Can the Absence of Prejudice Be More Threatening Than Its Presence? It Depends on One's Worldview

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The present research used validated cardiovascular measures to examine threat reactions among members of stigmatized groups when interacting with members of nonstigmatized groups who were, or were not, prejudiced against their group. The authors hypothesized that people's beliefs about the fairness of the status system would moderate their experience of threat during intergroup interactions. The authors predicted that for members of stigmatized groups who believe the status system is fair, interacting with a prejudiced partner, compared with interacting with an unprejudiced partner, would disconfirm their worldview and result in greater threat. In contrast, the authors predicted that for members of stigmatized groups who believe the system is unfair, interacting with a prejudiced partner, compared with interacting with an unprejudiced partner, would confirm their worldview and result in less threat. The authors examined these predictions among Latinas interacting with a White female confederate (Study 1) and White females interacting with a White male confederate (Study 2). As predicted, people's beliefs about the fairness of the status system moderated their experiences of threat during intergroup interactions, indicated both by cardiovascular responses and nonverbal behavior. The specific pattern of the moderation differed across the 2 studies.

Keywords: prejudice, worldviews, intergroup interactions, cardiovascular reactivity, system justification

Many theorists assert that members of stigmatized groups feel a sense of uncertainty, discomfort, anxiety, or even danger when interacting with others who are prejudiced against their group (Crocker, Major, & Steele, 1998; Goffman, 1963; E. E. Jones et al., 1984; Trawalter, Richeson, & Shelton, 2009). Surprisingly, although a number of studies have examined social interactions between members of stigmatized and nonstigmatized groups, little research has directly tested whether members of stigmatized groups experience threat during social interactions with prejudiced others. The paucity of research on this issue can be traced to the methodological obstacles confronting such work. Threat is notoriously difficult to assess directly, despite the central role it plays in many psychological theories, including theories of stereotype threat (Steele & Aronson, 1995), social identity (Tajfel & Turner, 1986), terror management (Greenberg, Solomon, & Pyszczynski, 1997), and dissonance (Festinger, 1957), to name a few. Experiences that are threatening are inherently difficult to acknowledge, either to oneself or others. Thus, people often are unable to report when they feel threatened or are unwilling to do so. Consequently, self-report measures of threat, such as reports of negative affect or anxiety, often fail to show predicted effects (e.g., Matheson & Cole, 2004; Steele & Aronson, 1995).

Psychophysiological measures of threat have several advantages over self-report measures. They circumvent potential distortions or omissions that might be present in self-reports of threat due to self-presentational concerns or lack of conscious awareness of threat (Blascovich, Mendes, Hunter, Lickel, & Kowai-Bell, 2001). They also have the advantages of being covert, continuous, and online. Historically, physiological measurement has been limited by the lack of specificity with regard to the meaning of physiological responses (Blascovich & Kelsey, 1990; Cacioppo, Tassinary, & Berntson, 2007). However, cardiovascular responses that index the psychological states of threat versus challenge have been identified and validated (see Blascovich & Mendes, 2000; Blascovich & Tomaka, 1996, for reviews). These markers provide a means of assessing threat during intergroup interactions (Blascovich et al., 2001).

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We conducted two experiments in which we measured cardiovascular responses to assess the extent to which members of stigmatized groups experience threat when interacting with prejudiced others. In addition, we examined whether individual differences in beliefs about the fairness or legitimacy of the status system moderate their threat responses. Recent evidence suggests that people are more threatened by information that disconfirms versus confirms their beliefs about the fairness of the status system, even when the former information has positive implications for their group (Major, Kaiser, O'Brien, & McCoy, 2007). Drawing on this research, we hypothesized that in interactions with members of higher status groups, the fairness beliefs of members of stigmatized groups would moderate their experiences of threat. Specifically, we predicted that those who believe the status system is fair would feel more threatened when their partner was prejudiced as compared with unprejudiced. In contrast, we predicted the reverse pattern for members of stigmatized groups who believe the system is unfair—we expected them to feel less threatened interacting with a prejudiced partner than with one who is unprejudiced. We tested these hypotheses in two studies.

