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Discrete emotions elucidate the effects of crossed-categorization on prejudice ☆

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ABSTRACT

Three studies integrated crossed-categorization and discrete emotion approaches to prejudice and prejudice reduction. Study 1 made salient crossed-categorization using naturally occurring groups and examined the ability of emotions to account for prejudiced evaluations. Study 2 constructed novel crossed-categorizations in the laboratory to examine the role of appraisal-based emotions in evaluations of crossed-categories. Study 3 crossed gender and sexual orientation, for which elicited discrete emotions predict different evaluative responses than do shared and unshared group memberships alone. In all three studies, discrete emotions were able to account for the effects of crossed-categorization on evaluative measures of prejudice and revealed emotional paths to prejudice reduction which would be obscured by the evaluative measures alone. In Study 3, a discrete emotions approach better predicted evaluations than did shared and unshared group membership alone. These results converge to highlight the importance of discrete emotions in understanding the evaluative implications of crossed-categorization, especially for prejudice reduction.

Social categorization plays a vital role in understanding and reducing prejudice. Members of national, religious, ethnic, age, and even arbitrarily created groups seem to almost universally prefer other ingroup members over members of different groups. When group memberships align, preference for others who share multiple ingroups over those who share multiple outgroups is particularly strong (Crisp & Hewstone, 2007). Members of one nationality who also share a common religion might particularly like one another, and particularly dislike people from another country who also adhere to a different religion. Affiliates of a political party who are employed by the same organization might like one other very well, while especially disliking affiliates of the opposing political party employed by a different organization.

Yet most group memberships are not perfectly correlated: members of different nationalities often share a common religion; members of different political parties can work for the same company. When group memberships are crosscutting, two people might share two ingroups (double ingroup members), only one of two possible ingroups (partial ingroup members), or no ingroups (double outgroup members). In American politics, for example, a politician's political party and a politician's position on specific issues sometimes diverge from one another. A Democrat who is pro-choice would view other pro-choice Democrats as double ingroup members, Democrats who are pro-life and Republicans who are pro-choice as partial ingroup members, and Republicans who are pro-life as double outgroup members.

Salient crosscutting social categorizations are not only a reality of the complex landscape of intergroup relations, but are also an effective tool for prejudice reduction. Research establishing the effectiveness of crossed-categorization typically demonstrates the differential impact of combining various shared and unshared category memberships on general attitudinal-evaluative measures of prejudice (Crisp & Hewstone, 1999; Crisp, Walsh, & Hewstone, 2006; Kenworthy, Canales, Weaver, & Miller, 2003; Hewstone, Islam, & Judd, 1993; Vescio, Judd, & Kwan, 2004). When such measures are used, targets who share one ingroup with the perceiver are regarded with less prejudice than double outgroup members, although double ingroup members are still preferred over partial ingroup members (Deschamps & Doise, 1978; for reviews see Crisp, Ensari, Hewstone, & Miller, 2002; Crisp & Hewstone, 1999, 2007; for meta-analyses see Migdal, Hewstone, & Mullen, 1998; Urban & Miller, 1998). That is, assuming crosscutting categories of roughly equal subjective importance, a pro-choice Democrat would typically prefer pro-life Democrats and pro-choice Republicans over pro-life Republicans, would show no preference between pro-life Democrats and pro-choice Republicans, but would still favor other pro-choice Democrats the most. In other words, salient crosscutting group memberships are typically combined additively. Any target with two shared group memberships is better than a target with one shared group membership and a target with one shared group membership is better than a target with no shared group memberships. In fact, a

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pattern of regular incremental improvements in evaluation which parallel shared group memberships is referred to as the "additive pattern" of evaluation (Brewer, Ho, Lee, & Miller, 1987; Hewstone et al., 1993). Although the relative salience of certain categories over others can affect the degree of preference for crossed-category combinations, in the vast majority of cases, crossed-categorization reliably and substantially reduces prejudice directed toward partial ingroup members compared to double outgroup members.

In this research, we integrate this literature on crossed-categorization with recent approaches to intergroup relations that emphasize the importance of discrete emotions in prejudice and prejudice reduction. The idea that discrete emotions play an important role in prejudice has been gaining steady support for more than a decade. In 1993, Smith argued that the emotions elicited by groups were more useful indications of relations between groups than the attitudinal evaluations that typically constitute prejudice measures. These claims have been borne out by later demonstrations showing that diverse and distinct emotions, ranging from admiration to empathy to fear to disgust, can contribute to and direct evaluative conceptions of prejudice (Alexander, Brewer, & Hermann, 1999; Cottrell & Neuberg, 2005; Cuddy, Fiske, & Glick, 2007; Esses & Dovidio, 2002). Under some conditions, such emotional reactions appear to mediate the impact of distal factors on such measures of prejudice. For example, Miller, Smith, and Mackie (2004) showed that both the impact of intergroup contact on prejudice reduction (Tropp & Pettigrew, 2005) and the impact of high social dominance orientation on increased prejudice (Pratto, Sidanius, Stallworth, & Malle, 1994) were mediated by emotions directed toward the target group. That is, increased intergroup contact reduced prejudice because group members felt more positive or less negative emotion toward the outgroup. Similarly, ingroup members with high social dominance orientation felt more prejudice toward an outgroup because they directed more negative emotion at that outgroup.

The importance of discrete emotion in intergroup relations does not supplant the importance of categorization, but rather complements the insights of social categorization. Intergroup Emotions Theory argues that self-categorization as a group member causes group-relevant objects (such as the ingroup itself and various outgroups) to trigger differentiated emotions (Mackie, Devos, & Smith, 2000; Mackie, Smith, & Ray, 2008; Smith, 1993). Thus when self-categorized as a Democrat, a perceiver will feel different emotions toward a Republican than when self-categorized as an American, for example. Similarly, self-categorization as a member of a campus Greek organization will promote different emotions toward a target categorized as a non-Greek, than if the same target were categorized as a student (Ray, Mackie, Rydell, & Smith, 2008). In this research, we take the importance of social categorization as a given and focus on the importance of discrete emotions in understanding prejudice and prejudice reduction in the context of crossed-categorization.

Similarly, we make the assumption that emotions cause attitudes. We base this assumption on the well-validated definition of an explicit attitude as an evaluative summary of different contributing components (Zanna & Rempel, 1988). The literature on attitude formation and change contain demonstrations that emotions influence attitudes (e.g. Edwards, 1990; Edwards & von Hippel, 1995; Krosnick, Betz, Jussim, & Lynn, 1992; Murphy & Zajonc, 1993) and the reverse causal order, that attitudes cause emotions, is inconsistent with the definition of attitudes as summary concepts. We share this assumption with prevailing influential conceptions about the contribution of emotions to intergroup attitudes and evaluations (e.g. Alexander et al., 1999; Brown & Hewstone, 2005; Cottrell & Neuberg, 2005; Cuddy et al., 2007; Esses & Dovidio, 2002; Haddock, Zanna, & Esses, 1993; Pettigrew & Tropp, 2008; Stangor, Sullivan, & Ford, 1991), although alternative non-attitudinal conceptualizations of evaluation support different causal models (e.g. Chartrand, van Baaren, & Bargh, 2006).

Based on these theoretical approaches to prejudice and intergroup relations, we propose that crossed-categorization reduces attitudinal prejudice through changes in group-based emotions that are triggered by different category combinations. We do not dispute the basic additive effects of crossed-categorization on evaluation. Rather, we suggest that such additive effects on evaluation reflect the combination of discrete emotions felt about the categories involved rather than the degree of shared and unshared group membership alone.

This approach to crossed-categorization has the potential to advance our theoretical understanding of crossed-categorization, and thus prejudice reduction, in several ways. First, in suggesting that group membership combinations explicitly equated in evaluative terms might differ with regard to the distinct emotions they evoke, we advance the possibility that some such apparently equal evaluations are not equal at all. This insight is especially important to crossed-categorization because equivalent evaluation based on different emotions within a single instance of crossed-categorization fundamentally changes the meaning of an additive pattern. An instance of crossed-categorization that combined one ingroup–outgroup distinction characterized by disgust for the outgroup with a second ingroup–outgroup distinction characterized by admiration for the ingroup, for example, would create one partial ingroup that elicited neither admiration nor disgust and a second partial ingroup that simultaneously elicited both admiration and disgust. Although these partial ingroups might elicit similar levels of evaluation, equating no emotion with ambivalent admiration and disgust would clearly be inaccurate in terms of the ways the groups are perceived or appraised, as well as the ways they are likely to be treated.

Second, the suggestion that additive effects in crossed-categorization reflect the combination of emotions about component memberships rather than the combination of shared and unshared group memberships both challenges and broadens crossed-categorization theory. In current perspectives, unshared group memberships either reduce evaluation relative to shared group memberships or, more rarely, have no effect on evaluation relative to shared group membership (Brewer et al., 1987; Crisp et al., 2002; Crisp & Hewstone, 1999, 2007; Hewstone et al., 1993; Migdal et al., 1998; Urban & Miller, 1998). In no case does current crossed-categorization theory predict that an outgroup membership would improve evaluation of a category combination. However, unshared group membership can elicit positive emotion and increase evaluation when an outgroup is appraised positively. For example, as a result of positive appraisals, men tend to regard women with positive emotion and to evaluate women more positively than they do other men (Eagly & Mladinic, 1989; Glick & Fiske, 2001). When crossed-categorizations involve a positively appraised outgroup, the additive combination of emotion predicts that category combinations involving that outgroup will be evaluated more positively than category combinations not involving that outgroup. Thus, a partial ingroup that includes an outgroup that evokes positive emotion might be evaluated more positively than the double ingroup. Similarly, a double outgroup that includes a group that evokes positive emotion might be evaluated more positively than a partial outgroup that does not include that particular outgroup membership. Such patterns of evaluation make no sense from crossed-categorization's current exclusive focus on shared group memberships. Indeed, focusing only on the additive combination of shared group membership makes the awkward prediction that category combinations involving a positively appraised outgroup will decrease evaluations in the same way as do combinations involving negatively appraised outgroups.

In sum, we suggest that additive effects in crossed-categorization reflect the additive combination of discrete emotions about ingroup and outgroup memberships rather than shared and unshared group

memberships per se. This perspective extends a discrete emotions perspective on attitudinal prejudice to the context of crossed-categorization, suggests that category combinations that are explicitly equated in current approaches to crossed-categorization might differ with regard to the distinct emotions underlying similar evaluations, and diverges from accounts of crossed-categorization based solely on shared and unshared group membership.

