multiple variables at the same time in order to understand their true nature as necessary or sufficient conditions. Without this, we limit our theoretical understanding as well as our efficacy to apply research findings to real world situations in which variables are not as easily controlled.

One way to account for the variability of human communication is to add more variables to a study. Besides the problems already mentioned, as the number of variables increases, traditional research methods and statistical models run into serious problems with power and interpretability. To that end, we will use a novel technique, Fuzzy Set/Qualitative Comparative Analysis (fs/QCA), to examine how communicative and psychological constructs may be either necessary, sufficient, or INUS (insufficient, but necessary parts of combinations which are themselves unnecessary but sufficient) in producing positive intergroup outcomes. Testing for INUS conditions allows us to test Allport's idea that the constructs needed for contact's effects work together in producing the outcome.

Given our tacit assumption that many possible combinations might lead to positive intergroup outcomes, we leverage the power and flexibility of imagined intergroup contact (Crisp & Turner, 2009), which allows participants to describe a variety of paths to positive interactions and outcomes. In what follows, we briefly review the intergroup contact literature to highlight variables that may be important in our combinations and provide a primer on fs/QCA, as it has not seen extensive usage outside of comparative sociology.

Intergroup Contact Theory

Intergroup contact theory (Allport, 1954) suggests that communication between social group members can lead to positive intergroup attitudes. Intergroup contact is effective in a variety of communication contexts including interpersonal, mediated, and even imagined interactions (Harwood & Joyce, 2012). Given the complexity of factors within these communicative events, researchers theorize about what variables might be central to their efficacy (Pettigrew & Tropp, 2006). While Allport (1954)

argued that individual differences (such as political ideology) would influence the effects of intergroup contact, he also noted that just having contact with the outgroup was itself not enough to improve intergroup attitudes. Specifically, he stated that it is the "forms of resulting *communication* that matter" in the contact scenario arguing that that contact between social group members needs equal status among interpersonal interactants, cooperation between interactants, common goals between interactants, and institutional support for the interpersonal interaction (p. 272, italics in the original). Scholars in this area have interpreted this to mean that these variables were necessary for contact to be effective (Harwood & Joyce, 2012). However, a meta-analysis of the contact literature found that while these four conditions were facilitative in improving intergroup relations, intergroup contact could still be effective even in their absence (Pettigrew & Tropp, 2006). While Pettigrew and Tropp did not directly engage with the issue of necessity versus sufficiency in this particular regard, their findings suggest that these four conditions are probably sufficient. This is because they produce the outcome, but the outcome can be produced by other causes. However, as previously mentioned, standard statistical analysis does not allow for a direct examination of this question. In addition to using fs/QCA to analyze necessity or sufficiency of intergroup contact theory's propositions, this study extends this examination to several other factors important in the intergroup contact literature.

Allport originally theorized that contact would be effective because it would increase knowledge about the other groups and dispel negative stereotypes. However, meta-analytic results show that while contact affects attitudes and emotions toward other groups it tends not to affect beliefs (Pettigrew & Tropp, 2006). This suggests that cognitive factors might not be necessary or sufficient but that emotional factors have the potential to be both. Contact research has found several mediating emotional factors that lead to improved intergroup attitudes from intergroup contact. Beyond having a positive or negative experience, researchers have found that feelings of intimacy born from self-disclosure (Harwood, 2010; Soliz, Ribarski, Harrigan, & Tye-Williams, 2009), as well as increased empathy and reduced anxiety stemming from intergroup contact (Tam, Hewstone, Harwood, Voci, & Kenworthy, 2006) may all be either necessary or sufficient emotional pre-conditions for the positive effects of contact. Research has also found effects of complex emotions such as sympathy and pity on intergroup outcomes (Cuddy, Fiske, & Glick, 2007).

While these emotional variables are intrinsic to the process of intergroup communication, there are also parallel perceptual and cognitive processes that may be activated by intergroup contact and intertwined with its ability to affect intergroup attitudes. For example, when an individual comes in contact with a member of another group, they may consider the potential for friendship and future social interaction. As a result, perception of possible friendship can be seen as a predictor, rather than an outcome, of intergroup attitudes (Pettigrew, 1998). Similarly, intergroup interactions often activate a cognitive process in which individuals attempt to judge how typical the outgroup member is of their group (Brown & Hewstone, 2005). When individuals are judged as more typical of their group, feelings about that group

member are more likely to generalize into attitudes about that group. However, outgroup member typicality is complex, with negative contact leading to higher perceptions of typicality and positive contact leading to perceptions that outgroup member is the exception rather than the rule (Paolini, Harwood, & Rubin, 2010), demonstrating just how important it is to study these variables in combination with others. For example, it may be that an outgroup member needs to be viewed as typical when we believe we are going to communicate with other outgroup members to reduce intergroup prejudice; on the other hand, outgroup members may need to be seen as atypical when we are in the early stages of friendship development (Pettigrew, 1998).

The above research suggests that there are a multitude of factors beyond the positivity of the communication that can influence whether intergroup interactions will improve attitudes toward the outgroup. Interestingly, many of these variables seem to be equally relevant across a wide variety of communication contexts (Harwood & Joyce, 2012), and understanding the nature of these variables as sufficient or necessary can help increase our theoretical understanding of contact as well as our ability to apply it to real world scenarios. For example, it might be that while improving positive emotions experienced during contact is *sufficient* to improve intergroup attitudes, removing negative emotions is *necessary*. If this were true then real world practitioners should focus first on the elimination of negative emotions. Other variables, like the extent to which individuals perceive the potential for enduring friendships and future relationships, might be sufficient to create short term effects but necessary to create long term effects.