Perceived Prejudice as a Situational Demand

According to the biopsychosocial model of challenge and threat (Blascovich & Mendes, 2000; Blascovich & Tomaka, 1996), the psychological states of threat, versus challenge, can be indexed by distinct patterns of cardiovascular reactivity when people are in performance situations that are goal relevant and engender some degree of self- or other evaluation. The extent to which people experience threat is determined by their conscious or unconscious evaluations of the demands of the situation relative to their conscious or unconscious evaluations of available coping resources. Generally, when individuals evaluate demands as outweighing resources, threat results; when individuals evaluate personal resources as approximating or exceeding demands, challenge results. Demand evaluations involve perceptions and judgments of danger, uncertainty, and required effort. Resource evaluations involve perceptions and judgments of skills, knowledge, abilities, dispositions, and external support. Although sometimes labeled as discrete states, challenge and threat actually reflect opposite ends of a single continuum, such that relative differences in challenge and threat are meaningful.

There are a number of reasons why a prejudiced interaction partner may heighten evaluations of danger, uncertainty, and required effort, and hence increase appraised demands. First, many theories converge to suggest that interacting with someone who is prejudiced against one's group may increase perceptions of psychological or physical danger. Ego and group justification theories predict that prejudice threatens individuals' needs to feel good about themselves and the groups to which they belong (Tajfel & Turner, 1986; Tesser, 1988). Sociometer theory suggests that prejudice is a form of social rejection that threatens people's need to feel accepted and valued (Leary & Baumeister, 2000). System justification theory suggests that prejudice threatens the fundamental need to view the social and political system as fair and just (Jost & Banaji, 1994; Jost & Hunyady, 2002; Lerner, 1980).

Second, a prejudiced interaction partner may also increase demands by increasing uncertainty about how one will be evaluated and about whether one will be treated fairly. Prejudice may introduce attributional ambiguity for members of stigmatized groups about the reasons for others' treatment of them (Crocker & Major, 1989). Third, interacting with someone who is prejudiced may affect judgments of required effort by increasing requirements on the part of the stigmatized individual to suppress automatically activated negative emotional states or concerns about fulfilling negative stereotypes (Schmader, Johns, & Forbes, 2008). It may also lead members of stigmatized groups to attempt to be more engaged in the interaction and exert more effort to ensure that it goes smoothly (Shelton, Richeson, & Salvatore, 2005).

In summary, a number of factors may independently or additively increase the demands associated with interacting with someone who is prejudiced against one's group. Thus, it is not surprising that a number of theories predict that members of stigmatized groups will feel more threatened interacting with someone who is clearly prejudiced against their group than someone who is not prejudiced or whose attitudes they do not know. There is growing evidence, however, that members of stigmatized groups vary widely in the extent to which they anticipate being a target of prejudice in intergroup interactions and in how they react when they encounter prejudice directed at themselves or their social group (Major & O'Brien, 2005). These findings illustrate that blanket assumptions about how members of stigmatized groups will respond to prejudice are unwarranted. One crucial determinant of differing reactions to prejudice is people's status ideology, that is, their beliefs about the basis and legitimacy of the status system.

Status Ideologies

Status ideologies, or shared beliefs about and explanations for existing status differences between groups in society, are a key component of people's worldview (Major, Gramzow, et al., 2002; Major, Kaiser, et al., 2007). Like other aspects of people's worldview, status ideologies provide meaning and order and guide perceptions and expectations of the world. Although status ideologies are shaped by personal experiences and reference groups, within a given culture certain ideologies are dominant, or widely endorsed. These ideologies tend to be system justifying—legitimizing the existing status hierarchy as fair, just, good, or deserved (Jost & Hunyady, 2002; Kluegel & Smith, 1986; Major, 1994; Sidanius & Pratto, 1993). In Westernized, capitalistic countries, a dominant status ideology is meritocracy—the belief that anyone, regardless of group membership, can be successful if he or she works hard enough or is talented enough (Plaut, Markus, & Lachman, 2002). Meritocracy legitimizes the status quo by implying that individuals and groups at the top of the status hierarchy are entitled to their privileged status because they worked hard or are especially meritorious.

According to system justification theory, people endorse system-justifying beliefs (SJBs) such as meritocracy in part because of a fundamental motive to believe that existing social arrangements are fair, legitimate, and justifiable. This belief imparts a sense of certainty, meaning, and control (Kay, Gaucher, Napier, Callan, & Laurin, 2008; Kay et al., 2009). Consequently, events that challenge the belief that the status system is fair are distressing (Jost & Hunyady, 2002). Stronger endorsement of SJBs is assumed to reflect greater justification of the system (Jost, Banaji, & Nosek, 2004; Jost & Hunyady, 2002) and is positively related to psychologically beneficial outcomes such as increased

well-being and reduced feelings of personal vulnerability to negative events (Lambert, Burroughs, & Nguyen, 1999).