We investigated the utility of this perspective in three studies. In Study 1, we establish that non-redundant discrete emotions effectively account for attitudinal evaluations following crossed-categorization and that category combinations explicitly equated in strictly evaluative accounts of crossed-categorization can elicit qualitatively distinct emotional reactions. In Study 2, we manipulate appraisals of crossed-categorizations involving novel groups in order to produce emotions which, when combined additively, effectively account for evaluations of those groups. In Study 3, we extend these ideas to the combination of gender and sexual orientation and demonstrate that, for crossed-categorization involving a positively appraised outgroup, the additive combination of emotions about component group memberships better predicts evaluation than does the additive combination of shared and unshared group membership alone.

Study 1

Study 1 crossed membership in a political party with membership in campus Greek organizations (i.e. fraternities and sororities). Specifically, we examined non-Greek Democrats' evaluations of other non-Greek Democrats, non-Greek Republicans, Greek Democrats, and Greek Republicans. We selected this category combination for two reasons. First, both political party and Greek system membership are salient and meaningful parts of campus life at the university at which Study 1 was conducted and were thus likely to yield the commonly observed additive pattern of evaluation. Second, we expected political party and Greek system membership to elicit different emotions from one another. We expected differences in political party to elicit disgust and anger because American politics involve zero sum competition over moral differences. Appraisals of moral difference elicit disgust and appraisals of blocked goals elicit anger (Cottrell & Neuberg, 2005; Ortony, Clore, & Collins, 1988; Rozin, Haidt, & McCauley, 2008). With regard to Greek affiliation, we expected that differences in social category membership would be characterized primarily by differences in admiration. Non-Greek students tend to view other non-Greek students as more academically serious than Greek students, an appraisal consistent with admiration (Cuddy et al., 2007; Keltner & Haidt, 2003; Ortony et al., 1988), but non-Greeks and Greeks frequently socialize together and there is no competition for limited resources between the two groups.

In summary, we expected participants' evaluations to reflect an additive pattern in which they would evaluate the double outgroup most poorly, the partial ingroups more positively than the double outgroup, and the double ingroup even more positively than the partial ingroups. At the same time we expected that this additive pattern would be well accounted for by discrete emotions and that the effects on evaluation of the component categories on evaluation would be accounted for by different emotions. Specifically we expected the effects of political party on evaluation to be accounted for primarily by disgust and anger and the effects of Greek membership to be accounted for by differences in admiration.

Method

Participants and design

Ninety-five University of California Santa Barbara (UCSB) undergraduates (70 females and 25 males) who self-identified as Democrats and Non-Greeks (unaffiliated with a fraternity or sorority) participated in a 2 (target Greek system membership: non-Greek or Greek) × 2 (target political party: Democrat or Republican) between subjects design. Participants received partial course credit in an introductory psychology course for their participation.

Procedure

Participants came to the laboratory in groups of approximately 5–7 students for an experiment investigating opinions about people. All participants were assigned to an individual cubicle where all subsequent materials were presented on the computer screen. To ensure that their group memberships were salient, participants first confirmed their political party and non-Greek membership. They then completed the dependent measures about one of four possible targets: non-Greek Democrats (the double ingroup), non-Greek Republicans (a partial ingroup), Greek Democrats (a partial ingroup), or Greek Republicans (the double outgroup).

Dependent measures

Participants rated the extent to which the target group made them feel each of three emotions (admiration, disgust, and anger) using 7 point scales anchored at 0 (*not at all*) and 6 (*very much*). For example, participants were asked, "To what extent do Greek Republicans make you feel disgusted?"

Next, participants responded to two standard measures of prejudice, semantic differentials and a feeling thermometer (Esses, Haddock, & Zanna, 1993). The semantic differentials consisted of rating the target group on three items anchored at −3 (*bad*, *negative*, *unpleasant*) and +3 (*good*, *positive*, *pleasant*). The feeling thermometer asked participants to rate the target group by selecting a number between 0 and 100, with zero anchored at *cold*/*negative* and 100 anchored at *warm*/*positive*.

Results

Crossed-categorization and evaluation

The semantic differentials and feeling thermometer were highly correlated, $r = .812$, $p < .001$. We standardized both measures and averaged them into a single index of attitudinal evaluation.[1] Mean evaluations are graphed in Fig. 1.

We expected crossed-categorization to reduce prejudice toward partial ingroups relative to double outgroups but not to eliminate prejudice relative to double ingroups. A 2 (target Greek membership: non-Greek or Greek) × 2 (target political party: Democrat or Republican) analysis of variance (ANOVA) on evaluations revealed both a main effect of Greek membership, $F(1,91) = 9.642$, $p = .003$, partial $\eta^2 = .096$, with non-Greeks ($M = .222$, $SE = .127$) preferred over Greeks ($M = -.326$, $SE = .122$), and a main effect of target political party, $F(1,91) = 16.361$, $p < .001$, partial $\eta^2 = .152$, with Democrats ($M = .304$, $SE = .114$) preferred over Republicans ($M = -.408$, $SE = .134$). There was no interaction, $F(1,91) = .051$, $p = .822$, partial $\eta^2 = .001$. Moreover, all simple effects were significant, $ps < .031$, all partial $\eta^2 s > .050$, and the comparison between Greek Democrats and non-Greek Republicans was non-significant, $F(1,91) = .409$, $p = .524$, partial $\eta^2 = .004$. Consistent with predictions, the partial ingroups (Greek Democrats and non-Greek Republicans) were evaluated better than the double outgroup (Greek Republicans), but not as well as the double ingroup (non-Greek Democrats).

Crossed-categorization and emotion

Mean levels of admiration, disgust, and anger are graphed in Fig. 2. Each emotion was analyzed separately with a 2 × 2 ANOVA. Results for admiration yielded only a main effect of target Greek membership, $F(1,91) = 4.386$, $p = .039$, partial $\eta^2 = .046$, which indicated, as

[1] In this Study as well as the Studies that follow, separate analysis of semantic differentials and thermometer ratings yields results convergent with the combined measure.

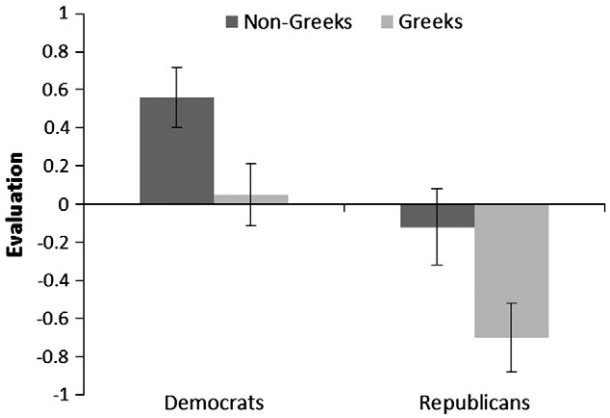

Fig. 1. Mean evaluations by target political party and Greek system membership. Participants were non-Greek Democrats.

predicted, that non-Greeks (an ingroup, $M = 2.158$, $SE = .244$) were regarded with significantly more admiration than were Greeks (an outgroup, $M = 1.448$, $SE = .236$). Neither the main effect of target political party nor the interaction approached significance, $ps > .18$, partial η^2s $< .017$. Results for disgust revealed only a strong main effect of target political party, $F(1,91) = 19.848$, $p < .001$, partial $\eta^2 = .179$, which indicated that Democrats (an ingroup, $M = 1.173$, $SE = .223$) were regarded with significantly less disgust than Republicans (an outgroup, $M = 2.707$, $SE = .262$), again consistent with expectations. The main effect of target Greek membership was not significant, $F(1,91) = 3.060$, $p = .084$, partial $\eta^2 = .033$, nor was the interaction significant, $F(1,91) = 0.554$, $p = .459$, partial $\eta^2 = .006$. Results for anger revealed only a strong main effect of target political party $F(1,91) = 14.769$, $p < .001$, partial $\eta^2 = .140$, which indicated that, as expected, Democrats (an ingroup, $M = 1.042$, $SE = .233$) were regarded with significantly less anger than Republicans (an outgroup, $M = 2.424$, $SE = .274$). Neither the main effect of target Greek membership nor the interaction approached significance, $ps > .327$, partial η^2s $> .011$. Participants' emotional reactions were clearly affected by both shared or unshared political party and shared or unshared Greek system membership. Participants' specific emotions, however, did not conform to the same additive pattern revealed in the evaluative ratings. Rather, shared or unshared Greek system membership affected only admiration, whereas shared or unshared political party affected only anger and disgust. Individually, none of these emotions could give rise to the additive pattern found in the measures of evaluation. Taken together, however, admiration had the potential to account for the effects of target Greek membership on evaluation whereas disgust, anger, or both emotions had the potential to account for the effects of target political party on evaluation.

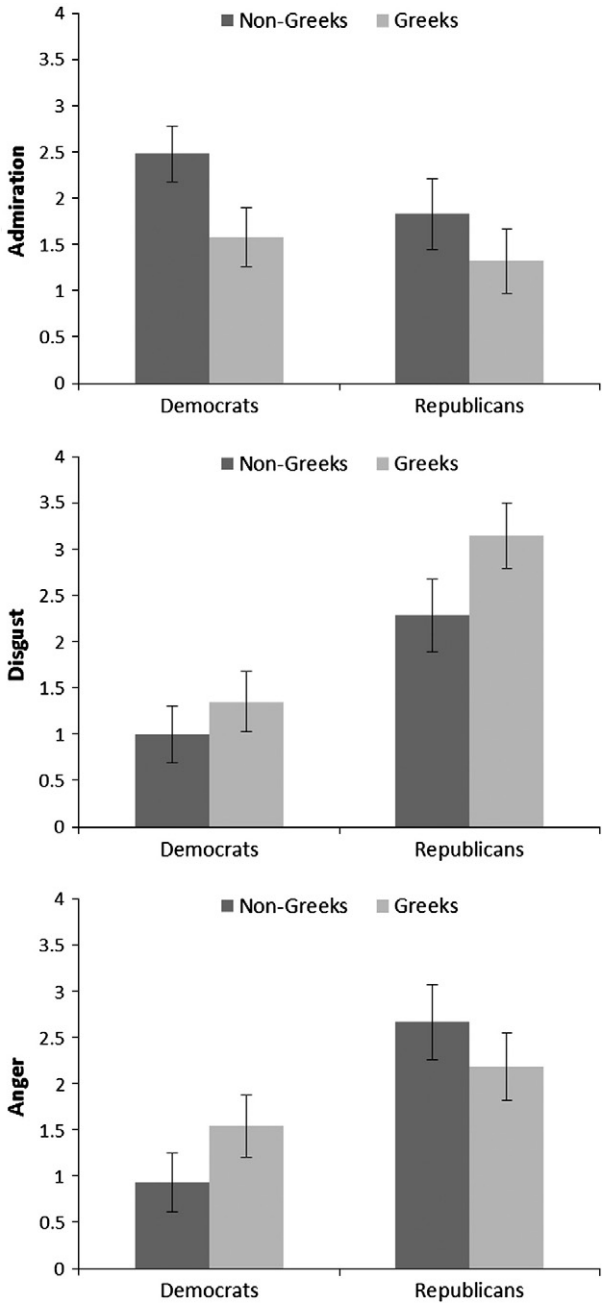

Fig. 2. Mean emotion levels by target political party and Greek system membership. Participants were non-Greek Democrats.

