

Perceptual Bias in Threat Distance: The Critical Roles of In-Group Support and Target Evaluations in Defensive Threat Regulation

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Abstract

Across two studies, we investigate how perceptions of distances to out-group threats may be critically regulated by the presence or absence of one's in-group and by beliefs regarding the potential for danger from the out-group. Threat regulation includes biases in the distance one perceives a threat, such that threats are perceived as relatively more distant by more formidable compared to less formidable individuals. We demonstrate that whether participants are alone or surrounded by their in-group modulates perceptual biases regarding an out-group male's proximity, depending on the degree to which participants evaluate out-group males negatively. Our findings illustrate how investigations of the psychology of motivated biases may benefit from a consideration of such perceptual biases within the functional workings of defensive threat regulation systems (McNaughton & Corr, 2004) and the strategic logic of animal conflict (Parker, 1974).

Keywords

coalitional psychology, defensive threat regulation, resource holding power, perceptual bias, motivated perception, in-group as resource

In the current article, we investigate the role that coalitional in-group members play in defensive threat regulation in humans. Defensive threat responses include biases in the perceived distance of a threat, and we propose that such biases may be critically modulated by the presence or absence of one's in-group. Specifically, the presence of an in-group will attenuate the tendency for people to perceive out-group males as closer the more negatively they evaluate such members. This research combines classic work in social psychology on the function of in-groups with principles from evolutionary biology on defensive threat regulation.

Our work on the psychology of threat responses is informed by the classic framework for the interpretation of aggressive conflict proposed by Parker (1974), which describes decisions to escalate or retreat from conflict as based on an animal's strategic assessment of its resource holding power (RHP). RHP is conceptualized as an internal regulatory variable instantiated as a calculation of one's ability to acquire or defend a resource, whether food, mates, or one's own life.

Multiple sources of information affect the assessment of RHP, including one's own physical strength and the presence of weapons. In the current research, we test the possibility that the presence of in-groups may also feed into assessments of RHP. Indeed, a growing body of evidence from the nonhuman animal literature suggests that one's potential for coalitional

support is an input into this computation (see Benson-Amram, Heinen, Dryer, & Holekamp, 2011). Benson-Amram et al. describe such computations in hyenas, where the numerosity of their own group (i.e., the *in-group*) relative to that of an unfamiliar group (*out-group*) predicted whether hyenas approached the sounds of the stranger hyenas or fled from the sounds. When this ratio exceeded one, hyenas approached the unfamiliar voices at a rate of more than twice as often as when the ratio was less than one. Similar evidence for coalitional assessments has been posited to be true of other social species, including chimpanzees (Wilson, Britton, & Franks, 2002; Wilson, Hauser, & Wrangham, 2001), lions (Grinnell, Packer, & Pusey, 1995; McComb, Packer, & Pusey, 1994), and humans (Chagnon, 1992; Wrangham, 1999).

Although an assessment of one's own formidability is critical, RHP requires an assessment of the opponent's formidability

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as well. Such assessments are influenced by physical features of the opponent, previous experience (e.g., past conflicts with the opponent), and the opponent's reputation for aggressive formidability (Maynard Smith, 1979; Maynard Smith & Parker, 1976; Maynard Smith & Price, 1973; Sell et al., 2009; Sell, Tooby, & Cosmides, 2009). Thus, an individual may be expected to evaluate a target based on previously internalized information regarding the target's potential to inflict harm. As such, we also test the role of target evaluations on defensive threat responses.

The Present Research: Regulation of Perceived Threat Distance

The perceived distance from a threat indicates a threat's imminence, thereby influencing the extent to which defensive responses are urgent and appropriate. McNaughton and Corr (2004) describe how the perceived distance to a threat may be adaptively patterned to minimize the probability of the lethal consequences of missing a threat. This "fire alarm" approach (Nesse, 2001) suggests that, for less formidable animals or in more dangerous situations, threats may be perceived as relatively closer, whereas for more formidable animals, threats may be perceived as relatively more distant. There is evidence consistent with this perspective in several species (McNaughton & Corr, 2004), and such perceptual biases may be functional to the extent that they provide the inputs necessary to the workings of a motivational system that generates successful behavioral responses (Fessler, Holbrook, & Snyder, 2012).

