When Bias Binds: Effect of Implicit Outgroup Bias on Ingroup Affiliation

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We tested a novel process we term *implicit homophily* in which perceivers' implicit outgroup bias shapes their affiliative responses toward ingroup targets with outgroup friends as a function of perceived similarity. Across 4 studies, we tested implicit homophily in the context of racial groups. We found that White participants with higher implicit anti-Black bias reported less affiliative responses toward White targets with Black friends compared with White targets with White friends, and this effect persisted above and beyond the effects of implicit pro-White bias and explicit racial bias (Studies 1–3). We further found evidence that this relationship between implicit anti-Black bias and affiliation exists because participants infer how comfortable targets are around outgroup members (Preliminary Study) and use this information to infer similarity on this dimension (Studies 1–3). Our findings also suggested that stigma transference and expectancy violation were not viable alternative mediators (Preliminary Study and Study 1). Finally, women's implicit anti-Black bias predicted their likelihood of having Facebook friends with Black friends, providing ecological and behavioral evidence of implicit homophily (Study 4). Implications for research on stigma by association, extended contact, affiliation, and network formation are discussed.

Keywords: implicit bias, similarity, affiliation, stigma by association, extended contact

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It is well documented that implicit outgroup bias impairs individuals' *intergroup* interactions (Dasgupta, 2004; Greenwald, Poehlman, Uhlmann, & Banaji, 2009; Jost et al., 2009). However, the impact of outgroup bias on *ingroup* affiliation may be currently underappreciated. In the present research we propose that irrespective of explicitly espoused group-based attitudes, people may be subtly attracted to ingroup members they perceive as having the same subjective re-

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sponses to intergroup contact, a process we have termed *implicit homophily*. Specifically, we hypothesize that because implicit bias predicts one's responses toward outgroup members, it may also predict one's perceived similarity to ingroup members in response to their degree of intergroup interaction. For example, an individual with high implicit anti-Black bias may be less likely than an individual with low implicit bias to perceive a person with Black friends as being similar to herself—regardless of her implicit ingroup favoritism or whether she believes herself to have positive or negative attitudes toward Blacks. In turn, one's level of perceived similarity to another person should predict affiliative responses toward them (Berscheid, 1985). We test this implicit homophily hypothesis in an interracial context and show that implicit racial bias predicts liking of ingroup members via perceived similarity.

Implicit homophily has numerous implications. Theoretically, the proposed process informs extant research on stigma by association (Goffman, 1963) and provides a new perspective on the mechanisms affecting how nonstigmatized individuals are evaluated in light of associations with stigmatized others. Rather than being driven by transference of stigma from one person to another, implicit homophily suggests that individuals with a similar response to a third party may experience similarity-based attraction. Therefore, observed intergroup contact can have either a positive or negative impact on ingroup affiliation depending on the perceiver's implicit bias.

Implicit homophily also has practical implications insofar as this process determines the likelihood that one might meet outgroup

members through friends (i.e., indirect contact). For instance, it suggests that individuals' social networks are likely to become disproportionally populated by people with similar amounts and quality of intergroup contact to their own. As a result, people with greater implicit bias not only will be less likely to have direct intergroup contact, but will also be less likely to have friends with outgroup friends. Such lack of social network diversity precludes those within it from experiencing indirect contact, what some researchers consider to be one of the most effective and socially viable means of attenuating outgroup biases (Wright, Aron, McLaughlin-Volpe, & Ropp, 1997).

Implicit Intergroup Bias Shapes Intergroup Experiences

Although one's level of implicit bias may not be directly accessible (e.g., Greenwald, McGhee, & Schwartz, 1998 but see Hahn, Judd, Hirsh, & Blair, 2014), there are noticeable differences, both to oneself and to others, in the outgroup comfort and social milieus of individuals high, as opposed to low, in implicit outgroup bias. Whites with higher implicit racial bias exhibit greater nonverbal signs of discomfort (Bessenoff & Sherman, 2000; Dasgupta & Rivera, 2006; Dovidio, Kawakami, & Gaertner, 2002; Dovidio et al., 1997; Fazio Jackson, Dunton, & Williams, 1995; McConnell & Leibold, 2001) and hormonal reactivity indicative of a "fight-or-flight" response (Blascovich, Mendes, Hunter, Lickel, & Kowai-Bell, 2001; Mendes, Blascovich, Lickel, & Hunter, 2002; Page-Gould, Mendoza-Denton, & Tropp, 2008) when interacting with Blacks. They also experience cognitive depletion after interracial interactions from trying to regulate their responses (Govorun & Payne, 2006; Park, Glaser, & Knowles, 2008; Richeson et al., 2003; Richeson & Shelton, 2003; Richeson, Trawalter, & Shelton, 2005; Richeson & Trawalter, 2005). These low-level reactions seem to inform people's conscious expectations for intergroup interactions: Whites with higher levels of implicit racial bias anticipate that they will be less comfortable during an interaction with a Black person than do Whites with lower levels of bias (Towles-Schwen & Fazio, 2003).

People also spontaneously express their discomfort in ways discernable by others (e.g., nonverbal behavior; see Dovidio et al., 2002; Fazio, Jackson, Dunton, & Williams, 1995; McConnell & Leibold, 2001). One clearly discernable consequence of implicit outgroup bias is the diversity of one's social network. Specifically, implicit outgroup bias is negatively associated with one's willingness to engage with outgroup members (Ashburn-Nardo, Knowles, & Monteith, 2003; Heider & Skowronski, 2007; Gabriel, Banse, & Hug, 2007; Neumann, Hülsenbeck, & Seibt, 2004; Towles-Schwen & Fazio, 2003) and quantity of intergroup contact (Aberson & Haag, 2007; Aberson, Shoemaker, & Tomolillo, 2004; Turner, Hewstone, & Voci, 2007). Aberson, Shoemaker, and Tomolillo (2004), for example, found that greater implicit racial bias among Whites was related to having fewer close Black friends.

Given the visceral and visible nature of these social experiences, implicit homophily predicts that individuals are able to sense whether an ingroup member has similar or dissimilar levels of outgroup comfort as they do. We posit that this perceived similarity in terms of intergroup anxieties and experiences forms a basis for people's affiliative judgments toward ingroup members.

Similarity Produces Affiliation

Perceived similarity between individuals is a well-documented determinant of interpersonal attraction and affiliation (Berscheid, 1985; Berscheid, Dion, Walster, & Walster, 1971; Brewer, 1979; Byrne, 1971; Byrne, Clore, & Worchel, 1966; Miller, Downs, & Prentice, 1998; Newcomb, 1961; Golbeck, 2009; Smith & Henry, 1996; Tesser, 1993; Walster, Aronson, Abrahams, & Rottman, 1966; Ziegler & Golbeck, 2007). Even seemingly superficial or coincidental commonalities, such as similarity in names, birthday, or fingerprint pattern, can foster increased liking between people (Burger, Messian, Patel, del Prado, & Anderson, 2004; Gamer, 2005; Jones, Pelham, Carvallo, & Mirenberg, 2004). Further, research from a number of theoretical perspectives suggest that subjective and personally relevant forms of similarity, such as that implied by similar intergroup experiences and preferences, are especially potent sources of affiliative desire. Research on "I-sharing" shows that when we believe we have had the same subjective experience of something as another person, we like them more (Pinel & Long, 2012; Pinel, Long, Landau, Alexander, & Pyszczynski, 2006). Shared reality theory postulates that perceiving similarity in subjective experiences is a necessary component of social relationship formation and maintenance, and it is thus a primary determinant of relational outcomes (Hardin & Conley, 2001; Hardin & Higgins, 1996). Finally, in the domain of racial subject matter, Conley, Rabinowitz, and Hardin (2010) showed that pairs of participants primed to think about the racially charged topic of the O.J. Simpson trial had more positive interpersonal perceptions and outcomes if they shared consensus on the topic compared to pairs that did not.

We propose that because implicit outgroup bias predicts subjective experiences of intergroup interactions, it should also predict perceivers' assumed similarity with ingroup members observed engaging in intergroup contact, even accounting for perceivers' explicit egalitarianism. Specifically, greater implicit outgroup bias should be associated with reduced feelings of similarity toward ingroup members viewed as having outgroup friends, whereas lower implicit bias should relate to greater perceived similarity with the same ingroup members. This level of perceived similarity should, in turn, affect willingness to affiliate with those ingroup members.

Implicit Homophily Expands Stigma by Association Theory

Our implicit homophily hypothesis expands understanding of how contact with outgroup members impacts the way one is socially evaluated. The primary body of work on this question comes from the perspective of stigma by association, the idea that perceivers devalue nonstigmatized individuals who have been linked to someone from a stigmatized group (Goffman, 1963). For example, a heterosexual man might be evaluated more negatively for associating with a homosexual, as opposed to heterosexual, male other (Neuberg, Smith, Hoffman, & Russell, 1994). The present research contributes to, and extends, this literature in three important ways.

First, we propose perceived similarity in outgroup comfort with a target person as a novel mechanism by which individuals are evaluated based on their interpersonal associations with outgroup

members. Across both clinical and social psychology, stigma by association has most commonly been characterized as involving transference of negative affect or perceptions from stigmatized individuals to associated nonstigmatized targets. Stigma researchers have shown that such spread can occur via the conditioning and misattribution of affect afforded by mere physical proximity (Baeyens, Hermans, & Eelen, 1993; Hebl & Mannix, 2003; Jones, Fazio, & Olson, 2009; Penny & Haddock, 2007; Walther, 2002; Walther, Nagengast, & Trasselli, 2005) or because perceivers assume that individuals who fraternize with the stigmatized have undesirable qualities or are otherwise contaminated by their relationship with the stigmatized person (Burk & Sher, 1990; Corrigan & Miller, 2004; Corrigan, Watson, & Miller, 2006; Mehta & Farina, 1988; Rozin, Markwith, & Nemeroff, 1992; Sigelman, Howell, Cornell, Cutright, & Dewey, 1991). Both of these accounts share the central contention that negativity associated with stigmatized individuals transfers to nonstigmatized individuals with whom they are proximal.