Relation between emotion and evaluation

Mediational analysis of the ability of admiration, disgust, and anger to account for the effects of political party and Greek system membership on evaluation is illustrated in Fig. 3. Previous analyses established that both target Greek membership and target political affiliation affected evaluation, that target Greek membership affected admiration, and that target political party affected disgust and anger. To assess the explanatory ability of admiration, disgust, and anger, we added all three emotions to a regression equation predicting evaluation from target Greek membership and target political party. The addition of admiration, disgust, and anger reduced both the relationship between target Greek membership and evaluation, $b = -.257$, $\beta = -.158$, $p = .063$, and the relationship between target political party and evaluation, $b = -.303$, $\beta = -.136$, $p = .091$, to non-significance. Both admiration, $b = .205$, $\beta = .359$, $p < .001$, and disgust, $b = -.230$, $\beta = -.443$, $p = .001$, were significant predictors of evaluation, but anger was not, $b = .026$, $\beta = .050$, $p = .673$. This analysis suggests that admiration can fully account for the effects of target Greek membership on evaluation and that disgust can fully account for the effects of target political party on evaluation. Anger, however, did not appear to influence evaluation once shared variance with admiration and disgust was taken into account.

To further support this interpretation, we used bootstrapping with 10,000 resamples to construct asymmetrical, bias corrected, accelerated 95% confidence intervals (MacKinnon, Lockwood, & Williams, 2004; Preacher & Hayes, 2008) around the unstandardized indirect effects of target political party, target Greek membership, and admiration, disgust, and anger on evaluation. In this analysis, a confidence interval that does not contain zero is equivalent to evidence for mediation at $p < .05$. For the indirect effects of target Greek membership on evaluation, only the confidence interval around admiration, 95% CI: $-.355$ to $-.015$, supported mediation. Both the

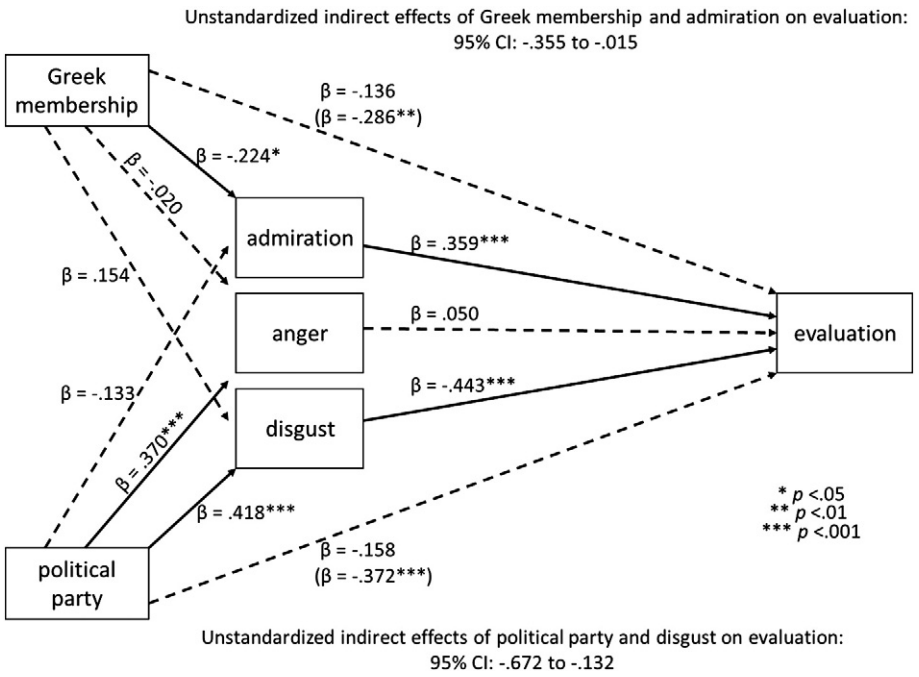

Fig. 3. Analysis of mediation by emotion of the effects of Greek membership and political party on evaluation.

confidence interval around disgust, 95% CI: −.364 to .015, and anger, 95% CI: −.076 to .038, contained zero. For the indirect effects of target political party on evaluation, only the confidence interval around disgust, 95% CI: −.672 to −.132, supported mediation. Both the confidence interval around admiration, 95% CI: −.250 to .038, and anger, 95% CI: −.147 to .257, contained zero. These results confirmed that admiration, but not anger or disgust, was able to fully account for the effects of target Greek membership on evaluation, and that disgust, but not admiration or anger, was able to fully account for the effects of target political party on evaluation.

Alternative causal models

Most of the approaches to explicit prejudice on which we build rely on attitude theory (Zanna & Rempel, 1988) to define evaluation in the context of prejudice (e.g. Alexander et al., 1999; Brown & Hewstone, 2005; Cottrell & Neuberg, 2005; Cuddy et al., 2007; Esses & Dovidio, 2002; Haddock et al., 1993; Pettigrew & Tropp, 2008; Stangor et al., 1991). Under attitude theory's definition of attitudinal evaluation as summary constructs, a causal model in which emotions cause attitudes is assumed. However, attitude theory is not the only theoretical framework with which to define evaluation and causal models in which evaluation precedes emotion or in which evaluation and emotion operate independently are possible under different theoretical frameworks. In order to assess the relative plausibility of such different models in these data, we formally compared models in which emotions cause attitudes and in which emotions and attitudes are independent outcomes of categorization and descriptively compared models emotions cause attitudes and in which attitudes cause emotion.

Formal comparison was accomplished through comparison of the respective models' fit to the data we report in structural equation modeling. Our assumed causal model, in which target Greek system membership and target political party cause emotions and in which emotions then cause evaluation, fit the data well, $\chi^2(3) = 6.78$, $p = .079$. The alternative model, in which Greek system membership and target political party cause emotions and evaluations independently of one another, fit the data relatively poorly, $\chi^2(3) = 39.50$, $p = .001$. These tests of model fit suggest that Study 1 is more consistent with a causal relationship between emotions and evaluation than with emotions and evaluations as independent outcomes.

Formal comparison of different causal orders between emotions and evaluations cannot be accomplished with structural equation modeling because such models are not nested and statistical comparisons of fit can be made only between nested models. However, the relative ability of emotions to account for evaluations and of evaluations to account for emotions provides some basis for descriptive comparison. Mediational analyses of the reverse causal model, in which target categorization causes attitudes which in turn cause emotions, yielded 95% confidence intervals around the estimated indirect effects of political affiliation and evaluation on disgust, 95% CI: .227 to 1.087, and around the estimated indirect effects of Greek system membership and evaluation on admiration, 95% CI: −.839 to −.138, that did not contain zero. The relationship between Greek system membership and admiration was reduced to non-significance, $\beta = -.093$, $p = .338$, but the relationship between political party and disgust remained significant, $\beta = .254$, $p = .007$. Thus, evaluation was able to fully account for admiration in reaction to Greek system membership but not able to fully account for disgust in reaction to political party. In our a priori causal model, emotions were able to fully account for the effects of both political affiliation and Greek system membership on evaluation indicating that a causal model in which emotions cause attitudes has superior explanatory ability.

Discussion

As predicted, specific emotions were able to account for the pattern of prejudiced evaluations typically found when crossed-categorizations are made salient. Although the anger evoked by political affiliation played no explanatory role, the combination of admiration at non-membership in the Greek system and disgust at Republican political affiliation was able to effectively explain the differential evaluations that non-Greek Democrats reported towards other non-Greek Democrats, Greek Democrats, non-Greek Republicans, and Greek Republicans, as predicted. Indeed, the impact of crossed-categorization on these specific emotions toward the target groups was able to fully account for the typical impact that crossed-categorization had on prejudice toward these groups.

These results supported our hypotheses well. It was not the case that admiration and disgust were mere proxies for evaluation. Admiration and disgust played quite different and separate roles from each other and were also distinct from anger. These results confirm the unique influence that distinct emotions exert on intergroup relations and confirm that discrete emotions cannot be reduced to shared and unshared group membership alone.

Of equal importance, attention to discrete emotions provided insight into the impact of crossed-categorization that would otherwise be hidden. Considering evaluations alone, the effects of shared political party and shared Greek membership appeared indistinguishable; either crossed-categorization reduced prejudice. When underlying emotions were taken into account, however, it became clear that these category memberships produced different outcomes. Participants simply did not admire Greeks as much as they admired non-Greeks but participants were more disgusted by Republicans than by Democrats. Although neither admiration nor disgust showed an additive pattern, their combined influence accounted for an additive pattern in evaluation.

An important implication of this finding is that the emotions directed at the partial ingroups, Greek Democrats and non-Greek Republicans, were quite different even while evaluations were quite similar. The category combination Greek and Democrat elicited neither admiration nor disgust whereas the category combination of Non-Greek and Republican elicited both admiration and disgust. While either of these emotional reactions can effectively account for middling evaluations, ambivalent disgust and admiration is clearly distinct from low levels of both disgust and admiration. Thus, partial ingroups that are traditionally equated in a single instance of crossed-categorization can elicit qualitatively distinct emotional reactions.