Among members of disadvantaged groups, however, endorsing SJBs also has costs. It implies that those who have low status are less deserving or meritorious than those who have high status. Consequently, the motivation to justify the system often competes with an equally or more powerful motivation among the disadvantaged—to feel good about themselves and social groups with which they identify (e.g., Tajfel & Turner, 1986; Tesser, 1988). The motivation to maintain personal or collective self-esteem, coupled with experiences of unfairness, can lead to rejection of the legitimacy of the status quo. Indeed, members of disadvantaged ethnic groups are less likely to endorse SJBs than are members of higher status ethnic groups (e.g., O'Brien & Major, 2005) and often do not display the lower personal or collective self-esteem that would be expected if disadvantage was internalized as deserved (Crocker & Major, 1989).

Instead of endorsing SJBs, members of disadvantaged groups may attribute status inequalities to discrimination or bias (J. M. Jones, 2004; Sellers, Rowley, Chavous, Shelton, & Smith, 1997). Explaining existing status differences in this way can help fulfill self- and group-enhancement needs (Major, Quinton, & McCoy, 2002) and enable members of disadvantaged groups to anticipate and prepare for injustice, thereby potentially lessening its sting (Sellers & Shelton, 2003). In African American families, for example, parents often teach their children to expect and be vigilant for prejudice and discrimination (e.g., Phinney & Chavira, 1995).

Status Ideologies and Reactions to Prejudice

Individual differences in endorsement of SJBs predict how people perceive and react to prejudice. For example, the more that members of disadvantaged groups, such as Latinos, Blacks, and women, endorse SJBs, the less likely they are to see their ethnic or gender group as a victim of discrimination, to attribute rejection by a member of a higher status group to discrimination (Major, Gramzow, et al., 2002), and to expect to be treated unfairly by outgroup members (Major & Townsend, 2010). Individual differences in endorsement of SJBs also moderate the association between perceptions of discrimination and self-esteem (Foster, Sloto, & Ruby, 2006; Foster & Tsarfati, 2005). For example, Major, Kaiser et al. (2007) found that women who strongly endorsed SJBs had lower self-esteem after reading that sexism is pervasive than after reading that it is rare. In contrast, women who strongly rejected SJBs had higher self-esteem after reading that sexism is pervasive rather than rare. Eliezer, Townsend, Sawyer, Major, and Mendes (in press) found a similar pattern—perceived discrimination was positively related to chronic stress, as indexed by resting blood pressure, among women who endorsed SJBs, but was negatively, although not significantly, related to resting blood pressure for women who rejected SJBs.

Major, Kaiser et al. (2007) proposed that these findings reflect people's motivation to verify their worldview and the aversive consequences of worldview violations. They theorized that just as people are motivated to maintain consistency between their attitudes and behaviors (Festinger, 1957) and in their self-views (Swann, Rentfrow, & Guinn, 2003), people are also motivated to maintain consistency between their beliefs about the world and their experiences, and will feel arousal and negative affect when these are inconsistent. According to worldview verification theory, individual differences in endorsement of SJBs reflect differences in the content of people's worldviews—their beliefs about the fairness of the system. Like other components of a person's worldview, these beliefs guide perceptions and expectations, including people's implicit expectations for how intergroup interactions will unfold. People who believe the status system is fair implicitly expect that they will be treated fairly, whereas those who believe the status system is unfair implicitly expect that they will be treated unfairly. Consequently, the former are less likely than the latter to perceive that they are victims of discrimination or to attribute intergroup rejection to discrimination. Furthermore, experiences that are inconsistent with these expectations heighten the perceived demands of the situation by increasing uncertainty and required effort; hence, they should lead to greater feelings of threat, as reflected, for example, in lower self-esteem (e.g., Major, Kaiser, et al., 2007).

Several recent studies have shown that interactions that violate implicit expectations are cognitively demanding (e.g., Dalton, Chartrand, & Finkel, 2010; Finkel et al., 2006) and threatening (Mendes, Blascovich, Hunter, Lickel, & Jost, 2007). As applied to intergroup interactions, worldview verification theory predicts that interacting with others who hold beliefs about one's group that are inconsistent with one's beliefs about system fairness will be more threatening than interacting with others who hold beliefs that are consistent with one's beliefs about system fairness, even when the inconsistent beliefs have positive implications for one's group.