One reason stigma by association researchers may have focused on stigma transference is that this perspective fits well with the types of stigma they tend to study. Most of the relevant research on stigma by association concerns gay (Neuberg et al., 1994; Sigelman, Howell, Cornell, Cutright, & Dewey, 1991; Swim, Ferguson, & Hyers, 1999), weight-based (Hebl & Mannix, 2003; Pryor, Reeder, & Monroe, 2012), mental and physical illness (Angermeyer, Schulze, & Dietrich, 2003; Blum, 1991; Corrigan & Miller, 2004; Corrigan et al., 2006; Haber, Roby, & High-George, 2011; Halter, 2008; Mehta & Farina, 1988; Poindexter & Linsk, 1999; Rozin, Markwith, & McCauley, 1994; Rozin et al., 1992; Wight, Aneshensel, Murphy, Miller-Martinez, & Beals, 2006; Wight, Aneshensel, & Wongvipat, 2000), and mental disability stigmata (Birenbaum, 1970, 1992; Gray, 2002; Green, 2003; Phelan, 2005).

There are a number of reasons findings about these more studied stigmata do not necessarily extend to interracial situations, the context that provides the most natural fit for testing the present hypothesis given its close link to implicit bias research. First, these stigmata could be construed as more transmissible than Black stigma. In the case of gay (Cottrell & Neuberg, 2005; Cottrell, Richards, & Nichols, 2010) and weight-based stigmata (Park, Schaller, & Crandall, 2007; Vartanian, 2010), negative evaluations are in part related to feelings of disgust toward these groups. In turn, work on "magical thinking" has shown that people perceive objects that come in contact with disgusting stimuli as acquiring the stimuli's properties (e.g., Rozin, Millman, & Nemeroff, 1986; see also Nemeroff & Rozin, 2000). In contrast, racial stigma is often based on group-specific social threats (Cottrell & Neuberg, 2005; Sears, 1988; Tajfel & Turner, 2004). In addition, studies on stigma by association with mental illness and disability often measure the impact on family members. In these cases, perceived heritability or assumptions that family members are responsible for the stigmatized individual's condition may drive effects (e.g., Corrigan et al., 2006). Such familial concerns are not relevant to ingroup targets seen with racial outgroup members. Finally, with the exception of mental disability, prejudice against Blacks is also deemed less permissible than against these other stigmatized groups (Crandall, Eshleman, & O'Brien, 2002). Given these reasons, race-based stigma may not elicit that same degree of stigma transference these other stigmata do (but see Pryor et al., 2012; Ratliff & Nosek, 2011). It could also be the case that stigma

transference and implicit homophily act simultaneously to affect evaluations of a target person, a possibility we test in the present research.

As the second contribution, this new framework represent a broader theoretical perspective on how viewing intergroup interactions affects social evaluations and assortment than stigma by association theory. Implicit homophily suggests that individuals who are associated with outgroup members may not only be devalued by biased ingroup members, but, as a function of perceived similarity, may also be viewed more positively by egalitarian ones. As such, the present research joins recent work on how the race of a target's friend informs social judgments. Shapiro, Baldwin, Williams, and Trawalter (2011), as well as Wout and colleagues (Wout, Murphy, & Barnett, 2014; Wout, Murphy, & Steele, 2010), have shown that rejection concerns are ameliorated prior to cross-race interactions when the expected interaction partner has a friend from the perceiver's racial ingroup. We extend this research by postulating a different process and investigating whether the presence of an outgroup friend affects affiliation with fellow ingroup members.

Finally, implicit homophily provides clarification regarding the factors that should moderate whether individuals' interactions with outgroup members affects ingroup members' desire to affiliate with them. Most notably, we posit that perceivers' implicit outgroup, rather than ingroup, bias should predict the extent to which they wish to affiliate with ingroup targets. Within the stigma by association literature, surprisingly little work has addressed this fundamental question of whether one's degree of bias against a stigmatized group or for one's own ingroup group predicts the extent to which he or she values individuals associated with members of that group (but see Pryor et al., 2012; Sigelman et al., 1991).[1] Establishing this relationship is necessary to determining whether stigma by association is caused by ingroup favoritism or outgroup antipathy, the relational conditions that produce devaluative association, when it is most likely to occur, and how it can be ameliorated.

Overview of Current Research

In the present set of studies, we test the occurrence of implicit homophily in the context of Black/White interaction and investigate its consequences. We test the implicit homophily hypothesis that Whites' implicit racial bias is negatively related to their affiliative responses to White targets with a Black friend across two paradigms and using two different measures of implicit racial bias (Studies 1–4). In doing so we distinguish whether this relationship is a product of ingroup favoritism (i.e., pro-White bias) or anti-Black bias (Studies 1 and 4). In all experiments we also measure explicit racial bias. Thus, we can determine the effect of implicit racial bias on ingroup affiliation controlling for conscious racial attitudes.

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[1] Pryor et al. (2012) posit a dual process model of stigma transference that conceptually differs from the present work. They argue that explicit prejudice predicts deliberative, conscious devaluation of targets with strong ties to stigmatized individuals (e.g., family members), while implicit prejudice predicts spontaneous, unconscious stigma bleed over across both strong and weak ties (e.g., mere proximity). In contrast, we predict that perceivers infer similarity as a function of their own implicit bias and the apparent outgroup comfort of the target.

Implicit homophily is postulated to be a product of perceived similarity regarding comfort with outgroup members. We seek direct and indirect support for this contention, as well as examine the relevance of alternative explanations. In a preliminary study we test the assumption that Whites perceive fellow Whites with a Black friend as more comfortable around outgroup members than Whites viewed with a White friend. In the Preliminary Study and Study 1 we examine the role of several potential mediators of the relationship between implicit bias and affiliative tendencies toward an ingroup member associated with an outgroup member (i.e., perceived similarity, stigma transference, and expectancy violation). If perceived similarity mediates the proposed process as hypothesized, then implicit outgroup bias should only predict affiliation when the race of the target's friend provides useful social information. Therefore, in Study 1 we also manipulate the apparent relationship between ingroup targets and the people they are presented with to determine whether the effect indeed depends on a meaningful social connection existing between the two. We also test the prediction that perceived similarity drives implicit homophily by manipulating participants' perceived similarity to ingroup targets regarding their comfort with racial outgroup members in Studies 2 and 3.

Finally, in Study 4 we explore whether implicit racial bias predicts the number of friends with Black friends a participant has within an actual online social network (i.e., Facebook). In doing so, Study 4 addresses the potential effect implicit homophily has on prejudice reduction opportunities afforded by indirect contact.

Preliminary Study

Because we expect perceived comfort to form the basis for similarity judgments, we conducted a preliminary investigation testing the assumption that a White target with a Black friend is viewed as more comfortable with outgroup members than a White target depicted with a White friend. Furthermore, we expected that participants' bias should not affect their ability to interpret intergroup contact as indicating outgroup comfort, such that participants both high and low in implicit bias would tend to identify targets with a Black friend as more comfortable with outgroup members. In this preliminary research we measure implicit anti-Black bias to ascertain whether this aspect of our foundational assumption is accurate.

While testing these assumptions, we also tested two alternatives to our hypothesis regarding why implicit outgroup bias should predict affiliative tendencies toward ingroup members associated with stigmatized outgroup members. First, a stigma transference account would predict that nonstigmatized targets take on the negative associations elicited by the stigmatized person with whom they are linked (Baeyens et al., 1993; Burk & Sher, 1990; Coovert & Reeder, 1990; Corrigan & Miller, 2004; Corrigan, Watson, & Miller, 2006; Hebl & Mannix, 2003; Jones et al., 2009; Mehta & Farina, 1988; Penny & Haddock, 2007; Pryor et al., 2012; Rozin et al., 1992; Sigelman et al., 1991; Walther, 2002). For example, Corrigan, Watson, and Miller (2006) found that spouses and other family members of people dealing with drug dependence are seen as at risk of having this illness "rub off" on them. Coovert and Reeder (1990) also showed that participants rated targets as more or less moral depending on the moral valence of their friends' individual behavior. From the stigma transference

perspective, participants might therefore ascribe the same attributes to Whites as to the Blacks with whom they are paired.

A second alternative account is that participants view Whites' interactions with Blacks as unexpected and therefore aversive. According to research on expectancy violation, individuals who violate expectations, especially expectations for ingroup behavior, are often evaluated more negatively (Bettencourt, Dill, Greathouse, Charlton, & Mulholland, 1997; Biernat, Vescio, & Billings, 1999; Jussim, Coleman, & Lerch, 1987). From this perspective, Whites with a Black friend should be seen as atypical. If either of these alternative accounts were indeed the mechanism behind the proposed process, we should see that implicit anti-Black bias predicts ratings on these dimensions.

Method

Participants. White participants who were both U.S. citizens and U.S. residents were recruited for pay via Amazon Mechanical Turk. Given that interpersonal evaluations can differ as a function of whether the target is within or outside of one's own generational cohort (North & Fiske, 2013), we selected participants who were within range of the targets' perceived age. According to pretest responses ($N = 42$), targets' mean perceived age was 23.24 years ($SD = 2.19$). Selecting participants who were within three standard deviations of the mean resulted in a sample of 88 (37 male) participants aged 18- to 30-years-old ($M = 24.48$ years, $SD = 3.69$).