That the perceived distance to a stimulus changes depending on its level of threat has recently been demonstrated in humans by Xiao and van Bavel (2012), who showed that participants bias their distance judgments depending on whether stimuli are framed as threats or not (see also Cole, Balcetis, & Dunning, 2013). The current research extends this line of research in ways that are critical for a deeper understanding of the psychological systems underlying such effects. We posit that a consideration of the strategic logic of RHP outlined above is key to understanding how perceptual biases work and to generating predictions about when such biases should be operative, exacerbated, or attenuated. As such, we submit that at least two variables should be conceptualized as critical inputs into the psychological system that judges threats. These are (1) presence/absence of social support and (2) evaluations of the target's danger potential. In the present studies, we investigate the roles of these variables in perceptual bias of distance judgments to threats.

We predicted that the presence versus absence of one's in-group would influence the perceived distance to an out-group, depending on the degree that the out-group target was negatively evaluated. Specifically, we expected that White participants' negative evaluations of Black Americans would be associated with closer distance judgments to a city populated by this out-group (Detroit) when they were alone, relative to the association found when participants were with their in-group (Studies 1 and 2).

Study 1

Method

Participants, Procedure, and Materials

One hundred sixty-eight White females from Michigan State University completed all measures ($M_{\text{age}} = 19.23$, $SD_{\text{age}} = 1.43$, 18–31).¹ Participants were randomly assigned to complete the experiment either alone or in the presence of up to four other participants. Randomization was accomplished by having participants sign up for the experiment online, with all sessions listed online as "individual sessions." Unbeknownst to subjects, the online recruitment website allowed multiple individuals to sign up for some of these sessions. Thus, self-selection into the group or individual condition was prevented.

Threat Distance Judgment Task. Participants estimated the distance from their current location in East Lansing to Detroit (actual distance = 87.5 miles) using a 7-point Likert-type scale with higher labels denoting greater perceived distance (1 = 35 miles, 2 = 50 miles, 3 = 65 miles, 4 = 80 miles, 5 = 95 miles, 6 = 110 miles, and 7 = 125 miles).

In-Group Presence. To manipulate the presence of the in-group, participants completed the experiment either alone (*In-group Absent*) or with up to four others (*In-group Present*). In the *In-group Present* condition, the experimenter made salient the presence of the in-group by reminding participants that "you all share the common bond of being female." See Appendix A for complete wording of this script.

Target Evaluation. To assess participants' evaluation of the target threat (Black males), we administered the Implicit Association Test (IAT), which indirectly measures the evaluations of Black versus White males (see Amodio & Devine, 2006). In this task, participants categorize concepts as either *good* or *bad* with male faces that are either *Black* or *White*. Reaction times in making categorizations under Black–Bad/White–Good pairings versus Black–Good/White–Bad pairings serve as an index of evaluations of Blacks relative to Whites. Higher numbers indicate greater negativity toward Blacks/positivity toward Whites.

Results and Discussion

Details concerning the distributions of all variables and outlier restrictions are described in Appendix B.

We tested the prediction that participants would judge Detroit as closer when alone and more distant when with their in-group, to the degree that they evaluated Black males negatively (i.e., a difference in slopes between the two conditions). To test this, we conducted a multiple regression with participants' distance judgment as the predicted variable, and in-group presence (0 = *absent*, 1 = *present*), target evaluation (zero-centered), and their interaction as predictors.

Table 1. Regression Results for Studies 1 and 2.

Variable	Study 1 (<i>df</i> = 164)				Study 2 (<i>df</i> = 153)			
	<i>B</i>	<i>SE</i>	<i>t</i>	β	<i>B</i>	<i>SE</i>	<i>t</i>	β
In-group presence	0.47	0.21	2.25*	0.34	0.01	0.20	0.07	0.01
Target evaluation	-0.93	0.46	-2.02*	-0.21	-0.37	0.46	-0.80	-0.10
In-Group Presence \times Target Evaluation	2.01	0.68	2.96**	0.45	1.03	0.61	1.68 [†]	0.27

Note. *SE* = standard error. Study 1: overall model $F(3, 164) = 4.70, p = .004, R^2 = .08$. Study 2: overall model $F(3, 153) = 1.12, p = .34, R^2 = .02$.

[†] $p < .10$, * $p < .05$, ** $p < .01$.