In this study, our predictions about emotion were based on theoretical analysis of the appraisal structure between Democrats and Republicans and Greeks and non-Greeks rather than on direct manipulation of appraisals. In order to provide experimental support for the role of appraisal-generated emotion, we conducted a second Study in which we constructed a novel instance of crossed-categorization to manipulate specific appraisals and, with those appraisals, specific emotions and general evaluations.

Study 2

In the tradition of minimal groups research we created and combined two novel personality groups (e.g., Doosje, Spears, & Koomen, 1995; Tajfel, Billig, Bundy, & Flament, 1971). We imbued these groups with characteristics that, based on appraisal theories of emotion, we expected to elicit admiration and disgust. Specifically, we provided participants with false personality feedback which indicated that they belonged to a high *achievement altitude* (AA) group and a high *metasociality* (MS) group, and contrasted those memberships with outgroups low in AA and low in MS. High AA people were described as having characteristics predictive of general professional success whereas the low AA outgroup was described as having characteristics predictive of professional mediocrity. High MS people were described as having strong moral character and being trustworthy in social interactions, whereas the low MS outgroup was described as lacking moral character and being untrustworthy in social interactions. We then asked participants about their emotional reactions to, and evaluations of, people who shared both, only one, or neither of participants' memberships in AA and MS.

We expected both AA membership and MS membership to affect evaluation through admiration. Since people experience admiration in reaction to good or praiseworthy actions or great skill (Cuddy et al., 2007; Keltner & Haidt, 2003; Ortony et al., 1988) both AA membership's relevance to professional success and MS membership's relevance to moral virtue are consistent with such appraisals. We expected MS membership, but not AA membership, to affect evaluation through disgust. People experience disgust in reaction to perception of moral violations, especially those that undermine social harmony (Cottrell & Neuberg, 2005; Rozin et al., 2008). Low MS people's untrustworthiness is consistent with such an appraisal but low AA people's professional mediocrity is not.

In summary, we created two novel group memberships based on the appraisals we theorized to be at play in Study 1 and we assessed participants' emotional reactions to and evaluations of the combination of those memberships. We expected once again to observe that crossed-categorization would reduce prejudice relative to double outgroup members, but would not eliminate prejudice relative to double ingroup members. More importantly, we expected that admiration would be able to account for the impact of both shared or unshared AA membership on evaluation, that the combination of admiration and disgust would be able to account for the impact of shared and unshared and MS membership on evaluation.

Method

Participants and design

Twenty-seven UCSB undergraduates (4 males and 23 females) participated in a 2 (AA: ingroup target and outgroup target) × 2 (MS: ingroup target and outgroup target) within-subjects design in return for US $6.00. Four participants expressed suspicion about the nature of the manipulations and their data were excluded from analysis.[2]

Procedure

Participants were recruited for an experiment on personality and cooperation. Participants expected to play a team-based game and were told that the experiment was investigating the influence of two newly discovered personality characteristics on cooperation.

To establish this cover story, participants completed scales assessing *Social Dominance Orientation* (Pratto et al., 1994), *Need for Cognition* (Cacioppo, Petty, & Kao, 1984), and *Need for Structure* (Neuberg & Newsom, 1993). Participants then received bogus feedback that indicated they were high in both AA and MS, as well as descriptions of what high and low AA and MS meant (see Appendix A).

Ostensibly to help the experimenter understand the coming interaction better, participants rated their emotional reactions to, and evaluations of, people who shared both high AA and high MS with the participant (the double ingroup), people who shared only high AA with the participant (a partial ingroup), people who shared only high MS with the participant (a partial ingroup), and people who shared neither high AA nor high MS with the participant (a double outgroup). The target groups were rated in a randomized order. All emotion and evaluation measures were the same as in Study 1.[3] After administration of the dependent measures for all targets, the experiment ended and participants were fully debriefed.

Results

Crossed-categorization and evaluations

Correlations between the semantic differentials and the feeling thermometer ranged from $r = .535$ to $r = .681$, all $ps < .01$, depending on the target of evaluation. We again standardized the semantic differentials and feeling thermometer and averaged them to form a single index of evaluation. Mean evaluations are graphed in Fig. 4.

[2] During debriefing three of the four suspicious participants indicated that they had completed advanced coursework in psychology that could have alerted them to be on guard against deception in psychology research.

[3] Although we expected no mediational role for anger given the appraisals we manipulated, we included anger both because it serves as a negative affect control for disgust and in case, as in Study 1, anger was unexpectedly evoked by either of the categories.

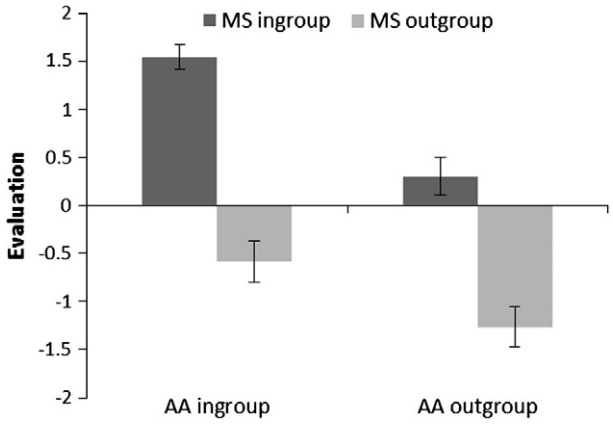

Fig. 4. Mean evaluations by target AA membership and MS membership.

A 2 (AA: ingroup and outgroup)×2 (MS: ingroup and outgroup) within-subjects ANOVA on evaluations revealed two strong main effects. The main effect of AA, $F(1,22)=25.391$, $p<.001$, partial $\eta^2=.536$, indicated that people who shared participants' AA ($M=.481$, $SE=.111$) membership were preferred over people who did not share participants' AA membership ($M=-.481$, $SE=.162$). An even stronger main effect of MS, $F(1,22)=59.228$, $p<.001$, partial $\eta^2=.729$, indicated that people who shared participants' MS membership ($M=.923$, $SE=.122$) were preferred over people who did not share participants' MS membership ($M=-.923$, $SE=.185$). In addition, the analysis also revealed a relatively weak interaction, $F(1,22)=7.346$, $p=.013$, partial $\eta^2=.250$, indicating that targets sharing *both* personality dimensions were evaluated even more positively than would be produced by the additive effects of AA and MS alone (see Fig. 4). Importantly, all simple main effects were significant, all $ps<.004$, partial η^2s$>.323$, indicating that the interaction between AA and MS supplemented rather than qualified the main effects of AA and MS. Reflecting the stronger influence of MS membership than of AA membership, additional comparison of the partial ingroups indicated that people who shared participants' MS membership but not AA membership were better evaluated than people who shared participants' AA membership but not MS membership, $F(1,22)=7.485$, $p=.012$, partial $\eta^2=.254$. These results indicate that the majority of variance in evaluation was accounted for by the additive combination of shared and unshared AA membership and MS membership combined with a weaker tendency to especially favor targets sharing both groups.

Crossed-categorization and emotion

Mean levels of admiration, disgust, and anger are graphed in Fig. 5.

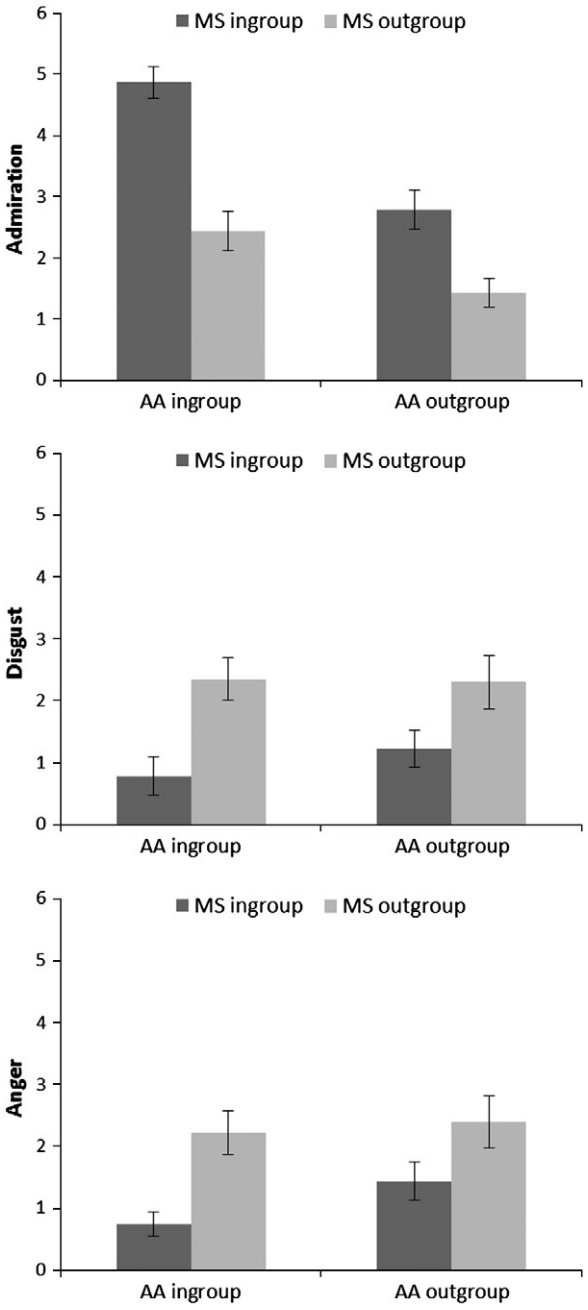

Fig. 5. Mean emotion levels by target AA membership and MS membership.

Admiration. Because both professional success and moral virtue are desirable characteristics, we predicted that both AA and MS memberships would influence admiration. A 2×2 ANOVA on admiration yielded the expected main effect of both AA, $F(1,22)=34.484$, $p<.001$, partial $\eta^2=.611$, with shared AA membership ($M=3.652$, $SE=.217$) admired more than unshared AA membership ($M=2.109$, $SE=.220$), and of MS, $F(1,22)=36.581$, $p<.001$, partial $\eta^2=.624$, with shared MS membership ($M=3.826$, $SE=.237$) admired more than unshared MS membership ($M=1.936$, $SE=.232$), as well as an interaction, $F(1,22)=6.807$, $p=.016$, partial $\eta^2=.236$ (see Fig. 5). All simple main effects were significant, all $ps<.006$, partial η^2s$>.299$, indicating that the interaction between AA and MS supplemented rather than qualified the effects of AA and MS. Additional comparison of the partial ingroups was non-significant, $F(1,22)=.593$, $p=.449$, partial $\eta^2=026$. These results generally parallel those observed for evaluation. The majority of variance in admiration was accounted for by additive effects in which targets sharing both AA and MS memberships with participants were evaluated more positively than targets sharing only one of AA or MS membership, who were in turn evaluated more positively than targets sharing neither AA nor MS membership. In addition, targets sharing both personality dimensions were regarded with more admiration than would be produced by the additive effects alone. The close parallel between the pattern observed for evaluations and the pattern observed for admiration indicated that, consistent with predictions, admiration had the potential to account for all effects of crossed-categorization on evaluation.