Procedure. Participants were recruited to participate in a study described as investigating "how friendly people come across as being" and told they would be viewing pictures of friends. They were then presented with a series of side-by-side same-gender headshot photographs. The stimuli included Whites with Blacks as well as Whites with Whites, with a White person as the target in all critical trials. While viewing each pair, participants answered questions assessing targets' perceived outgroup comfort, stigma transference, and expectancy violation. Upon completion of the ratings task, participants completed measures of implicit racial bias, explicit prejudice, and basic demographic questions.

Materials

Photograph pairs. While participants were told that the paired photographs were friends, in reality the photographs were taken from the Productive Aging Database (Minear & Park, 2004). Targets were selected from the database to be roughly equivalent in pretest ratings on attractiveness, age, familiarity, and trustworthiness.[2] In all, participants saw six photograph pairs, four of which were critical trials, with instructions above each reading "You are rating the friend on the LEFT." In critical trials, targets on the left side of the screen were always White. Two of these pairs were a White target with a Black friend (one female pair) and two pairs were of a White target with a White friend (one female pair). Each photograph pair was randomly selected from the larger

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[2] Forty-two U.S. residents (33 White, 16 male) pretested these faces on Amazon Mechanical Turk on a 1 (not at all) to 7 (extremely) scale. The aggregate statistics were calculated for the following traits: Attractiveness ($M = 4.14$, $SD = .54$), familiarity ($M = 3.40$, $SD = .34$), trustworthiness ($M = 4.75$, $SD = .34$), and age ($M = 23.24$, $SD = 2.19$).

pool of 16 possible photos (eight female). In addition, the race of the paired other was counterbalanced across participants, such that each of the 16 White targets were paired with a White person and a Black person at some point. The remaining two filler trials were included to disguise our hypotheses. In these trials, the targets being rated (one female pair) were non-White individuals paired with non-Black others.

Picture ratings. For all trials, participants rated targets on four dimensions. All questions were answered on a 6-point Likert scale (1 = *not at all/strongly disagree*, 6 = *extremely/strongly agree*). All questions were presented in random order for each photograph pair.

Perceived outgroup comfort. Targets' perceived outgroup comfort was assessed with three questions ("This person likely has many friends from different backgrounds," "This person likely feels uncomfortable around people from different backgrounds" reverse-scored, "This person likely feels nervous talking with people who are different from them" reverse-scored; $\alpha = .75$).

Stigma transference. Stigma transference was assessed with four questions about common African American stereotype attributes (How likely is it that this person is aggressive/loud/athletic/rhythmic?; Madon et al., 2001). We pretested the four attributes by asking a separate set of participants ($N = 39$) to use them to rate the Black photos that were to be paired with White targets during the experiment ($\alpha = .91$). However, Cronbach's alphas dropped considerably when participants in the present study were asked to rate the White targets on these dimensions ($\alpha = .17$ for White targets paired with Blacks; $\alpha = .44$ for White targets paired with Whites). A likely cause of this drop in scale reliability is that these Black stereotype attributes do not transfer between the Black and White photos when paired together. Nonetheless, we proceeded by creating a composite for positive stereotype attributes (i.e., rhythmic and athletic; $r = .32$, $p = .004$) and analyzing the negative stereotype attributes individually (i.e., loud and aggressive) given that these items did not significantly correlate, $r = .15$, $p = .179$.

We also tested stigma transference by gauging participants' general evaluative assessments of each target. These assessments were measured using two questions ("How good does this person seem?," "How bad does this person seem?" reverse-scored; $r = .38$, $p = .001$).

Expectancy violation. Expectancy violation was assessed with three questions addressing the target's typicality ("This person probably acts like most people do," "This person likely acts in socially acceptable ways," "How typical does this person seem?;" All items reverse-scored; $\alpha = .71$).

Single Target Implicit Association Tests. Two Single Target Implicit Association Tests (ST-IAT; Wigboldus, Holland, & van Knippenberg, 2006) served as the measures of implicit racial bias. One ST-IAT measured White implicit bias while the other measured Black implicit bias. Within the task, participants saw a single discrimination block of the evaluative stimuli (e.g., "marvelous"/"superb"/"pleasure" and "tragic"/"horrible"/"agony"). Next, participants completed a block in which the target stimuli (i.e., monochromatic photos of White faces for the White implicit bias measure or Black faces for the Black implicit bias measure) and positive stimuli were indicated using one keyboard key and negative stimuli were indicated using another. The stimuli pairing was then reversed in the final block. By doing so, the ST-IAT provided a score of evaluative associations for a single target category rather than a relative score as in the traditional IAT. Higher scores indicated greater implicit anti-Black or pro-White bias.

Explicit prejudice measure. After the ratings task, participants completed the Ambivalent Racism scale (Katz & Hass, 1988; 1 = *strongly disagree*, 8 = *strongly agree*), from which explicit anti-Black ($\alpha = .88$) and pro-Black ($\alpha = .88$) attitude scores were calculated.

Results

Preliminary analyses. Nine participants were removed for having an average response latency of less than 1 s on their target ratings. Seventy-eight participants remained in the final sample ($M_{age} = 25.37$ years, $SD = 3.42$; 43 male). Tables for all studies are presented in the Supplemental Materials. Descriptive statistics and correlations for the preliminary study can be found in Tables S1 and S2.[3]

Main analyses. In the preliminary study and Studies 1–3 we used Judd, Kenny, and McClelland's (2001) method for testing continuous moderators in repeated measures designs to analyze the effect of the race of a target's friend on participants' ratings, while accounting for the effects of racial bias. According to this method we computed difference scores for each of the ratings dimensions, with greater scores indicating higher ratings for Whites with Blacks versus Whites with Whites. We then entered these difference scores as dependent variables in separate linear regression analyses with implicit anti-Black, implicit pro-White, explicit anti-Black, and explicit pro-Black biases as predictors.

Effect of friend race and implicit anti-Black bias on perceived comfort. As predicted, even when controlling for the effect of implicit and explicit forms of racial bias, the effect of friend race was significant for perceived outgroup comfort, $B = .342$, $t(73) = 3.30$, $p = .002$, with Whites with a Black friend being perceived as more comfortable around outgroup members than Whites with a White friend. Further, implicit anti-Black bias also did not significantly predict ratings of perceived outgroup comfort ($p = .110$; see Table S3 for full statistics).

Effect of friend race and implicit anti-Black bias on other ratings. Inconsistent with the traditional notion of stigma by association, friend race did not significantly predict positive stereotype attribute ratings, $B = .038$, $t(73) = .45$, $p = .650$, ratings of either negative stereotype attribute; loud: $B = -.167$, $t(73) = -1.22$, $p = .227$; aggressive: $B = -.071$, $t(73) = -.56$, $p = .575$; or general evaluative assessments, $B = .048$, $t(73) = .54$, $p = .588$. Similarly, friend race did not significantly affect expectancy violation ratings, $B = .090$, $t(73) = 1.11$, $p = .269$. Also inconsistent with alternatives hypotheses regarding why implicit outgroup bias should predict affiliative tendencies, implicit anti-Black bias did not significantly predict ratings of either stigma transference or expectancy violation ($ps > .297$; see Table S3 for full statistics).

Effects of other forms of racial bias on ratings. In addition to the analyses above, some significant results emerged that were irrelevant to the hypotheses posed (see Table S3). To summarize these results, we found that participants with higher explicit pro-Black bias rated White targets with a White friend as being less

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[3] We conducted a Koenker-Bassett test of heteroscedasticity (Koenker & Bassett, 1982) on the predictor variables within each study. None produced a significant result, suggesting acceptable homogeneity of variance across all studies. Furthermore, we found acceptable skew and kurtosis statistics for variables in all studies (Kline, 2011). Together, these data suggest assumptions of normality for linear regression are met across studies.

comfortable around outgroup members and had marginally significantly more negative general evaluations of them. We also found that participants with higher implicit pro-White bias rated Black stereotype traits as less applicable to Whites with a Black friend than did participants with lower implicit pro-White bias. Full reporting of these analyses can be found in Table S4.

Discussion

As predicted, this preliminary study demonstrated that White targets viewed with a Black friend were rated as being more comfortable with outgroup members than Whites with a White friend irrespective of participants' implicit racial bias. We did not find effects of target's friend race for stigma transference or expectancy violation, suggesting that the primary interpersonal evaluation participants made as a function of friends' race was targets' apparent level of outgroup comfort.

Also as predicted, implicit anti-Black bias did not predict either stigma transference or expectancy violation ratings. This finding suggests that the hypothesized relationship between implicit anti-Black bias and affiliation is not mediated by one of these alternative mechanisms. The particular operationalization chosen for stigma transference and expectancy violation in this study could possibly have played a role in this null effect, and this issue is addressed in the subsequent study.

Study 1

Having confirmed that a target with a Black friend is perceived as more comfortable with outgroup members than a target with a White friend, in Study 1 we directly tested our hypotheses that (a) implicit outgroup bias predicts affiliative responses to ingroup targets as a function of their friend's race, and (b) that participants' perceived similarity with the target mediates this relationship. To test these hypotheses, participants indicated both their initial affiliative responses and perceived similarity to each target. Simultaneously, we also once again tested stigma transference and expectancy violation as potential mediators. Given the lack of significant effects with these variables in the preliminary study, we used different measures of these mediators in an attempt to more strongly test these alternative hypotheses. First, stigma transference may occur via transference of specific affective reactions rather than via trait or general evaluative transference. For example, Cottrell and Neuberg (2005) showed that Whites tend to associate Blacks with a specific array of negative affective reactions. From an evaluative conditioning perspective of stigma by association (e.g., Walther, 2002; Walther et al., 2005), greater implicit bias could precipitate the spontaneous transfer of negative affect from the stigmatized friend to the associated nonstigmatized target. We therefore measured participants' negative affective responses to targets to assess stigma transference. Second, we changed our expectancy violation measure from ratings of targets' typicality to their likelihood of violating expectations.