The above examples do not represent specific hypothesis, but rather illustrations of how more specific understanding of the variables might inform theory and practice. Unfortunately, despite occasionally using necessary and sufficient language in its propositions, contact research has been unable to elaborate on these specific variables as a result of the limitations of traditional methodologies. In the following, we discuss how fs/QCA allows us to preserve the complex interplay between multiple factors while not sacrificing theoretical parsimony.

Fuzzy Set/Qualitative Comparative Analysis (Fs/QCA)

Seeking to bridge the gap between quantitative and qualitative approaches, fs/QCA is a methodological perspective that draws on and incorporates the strengths from both perspectives (Ragin, 1987, 2000, 2008). Qualitative (also termed small-*N* or case-oriented) research typically focuses on empirical depth, as opposed to quantitative (also termed large-*N* or variable-oriented) research, which focuses more on empirical breadth. This methodology uses the researcher's familiarity with both the cases and the literature to examine combinations of predictors that produce the outcome of interest. Examining set-theoretical relationships, fs/QCA incorporates insights from fuzzy set theory and utilizes Boolean algebra to deduce the necessary and sufficient causes of an outcome (for a more comprehensive explanation of the underlying logic and mathematical computations of the fs/QCA approach, see Ragin, 2008).

Necessity and sufficiency are asymmetrical relationships that can be tested by fs/QCA. As previously mentioned, *necessity* is when the cause must be present to produce the outcome, but the cause's presence does not always ensure the outcome's presence. Ragin (2000, 2008) argued that this type of asymmetrical relationship is indicated when the outcome is a subset of the cause. For example, episodes of rain are a subset of episodes of clouds. You can have clouds but no rain, but you cannot have rain without clouds. In the contact scenario it could be that experiencing self-disclosure during intergroup contact is a necessary cause for prejudice reduction. In other words, the set of individuals with positive attitudes from a contact experience will be a subset of those who experienced self-disclosure. In Figure 1, if you remove the cause (X) you cannot have the outcome (Y). *Sufficiency* is when the cause (X) can produce the outcome (Y), but the outcome can be produced by other causes. Ragin (2000, 2008) argued that in this type of asymmetrical relationship the cause is a subset of the outcome. If X is present, Y is present. For example, plants outside during rain are a subset of plants that are watered—plants could have also been watered with a hose or a watering can. Hence, being outside during rain is sufficient for plants to be watered. For intergroup contact, it could be that experiencing self-disclosure is a sufficient cause for prejudice reduction, in which case a set of individuals who experienced self-disclosure during a contact experience would be a subset of those who ended up with reduced prejudice. Looking at Figure 1, if you remove the cause (X), you still can have the outcome (Y) because there are other causes that may produce the outcome.

Finally, conditions might combine in groups that operate together to influence an outcome. *INUS* conditions (*insufficient* but *necessary* parts of causal combinations which are themselves *unnecessary* but *sufficient*) are causal combinations (*causal recipes*; Ragin, 2008) that produce the outcome. For example, perhaps experiencing self-disclosure is neither a necessary nor sufficient cause of positive attitudes toward

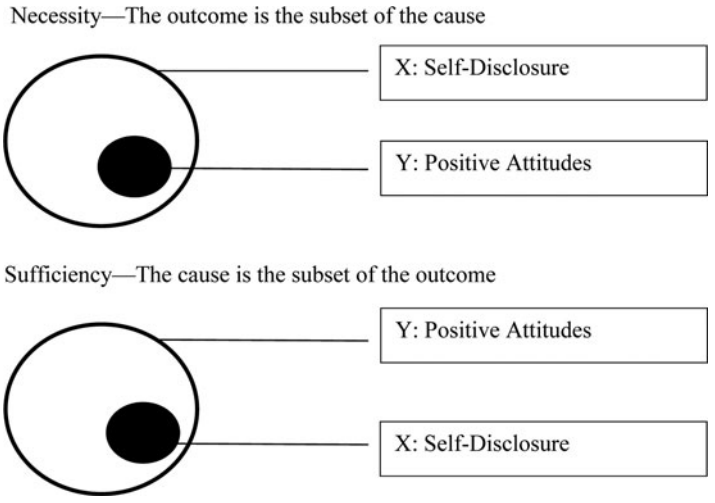

Figure 1 Venn diagram illustrating the sub-set relationship of necessity and sufficiency.

the outgroup. Instead, perhaps self-disclosure works together with an absence of negative communication to (sufficiently) produce positive intergroup attitudes. This combination of factors being present and absent defines INUS conditions and their respective roles in the causal recipe.

Truth Table

Researchers understand causal recipes through the use of a "truth table" (Ragin, 2008). The rows of the truth table present all logical combinations of the causal conditions (equal to 2^k, where k is equal to the number of causal conditions). The truth table provides the number of cases that are nested in that particular causal combination. In other words, "the truth table elaborates and formalizes one of the key analytic strategies of comparative research—examining cases sharing specific combinations of causal conditions to see if they share the same outcome" (Ragin, 2008, p. 24). When there is a lack of empirical cases in a causal recipe, this is termed a logical remainder.

Logical remainders are common in fs/QCA due to the limited diversity that exists in the social world (Ragin, 2008). Logical remainders provide information to the researcher and are used for counterfactual analyses. Counterfactual analyses allow the researcher to pare down causal recipes to more meaningful combinations. For example, cases that exhibit the outcome might differ from cases that do not by only one causal condition. This provides the researcher information about the relative importance of that construct. The truth table is the primary tool for uncovering the set relations in fs/QCA. Once the truth table is constructed, the researcher then needs to score causal combinations in the fs/QCA analysis based on two factors—consistency and coverage—that are then used in decisions on retaining specific combinations.