Disgust. Because only MS membership was relevant to morality and trustworthiness, we predicted that shared or unshared MS

membership, but not shared or unshared AA membership, would elicit disgust. A 2×2 ANOVA on disgust yielded only a main effect of MS, $F(1,22) = 15.393$, $p < .001$, partial $\eta^2 = .412$, with targets who did not share MS membership ($M = 1.000$, $SE = .231$) regarded with more disgust than targets who shared MS membership ($M = 2.326$, $SE = .307$). Neither the main effect of AA membership nor the interaction was significant, $ps > .30$, partial η^2s $< .027$. These results indicated that, consistent with predictions, disgust had the potential to account for the main effect of MS membership, but not AA membership, on evaluations.

Anger. A 2×2 ANOVA on anger yielded an unexpected main effect of MS membership, $F(1,22) = 18.789$, $p < .001$, partial $\eta^2 = .461$, with outgroup MS targets ($M = 1.087$, $SE = .198$) eliciting more anger than ingroup MS targets ($M = 2.304$, $SE = .328$). Neither the main effect of AA membership nor the interaction was significant, $ps < .076$, partial $\eta^2 < .136$. As in Study 1, the mean level effects of crossed-categorization on anger paralleled the effects of crossed-categorization on disgust. Anger thus also had the potential to account for the main effect of MS membership, but not AA membership, on evaluations.

Relation between emotion and evaluation

To assess the ability of emotions to account for the effects of crossed-categorization on evaluation in a within-subjects design, we followed the recommendations of Judd, Kenny, and McClelland (2001). In this approach, the difference between two observations of a within-subjects dependent measure is regressed on the difference between two observations of a within-subjects mediating variable. These difference scores capture the effect of condition in a within-subjects design. Testing such a difference score against zero is equivalent to a paired sample *t*-test. A significant relationship between the relevant difference scores means that the effects of condition on the mediator variable predict the effects of condition on the outcome variable. In other words, a significant relationship supports mediation assuming the other traditional preconditions of mediation analysis have been met. A particularly useful feature of this analysis is that the intercept of the regression equation (denoted with an *a*) represents the amount of unexplained variance remaining in the dependent measure after the mediator is taken into account (see Judd et al., 2001 for mathematical derivation). Thus, a significant intercept supports only partial mediation, whereas a non-significant intercept is consistent with full mediation. Note that the use of difference scores in this analysis strategy is required in order to analyze the relationship between within-subjects manipulations without violating the critical assumption of independence between observations (Judd et al., 2001).

We applied this approach to our findings by decomposing the 2 (target AA: ingroup and outgroup)×2 (target MS: ingroup and outgroup) within-subjects ANOVA into its component parts and assessing mediation by emotion separately for each component part. This approach allowed us to examine the role of particular emotions in evaluations based on the main effect of target AA membership, the main effect of target MS membership, and the interaction between the two. The results of these mediational analyses are summarized in Table 1.

AA membership. Only admiration emerged as a candidate mediator for the effects of AA on evaluation. To assess the ability of admiration to account for the effects of AA on evaluation, we regressed the difference in evaluation of targets who shared participants' AA membership and targets who did not share participants' AA membership (post-standardization) on the same difference in admiration. This analysis revealed a strong and significant relation between the effects of shared and unshared AA membership on admiration and on evaluation, $R^2 = .436$, $b = .493$, $\beta = .680$, $p < .001$, and a non-significant intercept, $a = .200$, $p = .394$. Consistent with predictions, admiration was able to fully account for the effects of AA membership on evaluation.

Table 1
Analysis of within-subjects mediation by emotion of the effects of achievement altitude (AA), metasociality (MS), and the interaction between the two on evaluations.

	R^2	*a*	*b*	β
Achievement altitude	.436***	.200		
Admiration			.493***	.680***
Metasociality	.697***	.723**		
Admiration			.327*	.426*
Disgust			−.311*	−.438*
Anger			−.076	−.089
Interaction	.181*	.330		
Admiration			.211*	.426*

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

MS membership. In addition to the predicted role of admiration and disgust, anger also emerged as a candidate mediator for the effects of MS membership on prejudice. To assess mediation, we simultaneously regressed the difference in evaluation of ingroup and outgroup MS targets on the same differences in admiration, disgust, and anger. The effects of shared and unshared MS membership on evaluation were well predicted by the effects of shared and unshared MS membership on admiration, disgust, and anger, $R^2 = .697$, $p < .001$; $a = .723$, $p = .006$. Importantly, however, the effects MS membership on admiration, $b = .327$, $\beta = .426$, $p = .022$, and disgust, $b = -.311$, $\beta = -.438$, $p = .024$, were strong and significant predictors of evaluation, but the effects of MS membership on anger were not $b = -.076$, $\beta = -.089$, $p = .656$. These results indicated that, consistent with predictions, admiration and disgust were able to account for the impact of shared MS membership on evaluations. As in Study 1, once shared variance with admiration and disgust was taken into account, anger did not explain evaluation.

Interaction between AA and MS membership. Admiration was the only candidate mediator for the interaction between AA and MS membership. We assessed mediation by first calculating a difference score in evaluations that represented the interaction between target AA membership and target MS membership.[4] We then regressed this difference score on the same difference score for admiration. The interaction in evaluations was significantly predicted by the interaction in admiration, $R^2 = .181$, $b = .211$, $\beta = .426$, $p = .043$; $a = .330$, $p = .146$. This analysis suggested that admiration was able to effectively account for the interaction between AA and MS membership on evaluation.

Alternative causal models

The repeated measures design of Study 2 prevents formal comparison of the causal models in which emotions cause attitudinal evaluations and in which emotions and attitudinal evaluations are independent outcomes of target categorization. However, the explanatory ability of the causal model in which evaluations cause emotions

[4] This difference score is a difference between two differences. Specifically we first calculated the difference in evaluation of targets who shared and did not share participants' AA, but only for targets who shared participants' MS. We then calculated the same difference in evaluation for targets who did not share participants' MS. We then calculated the difference between the two difference scores. Testing this final difference score against zero is equivalent to testing a 2 way interaction in within-subjects ANOVA.

can be descriptively compared to our assumed causal model in which emotions cause evaluations. In Study 2, evaluation was able to partially account for admiration in reaction to AA membership, $a = -.949$, $p = .004$, in reaction to MS membership, $a = -1.725$, $p < .001$, and for disgust in reaction to MS membership, $a = 1.806$, $p < .001$. Evaluation could fully account for the interaction in admiration, $a = -.357$, $p = .432$. In our a priori model, emotions were able to fully account for the effects of AA membership on evaluation and the interaction in evaluation, but also could only partially account for the effects of MS membership on evaluation. As in Study 1, evaluation was less effective in accounting for the observed variance in emotions than emotions were in accounting for the observed variance in evaluation.

Discussion

We constructed two novel group memberships based on the theoretically relevant appraisals from Study 1. As expected, the combination of these two novel group memberships had strong additive effects on evaluation. Also as predicted, the combined effects of admiration and disgust, but not anger, were able to effectively account for the effects of crossed AA and MS categorization on evaluation. Specifically, admiration was able to account for the effects of AA on evaluation and was able to partially account for the effects of MS on evaluation, and disgust was also able to partially account for the effect of MS on evaluation.

Interestingly, MS membership influenced evaluation more than did AA membership. Discrete emotions provide insight into this outcome. The effects of AA membership and MS membership on admiration were comparable but MS also affected disgust. Thus, the larger effect of MS on evaluation can be accounted for by feelings of disgust supplementing (lack of) admiration in reaction to unshared MS membership.

Additionally, we also observed a comparatively weak interaction effect in which double ingroup members were especially favored over other category combinations. Although not anticipated here, this effect has been observed in past investigations of crossed-categorization (Crisp & Hewstone, 2007) and is readily explicable in terms of underlying emotion. The interaction in evaluation was paralleled by and could be well accounted for by an interaction in admiration.

Of course Study 2's target membership groups were artificially designed to allow us to isolate and manipulate the appraisals we specified in a way that true group memberships rarely, if ever, do. The value of Study 2 is that it demonstrates that an appraisal structure similar to the one that we theorized to drive emotions in Study 1 (but did not directly observe) does indeed produce emotional reactions which were comparable across studies. Taken together, Studies 1 and 2 show the important role played by discrete emotions in crossed-categorization; complex and sometimes contradictory discrete emotions underlie the established effects of crossed-categorization on evaluative measures of prejudice and prejudice reduction.

Importantly, this integration also has the potential to increase the explanatory power of current approaches to crossed-categorization. When outgroups are appraised positively, the additive combination of emotions about outgroups suggests that crossed-categorizations involving such outgroups should improve evaluation. In contrast, the traditional exclusive focus on shared and unshared group memberships makes the implausible prediction that crossed categorizations involving outgroups will uniformly decrease evaluations. To demonstrate that the additive combination of emotions about component group memberships better predicts evaluation than the additive combination of shared and unshared group membership alone, we conducted a third study.

Study 3

Study 3 uses a discrete emotions approach to investigate prejudice against gay men and lesbian women, referred to as sexual prejudice (Herek, 2000a). We examined straight men's evaluations of and emotions about other straight men, straight women, gay men, and lesbian women.

Straight men typically appraise their gender outgroup, women, positively. Specifically, women are appraised as a source of romantic satisfaction (Glick & Fiske, 2001). However, straight men's sexual outgroup, gay people, are appraised less positively than the ingroup (Herek, 2000a). One clear contributor to these appraisals is that gay people are less likely to be appraised as a source of platonic companionship than are other straight people (Brewer, 1999; Kandel, 1978). In addition, such negative appraisals are sometimes contributed to by the perceived violation of gender roles, although this perception is less prevalent in young affluent educated populations such as university students (Herek, 2000a).