We also examined whether the participants' implicit bias predicts their affiliative responses only when a meaningful social relationship exists between the target and the paired other. According to our predictions, a White target's interaction with a Black person provides the perceiver with important information about the quality of the target's experiences and comfort around Blacks. This information is then used as a basis for perceived similarity to the target. In contrast,

mere proximity (e.g., Hebl & Mannix, 2003; Penny & Haddock, 2007) and evaluative conditioning accounts (Baeyens et al., 1993; Jones et al., 2009; Walther, 2002; Walther et al., 2005) predict that simply seeing a White target paired together with a Black person would be enough to make the perceiver dislike the target. Therefore, between participants we manipulated the ostensible relationship between the target and paired other to determine whether the effect would disappear when participants were told the photos had been randomly paired.

Method

Participants. Eighty-eight White participants who were both U.S. citizens and U.S. residents aged 18- to 30-years-old were recruited for pay via Amazon Mechanical Turk (37 male; M_{age} = 24.48 years, SD = 3.69).

Procedure. The current study largely replicated the design of the preliminary study but with two major changes. First, after they were told that they were participating in a study of how friendly people come across as being, participants were randomly assigned to one of two conditions: Half of participants were told that the pairs were friends and saw the instructions "You are rating the friend on the LEFT" while rating each pair (as in the preliminary study). The other half of participants were told the pictures had been randomly paired and saw the instructions, "You are rating the person on the LEFT" while rating each pair. The second change was that, while viewing each photograph pair, participants answered our new questions related to our three potential mediators (i.e., perceived similarity, expectancy violation, and stigma transference), as well as affiliative responses to the target. All other design elements of Study 1 were identical to those in the preliminary study.

Materials.

Photograph pairs. Participants viewed the same photograph pairs as in the preliminary study.

Picture ratings. For all trials, participants rated targets on four dimensions. All questions were presented in random order for each photograph pair and were answered on a 6-point Likert scale (1 = *not at all/strongly disagree*, 6 = *extremely/strongly agree*).

Affiliative response. Affiliative response to the target was assessed with two questions ("To what extent do you think you would want to become friends with this person?," "I would expect to get along easily with this person;" α = .82).

Perceived similarity. Perceived similarity was assessed with three questions adapted from the Turban and Jones' (1988) shared worldview scale ("This person and I are probably similar in terms of our outlook, perspective, and values," "This person and I probably see things in much the same way," "This person and I are probably alike in a number of areas;" α = .94).[4]

Stigma transference. According to Cottrell and Neuberg (2005), Blacks are associated with negative affect, including anger, disgust, and fear/anxiety. Therefore, stigma transference was mea-

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[4] A confirmatory principal components factor analysis with a varimax rotation showed that similarity and affiliation items, while correlated, load closest with the questions from their respective scales. The three similarity questions loaded onto the first component above .84 but below .48 on the second component. The two affiliation questions loaded onto the second component at .70 (i.e., "To what extent do you think you would want to become friends with this person?") and .90 (i.e., "I would expect to get along easily with this person").

sured by asking participants the degree to which targets were likely to evoke these forms of affect (e.g., "How likely is this person to make you feel disgusted/angry/anxious?;" α = .80).

Expectancy violation. Two questions assessed targets likelihood of violating expectations ("This person is likely to behave in ways that are surprising to me," "How unpredictable does this person seem?;" α = .60).

Single Target Implicit Association Tests. The same two Black and White Single Target Implicit Association Tests (ST-IAT; Wigboldus et al., 2006) once again served as the measures of implicit racial bias.

Explicit racial bias measure. We again measured explicit racial bias using the Ambivalent Racism scale (Katz & Hass, 1988; anti-Black: α = .89; pro-Black: α = .87).

Results

Preliminary analyses. Five participants were removed for having an average response latency of less than 1 s on their target ratings or explicit item responses. Eighty-three participants (friends condition: $n = 42$) remained in the final sample ($M_{age} = 24.46$ years, $SD = 3.73$; 35 male). Descriptive statistics and correlations can be found in Tables S5 and S6.

Main analyses. Using the same analytic strategy as before, mean-centered scores for implicit anti-Black, implicit pro-White, explicit anti-Black, and explicit pro-Black biases were entered as predictors in a regression analysis. Photo pair relationship (friends condition = 0; randomly paired condition = 1), and all two-way interactions between photo pair relationship were also entered as predictors. Relative ratings for Whites with a Black other minus Whites with a White other were calculated for affiliative response, stigma transference, and expectancy violation and were entered as dependent variables in separate regression analyses.

Effects of racial bias on affiliative response. The predicted two-way interaction of implicit anti-Black bias and photo pair relationship was significant, $\beta = .361$, $t(73) = 2.29$, $p = .025$. No other interactions significantly predicted affiliative response (see Table S7). For participants told that the photos were of friends, greater implicit anti-Black bias was negatively correlated with affiliative responses to Whites with a Black friend relative to Whites with a White friend, $\beta = -.375$, $t(37) = -2.42$, $p = .018$ (see Figure 1). However, for participants told that the photos had been randomly paired, the effect of implicit anti-Black bias on affiliative response was not significant, $\beta = .138$, $t(36) = .85$, $p = .398$.

Effects of racial bias on perceived similarity. As with affiliative response, the two-way interaction of implicit anti-Black bias and photo pair relationship for perceived similarity was significant, $\beta = .419$, $t(73) = 2.61$, $p = .011$. No other interactions significantly predicted affiliative response (see Table S7). For participants told that the photos were of friends, greater implicit anti-Black bias significantly predicted decreased perceived similarity to Whites with a Black friend relative to Whites with a White friend, $\beta = -.402$, $t(37) = -2.55$, $p = .013$. However, for participants told that the photos had been randomly paired, the effect of implicit anti-Black bias on affiliative response was not significant, $\beta = .193$, $t(36) = 1.17$, $p = .245$ (see Figure 1).

Effects of racial bias on stigma transference. No interactions significantly predicted stigma transference (ps > .171; see Table S7).
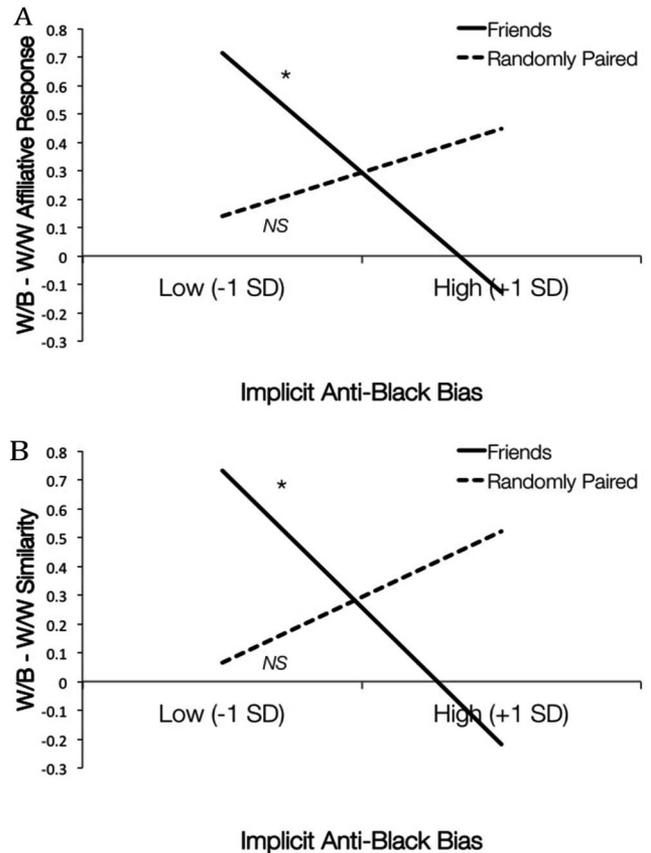

Figure 1. Effect of implicit anti-Black bias, by condition, on affiliative response (Panel A) and perceived similarity (Panel B) to White targets with Black other (W/B) versus White targets with a White other (W/W). Higher ratings indicate more favorable affiliative responses or greater perceived similarity to Whites with a Black other relative to Whites with a White other (Study 1). * $p < .05$. NS = $p > .05$.

Effects of racial bias on expectancy violation. No interactions significantly predicted expectancy violation (ps > .187; see Table S7).

Mediation analyses. We used Preacher and Hayes' (2008) bootstrapping method to test whether perceived similarity mediated the effect of implicit anti-Black bias on affiliative responses to targets with a White friend versus a Black friend, controlling for implicit pro-White, explicit anti-Black, and explicit pro-White biases. To facilitate the preciseness of our mediation analysis, we also controlled for stigma transference and expectancy violation ratings of targets with a White friend versus a Black friend by entering the mean-centered difference scores for each as additional predictors.[5] Using 10,000 bootstrapped samples, the unstandardized indirect effect of implicit anti-Black bias on affiliative response via perceived similarity ($B = -1.14$, $SE = .41$) was significant with a 95% confidence interval (CI) [-2.05, $-.43$] (see

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[5] Exclusion of stigma transference and expectancy violation as covariates does not alter the pattern of significant effects.

Figure 2). The direct effect of implicit anti-Black bias on affiliative response was reduced to nonsignificance ($B = -.46$, $SE = .40$, CI [-1.27, $.34$]; see Table S8), suggesting full mediation.

Discussion

The results provide support for the hypothesis that implicit anti-Black bias predicts ingroup affiliation with White targets viewed with a Black or White friend, and that participants' perceived similarity to the targets mediates this relationship. We found that as implicit anti-Black bias increased, affiliative responses and perceived similarity to Whites with a Black friend decreased relative to ratings of Whites with a White friend. Using correlational modeling, participants' perceived similarity to targets fully mediated their affiliative responses to them, even above and beyond the effect of stigma transference and expectancy violation, and when controlling for other implicit and explicit forms of racial bias. Comparatively, no evidence was found for either stigma transference or expectancy violation as significant mediators.