Consistency

Consistency is the degree to which the data support the set theoretical claim espoused by the researcher (i.e., necessity or sufficiency). For sufficiency, consistency indicates the degree to which a cause (or causal recipe) is in fact a subset of the outcome. Consistency scores range from 0–1, where 0 indicates that the causal combination is not a subset of the outcome and 1 indicates that the causal recipe is a perfect subset of the outcome. Ragin (2000, 2008) suggested that for sufficiency, causal recipes should only be retained if their consistency score is 0.80 or higher. In other words, a consistency score of 0.80 for sufficiency provides evidence that the cause is a subset of the outcome. For necessity, consistency indicates the degree to which the outcome is a subset of the cause. Ragin (2000, 2008) suggested for a cause to be necessary that its consistency score should ideally be as close to 1 as possible, but consistency scores above 0.90 are acceptable. A consistency score of 0.90 (or above) for necessity indicates that the outcome is a subset of the cause.

Coverage

After each causal recipe is scored for consistency, it is scored for *coverage*. Coverage refers to the proportion of cases that exhibit the outcome that the causal condition(s) explain. In essence, coverage is conceptually similar, but not mathematically equivalent, to a measure of statistical effect size (e.g., "total variance explained"). There are three types of coverage. *Raw coverage* refers to the proportion of cases that exhibit the outcome that the causal input explains, regardless of conceptual overlap with other causal inputs. *Unique coverage* refers to proportion of cases that exhibit the outcome that a causal input uniquely covers. Unique coverage is conceptually similar to "partitioned (or unique) variance" in multiple regression (for more detail, see Ragin, 2008). Finally, *solution coverage* refers to the proportion of cases that exhibit the outcome that is covered by all causal inputs (or causal recipes).

Fuzzy Sets and Calibration

In the previous examples, all of the sets described were discussed as crisp sets. Crisp sets are groups that cases do or do not belong to. For example, a case is either in the group that experienced self-disclosure or not. However, in the social sciences, relatively few causal conditions of interest are dichotomous in nature, and cases may have varying degrees of membership in the resulting "fuzzy sets" (Ragin, 2000). fs/QCA incorporates fuzzy sets via a process known as calibration.

Membership scores in fuzzy sets range from 0 (complete non-membership in the set) to 1 (full membership in the set). Individual cases can receive scores along this continuum, indicating partial membership in the set. Researchers use their knowledge of the cases to indicate what should equal full membership and complete non-membership. This is accomplished by recoding variables such that certain values are equivalent to 0 or 1, and other values are scored with intervening values. For example, if the difference between 1 and 2 on a 7-point Likert scale is not particularly meaningful to the researcher, both might be recoded as 0. Similarly, values of 5 or higher might functionally represent full membership in a set and be recoded as 1. An intervening value would be designated as indicating the closest point to true ambiguity (or complete fuzziness) between categories (designated the *crossover*) and be scored as 0.5. Any remaining values will receive intermediate scores (e.g., in the scheme just described, a score of 3 might be recoded to a 0.18: more out of the set than in it but not completely out). This process is termed calibration. In the current analyses, for example, the 1–7 variable representing the *general valence* of an interaction was recoded in exactly the manner just described: Individuals with scores 5 and above were considered full members having positive communication with the imagined outgroup member, individuals with scores of 2 or below were considered out of the group (not having positive communication), individuals scoring a 3 were recoded as 0.18, and individuals with scores of 4 were considered neither in nor out of the group (coded as 0.50: see calibration column in Table 1). These "cut-offs" were determined by examining histograms for natural cut-off points in the distribution. For example, a *general valence* score of 2 was selected as completely out of

Table 1 Calibration and Descriptive Statistics

Variable	Calibration	Descriptives	Present or Absent
Communication Valence Scale		$M = 0.50$ $SD = 0.38$	Present
General Valence	Full = 5; Crossover = 4; Out = 2		
Positive Valence	Full = 6; Crossover = 4; Out = 1		
Negative Valence	Full = 6; Crossover = 5; Out = 1		
Self-Disclosure	Full = 4.5; Crossover = 3.25; Out = 2.75	$M = 0.55$ $SD = 0.40$	Present
Future Interaction	Full = 5; Crossover = 4; Out = 3	$M = 0.55$ $SD = 0.42$	Present
Positive Affect	Full = 5; Crossover = 4; Out = 3	$M = 0.43$ $SD = 0.35$	Present
Negative Affect	Full = 4; Crossover = 3; Out = 2	$M = 0.57$ $SD = 0.24$	Absent
Conservative	Full = 7; Crossover = 4; Out = 1	$M = 0.43$ $SD = 0.30$	Absent
Sympathy	Full = 4; Crossover = 3; Out = 2	$M = 0.51$ $SD = 0.37$	Either
Pity	Full = 4; Crossover = 3; Out = 2	$M = 0.50$ $SD = 0.38$	Either
Typicality	Full = 5; Crossover = 4; Out = 3	$M = 0.51$ $SD = 0.36$	Either
Attitudes Toward Illegal Immigrants	Full = 6; Crossover = 4; Out = 2	$M = 0.57$ $SD = 0.38$	

Note: The individual items for summated scales (positive affect, negative affect, typicality, and self-disclosure) were all calibrated using the same calibration structure prior to scale calculation; hence, the specific items were not listed here.

the set because there were several individuals at this level ($N = 17$), but very few below, indicative of trivial variation between points 1 and 2 on this scale.