Because of these established intergroup appraisals, a discrete emotions approach to this case of crossed-categorization predicts a different pattern of evaluation than does shared and unshared group membership alone. Consistent with work on benevolent sexism, a discrete emotions approach predicts that positive emotion, specifically lust, will elevate straight men's evaluations of category combinations involving women, straight men's gender outgroup, above straight men's evaluations of other men. Consistent with work on sexual prejudice, a discrete emotions approach predicts that lack of positive emotion, specifically lack of camaraderie, would reduce straight men's evaluations of category combinations involving gay people, straight men's sexual outgroup, relative to other straight people. Additive combination of these emotions yields an evaluative pattern in which one partial ingroup, straight women, would be evaluated most positively, in which the double ingroup and double outgroup, straight men and lesbian women respectively, would be evaluated equivalently, and in which the second partial ingroup, gay men, would be evaluated most negatively. In contrast, additive combination of shared and unshared group membership alone predicts that straight men would best evaluate other straight men, would evaluate straight women and gay men at moderate levels, and would evaluate lesbian women most poorly.

Note that some elements of predictions based on shared and unshared group membership alone might change according to known moderators. Although the relative differences between double ingroups and partial ingroups or between double outgroups and partial ingroups might be exaggerated or muted by factors like an inclusive or exclusive mind set (Crisp & Hewstone, 2007), under no circumstances would current theoretical accounts of crossed-categorization predict that a partial ingroup would be evaluated more positively than a double ingroup and only in cases of identity threat would a partial ingroup be evaluated less positively than a double outgroup (Brewer et al., 1987; Crisp et al., 2002; Crisp & Hewstone, 1999, 2007; Crisp, Stone, & Hall, 2006; Crisp, Walsh, et al., 2006; Hewstone et al., 1993; Migdal et al., 1998; Urban & Miller, 1998). A discrete emotions perspective predicts exactly such evaluations because of additive combination of positive emotion directed at an outgroup involved in crossed-categorization.

Methods

Participants and design

Fifty-nine self-identified straight male students at the University of Tübingen, Germany participated in a 2 (target gender: male or female) × 2 (target sexual orientation: heterosexual or homosexual) within-subjects design, administered over the Internet, in exchange for the chance to win 100€. Three participants were excluded from analysis because their responses showed little or no variability (which

we interpreted as disengagement, especially given the study's online administration) and four participants were excluded because they reported moderate or greater levels of lust in reaction to other men, leaving 52 participants in the final sample. The inclusion of the excluded participants did not meaningfully change the outcome of any reported analysis.

Procedure

Participants were invited by email to participate in a survey about heterosexual men's opinions. Participants accessed the survey at their convenience by following a link embedded in the recruitment email. Participants first confirmed their gender and sexual orientation and then reported their emotions about and evaluations of other heterosexual men, heterosexual women, homosexual men, and homosexual women in a randomized order. Evaluations, lust, camaraderie,[5] and disgust[6] were assessed using German language versions of the scales used in Studies 1 and 2.

Results

Crossed-categorization and evaluation

Correlations between the semantic differentials and the feeling thermometer ranged from $r = .557$ to $r = .752$, all $ps < .001$, depending on the target of evaluation. We again standardized and averaged the semantic differentials and feeling thermometer to form a single index of evaluation. Mean evaluations are graphed in Fig. 6.

A 2 (target gender: male or female) × 2 (target sexual orientation: heterosexual or homosexual) within-subjects ANOVA on evaluation revealed two strong main effects. Consistent with predictions, the main effect of gender indicated that women ($M = .267$, $SE = .104$) were preferred over men ($M = -.267$, $SE = .112$), $F(1,51) = 44.735$, $p < .001$, partial $\eta^2 = .467$, and the main effect of sexual orientation indicated that heterosexuals ($M = .265$, $SE = .095$) were preferred over homosexuals ($M = -.265$, $SE = .132$), $F(1,51) = 22.208$, $p < .001$, partial $\eta^2 = .303$. The ANOVA also revealed an interaction, $F(1,51) = 10.779$, $p = .002$, partial $\eta^2 = .174$, indicating that straight women were evaluated even more positively than would be produced by the two main effects alone (see Fig. 6). Importantly, all simple main effects were significant, all $ps < .025$, partial η^2s $> .094$, indicating that the interaction between gender and sexual orientation supplemented rather than qualified the main effects of gender and sexual orientation. Additional comparison of the double ingroup (straight men) and the double outgroup (lesbian women) was non-significant, $F(1,51) = .001$, $p = .976$, partial $\eta^2 = .000$. As predicted, these effects indicate that straight women, a partial ingroup, were evaluated most positively, that gay men, the second partial ingroup, were evaluated least positively, and that straight men and lesbian women, the double ingroup and double outgroup respectively, were evaluated at levels between the partial ingroups.

Crossed-categorization and emotion

Mean levels of lust, camaraderie, and disgust are graphed in Fig. 7.

Lust. We predicted that straight men would direct more lust at women than at men. Consistent with predictions, we observed a main effect of gender in which women ($M = 4.615$, $SE = .196$) were viewed with substantial lust but men ($M = .269$, $SE = .068$) were viewed with almost no lust, $F(1,51) = 332.725$, $p < .001$, partial $\eta^2 = .867$. An additional main effect of sexual orientation, $F(1,51) = 62.033$, $p < .001$,

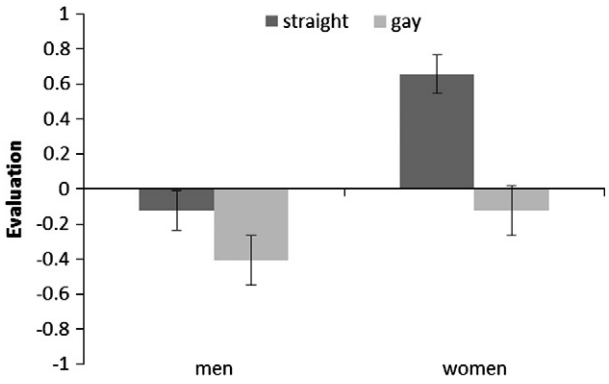

Fig. 6. Mean evaluations by target gender and sexual orientation. Participants were straight men.

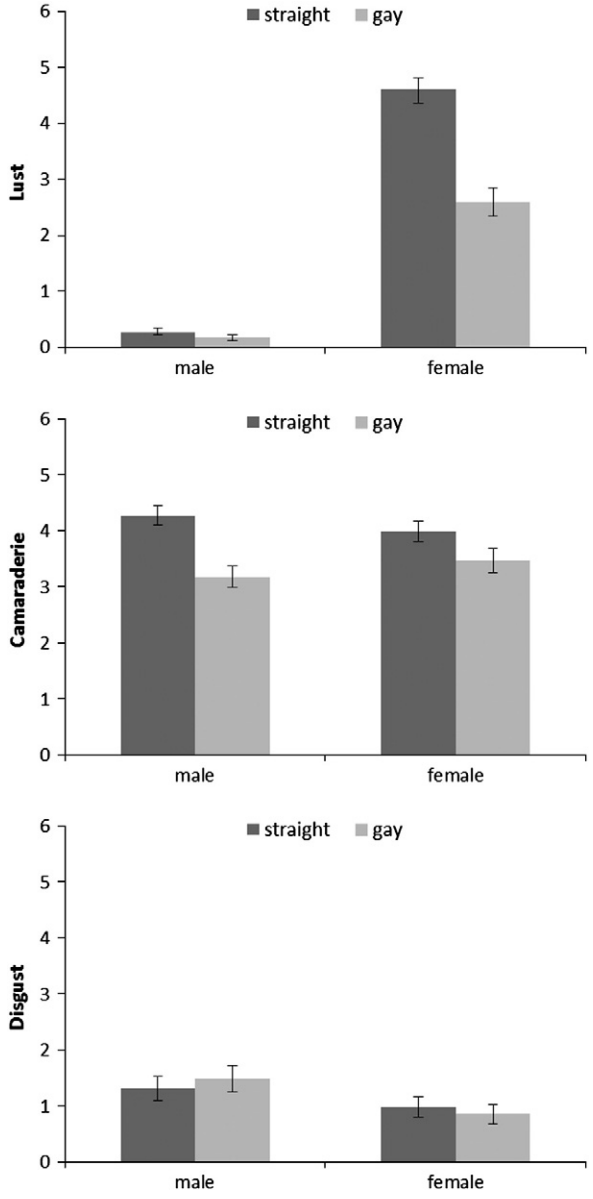

Fig. 7. Mean emotion levels by target gender and sexual orientation. Participants were straight men.

[5] Assessment of camaraderie in Germany is somewhat complicated by heavy use of the German word for camaraderie, "Kameradschaft", in World War II propaganda. The first author's native German colleagues advised the use of "Kameradschaft/Freundschaft", which literally translates to "camaraderie/friendship", to provide appropriate context. This language conveys platonic affiliative emotion without militant connotations.

[6] We did not expect disgust to explain anti-gay prejudice in this demographic but included the emotion because of its documented role in cases of anti-gay prejudice in other demographics.

partial $\eta^2 = .549$, was qualified by an interaction, $F(1,51) = 52.254$, $p = .002$, partial $\eta^2 = .506$, indicating that straight men felt more lust about straight women than about lesbian women, $F(1,51) = 61.097$, $p < .001$, partial $\eta^2 = .545$, but that sexual orientation did not affect the low levels of lust directed at other men, $F(1,51) = 1.959$, $p = .168$, partial $\eta^2 = .037$ (see Fig. 7). Both simple effects of gender were significant, indicating that the main effect of gender was supplemented rather than qualified by the interaction, $ps < .001$, partial η^2s $> .647$. These results indicate that lust had the potential to account for both the observed evaluative preference for women over men, as well as for the observed evaluative preference for straight women over lesbian women not explained by the influence on evaluation of differences in sexual orientation.