Participants' implicit anti-Black bias significantly predicted perceived similarity and affiliative responses to the target only when participants were told that the target and paired other were friends but *not* when they were told they were viewing randomly paired photos. If stigma transference were indeed the process mechanism, we should expect implicit bias to predict affiliation regardless of pair relationship. In contrast, it appears that when participants cannot use the pairing of target and other to infer the subjective experience of the target, the presence of the other ceases to influence their affiliative responses.

Study 2

Having found correlational evidence that perceived similarity statistically mediates the effect of implicit anti-Black bias on affiliative responses toward ingroup members, in Study 2 we sought to confirm this finding by directly manipulating this mediator. We have hypothesized and provided evidence that the race of a target's friend signals the target's comfort around outgroup

Figure 2. Correlational model with perceived similarity to the target mediating the relationship between implicit anti-Black bias and affiliative response toward Whites paired with a Black friend (W/B) minus Whites paired with a White friend (W/W). The indirect effect controls for stigma transference and expectancy violation ratings. Coefficients are unstandardized (Study 1). CI = confidence interval. * $p < .05$. ** $p < .01$. *** $p < .001$.

members and observers use the race of a target's friend to infer similarity. In turn, this perceived similarity drives affiliative responses for the ingroup target. In line with this hypothesis, we predict that if we provide participants with information about how similar they are on the dimension of outgroup comfort, the race of a target's friend would no longer be necessary to infer this information. We therefore predicted that directly telling participants that targets were similar to them in comfort with outgroup members would increase affiliative responses to targets—regardless of their race of their friend pair—and diminish the extent to which implicit anti-Black bias predicts participants' affiliative responses.

Method

Participants. We recruited White participants on two east coast college campuses between the ages of 17- to 22-years-old, resulting in a sample of 70 participants ($M_{age} = 19.53$ years, $SD_{age} = 1.33$; 18 male).

Procedure. The current study utilized a design similar to that of Studies 1 and 2 in that participants rated White targets paired with a Black or White friend. The primary change was that participants were randomly assigned to one of two between participant conditions. In one condition, participants were given information about how similar their experiences with racial outgroup members were to those of each target (*outgroup comfort similarity* condition). The other condition was a control condition in which no similarity information was provided, as in Study 1. To create this key manipulation, we made the following changes to the procedure: Before the ratings task, participants completed two surveys, which ostensibly assessed their "social experiences" and personality, and then completed demographic information. After completing these surveys, we told all participants that they would see pairs of friends and rate one person in each pair. In the control condition we told participants, "We have also collected demographics for each person you will see. Their information will be provided. You may use this information at your discretion." In the outgroup comfort similarity condition we told participants "We have also collected social experience questionnaire responses for each person you will see. Their scores will be compared to your own. You may use this information at your discretion." Next we provided participants in both conditions with bogus, predetermined demographic information for each target. In the outgroup comfort similarity condition, we additionally gave predetermined feedback about the percentage that their own responses on the social experiences questionnaire matched with the targets'.

After rating the targets as done in previous studies, participants completed implicit and explicit measures of bias. Due to null effects of implicit pro-White and explicit pro-Black biases in the previous studies, and in an attempt to minimize the experiment's duration for participants, we measured only implicit and explicit anti-Black biases.

Materials.

Preliminary surveys. At the beginning of the experiment, participants completed three surveys. One was entitled the "Social Experiences Questionnaire" and participants were told it assessed how they feel in different social situations. This survey was designed to allow participants to express their level of comfort around members of other ethnic backgrounds with six questions (e.g., "I feel uncomfortable about interacting with Black people,"
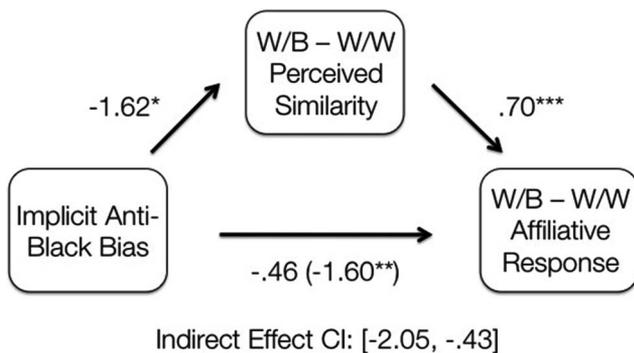
"I feel nervous talking with people who are different from me," "I like spending my time with people from different backgrounds;" $\alpha = .70$). These items were rated alongside six additional questions included to minimize participant reactance (e.g., "I enjoy meeting new people," "I feel uncomfortable about interacting with elderly people"). In pretest, when MTurk participants ($N = 22$) were asked to imagine having a high percentage match with someone else on this questionnaire, they rated being similar to the other person in terms of experiences with, and comfort during, interracial interactions ($M = 5.12$, $SD = 1.05$; $1 = not\ at\ all\ similar$, $7 = very\ similar$). The second survey, entitled "Personality Questionnaire", was used as a filler task to reduce participants' suspicion regarding the intergroup nature of the social experiences questionnaire. The personality questionnaire included a selection of 12 items from the Big Five personality inventory (John & Srivastava, 1999). The order of these two surveys was counterbalanced between participants. Last, participants completed a standard demographic information survey, but with racial group membership questions omitted.

Target information. Participants were presented with fabricated information about each target before providing their ratings. The information remained on the screen along with photos of the target and the target's ostensible friend for 5 s before participants were given the option begin rating the target. For all participants this information consisted of predetermined, bogus information about the targets' home state and date of birth in order to disguise the purpose of the study. This fake demographic information was also randomly selected without replacement from a predetermined set (home state set: Wyoming, Washington, D.C., Delaware, Rhode Island, North Dakota, and Vermont; birth date set: 5/30/1993, 11/28/1994, 2/29/1993, 1/1/1993, 12/24/1994, and 1/17/1993). States were chosen according to their low populations, and birth dates were selected because they are among the least common for Americans. These selection criteria decreased the likelihood that targets' demographics would match those of our participants. Birth dates were also chosen such that the ostensible ages of the targets would be similar to those of our college campus participant sample.

Importantly, in the outgroup comfort similarity condition, the information also included targets' social experiences match with the participant. The match percentage for each target was randomly selected without replacement from a predetermined set. The average of the set was 90% (range: 83%–96%) in order to suggest strong similarity with the targets being rated.

Photograph pairs. Participants viewed the same photograph pairs as in the previous studies.

Picture ratings. For all trials, participants rated three affiliative response questions ("I would expect to get along easily with this person," "To what extent do you think you would want to become friends with this person?," "I would expect to have a smooth interaction with this person;" $\alpha = .86$). These three items were presented in random order for each photograph pair.

Single Target Implicit Association Test. We measured implicit anti-Black bias using the same Single Target Implicit Association Test (ST-IAT; Wigboldus et al., 2006) employed in previous studies.

Explicit racial bias measure. We measured explicit racial bias using the anti-Black subscale of the Ambivalent Racism scale (Katz & Hass, 1988; anti-Black $\alpha = .85$).

Results

Preliminary analyses. One participant was removed for having an average response latency of less than one second on their target ratings and another was removed for having a implicit bias score more than three standard deviations from the mean. Sixty-eight participants (outgroup comfort similarity condition: $n = 34$) remained in the final sample ($M_{age} = 19.53$ years, $SD_{age} = 1.32$; 17 male). Descriptive statistics and correlations can be found in Tables S9 and S10.

Main analyses. Following the same analytic procedure as before, mean-centered versions of implicit anti-Black and explicit anti-Black biases, condition (control condition = 0; social similarity condition = 1), and all two-way interactions between condition and each type of bias were entered as predictors of relative ratings of Whites with a White versus Black friend.

Effects of racial bias on affiliative response. The predicted two-way interaction of implicit anti-Black bias and condition was significant, $\beta = .361$, $t(62) = 2.29$, $p = .039$. The interaction of explicit prejudice and condition was not significant (see Table S11). We found the predicted patterns in both conditions (see Figure 3): In the control condition, greater implicit anti-Black bias significantly predicted decreased affiliative responses to Whites with a Black friend relative to Whites with a White friend, $\beta = -.391$, $t(31) = -2.18$, $p = .033$. For participants told that they were similar to targets in their comfort with outgroup members, the effect of implicit anti-Black bias on affiliative response was not significant, $\beta = .166$, $t(31) = .86$, $p = .394$.

Effect of friend race on ratings. We tested whether participants' affiliative responses to targets increased as a function of being told they had similar outgroup comfort to targets by entering average target liking as the dependent variable in the same regression model described in the previous section.

As predicted, participants in the outgroup comfort similarity condition had significantly more positive affiliative responses to targets ($M = 4.42$, $SD = .57$) than participants in the control condition ($M = 4.04$, $SD = .55$); $\beta = .307$, $t(62) = 2.79$, $p = .007$; (see Table S11 for full regression model statistics).
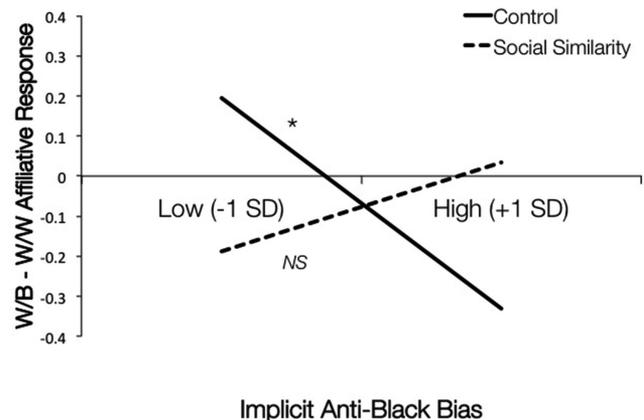

Figure 3. Effect of implicit anti-Black bias, by condition, on affiliative response toward White targets with Black friend (W/B) versus White targets with a White friend (W/W). Higher ratings indicate more favorable affiliative responses to Whites with a Black friend relative to Whites with a White friend (Study 2). * $p < .05$. NS = $p > .05$.