Results revealed a main effect for condition and an interaction between condition and target evaluation (Table 1 and Figure 1). Decomposing the interaction, simple slopes analysis revealed a negative slope for target evaluation when the in-group was absent, $\beta = -0.21, p = .045$, but a positive slope when the in-group was present, $\beta = 0.24, p = .032$. Of most importance, the significant, positive interaction indicated that the judged distance to Detroit differed between the in-group present and in-group absent conditions in the expected direction, depending on the degree to which Black males were evaluated negatively, $\beta = 0.45, p = .004$. Thus, as predicted, the presence of one's in-group had a buffering effect on participants' judgments of the distance to Detroit, to the extent that participants evaluated Black males negatively.

Study 2

Study 2 replicated the findings from Study 1 while providing two useful extensions. First, a different in-group was used (university affiliation). Second, a different target evaluation measure was used, one whose content focuses more specifically on danger rather than general negativity, thereby providing greater face validity.²

Method

Participants, Procedure, and Materials

One hundred fifty-seven White participants completed all measures (60.5% female, $M_{\text{age}} = 19.38, SD_{\text{age}} = 1.64, 18-31$).³ Procedure and materials were identical to those described in Study 1 unless otherwise stated.

In-Group Presence. Identical to Study 1, with the exception that instead of making salient participants' shared gender, the experimenter made salient shared university affiliation.

Target Evaluation. Evaluations of Black males were measured with a variation on Fazio's *sequential priming* task (see Fazio, Jackson, Dunton, & Williams, 1995), modified to measure more targeted assessments of danger concepts. In this task, participants' baseline reaction times to categorize positive and negative adjectives are compared to reaction times to categorize these same adjectives when preceded by images of Black or White male faces. The original version was modified by substituting specific "danger/safety" words in place of a number of the generic

positive or negative adjectives. Scores were calculated by comparing reaction times for adjectives presented after Black faces compared with White faces, representing the strength of association between Black men and danger, calculated such that higher numbers represent greater associations of Black men with danger.

Results and Discussion

Details concerning the distributions of all variables and outlier restrictions are described in Appendix B.

In testing the prediction that participants surrounded by their in-group would judge threats as relatively more distant compared to those participants who were alone, to the extent that they evaluate Black males negatively, we conducted a multiple regression analysis identical to that described in Study 1.

The analysis revealed the predicted interaction between condition and target evaluation (Table 1 and Figure 1). Decomposing the interaction, simple slopes analysis revealed a negative slope for target evaluation when the in-group was absent, $\beta = -0.10, p = .43$, but a positive slope when the in-group was present, $\beta = 0.17, p = .10$. Of importance, the positive interaction indicated that the judged distance to Detroit differed between the in-group present and in-group absent conditions in the expected direction, depending on the degree to which Black males were evaluated negatively, $\beta = 0.27, p = .09$. Thus, as predicted, the presence of one's in-group (relative to being alone) again had a buffering effect on participants' judgments of the distance to Detroit, to the extent that participants evaluated Black males negatively.

General Discussion

Across two studies, we found that the presence or absence of an in-group and evaluations of Black males together had a moderating effect on participants' distance judgments to Detroit from their own location in East Lansing, Michigan. Specifically, we found that negative evaluations of Blacks were linked to more distant judgments of Detroit when participants were with an in-group, relative to the association found when they were alone.

Our findings are consistent with the notion that adaptively patterned perceptual biases in threat detection may rely on several critical variables, including (1) the presence/absence of in-group coalitions and (2) evaluations of potential danger. We believe that future work along these lines could benefit from a consideration of the function of perceptual biases within a broader

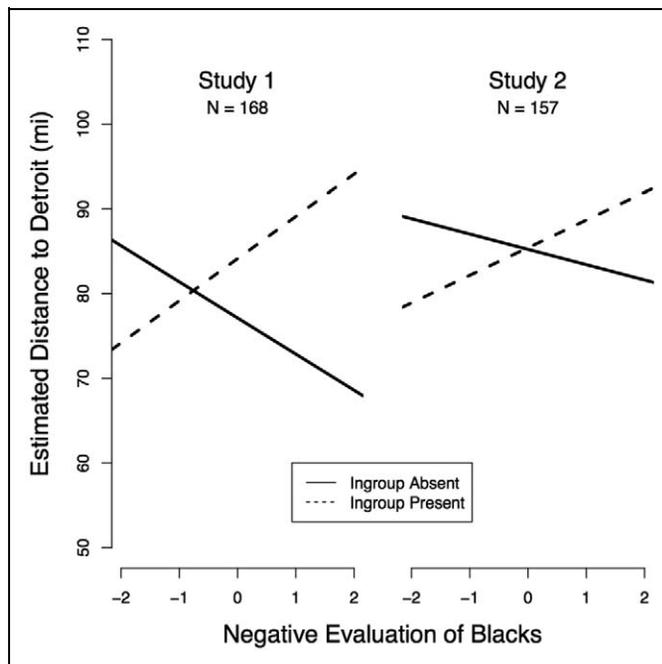


Figure 1. Threat distance judgments (estimated distance to Detroit, in miles) as predicted by target evaluation and the presence or absence of members of one's in-group. X-axis depicts standardized values, with higher values indicating more negative evaluations of Blacks/less positive evaluations of Whites.