Camaraderie. We predicted that straight men would feel more camaraderie towards other straight people than towards gay people regardless of gender. A 2×2 ANOVA revealed a robust main effect of sexual orientation, $F(1,51) = 25.792$, $p < .001$, partial $\eta^2 = .336$, which indicated that this sample felt more camaraderie towards straight people ($M = 4.125$, $SE = .148$) than towards gay people ($M = 3.317$, $SE = .169$), as well as an interaction, $F(1,51) = 4.327$, $p = .046$, partial $\eta^2 = .076$. The pattern of the interaction indicated that the level of camaraderie directed at men relative to women depended on sexual orientation (see Fig. 7). For straight targets, more camaraderie was directed at other men whereas for gay targets, more camaraderie was directed at women. However, neither simple effect of gender reached statistical significance, $ps > .171$, partial η^2s $< .036$. Regardless of gender, more camaraderie was directed at heterosexual targets than at homosexual targets $ps < .024$, partial η^2s $> .095$. These results indicate that differences in camaraderie had the potential to account for the anti-gay prejudice observed in this study.

Disgust. We assessed disgust because of its role in the sexual prejudice literature, but did not expect disgust to explain sexual prejudice in a university subject population. A 2×2 ANOVA revealed no evidence, through either a main effect of sexual orientation or through an interaction, that this sample of straight men felt more disgust about gay people than about straight people, $ps > .215$, partial η^2s $< .030$. However, the ANOVA did reveal an unexpected main effect of gender, $F(1,51) = 10.572$, $p = .002$, partial $\eta^2 = .172$, which indicated that male targets ($M = 1.394$, $SE = .173$) elicited more disgust than female targets ($M = .913$, $SE = .155$) across sexual orientation, although both genders elicited low levels of disgust overall. This pattern indicates that, in this sample of straight male university students, disgust might contribute to more positive evaluations of women than of men, but that disgust played no role in determining evaluations based on sexual orientation.

Relation between emotion and evaluation

We employed the same within-subjects approach to mediation analysis used in Study 2. We decomposed the 2 (target gender: male and female)×2 (target sexual orientation: gay and straight) ANOVA on evaluation into its component parts by computing difference scores which respectively captured each of the two main effects as well as the interaction. We then regressed those difference scores on the corresponding differences in potential emotional mediators. This approach allowed us to parcel out the influence of particular emotions on the different elements of evaluation involved in the combination of gender and sexual orientation. The results of this analysis are summarized in Table 2.

Gender. Women were evaluated more positively than were men. Two emotions had the potential to mediate this difference, lust and disgust. To assess mediation, we simultaneously regressed the difference in the evaluation of men and women on the same differences in lust and disgust. The effects of gender on evaluation were well predicted by the effects of gender on lust and disgust, $R^2 = .306$, $p < .001$; $a = .049$, $p = .497$. Both the effect of gender on lust, $b = .151$, $\beta = .352$, $p = .005$, and the effect of gender on disgust, $b = -.241$, $\beta = -.446$, $p < .001$, were strong and significant predictors of the effects of gender on evaluation. Consistent with predictions, these results indicate that straight men's lust in reaction to women partially accounted for straight men's evaluative preference for women over men regardless of target sexual orientation. Unexpectedly, these results also suggest that this sample's disgust at men also contributed to the evaluative preference for men over women independent of sexual orientation. Together, greater lust at women than at men and greater disgust at men than at women were able to fully account for this sample's evaluative preference for women over men.

Table 2
Analysis of within-subjects mediation by emotion of the effects of gender, sexual orientation, and the interaction between the two on evaluations.

	R^2	a	b	β
Gender	.306***	.094		
Lust			.151**	.352**
Disgust			−.241***	−.446***
Sexual orientation	.266***	.235		
Camaraderie			.365***	.516***
Interaction	.148**	−.076*		
Lust			.217**	.384**

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

Sexual orientation. Straight people were evaluated more positively than were gay people. Only camaraderie had the potential to mediate this effect. Regression of the difference in evaluations of straight and gay people on the same difference in camaraderie indicated that the effects of sexual orientation on camaraderie accounted for the effects of sexual orientation on evaluation well, $R^2 = .266$, $b = .365$, $\beta = .516$, $p < .001$; $a = .235$, $p = .054$. Consistent with predictions, these results indicate that reduced camaraderie was able to account for this sample's evaluative preference for straight people over gay people.

Interaction. Straight women were evaluated particularly positively. The degree of this positivity exceeded that which would be expected because of the combined effects of gender and sexual orientation alone. Lust was the only emotion which had the potential to mediate this effect. Regression of the interaction term for evaluation on the same term for lust predicted evaluation well, $R^2 = .148$, $b = .217$, $\beta = .384$, $p = .005$; $a = -.076$, $p = .705$. These results indicate that greater lust in reaction to straight women than to lesbian women was able to account for this sample's particularly positive evaluations of straight women.

Alternative causal models

As in Study 2, the explanatory ability of a model in which evaluations cause emotions was descriptively compared to the model in which emotions cause evaluations. Evaluation could partially account for lust in reaction to gender, $a = -2.977$, $p < .001$, for camaraderie in reaction to sexual orientation, $a = .421$, $p = .014$, and for the interaction between gender and sexual orientation in lust, $a = -1.587$, $p < .001$, but could fully account for disgust in reaction to male gender, $a = .058$, $p = .756$. Our a priori model could fully account the effects on evaluation of gender, sexual orientation, and the interaction between the two. As in Studies 1 and 2, evaluation was less effective in accounting for the observed variance in emotions than emotions were in accounting for the observed variance in evaluation.

Discussion

The combination of gender and sexual orientation yielded an evaluative pattern in which straight men evaluated one partial ingroup, straight women, most positively and the other partial ingroup, gay men, least positively. Straight men also evaluated the double ingroup, other straight men, and the double outgroup, lesbian women, at comparably intermediate levels. This pattern of evaluation is difficult to account for by considering only shared and unshared group memberships but could be well accounted for by the combination of lust, camaraderie, and disgust elicited by these category combinations.

Importantly, a crossed-categorization framework is clearly applicable to the combination of gender and sexual orientation. In our sample, the low levels of disgust directed at men were shared across sexual orientation. In more prejudiced populations, prejudice against gay men is enhanced by shared group membership. That is, some straight men are disgusted by gay men because they are perceived to violate the prescriptive norms of shared male gender (Herek, 2000a; Parrott, Peterson, Vincent, & Bakeman, 2008). Women, on the other hand, are an interesting outgroup because straight men generally desire positive interaction with women. However, this interaction is clearly group-based; straight men would generally not desire the same type of positive interaction with other straight men. One of the strengths of a discrete emotions approach to intergroup relations is that the construct of appraisal provides a systematic means by which to relate such positive intergroup dynamics to the broader context of intergroup relations.

Although it was not our main focus, the application of a crossed-categorization framework to gender and sexual orientation has important implications for the study of sexual prejudice. In the current sexual prejudice literature, straight men's positive evaluations of lesbian women relative to gay men is typically explained by the emotions elicited by the unique relationships of gay men and lesbian women with straight men. For example, when such evaluative differences are attributed to the relationship between straight men and gay men, they are explained by negative emotion directed at gay men resulting from violation of male gender roles (e.g. Herek, 2000a). When such evaluative differences are attributed to lesbian women, they are explained by sexual attraction to lesbian women resulting from socialization of straight men by erotic media (e.g. Herek, 2000b; Kite & Whitley, 1996; Louderback & Whitley, 1997). If one were to consider only evaluations of and emotions about gay men and lesbian women, both of those hypotheses would appear to garner support in these data. More positive evaluation of gay men than of lesbian women would be explained by disgust directed at gay men and lust directed at lesbian women. It is only when one considers the separate emotions evoked by sexual orientation and by gender that it becomes apparent that neither hypothesis is supported in these data. Disgust at gay men reflects this progressive sample's disgust at men in general. Similarly, lust in reaction to lesbian women does not require an appeal to a unique straight male fascination with lesbians, but is part of male emotions about women in general. Explanations that focus only on gay men or on lesbian women risk losing sight of differences in the evaluation of gay men and lesbian women that might arise because of emotions about men and women independent of sexual orientation.

We do not mean to suggest that differences in the perception and evaluation of gay men and lesbian women will always, or even usually, be explained by generalized differences in the perception of men and women. Different trends would likely emerge in a sample with more representative demographics (Herek, 2000a, 2000b) and not all methodologies which focus on only gay men or lesbian women are subject to such misinterpretation (e.g. Parrott et al., 2008). What we do suggest is that closer consideration of the separate contributions of emotions about gender and sexual orientation in general to emotions about gay men and lesbian women would bring greater precision to the sexual prejudice literature.

General discussion

In three studies, we integrated two important literatures in prejudice and prejudice reduction, the well-established literature on crossed-categorization and the increasingly important literature on the role of discrete emotions in intergroup relations. Study 1 examined admiration, disgust, and anger in reaction to the combination of political party and Greek system membership and showed that discrete emotions were able to account for the typical effects of crossed-categorization on evaluations of shared and unshared group membership. Admiration was able to account for the effects of Greek system membership on evaluation, disgust was able to account for the effects of political party, and the effects of both admiration and disgust were distinct from anger.

The added specificity provided by discrete emotions was especially important with regard to the partial ingroups in this example, Greek Democrats and non-Greek Republicans, because current theoretical accounts of crossed-categorization predict equal evaluations of partial ingroups in most circumstances (Brewer et al., 1987; Crisp et al., 2002; Crisp & Hewstone, 1999, 2007; Hewstone et al., 1993; Migdal et al., 1998; Urban & Miller, 1998). In our results, Greek Democrats and non-Greek Republicans were evaluated equivalently, but elicited very different emotions. Non-Greek Republicans were the recipients of ambivalent emotion – admiration and disgust – but Greek Democrats were affectively neutral, eliciting neither admiration nor disgust. These different emotional reactions are important because the link between specific emotions and specific action tendencies is broadly supported in both the discrete emotions literature (e.g. Frijda, Kuipers, & terSchure, 1989; Ortony et al., 1988; Rozin et al., 2008) and the intergroup relations literature (e.g. Cuddy et al., 2007; Mackie et al., 2000; Pettigrew & Tropp, 2006, 2008; Smith, Seger, & Mackie, 2007). Thus, because of the different combinations of emotions they elicit, non-Greek Republicans could expect non-Greek Democrats to treat them with ambivalence, but a Greek Democrat might simply be ignored.

Study 2 examined the role of appraisal in determining emotions about crossed-categorization. We drew on appraisal theories of emotion to construct novel crossed-categorizations in the lab. In support of our emphasis of appraisal as a determinant of emotions about crossed-categories, these novel crossed-categorizations yielded similar emotional reactions to those observed in Study 1. Admiration was able to account for evaluations of group memberships relevant to both professional competence and morality, whereas disgust was able to account for evaluations only when group memberships involved morality.