Discussion

Through manipulating the hypothesized mediator, we found additional evidence that participants' implicit outgroup bias predicts ingroup affiliation via perceived similarity in outgroup comfort. We posited that directly providing participants with outgroup comfort similarity information would increase affiliative responses and decrease the need to infer such information as a function of the race of a target's friend. Indeed, participants provided with information about how similar they were to targets in their comfort with outgroup members showed increased affiliative responses to targets compared with a control condition. Furthermore, as predicted, when participants were led to believe that they had similar subjective experiences of intergroup contact as targets, the race of a target's friend did not affect participants' affiliative responses toward them.

Study 3

In Study 3, we aimed to clarify the specific type of similarity that is inferred from the race of a target's friend. Although there are myriad dimensions on which people may be similar, we have so far provided evidence supporting the contention that similarity in outgroup comfort drives the effect in question. If perceived outgroup comfort similarity is indeed a unique mechanism, then the effect of implicit anti-Black bias on affiliative responses should persist when providing participants with similarity information on an unrelated but nonetheless important dimension. For this reason, we tested the outgroup comfort similarity condition against one in which participants were instead given personality similarity information. While personality similarity is known to produce affiliation (Byrne, Griffitt, & Stefaniak, 1967; Izard, 1960), participants are unlikely to make personality inferences as a function of the race of a target's friend. Finding that implicit anti-Black bias predicts affiliation when participants are given personality similarity information, but not when given outgroup comfort similarity information, would suggest that perceived similarity in intergroup contact experiences uniquely mediates the relationship between implicit bias and affiliation.

Method

Participants. We once again recruited White participants who were U.S. citizens, U.S. residents, and 18- to 30-years-old via Amazon Mechanical Turk, resulting in a sample of 78 participants (M_{age} = 24.53 years, SD = 3.10; 45 male).

Procedure. The current study utilized the same design as Study 2, but with one main change. First, participants were randomly assigned to either an *outgroup comfort similarity* condition or a *personality similarity* condition in which participants were given information about how similar their personalities were to each target. Similar to the outgroup comfort similarity condition, participants in the personality similarity condition were told "We have also collected personality questionnaire responses for each person you will see. Their scores will be compared to your own. You may use this information at your discretion." Correspondingly, participants received predetermined feedback about the per-

centage of their personality match with each target before making their ratings.

Materials.

Preliminary surveys. Participants completed the same social experiences and personality questionnaires as in Study 2.

Target information. Participants were presented with fabricated information about each target in the same manner as in Study 2, but depending on the condition, the information included either targets' social experiences or personality match with the participant. In both conditions, we altered the set of match percentages to be on average 65%. We made this change to replicate Study 2 while ensuring that our effects were not driven by the particular range of percentages chosen. Pretesting with Mechanical Turk participants showed that the median and average expected match with a random stranger was 50% and 49%, respectively (N = 49), so our chosen match percentage used in Study 3 was slightly above average.

Demographic information displayed was identical to Study 2 with the exception of the birth date set. For the current study the following dates were chosen to better match the ranges typically observed in our online samples: 5/30/1988, 11/28/1987, 2/29/1988, 1/1/1989, 12/24/1987, and 1/17/1989.

Photograph pairs. Participants viewed the same photograph pairs as in the previous studies.

Picture ratings. Participants answered the same three affiliative response items as in Study 2 (α = .93).

Single Target Implicit Association Test. We measured implicit anti-Black bias using the same single Target Implicit Association Test (ST-IAT; Wigboldus et al., 2006) employed in the previous studies.

Explicit racial bias measure. We measured explicit racial bias using the anti-Black subscale of the Ambivalent Racism scale (Katz & Hass, 1988; anti-Black: α = .94).

Results

Preliminary analyses. Six participants were removed for having an average response latency of less than one second on their target ratings and three more were removed for having implicit anti-Black scores that were more than three standard deviations from the mean. Sixty-nine participants (outgroup comfort similarity condition: n = 36) remained in the final sample (M_{age} = 24.61 years, SD = 3.12; 40 male). Descriptive statistics and correlations can be found in Tables S12 and S13.

Effects of racial bias on affiliative response. Mean-centered implicit anti-Black bias and explicit anti-Black bias scores, condition (personality condition = 0; social similarity condition = 1), and all two-way interactions between condition and each type of bias were entered as predictors of relative ratings of Whites with a White versus Black friend (ratings for White targets with a White friend minus ratings for Whites with a Black friend).

The expected two-way interaction of implicit anti-Black bias and condition was significant, β = .438, $t(63)$ = 2.41, p = .019. The interaction of explicit anti-Black bias and condition was not significant (see Table S14). We found the predicted effects for each condition (see Figure 4): In the personality similarity condition greater implicit anti-Black bias significantly predicted decreased affiliative response to Whites with a Black friend relative to Whites with a White friend, β = −.360, $t(30)$ = −2.23, p =
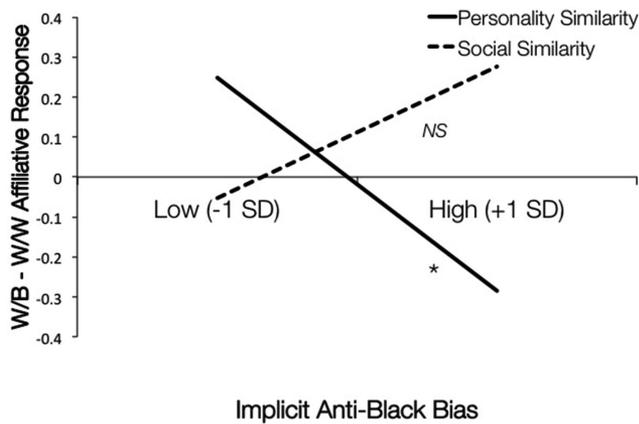
Figure 4. Effect of implicit anti-Black bias, by condition, on affiliative response toward White targets with Black friend (W/B) versus White targets with a White friend (W/W). Higher ratings indicate more favorable affiliative responses to Whites with a Black friend relative to Whites with a White friend (Study 3). * $p < .05$. NS = $p > .05$.

.049. In the outgroup comfort similarity condition, implicit anti-Black bias once again did not significantly predict affiliative response, $\beta = .222$, $t(33) = 1.37$, $p = .176$.

Discussion

Study 3 provided further support for our hypothesis that perceived similarity, and similarity regarding experiences with racial outgroup members in particular, mediates the effect of implicit outgroup bias on affiliative responses toward ingroup members. We posited that although directly providing participants with outgroup comfort similarity information should decrease the need for them to infer such information as a function of the race of a target's friend, providing them with irrelevant similarity information should not decrease the importance of friend race. In line with this prediction, when participants were told that their personality was similar to the people they were rating, implicit anti-Black bias predicted affiliative responses toward White targets in the same manner as in our previous two studies: As implicit anti-Black bias increased, affiliative responses became more negative toward Whites with a Black friend relative to Whites with a White friend. But as in Study 2, when participants were lead to believe that they had similar outgroup experiences to targets, implicit anti-Black bias no longer predicted differential affiliative responses to the two target types.

Study 4

In Study 4 we examined whether individuals' implicit outgroup bias predicts their actual likelihood of being affiliated with individuals who have outgroup friends. Specifically, we tested whether participants' implicit anti-Black bias predicts how many Facebook friends they have with a Black friend. At the time of data collection, each profile displayed pictures of the friends with whom individuals interacted most frequently on Facebook ("Which friends appear," 2011). Given that interaction frequency over this widely used social networking site is positively correlated with

self-reported closeness and trust (Kahanda & Neville, 2009; Xiang, Neville, & Rogati, 2010), Facebook provided us with a unique opportunity to measure the extent to which implicit anti-Black bias predicts individuals' friendship choices. Furthermore, the racial composition of individuals' friendship networks was visible not only to us, but also to other users of the site, including potential and existing friends. In addition, contact over Facebook strongly corresponds to individuals' real-world social networks, with 48% of their real-world contacts also connected to them via this site (Bakshy, Karrer, & Adamic, 2009). As such, using Facebook allowed us to examine predictions consistent with implicit homophily using a very different and behaviorally rich paradigm, illustrating the robustness of this phenomenon.

In addition to testing whether we could find downstream behavioral patterns consistent with the implicit homophily effects we had seen in the lab, we sought to determine whether the implicit bias is related to the amount of indirect intergroup contact to which a person is exposed. Having friends with outgroup friends (i.e., indirect contact) has been shown to be an effective means of prejudice reduction (Wright et al., 1997; for a recent meta-analysis see Zhou, 2013), particularly among individuals who do not have much direct contact (Eller, Abrams, & Gomez, 2012). Thus, whether exposure to such experiences is subject to the vicissitudes of implicit bias is of both theoretical and practical import. In fact, while we are aware of research examining moderators of the effectiveness of indirect contact for prejudice reduction (Munniksma, Stark, Verkuyten, Flache, & Veenstra, 2013; Sharp, Voci, & Hewstone, 2011; Tausch, Hewstone, Schmid, Hughes, & Cairns, 2011), we are not aware of prior research examining moderators of exposure to relationships that afford indirect contact.

Method

Participants. White undergraduates ($N = 143$; 70 male) were recruited for pay or course credit.