The Current Study

The current study examines whether there are necessary, sufficient, and INUS causes for intergroup contact effects using an imagined contact scenario. Imagined contact is a simulation of an interpersonal conversation with an outgroup member that is imagined by the individual (Crisp & Turner, 2009). Crisp and Turner (2009) argued that imagined contact is theoretically similar to traditional face-to-face contact incorporating the basic tenets of intergroup contact theory. Imagined contact has been shown to reduce prejudice toward outgroup members through the same mechanisms as face-to-face contact (Turner, Crisp, & Lambert, 2007). Research findings on imagined contact are often based on experimental methods and do not simply reflect a

self-fulfilling prophecy wherein people who have positive attitudes about towards the group also imagine more positive interactions. For example, while individuals who were more negatively predisposed and anxious about intergroup contact demonstrated less change in their attitudes, they still revealed significant positive effects (Birtel & Crisp, 2012). This form of contact is useful in the context of this study because it forces individuals to be introspective and focus on their emotional states; recent research suggests that such states are influential in determining outcomes of contact (Tam et al., 2006). Individuals in the current study imagined an interpersonal interaction with an illegal immigrant and we examined the processes by which such contact affected attitudes about illegal immigrants. The study took place in the southwestern United States, in an area where illegal immigration is a major regional issue.

Much as with the traditional development of hypotheses, fs/QCA requires the researcher to identify what causal inputs should be present or absent for a specific outcome (conceptually similar to a directional hypothesis), as well as to identify causal inputs that may be either present *or* absent (conceptually similar to a non-directional hypothesis). These decisions happen *a priori* based on theory and substantive knowledge. In the current analysis, positive communication valence, self-disclosure, future interaction, and positive affect toward the illegal immigrant were all predicted to be present in producing positive attitudes toward illegal immigrant, whereas negative affect during the interaction was predicted to be absent (see Table 1). Conservative political ideology was predicted to be absent in producing positive attitudes toward outgroup members because research has found that conservatives tend to have more favorable views toward dominant groups in society (Nosek, Banaji, & Jost, 2009), which illegal immigrants are not. In addition, research suggests that conservatives are less open-minded and more resistant to ideological change (Carney, Jost, Gosling, & Potter, 2008). In the case of pity, sympathy, and typicality, specific predictions about presence/absence were unclear and so both possibilities were left open ("either" in Table 1). Research incorporating the stereotype content model has found that sympathy and pity are related to both positive and negative perceptions of outgroup members (Cuddy et al., 2007). For example, pity and sympathy are related to perceptions of older adults being warm (positive) but also incompetent (negative). Similarly, typicality is associated with both positive and negative outcomes. Having contact with an outgroup member that is typical of their group is important in leading to generalization to the outgroup as a whole (positive: Brown & Hewstone, 2005), but outgroup member typicality is also associated with more negative interactions (negative: Paolini et al., 2010). Because these variables lead to mixed predictions, we modeled them as potentially being either present or absent in producing positive attitudes toward illegal immigrants.

Method

Participants

Participants recruited from communication classes at a large southwestern U.S. university participated in exchange for extra credit in their class. The experimental stimulus (described below) involved contact with an illegal immigrant; in the

southwest United States, the majority of discussion about illegal immigration surrounds border-crossings from Latin America. Therefore, Latinos and non-U.S. citizens were excluded from the analyses (final $N = 98$). The final sample was a majority female ($N = 65$; 66.3%) and the average age was 22.48 ($SD = 4.80$).

Procedure

Participants were randomly assigned to imagine themselves in either a positive or a negative interaction with an unfamiliar illegal immigrant. Participants were given a series of prompts that both encouraged elaboration on the imagined experience and yielded open-ended responses (e.g., "What did the person look like?", "What did you talk about?"). In addition to the open-ended questions, closed-ended scales measured a variety of aspects of the interaction (see following). The results of the experimental manipulation are reported elsewhere (Harwood, Paolini, Joyce, Rubin, & Arroyo, 2011). The data were reanalyzed including a crisp set variable for experimental condition, but this variable did not change any of the substantive relationships reported here. More specifically, the experimental variable was coded such that the positive communication condition was coded as 1 and the negative communication condition was coded as 0. The inclusion of this variable did not influence the causal recipes because the variables that the manipulation was intended to influence were coded and included in the analyses. Because the current report is not focused on the experimental manipulation, this variable is excluded from the current analyses.

Causal Conditions

Communication valence. The open-ended responses were coded by two trained undergraduate coders who were blind to the study's purpose. The responses were coded with three separate items indicating communication valence. The first two items assessed how positive and negative the communication was between the interactants (1 = Not at All; 7 = Very Much; Krippendorff $\alpha = 0.67$ and 0.78, respectively). The third item was a semantic differential (Negative/Positive; Krippendorff $\alpha = 0.66$). The intercoder reliablities were calculated with approximately 30% of the sample ($N = 31$). In the case of disagreement, the coders' responses were mathematically averaged. These three items were combined into a communication valence scale with higher scores indicating more positive communication (Cronbach's $\alpha = 0.96$).

Self-disclosure. Participants rated the extent to which they felt that they had both received and provided self-disclosure during the imagined interpersonal conversation (e.g., "How much personal information did you disclose?") on a seven-point scale. The four items were averaged, with higher scores equaling higher levels of self-disclosure (Cronbach's $\alpha = 0.76$)

Future interaction/friendship potential. Using a single item, participants rated the extent to which they were likely to socialize and interact with someone from that social group in the future (1 = Very Unlikely; 7 = Very Likely).

Positive affect towards the partner. Participants rated the extent to which they felt four positive emotions toward their interaction partner: enjoyment, pleasure, admiration, and respect on a five-point scale. These scores were averaged, with higher scores indicating higher levels of positive affect towards the interactant (Cronbach's $\alpha = 0.89$).

Negative affect during the interaction. Participants rated how much they felt uneasiness and anxiety during their interaction on a five-point scale. These items were averaged, with higher scores indicating higher levels of negative affect during the interaction (Cronbach's $\alpha = 0.92$).

Political ideology. Participants provided their political ideology with a single-item semantic differential scale. Specifically the item asked, "What position best describes your political views (1 = Liberal/Democrat; 7 = Conservative/Republican)?"

Pity/sympathy. Participants rated the extent to which they felt (a) pity and (b) sympathy towards their interaction partner (1 = Never; 5 = Very Often).