Study 3 echoed each of these points and also demonstrated that, when predictions based on the additive combination of emotion about group memberships and predictions based on the additive combination of shared and unshared group membership diverge, predictions based on the additive combination of emotion win out. Specifically, when evaluating the combination of gender and sexual orientation, straight men evaluated combinations involving women, their gender outgroup, more positively than category combinations involving men, their gender ingroup. At the same time, straight men exhibited traditional intergroup bias in reaction to ingroups and outgroups based on sexual orientation. At first glance this pattern appears inconsistent with the existing crossed-categorization literature (Brewer et al., 1987; Crisp et al., 2002; Crisp & Hewstone, 1999, 2007; Hewstone et al., 1993; Migdal et al., 1998; Urban & Miller, 1998). However, the additive combination of relatively positive emotions about women and of relatively less positive emotions about gay people was able to effectively account for this pattern.

One criticism specific to Study 2 is that non-members of either group might have responded in the same way as did participants assigned to the involved groups. Importantly the same criticism cannot be leveled at Studies 1 and 3, which used groups to which participants clearly belonged and about which they cared. The consistency of results across the three studies reassures us that qualitatively different processes were not at work in Study 2.

Additionally, we would agree that our predictions in Study 3 are more intuitive than those made by focusing on shared and unshared group membership alone. In fact, the inability of current accounts of crossed-categorization to derive these predictions without resorting to the claim that either gender or sexual orientation is a special case of group membership unlike any other clearly highlights the importance of our contribution. Appealing to the additive combination of emotion about component ingroup and outgroup memberships in crossed-categorization provides a theoretically coherent reconciliation of research on gender relations and sexual orientation with existing frameworks of crossed-categorization.

Although positively appraised outgroups might be the exception rather than the rule, the example of heterosexual men appraising women is hardly unique. University students positively appraise outgroups that are perceived to increase campus diversity (Ray et al., 2008); work on the Stereotype Content Model identifies groups that are appraised positively in nationally representative samples (Cuddy et al., 2007; Fiske, Cuddy, Glick, & Xu, 2002); and System Justification Theory documents systematic outgroup favoritism in support of existing social orders (Jost & Banaji, 1994; Jost, Banaji, & Nosek, 2004). Instances of crossed-categorization drawn from any of these examples might very well elicit positive emotion in reaction to outgroup members and thus lead to a similar pattern of evaluation to that which we observed in reaction to the combination of gender and sexual orientation.

Causation between emotion and evaluation

We derived our predictions by drawing on the assumption that emotions cause attitudinal evaluations. However, most of the insights offered by a discrete emotions approach do not depend on strong assumptions about the causal relationship between emotion and evaluation. We advance the ideas that (a) emotions about crossed-categorizations provide more specific information than evaluations of crossed-categorizations, (b) evaluative approaches to crossed-categorization sometimes equate category combinations that elicit qualitatively distinct emotional responses, and (c) the additive combination of emotion allows for parsimonious understanding of crossed-categorizations involving positively appraised outgroups. Although these ideas follow logically from the assumption that emotion causes evaluation, all of these ideas remain unchanged whether emotions cause evaluation, whether evaluation causes emotion, or whether evaluation and emotion are entirely independent from one another. In short, our major claim is that patterns of discrete emotions permit more textured understanding and more refined predictions of reactions to cross-categorized groups, even in cases where evaluations of the groups are equivalent.

We do believe, however, that the best and most comprehensive theoretical account of crossed-categorization is one in which the additive combination of emotions are summarized in attitudinal evaluations. We believe this for three reasons. First, a causal relation between emotion and evaluation is already well established in the attitudes literature (Edwards, 1990; Edwards & von Hippel, 1995; Krosnick et al., 1992; Murphy & Zajonc, 1993; Zanna & Rempel, 1988). Second, attitudinal evaluation preceding emotions is inconsistent with the idea of attitudes as summary concepts. Third, a model in which evaluations cause emotions consistently had less explanatory power than a model in which evaluations cause emotions and, when comparison was viable, a model in which evaluations were independent of emotion was poorly supported by our data. Certainly, this analysis does not definitively settle the issue of causation between emotions and evaluations in intergroup contexts nor is this issue one that could be fully resolved using the methods we employ here. However, to the extent that we were able to investigate the question, our data supported the dominant attitudinal approach to explicit prejudice in which emotions inform evaluation.

Implications for current models of crossed-categorization

Other mediators have also been proposed for the effects of crossed-categorization on evaluation, chiefly intergroup differentiation. According to Crisp and Hewstone's (2007) differentiation–decategorization model, when multiple salient categories converge with regard to ingroup and outgroup membership (double ingroups and double outgroups), differentiation between a perceiver's and a target's category memberships is increased (categories seem less similar). As category differentiation is increased, so too is bias. In contrast, when multiple salient category memberships crosscut single ingroup and outgroup memberships (partial ingroups), differentiation, and thus bias, is reduced. In this view, differentiation processes cause different categorizations to be activated: the currently salient ingroup and outgroup categorizations are different under these different convergent or crosscutting conditions, and these differentiated or undifferentiated categories determine bias (Crisp & Hewstone, 2007).

The emphasis of the differentiation–decategorization model on categorization differences as the cause of evaluative differences is paralleled in Intergroup Emotions Theory. We view category differentiation as a distal cause of evaluation and emotions as a proximal cause of evaluation. In fact, our view is precisely that emotions are the means by which category differences come to influence evaluation. Thus, rather than viewing category differentiation and emotional reaction as competing mediators, we suggest they function at subsequent steps in a causal chain. For example, our results suggest that different specific emotions are able to account for the impact of particular differentiated (double ingroup or outgroup) and particular less differentiated (partial ingroup) categories on evaluation. That is, the less differentiated categorizations that might be salient when non-Greek Democrats think about Greek Democrats are distinct from the less differentiated categorizations that might be salient when non-Greek Democrats think about non-Greek Republicans. In our data, these distinct category representations triggered different emotions. Both of the less differentiated categorizations reduced evaluative bias in the end, but we suggest that they did so through different emotions. Given the common roots of the differentiation–decategorization and Intergroup Emotions Theory models in social identity and self-categorization approaches to intergroup relations, it is not surprising that both models suggest categorizations will differ in content according to context and importance, and that these differences will determine intergroup evaluations.

Additionally, although crossed-categorization typically produces patterns of evaluation that reflect the added influence of two categories on evaluation, other patterns of evaluation can emerge. For example, distinctions between partial ingroups and double ingroups are sometimes exaggerated or reduced. Such departures from a strictly additive pattern can be caused by well understood moderators, such as priming with inclusive or exclusive concepts (Crisp & Hewstone, 2007). As observed here, we expect that non-additive effects in crossed-categorization will be effectively accounted for by non-additive effects in underlying emotions.

Future directions

Examining the role of discrete emotions in other well established interventions into prejudice has the potential to be equally informative. For example, the Common Ingroup Identity model (Dovidio, Gaertner, & Saguy, 2009) has accumulated decades of support showing that prejudice can be reduced by making a common ingroup membership salient. We suspect that common ingroup identities reduce prejudice by changing the nature and extent of emotion felt about former outgroups. Similarly, decategorization based approaches to prejudice reduction (Bettencourt, Brewer, Croak, & Miller, 1992; Tropp & Pettigrew, 2005), in which prejudice is reduced by individuating intergroup interactions, likely affects the nature and extent of emotions experienced about outgroup members. Similarly, there is considerable evidence that positive contact with individual outgroup members produces reductions in prejudice that are mediated by specific emotions (e.g., Miller et al., 2004).

All of these approaches to prejudice reduction might be more or less effective depending on the particular emotions involved in an intergroup conflict. For example, contamination emotions, such as disgust, might be more difficult to erase than conflict based emotions, such as anger or fear. Alternatively, it is possible that particular approaches are more effective with different emotions. For example, crossed-categorization or common ingroup identity might be particularly effective at reducing anger arising out of perceived resource competition. Decategorization based approaches might be particularly effective at reducing fear of physical harm.

For a decade or more, we have been aware that it is a simplification to summarize the diversity of anger, disgust, admiration, camaraderie, lust, and a host of other emotions with a simple negative or positive evaluation. Just as treating prejudice in this way is a simplification, measuring the effectiveness of prejudice reduction with evaluative measures is likely to be a simplification. We have demonstrated the important subtleties that can emerge when discrete emotions are considered in crossed-categorization approaches to prejudice reduction. We look forward to the new insights that will emerge as more of what we know about prejudice and prejudice reduction is revisited in light of the powerful impact of discrete emotions on intergroup relations.

Appendix A. Category descriptions from Study 2

Achievement altitude

Achievement altitude is predictive of professional success.

People who are high on achievement altitude tend to be successful and recognized for their success. Although it is not a perfect predictor, most people who are high on achievement altitude excel in their chosen professions and find that their achievements are recognized by others. Most people find that they can think of a friend or colleague who simply stands out on whatever he or she applies himself or herself to. These sorts of people are often extreme examples of high achievement altitude.

People who are low on achievement altitude tend be less obviously successful. Although it is not a perfect predictor, many people who are low on achievement altitude find they are viewed as mediocre in their chosen profession. This is not necessarily a bad thing as low achievement altitude people can often look to other areas of their life for validation. Most people find that they can think of a friend or colleague who has trouble distinguishing himself or herself on most tasks. These sorts of people are often extreme examples of low achievement altitude.

Metasociality

Metasociality is predictive of quality of friendships.

People who are high on metasociality tend to be cooperative contributors to social groups and team efforts. Although metasociality is not a perfect predictor, most people who are high on metasociality have rich friendships and are viewed by people who know them as moral and reliable. Most people can think of at least one person they view as extremely trustworthy. These sorts of people are often extreme examples of high metasociality.

People who are low on metasociality tend to be quick to take advantage in social groups and team efforts. Although metasociality is not a perfect predictor, many people who are low on metasociality have shallow friendships and are viewed by people who know them as immoral and unreliable. Although low metasociality sounds negative to some people, people who are low on metasociality are usually quite happy with their own personality characteristics. Most people can think of at least one person they associate with but still view as extremely untrustworthy. These sorts of people are often extreme examples of low metasociality.

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