Procedure. A White female experimenter greeted participants upon their arrival in the lab. Participants first completed a subliminal prime lexical-decision task designed to measure implicit anti-Black and pro-White biases (Dovidio et al., 2002, 1997) and then completed explicit racial bias measures. After all participants' data were collected, a research assistant accessed publically available information on each person's Facebook profile. During the time in which profiles were accessed for this study, each profile displayed 10 friends (i.e., first-order friends) in a panel on the left side of the profile, with greater numbers of interactions over Facebook increasing the likelihood of a friend being displayed ("Which friends appear," 2011). Each friend's profile was then accessed and the number of Black friends he or she had (i.e., second-order friends) was recorded. If the race of the profile holder was not clearly distinguishable, then race was not coded.

To test whether implicit anti-Black bias predicts participants' likelihood of indirect Black contact, we calculated the number of friends with Black friends, a variable that corresponds to the way in which extended contact has been operationalized in extant research (e.g., Eller et al., 2012; Gómez, Tropp, & Fernandez, 2011; Paolini, Hewstone, Cairns, & Voci, 2004; Wright et al.,

1997). On average, participants had 1.0 friend with a Black friend ($SD = 0.98$) and 1.6 Black second-order friends ($SD = 2.1$).

Materials.

Implicit racial bias measure. For this study we used the subliminal priming lexical-decision task developed by Dovidio and colleagues (Dovidio et al., 2002; Dovidio et al., 1997). One benefit of this measure is that it does not appear to be about racial prejudice, as the IAT might. In this task, participants believed they were identifying whether supraliminally presented words were characteristic of houses or people, while being subliminally presented with an image of a Black or White person. Specifically, participants were presented with subliminal face primes for ~17 ms, which were then masked with either a "P" inside an oval (signifying "person") or an "H" inside a rectangle (signifying "house"). The mask was replaced with a word and participants were asked to respond "yes" or "no" as to whether it was a person word (when the preceding mask was a "P") or a house word (when the mask was an "H"). Participants responded by pressing either "z" or "m" on the keyboard and the meaning of each key (i.e., "yes" or "no") was counterbalanced across participants. The face primes consisted of 2" × 1.75" black and white photographs of Black and White men and women. Each of the four racial/gender categories was represented by four separate photos (i.e., four Black women, four White men, etc.).

Lexical-decision task data were analyzed according to the procedures of Dovidio, Kawakami, and Gaertner (2002). Errors and latencies greater than three standard deviations from each participant's mean latency were excluded from analyses. These trials accounted for 2.8% of critical trials. The remaining latencies were log transformed. Implicit bias scores were calculated using the following steps: First, the mean latency for trials in which negative words followed Black faces was subtracted from the mean latency for positive words following Black faces to create the anti-Black bias score; second, the mean latency for trials in which negative words followed White faces was subtracted from the mean latency for negative words following White faces for the pro-White score. Higher scores indicated greater implicit anti-Black bias and implicit pro-White bias, respectively.

Explicit attitude measures. The Attitudes Toward Blacks questionnaire (ATB; Brigham, 1993) and Internal Motivation to Respond Without Prejudice scale (Plant & Devine, 1998) were used as measures of explicit racial attitudes. Each was rated on 7-point Likert scale with higher numbers indicating more explicit prejudice and greater motivation, respectively.

Results

Preliminary analyses. Fifty-three participants did not have a publically accessible Facebook profile and five had error rates of greater than 10% on the implicit bias measure, resulting in 84 participants included in the analyses (39 male). There were no statistically significant differences between participants with viewable profiles versus those without on measures of implicit ($p = .95$) or explicit bias ($p = .83$). Descriptive statistics and correlations can be found in Tables S15 and S16.

Main analyses. We entered the number of first order friends with a Black friend as a dependent variable into a linear regression model with mean-centered implicit anti-Black bias, implicit pro-White bias, explicit racial bias (i.e., ATB), and IMS entered as

predictors. Contrary to our hypotheses and to the previous effects, in this sample of real-life friendship networks we found no overall effect of implicit anti-Black bias on number of friends with a Black friend (see Table S17). We hypothesized post hoc that we might observe different patterns of effects for women and men in this particular study. Although gender did not significantly moderate participants' initial affiliative responses in the four previous experimental studies, we suspected that gender might be a moderating factor in the downstream effect of these initial responses. Although both women and men exhibited the same initial reactions to novel targets in our controlled experiments, women typically demonstrate more similarity, closeness, and interpersonal sharing in their ongoing social relationships than do men (Clark & Ayers, 1992; Kuttler, LaGreca, & Prinstein, 1999; McNelles & Connolly, 1999; Parker & de Vries, 1993; Sheets & Lugar, 2005; Verkuyten & Masson, 1996). Therefore, insofar as implicit bias shapes participants' perceived similarity to targets, it might predict women's actual relationship ties more strongly than men's.

Effect of racial bias on friends with Black friends. To test whether implicit anti-Black bias predicts participants' likelihood of indirect Black contact differently for women and men, we entered the number of friends with a Black friend into a regression analysis with mean-centered implicit anti-Black and pro-White scores, ATB, IMS, gender (female = 0; male = 1), and the two-way interactions between each of the four racial attitude types and gender as predictors.

We found a significant interaction of implicit anti-Black bias and gender, $\beta = .389$, $t(74) = 2.35$, $p = .021$.[6] There were no other significant two-way interactions of racial bias and gender (see Table S18). For women, greater implicit anti-Black bias predicted fewer friends with Black friends, $\beta = -.417$, $t(40) = -2.6$, $p = .011$ (see Figure 5). For men, there was no significant effect of implicit anti-Black bias, $\beta = .125$, $t(34) = .75$, $p = .454$.

Discussion

We did not find that implicit anti-Black bias generally predicts one's likelihood of having friends with Black friends. Nonetheless, Study 4 provides suggestive evidence of downstream consequences of implicit homophily for women in particular. Above and beyond the effects of explicit racial bias, women's implicit anti-Black bias predicted fewer friends with Blacks friends within one's Facebook community. The corresponding relationship did not hold for men. This difference might be explained by the well-documented differences in the characteristics that mark women's versus men's ongoing relationships; namely, women's friendships tend to be based more on interpersonal similarity than do men's (Clark & Ayers, 1992; Kuttler et al., 1999; McNelles & Connolly, 1999; Parker & de Vries, 1993; Sheets & Lugar, 2005; Verkuyten & Masson, 1996). This finding suggests that women who are higher in implicit anti-Black bias are less likely to have indirect interracial contact, an experience known to remediate racial bias (Wright et al., 1997).

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[6] The reported effect remains significant when controlling for participants' number of Black first-order friends.
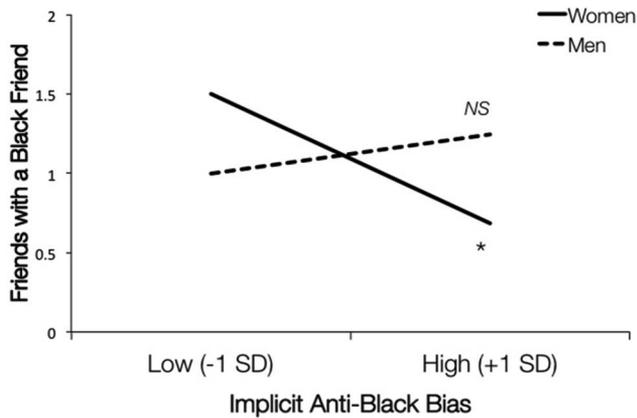
Figure 5. Effect of implicit anti-Black bias on number of friends with at least one Black friend by participant gender (Study 4). $^*p < .05$. $NS = p > .05$.

General Discussion

We found consistent support for implicit homophily across five studies and using two different measures of implicit racial bias. As predicted, Whites' implicit racial bias was related to their affiliative responses to White targets as a function of their friends' race over and above effects of explicit racial bias (Studies 1–4). This relationship was not driven by ingroup favoritism; implicit anti-Black bias, not implicit pro-White bias, predicted affiliation toward ingroup targets as a function of the race of their friends (Studies 1 and 4).

Several pieces of evidence substantiate our claim that this effect occurs due to feelings of similarity with the target. In Study 1, perceived similarity mediated the relationship between implicit racial bias and affiliative responses. Also in this study, implicit anti-Black bias predicted affiliative responses when targets were in the presence of an ostensible Black friend but not when in the presence of a Black stranger. Presumably target relationship status moderated the link between implicit bias and affiliative responses because Black friends provide information regarding targets' comfort around Blacks (e.g., the preliminary study). In contrast, simply being proximal to a Black stranger does not provide information with which perceivers can judge their similarity to the target. Studies 2 and 3 directly manipulated perceived similarity and clarified the specific form of perceived similarity mediating the relationship between implicit outgroup bias and affiliation. When given direct information that targets were similar to them in their comfort with outgroup members, participants' affiliative responses increased (Study 2) and implicit anti-Black bias no longer predicted these affiliative responses (Studies 2 and 3). In contrast, when participants were instead given personality similarity information, implicit anti-Black bias still predicted affiliative response as a function of target's friend race, suggesting that participants' inferences about targets' comfort around Blacks continued to impact evaluations (Study 3). Finally, in Study 4, implicit anti-Black bias predicted the number of Black friends of friends women had on Facebook, but not those of men. It is possible that this gender difference is due to differences in the basis of women's and men's friendships; women's friendships tend to be based on inter-

personal similarity in than men's (Clark & Ayers, 1992; Kuttler et al., 1999; McNelles & Connolly, 1999; Parker & de Vries, 1993; Sheets & Lugar, 2005; Verkuyten & Masson, 1996).