threat regulation system shared among a wide range of nonhuman animals, as well as how psychological variables leading to such responses may underlie the strategic logic of contests as described in Parker (1974) and elsewhere (e.g., Sell et al., 2009; Sell, Tooby, & Cosmides, 2009). Such considerations may be critical for a more thorough understanding of recent empirical findings along these lines (e.g., Cole et al., 2013; Fessler et al., 2012; Xiao & van Bavel, 2012), as well as a richer understanding of the general cognitive architecture of psychological systems underlying defense threat regulation in humans and other animals.

The Meaning of the Presence of Others

The obtained findings may depend in important ways on at least two factors. First, the in-group identity may need to be meaningful. If one is surrounded by others but cannot rely on them (i.e., they are not a meaningful identity), it might be that the presence of these others does not play into the computation of RHP. In the current research, participants strongly identified with the salient in-groups. We included Leach et al.'s (2008) group identification measure, tailored for female (Study 1) and university (Study 2) identity. Responses can range from 14 to 98; participants showed strong identification with being female ($M = 75.20$, $SD = 11.04$, $Min = 45$, $Max = 98$) and with university affiliation ($M = 75.41$, $SD = 12.82$, $Min = 30$, $Max = 98$). Second, given that race may be considered an arbitrary cue indicating in-group/out-group distinctions (see McDonald, Asher, Kerr, & Navarrete, 2011), race salience within the experimental context may be critical. For instance, in Study

2, the measures were part of a larger study in which all participants completed a task interacting with a Black male.

Both of the above points inform the question of how the current research fits with related, existing findings. Most obvious is the classic research on mere presence effects (e.g., Zajonc, 1965), and one might ask whether the current findings on the role of the in-group are simply due to the mere presence of conspecifics. There are several reasons to suspect that this is not the case. Most important, Cesario and Jonas (Manuscript under review) demonstrated that the presence of reliable in-groups (using the same manipulations as in the current research) influenced the accessibility of action-related words; the mere presence of others, however, did not have the same effects. Specifically, these researchers found that the automatic activation of words related to rioting in response to police primes was stronger in the presence of an in-group, but not in the mere presence of others. A mere presence account would be unlikely to account for these effects.

Equally as important, if one works through the logic of a mere presence account, it is clear that such an account would not predict the current findings. The mere presence of others would serve to increase arousal, thereby making the dominant response tendency more likely. In the current study, one would have to assume that participants' dominant response was, "the more negatively you evaluate Black males, perceive them as farther away," and the presence of others increased the likelihood of this response. It is not clear how this assumption would be justified from any existing data or related theory, and the responses of participants who were alone argue, if anything, for the opposite tendency.

Also related to the current research is the finding by Balcetis and Dunning (2009) that desired objects are judged closer than undesired objects, and one may ask how this fits with the current findings that out-group males are judged more closely when participants are alone, to the extent that they judge this target group negatively. First, it is important to note that both effects can be present without contradiction, as self-regulation with respect to desired objects is almost certainly governed by a separate system than the threat regulation system. Therefore, the current findings are not a contradiction with the finding that objects which are desired (relative to objects not desired) are perceived more closely. More generally, both perceptual bias effects are functional: They are in the service of effective self-regulatory behavior, but what counts as functional is different depending on the nature of the target. This same logic may apply to other related work on social distance and out-groups, such as Bogardus' classic studies on social distance and prejudice toward out-groups (Bogardus, 1967; Wark & Galliher, 2007). To the extent that the *desire* to keep out-groups at a distance is separable from perceptual biases in the threat regulation system, measures of "distance" will need to be specific to account for the full patterning of inter-group interaction. In other words, it is not contradictory to find that people desire greater distance between oneself and a threatening out-group, but perceive members of such groups as closer as a means of functional threat regulation.