Typicality. Participants rated the extent to which they thought their communication partner was typical of illegal immigrants with four items on a seven-point scale (e.g., "How much did your interaction partner seem typical of illegal immigrants?"). The scores were averaged, with higher scores indicating higher levels of typicality (Cronbach's $\alpha = 0.70$).

Outcome Measure

Participants rated the extent to which they felt cold/unfavorable (1) or warm/favorable (9) towards illegal immigrants, such that higher scores indicated more positive attitudes toward illegal immigrants. To ensure that this measure represented an exogenous outcome variable rather than a reflection of a predisposition, participants in the positive and negative imagined contact conditions were compared on this outcome measure. Participants in the positive imagined contact condition were significantly more favorable towards illegal immigrants than participants in the negative condition, $t(66) = 2.32$, $p < 0.05$, $d = 0.57$, reinforcing that this measure is in fact an exogenous outcome variable.

Analysis (Fs/QCA)

All variables were calibrated using the fs/QCA calibration procedure (Ragin, 2008; see our earlier discussion of this process). Table 1 provides calibration decisions and descriptive statistics. To examine the necessary and sufficient causal conditions for intergroup contact in producing positive attitudes toward illegal immigrants, two sets of fs/QCA analyses were conducted. All analyses were conducted using the fs/QCA software 2.0 (www.u.arizona.edu/~cragin/fsQCA/software.shtml).

The first step of fs/QCA analysis is to test for *necessary* conditions in producing the outcome of interest (i.e., positive attitudes toward immigrants). The second stage is conducting tests for *sufficiency*, based on the present/absent/either specifications in Table 1. Decisions on combinations of variables indicating sufficiency are made on the basis of two types of coverage statistic. The first is raw coverage, which refers to the total proportion of cases in each vector space (the causal configuration), regardless of overlap with other causal configurations. The second is unique coverage, which refers to the total proportion of cases in each vector space parceling out overlap with other causal configurations. For the current analyses, the truth table rows were coded if they had one empirical case and had a consistency score of at least 0.80, as recommended by Ragin (2008). Causal recipes were retained if the unique coverage was at least 1%. These decisions represent a fine-grained analysis (Ragin, 2008). We took this approach because our experimental data are representative of a "medium-*N*" design ($N = 98$), and only about half of our participants received the positive induction (with those individuals more likely to exhibit the outcome). Hence, our analysis is comparable to macro-level work in sociology, wherein retaining causal combinations with one empirical case is normative (Ragin, 2000). Moreover, while the unique coverage is small, it is similar to that of other individual level data (C. Ragin, personal communication, January 2011).

Three types of solutions are given by the fs/QCA software: complex, parsimonious, and intermediate. These solutions are differentiated by the way they incorporate logical remainders (causal configurations in the truth table that do not have any empirical instances and are used counterfactually to derive the solution). The inclusion of logical remainders increases the amount of information available, and typically this allows the analyst to achieve more parsimonious causal recipes (see earlier discussion of logical remainders). Complex solutions incorporate no logical remainders and provide the least parsimonious solution. Intermediate solutions use theoretical logical remainders, as specified prior to the truth table analysis. As suggested by Ragin (2008), the current study uses the intermediate solution. All variables in this analysis utilize fuzzy sets, so a *specific case* may be represented in one or more truth table rows. As suggested by Epstein, Duerr, Kenworthy and Ragin (2008) the truth table configuration should be thought of as representing "case aspects rather than the cases themselves" (p. 76).

Results

Based on intergroup contact theory research, we sought to parcel out the necessary and sufficient causal conditions producing positive attitudes toward illegal immigrants. First, the data revealed that there were no necessary (or almost necessary) conditions for intergroup contact in producing positive attitudes toward illegal immigrants, as indicated by the consistency scores for causal necessity being below the 0.90 threshold suggested by Ragin (2000). In other words, our analysis indicates that positive attitudes are not a subset of any specific causal condition.

Next, tests for sufficiency were conducted. The fs/QCA analysis yielded six sufficient causal recipes. Causal recipes were retained if their consistency score for sufficiency was 0.80 or above, and the unique coverage was at least 1%. Consistency scores refer to how well the data fit the sufficient subset relationship. Table 2 shows the causal combinations' conditions, consistency, and coverage. For ease of understanding, the six causal combinations have been grouped such that causal combinations sharing causal factors are combined. For example, the first set of causal combinations each recipe shared was *not* being conservative, feeling pity for the interactional partner and feeling sympathy for the interactional partner. However, these were INUS causal conditions such that they took place together with other causal inputs indicated by the causal recipes (i.e., must be combined with either the factors in 1a or 1b). These analyses indicate that these causal conditions are sufficient causal recipes for membership in the group of people with positive attitudes toward illegal immigrants (i.e., they produce positive attitudes toward illegal immigrants, but other causes can also produce such attitudes as well).

Causal Combinations 1a and 1b

The base causal conditions for this recipe (i.e., the conditions that these two causal recipes share) are *not* being conservative, feeling pity for the interaction partner, and feeling sympathy for the interaction partner (Table 2). In addition to the base, the outcome can be achieved with either (1a) experiencing self-disclosure and feeling that the interaction partner was *not* typical of illegal immigrants or (1b) feeling that the interaction partner was typical and reporting a likelihood of future interaction with illegal immigrants. These are distinct patterns of effects that nonetheless share certain features. When working with individual level data, configuration overlap and causal complexity of this kind is common and indeed desirable because it speaks to the complex nature of social phenomena (Ragin, 2008).

Causal Combinations 2a and 2b

The base causal conditions for this recipe are *not* being conservative, feeling sympathy towards the interaction partner, *not* experiencing negative affect during the interaction, experiencing positive affect towards the partner, and having positive communication valence. As with the previous recipe, there are two distinct paths that emerge in producing positive attitudes toward illegal immigrants. The first (2a) is that the individual can perceive their interaction partner as typical of their social group and report that it was likely that they would have future interaction with members of that social group. The second (2b) is that individual can perceive the interaction partner as *not* typical of their social group while feeling pity towards their interaction partner.