We found no evidence that the results can be alternatively explained by either stigma transference or expectancy violation. In the Preliminary Study and Study 1, implicit anti-Black bias predicted neither stigma transference nor expectancy violation ratings for Whites with a Black friend versus a White friend despite multiple operationalizations of each variable. Furthermore, that implicit anti-Black bias predicted affiliative responses only toward Whites seen with friends, but not when pictures were believed to be randomly paired, provides evidence against devaluation by mere proximity, a finding linked to traditional stigma by association accounts (e.g., Hebl & Mannix, 2003; Penny & Haddock, 2007). Future research might nonetheless investigate the parallel or interactive effects of stigma transference and implicit homophily when the stigmatized other is known to elicit especially high levels of negative affect.

Although we made clear predictions involving the effects of implicit racial bias, we did not have specific predictions whether explicit racial prejudice would predict affiliation above and beyond the effect of implicit bias. The main reason for this is that explicitly discriminating against Blacks is counternormative, muddying the relationship between people's consciously recognized racial attitudes and what they are willing to report. However, it is interesting to note that we did not find consistent results with explicit bias. Explicit bias significantly predicted affiliative responses toward White targets as a function of friend race in Studies 1 and 4, though never mirroring the effects of implicit bias (see Tables S7 and S18). One possibility is that implicit measures of racial bias are more valid predictors of behavior than explicit measures (Greenwald et al., 2009), particularly when the behavior is relatively subtle, such as spontaneously considering people's friends when evaluating them (Toosi, Babbitt, Ambady, & Sommers, 2012). Another possibility is that, while implicit bias relates to people's felt comfort with outgroup members, explicit bias correlates with different intergroup outcomes (as suggested by Nosek & Smyth, 2007; Nosek et al., 2007). Furthermore, whereas evaluations may be influenced by implicit bias subtly enough to slip through the cracks, decreasing societal acceptance of explicit prejudice (Bobo, 2001; Bobo & Charles, 2009) may decrease individuals' willingness to make unfavorable evaluations on the basis of their outspoken biases.

Regardless, the role of explicit bias in racial stigma by association has been unclear in related work; Pryor, Reeder, and Monroe (2012) found that explicit bias did not predict more negative evaluations of a White man seen having a conversation with a Black man at a work gathering, whereas implicit bias did. Additionally, Ratliff and Nosek (2011) showed that an experimentally created negative explicit attitude toward a Black individual did not transfer to another Black individual, whereas negative implicit attitudes did. Given the myriad of potential explanations, future research specifically seeking to understand the relative importance of implicit and explicit bias in the effect of one's social milieu on liking of that person is warranted. Additionally, the existing literature focuses on positive or neutral sources of similarity (but see Bosson, Johnson, Niederhoffer, & Swann, 2006; Bosson & Weaver, 2011); however, the present work shows that similarity regarding a normatively negative attitude (i.e., racial bias) can also

breed liking. The idea that implicit bias supersedes explicit attitudes in predicting affiliation and that similarity on normatively devalued dimensions produce attraction both have generalizable implications beyond intergroup contexts.

The articulation of implicit homophily has many intriguing theoretical and practical implications. Theoretically, it offers a potential alternate explanation of some findings assumed to stem from affective or evaluative transfer brought about by stigma by association. For example, perhaps evaluations of a White target who seems comfortable casually chatting with an African American person are not driven by the automatic transfer of negative assumptions about the Black person to the White one as posited by some (e.g., Pryor et al., 2012, Study 3). Rather, White individuals high in implicit racial bias may have assumed that the target person did not share their discomfort around Blacks and this perceived dissimilarity accounted for their evaluations of the target (Jacoby-Senghor, Sinclair, Smith, & Skorinko, under review). Additionally, it is possible that stigma transference and implicit homophily act simultaneously to affect evaluations of a target person. Indeed, the particular stigma in question might determine which mechanisms drive the effect. Though we investigated racial—specifically Black—stigma, previous stigma by association research focused on an array of different social groups. Future research should test whether different types of stigmata produce associative devaluation via distinct processes.

Next, the present work builds upon extant similarity research by exploring the relative importance of similarity in spontaneous, automatic (i.e., implicit) responses versus similarity in explicitly espoused attitudes. Heider's balance theory (Heider, 1958), which suggests we strive to keep our attitudes toward a referent consistent with our attitudes toward others, provides the foundation for much of the current thinking regarding similarity-based attraction. For example, balance theory predicts that if we dislike a stigmatized individual, we should then dislike someone who indicates an affinity for that individual. However, dual process perspectives (see Chaiken & Trope, 1999; Wilson, Lindsey, & Schooler, 2000) argue the existence of independent automatic and deliberative attitudinal dimensions, a dichotomy for which balance theory does not account. In contrast, implicit homophily suggests that when implicit and explicit biases diverge, as is often the case with intergroup attitudes (Nosek & Smyth, 2007; Nosek et al., 2007), one's automatic response to an attitudinal referent is more likely to predict similarity-based attraction than one's consciously avowed stance. Future research should investigate whether perceivers generally tend to affiliate with ingroup targets as a function of their automatic biases toward social referents, regardless of their explicit attitudes toward them.

Implicit homophily additionally reveals how forming relationships with stigmatized group members can lead not only to associative devaluation, but also to increases in a perceiver's willingness to affiliate when the perceiver's is more implicitly egalitarian. From this perspective, rather than suggesting uniformly negative information, a target's association with stigmatized individuals communicates the target's subjective experiences in particular contexts, subjective experiences that can either be shared or not shared with the perceiver.

Although we have focused on stigmatized group membership, implicit homophily provides a broader perspective on the effect of one's social milieu on the affiliative responses and evaluations of individuals outside of the immediate intergroup context. In particular, the individuals with whom one fraternizes does not affect evaluations only when one's associates are members of stigmatized groups. Rather, any interpersonal relationships that signal attitudes, beliefs, or experiences that observers perceive as a meaningful basis of similarity can shape evaluations of those targets.

The process of implicit homophily may also apply to nonhuman attitude objects to the extent that implicit bias predicts one's subjective experiences toward them. For example, one's implicit attitudes toward modern art should predict one's felt similarity toward people seen engaging with the material and subsequently impact downstream evaluations and behaviors. Moreover, to the extent that implicit bias and explicit attitudes differentially predict one's subjective experience (as in the case of anti-Black bias and attitudes), so should implicit bias and explicit attitudes differentially predict affiliation. For example, within repressive regimes where antigovernment attitudes are explicitly and normatively despised, implicit homophily may cause citizens who harbor negative feelings toward the regime to cluster via subtle social signals of despondency. For these reasons, implicit homophily represents a generalizable and potentially pervasive determinant of interpersonal outcomes and social network formation.

Practically speaking, implicit homophily suggests a means by which those individuals who could benefit most from indirect intergroup contact actually avoid it. Knowing that one's friends have outgroup friends has been shown to reduce prejudice without the anxiety and fraught interactions that may characterize direct intergroup contact (Wright et al., 1997). Indirect contact has also been found to be particularly effective for those who do not have a great deal of direct intergroup contact themselves (Eller et al., 2012). These advantages are especially important given the tendency for people high in implicit bias to avoid and have difficulty with direct intergroup contact. However, the current findings, particularly those of Study 4, suggest that individuals' implicit racial bias negatively relates to the degree to which they are attracted to relationships that afford indirect contact.

This problem of when and how social networks are being shaped—even at this secondary level—to increase or decrease the likelihood of outgroup interactions and experiences deserves continued focus. In light of the correlational design of Study 4, future experimental research is needed to examine the precursors to selecting relationships that facilitate indirect contact. Our findings also point to the necessity for research on the manner in which an ingroup member's outgroup friends should be revealed to optimally achieve prejudice reduction through indirect contact. Consideration of the present findings and the indirect contact literature in concert suggests that becoming friends with an ingroup member before revealing one's relationships with outgroup members is a more effective means of changing attitudes of people with high outgroup bias than such revelation prior to the solidification of the ingroup friendship.

The notion of implicit homophily also joins a variety of findings trying to understand how and why individuals end up in social networks that are demographically and attitudinally homogenous (Bishop, 2009). With respect to interracial relations, social network diversity is constrained by a variety of forces. At a sociological level it is hampered by extensive residential segregation. For example, despite increasing demographic diversity in the United States, it is estimated that the average White person lives in

a neighborhood that is approximately 75% White (Rugh & Massey, 2013). Furthermore, even when people have opportunities for intergroup contact, psychological factors differentially attract individuals to others, thereby fostering further clustering. That is, people are less likely to seek out and maintain interactions with outgroup members (Shelton & Richeson, 2005), something that is particularly true for those who are explicitly or implicit biased (Towles-Schwen & Fazio, 2003). The present research adds to this work by suggesting that biased individuals are also less likely to have ingroup friends known to affiliate with outgroup members. Conversely, this work suggests the possibility that people with lower implicit bias may also subtly develop homogeneous groups, creating networks that are largely devoid of high-bias individuals. The dual pressure toward similar friends on both ends of the bias spectrum has interesting implications for how additional layers of homogeneity can develop, perpetuate, and intensify within groups.

Once individuals are connected within a social network, norms may emerge that reify and exacerbate members' extant biases, for good or for bad. Individuals have been shown to favor those who stereotype or otherwise disadvantage outgroup members (Castelli, Pavan, Ferrari, & Kashima, 2009; Castelli, Zogmaister, & Tomelleri, 2009). Further empirical verification of the causal factors of attitudinally homogeneous social networks, and experimental research delineating the ramifications of such networks for attitude strength and change, as well as for outgroup network members' well-being, are rich avenues for future inquiry.

Conclusion

Our focus in this research has been on how implicit biases and social experience come together to determine ingroup affiliation. Our findings suggest that significant barriers exist to fighting network homogeneity and, therefore, to reducing extant levels of implicit prejudice. But our work is also hopeful. Compared with viewing attitudinal and racial homogeneity as something intractably fundamental to social networks, by demonstrating the importance of perceived similarity with another for shaping these problematic outcomes, this analysis uncovers a social psychological lever for change.

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