Moreover, the present findings are consistent with recent work demonstrating that psychosocial support can influence perceptual

bias in a functional way (e.g., Schnall, Harber, Stefanucci, & Proffitt, 2008). Schnall and her colleagues demonstrated that the presence of a friend led participants to estimate a hill as being less steep, compared to when participants estimated hill slant while alone. Furthermore, participants' ratings of the quality of the relationship with the present friend mediated this effect. The presence of reliable social support regulated visual perception to prepare action in a functional way. Consistent with this idea, the current research also demonstrates the functional regulation of behavioral systems, in this case defensive threat systems. We therefore bolster this related work, while at the same time drawing connections with other literatures in a constructive, generative way.

Conclusion

We think the current findings may contribute to the broader scientific enterprise of drawing connections between social psychology and other natural sciences, including evolutionary biology (e.g., Navarrete, McDonald, Molina, & Sidanius, 2010). Social psychology has, of course, long-standing interest in the psychological functions of in-group identification and commitment. Connecting this interest with evolutionary psychological approaches, which emphasize how fundamental features of the mind such as memory and perception are influenced by coalitional computation (e.g., Kurzban, Tooby, & Cosmides, 2001), may fruitfully drive new research questions and directions. We hope the current research represents a meaningful advance in this regard.

Appendix A

In-group Present *Experimenter Scripts*

Study 1

For this study, we, and other researchers collaborating on this project, are bringing together groups of people who share some common bond, people who are all in the same group together. So for example, people who like the same sports team, people who are all dog owners, and so on. For today's session, it's that you all share similar demographic information, which is that you all share the common bond of being female.

Study 2

For this study, we're bringing together groups of people who share some common bond, people who are all in the same group. So for example, people who like the same sports team, people who are all dog owners, and so on. For today's session, it's that you're all students together here at MSU—you're all Spartans.

Appendix B

Descriptive Statistics and Restrictions, Studies 1 and 2

Study 1

The distributions of three relevant inclusion criteria for the IAT were explored; these included average latency of responses,

percentage of responses below 300 ms, and the percentage of error responses, and for all three there were clear break points in the distributions beyond which a small percentage of participants fell (greater than 1,000 ms, 1%, and 15%, respectively). Analyses are restricted along these cutoffs; however, it is important to note that none of the interactions reported become nonsignificant if these cutoffs are not imposed. Regression diagnostics (Q-Q plot, residuals \times fitted plot, and plot of hat values, indicating leverage) for an initial round of the primary analysis identified five outliers, who were removed from analyses. Responses on the threat distance measure were normally distributed ($M = 4.10$, $SD = 1.37$, $Min = 1$, $Max = 7$, $skew = 0.15$). Responses on the IAT were also normally distributed ($M = 0.43$, $SD = 0.31$, $Min = -0.34$, $Max = 1.25$, $skew = -0.06$).

Study 2

Initial regression diagnostics identified six outliers who were removed from subsequent analyses. Responses on the threat distance measure were normally distributed ($M = 4.36$, $Mdn = 4.00$, $SD = 1.24$, $Min = 2$, $Max = 7$, $skew = 0.29$). Responses on the target evaluation measure were normally distributed ($M = 0.06$, $Mdn = 0.04$, $SD = 0.33$, $Min = -0.72$, $Max = .97$, $skew = -0.09$).

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Authors' Note

To facilitate replication attempts and further research, all data and materials described in this article are available for download on the first author's website.

Declaration of Conflicting Interests

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Notes

1. The measures reported here were a subset of a larger set (see Cesario and McDonald, in press). As part of that research, participants were randomly assigned to complete the experiment either with their arms bound to the table or not. This was not relevant to the current research and did not interact with any variables of interest.
2. Importantly, each evaluation measure was included in only one of the studies. Therefore, we are not capitalizing on increased Type I error by including both measures across both studies.

3. The measures reported here were a subset of a larger set (see Cesario & Jonas, Manuscript under review).

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Carlos David Navarrete is a social and personality psychologist who studies how human threat responses affect the psychology of within-group cooperation and between-group conflict. His research explores how it is that humans can be seemingly fair-minded and altruistic toward some people yet, at the same time, be so biased against or even nasty toward others. As such, Dr. Navarrete's work describes the mechanisms that connect inter- and intra-group processes, and how the output of these mechanisms are instantiated as normative beliefs, implicit biases, moral intuitions, and non-conscious autonomic nervous system responses.