Casual Combinations 3a and 3b

The third base causal recipe included reporting sympathy toward the interaction partner, self-disclosure with the interaction partner, experiencing positive affect

Table 2 Sufficient Causal Combinations in Producing Positive Attitudes Toward Illegal Immigrants

	Positive Communication	Self-Disclosure	Future Interaction	Positive Affect	Negative Affect	Conservative	Sympathy	Pity	Typicality	Coverage	Consistency
1a.		●				○	●	●	○	0.19	0.86
1b.			●			○	●	●	●	0.17	0.90
2a.	●		●	●	○	○	●		●	0.19	0.94
2b.	●			●	○	○	●	●	○	0.16	0.86
3a.	●	●		●	○		●	●	○	0.16	0.87
3b.	●	●	●	●			●		●	0.21	0.87

Note: The solution coverage for the current analysis is 0.42 and the solution consistency: 0.84. ● =Causal input is present in producing the outcome; ○ =Causal input is absent in producing the outcome.

towards the interaction partner, and having positive communication valence. Again, there are two distinct paths that produce positive attitudes toward illegal immigrants. The first (3a) is perceiving their conversation partner as *not* typical, feeling pity towards them, and reporting *not* experiencing negative affect during the interaction. The second (3b) is that they perceive their interaction partner as typical of illegal immigrants and report that it is likely that they will have a future interaction with a member of that social group.

Discussion

The current study examined the necessary and sufficient causal conditions for intergroup contact in producing positive attitudes toward illegal immigrants. Intergroup contact theorists (e.g., Pettigrew, 1998) argue that there are four necessary structural conditions that needed to be present for intergroup contact theory to be effective in producing intergroup harmony. More recent theorizing suggests that individual-level emotional factors, such as an absence of anxiety, and self-disclosure with the outgroup member are needed in order for communication between social groups to improve intergroup attitudes (Brown & Hewstone, 2005). Meta-analytic research has suggested that all of the above can improve the outcomes of contact but are not necessary (Pettigrew & Tropp, 2006). Although this previous work provides valuable insights into the role of communication in predicting intergroup outcomes, this linear net-effects approach (e.g., regression) is not able to discuss necessity or sufficiency because these relationships are, by definition, asymmetrical. Moreover, these net-effects approaches do not provide insight into the complex nature of causality. To address these issues, the current study utilized fs/QCA methodology to test for asymmetrical relationships between the theorized plurality of causes and positive attitudes toward illegal immigrants. While this methodology is gaining traction in other disciplines outside of sociology, this study represents the first test of the fs/QCA methodology as applied to intergroup communication.

We found that among the most theorized contact-related factors there were no necessary causal conditions for intergroup contact to be successful for intergroup outcomes; our analyses indicate that positive attitudes toward illegal immigrants was not a subset (or near subset) of any of the causal conditions. These findings support and add clarity to the previous meta-analytic work by Pettigrew and Tropp (2006), which suggested that regardless of the presence and quantity of variety of potential moderators, there was a positive baseline effect of contact on intergroup attitudes. Our research provides further evidence that the causal inputs in this literature are facilitative rather than necessary.

Implications for Intergroup Contact

The existence of facilitative variables suggested that there would be sufficient rather than necessary conditions, a supposition which the current study supported. Our

analysis reveals a theoretically consistent set of causal recipes—combinations of specific predictors—that result in positive attitudes toward illegal immigrants. We found that communication constructs, which have been relatively ignored in previous research, work together with affective components in producing positive attitudes toward illegal immigrants. Either a reduction in negative affect or an increase in positive affect combined with the quality and type of the communication in yielding positive attitudes toward illegal immigrants. More specifically, self-disclosure adds to three of the causal combinations, combining with positive communication in two of those cases. A great deal of research suggests that self-disclosure is linked with positive relationships and interactions generally (Ledbetter et al., 2011) and also serves as a mediator between positive intergroup contact and positive attitudes towards the outgroup member (Turner, Voci, & Hewstone, 2007).

Most interesting, both the presence *and* the absence of typicality serve as INUS conditions for positive intergroup attitudes: Both typicality and *a*typicality contribute to causal combinations resulting in positive outcomes. Past research helps unravel this paradox. Brewer (1996) suggested that the best way to improve attitudes towards a group was to break down the perceived homogeneity of that group by finding ways to differentiate the outgroup member from the stereotypes of the outgroup. Through this process of reducing typicality, the outgroup member was *personalized* and made to be seen as a unique individual. This had the effect of improving reported attitudes about the group by reducing the apparent applicability of the stereotype. In our study, when non-typicality is paired with a person-centric emotion (pity) or person-centric communication (self-disclosure), intergroup attitudes are improved. However, Brown and Hewstone (2005) suggested that positive feelings toward an outgroup individual generalize more efficiently to other outgroup members when the outgroup individual is considered typical of their group. Our study also supported this, finding that typicality was a part of a sufficient causal recipe for positive intergroup attitudes but only when linked with expectations of future contact. Only when we expect to interact with outgroup members in the future does an outgroup member's typicality contribute to positive outgroup attitudes. This finding adds a new dimension to our understanding about why typicality, and in other cases the lack of it, is so important. In the context of intergroup contact theory, the finding offers some resolution to conflicting positions on the effects of typicality, indicating when and why it can have both positive and negative effects. The results for typicality provide a compelling illustration of the complex cognitive processes that can be revealed within the fs/QCA approach. Moreover, such findings provide novel directions for future hypothesis testing in this area (e.g., examining and manipulating typicality at various stages of the relational process).

Intergroup contact is frequently applied in the real world as a prejudice reduction strategy, with theory suggesting that imagined intergroup contact is a positive first step in improving intergroup relations (Crisp & Turner, 2010). Traditional social scientific approaches to intergroup contact have dealt with the complexity of communicative and psychological variables by exercising as much control as possible and dealing with any leftover "error" as a nuisance. On the other hand, our approach

provides a way to treat this "error" more accurately by recognizing that even within this strategy, there are multiple pathways to success. Ultimately then, these types of causal recipes may be more useful to researchers who prefer not to ignore error brought about by individual differences or contextual factors.

Although our findings are consistent with intergroup contact theory, they specifically apply to a situation in which members of a higher status group (i.e., Whites) imagine contact with a low-status group (i.e., illegal immigrants). Hence, we might expect our findings to extend to scenarios where individuals with higher status (e.g., heterosexuals, Whites, younger adults) positively communicate with individuals that have a lower status (e.g., gay and lesbians, Hispanics, older adults). Although the preponderance of intergroup contact research has examined the effect of contact on high status group members (Pettigrew & Tropp, 2006), it should be noted that these findings may not extend to scenarios where low-status group members imagine contact with people from lower status outgroups (Stathi & Crisp, 2008).

Implications for Communication Research

Intergroup contact provides a good context to demonstrate the utility of the fs/QCA in communication research. First, in both the original conception and in more recent extensions of this theory, scholars have explicitly stated that the relationships between the variables of interest are necessary. Second, many important theoretical constructs have been proposed to work together in producing positive intergroup attitudes. Third, although intergroup contact represents a specific type of communication, we believe that the fs/QCA approach allows researchers to examine both the asymmetrical relationships and causal complexity of communication conditions across a wide variety of contexts. fs/QCA is typically used in comparative macro-level research to examine why particular cases have produced certain outcomes. However, in our research, we move to the micro level use fs/QCA to examine expectations and consequences of intergroup communication within the individual. Using imagined contact limits our ability to generalize about what would happen in a bilateral, uncontrolled, intergroup interaction, but it allows us to more accurately examine what combinations of events lead to positive outcomes for individuals. While expectations and reality may not always be analogous, our study finds causal combinations that echo the research on face-to-face contact, providing some evidence for generalizability. Because this methodological approach deals so ably with the non-parsimoniousness of real life, it can be applied to many other content areas within the field of communication that often struggle with this complexity.

Communication research often yields small effect sizes. In part, these are a function of being unable to examine complex combinations of predictors, even though we typically realize that our outcome variables are multiply determined. In other words, the outcomes most interesting to communication scholars are ones in which multiple exogenous and endogenous variables act and interact simultaneously. However, it is simply not possible to meaningfully interpret four- or five-way interaction effects, and so we are stuck with examining only a limited degree of complexity in our

predictors. As a result, communication researchers often resign themselves to looking at only a few variables at a time and, as a result, miss out on the larger theoretical picture. On the other hand, fs/QCA permits examination of complex combinations far beyond the reach of general linear model techniques. If a given persuasive appeal only has the desired effect on a certain type of person in a certain context when the message concerns a certain topic, fs/QCA has the potential to sniff out that unique set of circumstances and lay out the causal recipe for effective influence.

This is not to say that fs/QCA is a panacea or that it replaces experimental research. On the contrary, a strength of this approach is its ability to deductively guide and focus experimental research. Simply put, fs/QCA informs experimental research by illuminating variables that explain *how* and *when* independent variables work in combination with other variables. In other words, fs/QCA provides novel insight into what moderators or mediators are implicated in predicting the dependent variable and the boundary conditions under which they have their effects. To illustrate, our work suggests that when the conversational partner was atypical, self-disclosure was a particularly important variable in the recipes producing positive intergroup attitudes. On the other hand, for typical conversational partners, the perception of future intergroup interactions was integral to the recipe. Hence, fs/QCA raises the possibility that each level of the independent variable has a distinct process, each with its own moderators or mediators. If an experimenter only looked at self-disclosure as a mediator of typicality, she would either have no tools to explain the differential effect of atypicality or would falsely conclude that atypicality simply leads to less positive attitudes. Conversely, we found that positive communication leads to positive attitudes for people who imagined contact with either an atypical or typical interlocutor. Hence, under an experimental manipulation of conversational partner typicality, positive communication leads to positive intergroup attitudes for *both* levels of the independent variable. These types of distinctions can clarify our theoretical understanding of communication, and they provide novel tools for designing experimental research. Using the findings described above, experimenters could avoid null effects by including specific companion variables relevant to their focal predictor. Surveys and structural models serve a similar function, but fs/QCA yields more information about which variables have necessary or sufficient causal impacts on the dependent variables, which is useful information when planning an experiment.

Our goal was to contribute to the theoretical and methodological understanding of intergroup contact, specifically, and communication research, more broadly. We have shown that the conditions proposed by intergroup contact theory are sufficient, but not necessary, in producing positive intergroup outcomes. These sufficient communication inputs, such as self-disclosure and positive communication valence, are important conditions that work with affective processes in producing positive attitudes toward illegal immigrants in a variety of viable combinations. While previous meta-analytic work implied that there might not be a wrong way to do contact (Pettigrew & Tropp, 2006), this research suggests that there are multiple combinations of critical variables that aid in doing it right. This type of conclusion is useful

to practitioners who may prefer a more holistic view of what is effective over narrowly defined demonstrations concerning a single parameter. While we acknowledge the importance of regression-based work in the research process, we believe that the fs/QCA methodology allows for a different type of conclusion that has the potential to provide more sophisticated insights on a multitude of diverse communication phenomena.

References

Allport, G. W. (1954). *The nature of prejudice*. Reading, MA: Addison-Wesley.

Birtel, M. D., & Crisp, R. J. (2012). Imagining intergroup contact is more cognitively difficult for people higher in intergroup anxiety but this does not detract from its effectiveness. *Group Processes & Intergroup Relations*, *15*(6), 744–761. doi:10.1177/1368430212443867

Brewer, M. B. (1996). When contact is not enough: Social identity and intergroup cooperation. *International Journal of Intercultural Relations*, *20*, 291–303. doi:10.1016/0147-1767(96)00020-X

Brown, R., & Hewstone, M. (2005). An integrative theory of intergroup contact. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (vol. 37, pp. 255–342). San Diego, CA: Elsevier. doi:10.1016/S0065-2601(05)37005-5

Campbell, D. T., & Stanley, J. C. (1963). *Experimental and quasi-experimental designs for research*. Chicago, IL: Rand-McNally.

Carney, D. R., Jost, J. T., Gosling, S. D., & Potter, J. (2008). The secret lives of liberals and conservatives: Personality profiles, interaction styles, and the things they leave behind. *Political Psychology*, *29*, 807–840. doi:10.1111/j.1467-9221.2008.00668.x

Crisp, R. J., & Turner, R. N. (2009). Can imagined interactions produce positive perceptions?: Reducing prejudice through simulated social contact. *American Psychologist*, *64*, 231–240. doi:10.1037/a0014718.

Crisp, R. J., & Turner, R. N. (2010). Having confidence in contact. *American Psychologist*, *65*, 133–135. doi:10.1037/a0018437

Cuddy, A. J., Fiske, S. T., & Glick, P. (2007). The BIAS map: Behaviors from intergroup affect and stereotypes. *Journal of Personality and Social Psychology*, *92*, 631–648. doi:10.1037/0022-3514.92.4.631

Epstein, J., Duerr, D., Kenworthy, L., & Ragin, C. (2008). Comparative employment performance: A fuzzy-set analysis. In L. Kenworthy & A. Hicks (Eds.), *Method and substance in macro-comparative analysis* (pp. 67–90). New York, NY: Palgrave MacMillan.

Harwood, J. (2010). The contact space: A novel framework for intergroup contact research. *Journal of Language and Social Psychology*, *29*, 147–177. doi:10.1177/0261927×09359520.

Harwood, J., & Joyce, N. (2012). Intergroup contact and communication. In H. Giles (Ed.), *Handbook of intergroup communication* (pp. 167–180). New York: Routledge.

Harwood, J., Paolini, S., Joyce, N., Rubin, M., & Arroyo, A. (2011). Secondary transfer effects from imagined contact: Group similarity affects the generalization gradient. *British Journal of Social Psychology*, *50*, 180–189. doi:10.1348/014466610X524263

Ledbetter, A. M., Mazer, J. P., DeGroot, J. M., Meyer, K. R., Mao, Y., & Swafford, B. (2011). Attitudes toward online social connection and self-disclosure as predictors of Facebook communication and relational closeness. *Communication Research*, *38*, 27–53. doi:10.1177/0093650210365537

Nosek, B. A., Banaji, M. R., & Jost, J. T. (2009). The politics of intergroup attitudes. In J. T. Jost A. C. Kay H. Thorisdottir J. T. Jost A. C. Kay H. Thorisdottir (Eds.), *Social and psychological bases of ideology and system justification* (pp. 480–506). New York: Oxford University Press. doi:10.1093/acprof:oso/9780195320916.003.020

Paolini, S., Harwood, J., & Rubin, M. (2010). Negative intergroup contact makes group memberships salient: Explaining why intergroup conflict endures. *Personality and Social Psychology Bulletin*, *36*, 1723–1738. doi:10.1177/0146167210388667

Pettigrew, T. F. (1998). Intergroup contact theory. *Annual Review of Psychology*, *49*, 65–85. doi:10.1146/annurev.psych.49.1.65

Pettigrew, T. F., & Tropp, L. R. (2006). A meta-analytic test of intergroup contact theory. *Journal of Personality and Social Psychology*, *90*, 751–783. doi:10.1037/0022-3514.90.5.751

Ragin, C. C. (1987). *The comparative method: Moving beyond qualitative and quantitative strategies*. Los Angeles, CA: University of California Press.

Ragin, C. C. (2000). *Fuzzy-set social science*. Chicago, IL: University of Chicago Press.

Ragin, C. C. (2008). *Redesigning social inquiry: Fuzzy sets and beyond*. Chicago, IL: University of Chicago Press.

Soliz, J., Ribarski, E., Harrigan, M. M., & Tye-Williams, S. (2009). Perceptions of communication with gay and lesbian family members: Predictors of relational satisfaction and implications for outgroup attitudes. *Communication Quarterly*, *58*, 77–95. doi:10.1080/01463370903538622

Stathi, S., & Crisp, R. J. (2008). Imagining intergroup contact promotes projection to outgroups. *Journal of Experimental Social Psychology*, *44*, 943–957. doi:10.1016/j.jesp.2008.02.003

Tam, T., Hewstone, M., Harwood, J., Voci, A., & Kenworthy, J. (2006). Intergroup contact and grandparent-grandchild communication: The impacts of self-disclosure on implicit and explicit biases older people. *Group Processes & Intergroup Relations*, *9*, 413–429. doi:10.1177/1368430206064642

Turner, R. N., Crisp, R. J., & Lambert, E. (2007). Imagining intergroup contact can improve intergroup attitudes. *Group Processes & Intergroup Relations*, *10*, 427–441. doi:10.1177/1368430207081533.

Turner, R. N., Voci, A., & Hewstone, M. (2007). Reducing explicit and implicit prejudice via direct and extended contact: The mediating role of self-disclosure and intergroup anxiety. *Journal of Personality & Social Psychology*, *93*, 369–388. doi:10.1037/0022-3514.93.3.369