It is important to note that the predictions of worldview verification theory for intergroup interactions are the same as those of system justification theory for members of disadvantaged groups who strongly endorse SJBs—both theories predict these individuals will feel more threatened by a prejudiced than an unprejudiced interaction partner, although for different reasons. Worldview verification theory suggests they will feel threat because discrimination is inconsistent with their belief that the system is fair, whereas system justification theory suggests they will feel threat because prejudice impedes their greater need to see the system as fair. However, these theories make divergent predictions for members of disadvantaged groups who strongly reject the legitimacy of the status system. Worldview verification theory predicts that people who reject SJBs will be less threatened by a prejudiced interaction partner than by an unprejudiced one because the former confirms, whereas the latter disconfirms, their worldview. In contrast, system justification theory suggests that they will be more threatened by a prejudiced than an unprejudiced interaction partner, although to a lesser extent than those who strongly endorse SJBs. We tested these hypotheses in the present research.

The Present Research

We conducted two experiments in which we used cardiovascular responses to assess the threat reactions of members of low-status or stigmatized groups during face-to-face interactions with members of nonstigmatized groups. In Study 1, Latinas interacted with a White female partner; in Study 2, White women interacted with a White man. We also examined two different types of interactions. In Study 1, participants learned that their partner held prejudiced or unprejudiced attitudes toward ethnic minorities, but

the partner did not evaluate the participant personally. In this type of interaction, the partners' level of prejudice conveyed an expectation for how fairly participants might be treated—an expectation that either confirmed or disconfirmed participants' worldview. Our primary prediction was that Latinas' endorsement of SJBs would moderate their experiences of threat during an interaction with a prejudiced versus an unprejudiced White partner. We expected that Latinas who strongly endorsed SJBs would be more threatened during an interaction with a prejudiced partner than an unprejudiced partner, and we expected the reverse pattern among Latinas who strongly rejected SJBs.

In our second study, we examined threat within the context of a more evaluative intergroup interaction—one in which female participants had to interact with a man who had just evaluated them negatively, and done so for either clearly prejudicial reasons or ostensibly merit-based reasons. We assessed cardiovascular responses not only during the interaction but also in anticipation of and after the interaction. These latter assessments are particularly important from a health perspective. According to the allostatic load model of stress (McEwen, 2000), when autonomic and neuroendocrine responses are elevated during periods of preparation or anticipation, when the individual is not actively engaged in the stressor, cumulative wear and tear on the body may be exacerbated, and the potential for physical damage caused by stress possibly increases. Furthermore, the elevation of cardiovascular (CV) responses poststressor may suggest more cognitive rumination associated with the succeeding events (Nolen-Hoeksema, 1991).

As with Study 1, our primary prediction was that women's endorsement of SJBs would moderate their experiences of threat during the interaction. In particular, we expected that participants who rejected SJBs would experience less threat when interacting with a partner who gave a sexist reason versus a merit-based reason for potentially rejecting them. As we elaborate below, we reasoned that these women would find the sexist evaluation both worldview confirming and self-protective (Crocker & Major, 1989). In contrast, we expected that participants who endorsed SJBs would be just as threatened when interacting with an evaluator who gave a sexist reason as a merit-based reason for potentially rejecting them. We reasoned that for these women, the self-protective benefits of being able to blame rejection on sexism are offset by the worldview-disconfirming nature of the prejudiced evaluation. We also measured anxiety, as indicated by nonverbal behavior, as well as self-reported negative affect and self-reported vigilance in our second study.

Study 1

In Study 1, Latino American, female participants, all of whom had completed a measure of SJBs prior to the experiment, interacted with a White female confederate who they were led to believe was either prejudiced or not prejudiced against ethnic minorities. We measured participants' CV responses while they performed a cooperative task with the partner. The partner's affect and behavior was neutral throughout the experiment.

Method

Setting and participants. The experiment took place in a social psychophysiology laboratory containing separate control and recording rooms equipped with physiological recording, audiovisual, and computer equipment. Self-identified Latino American female undergraduates ($N = 53$) participated in exchange for course credit or pay. Women who were pregnant, had a pacemaker or a doctor diagnosed heart murmur, or were on medication that could influence their CV reactivity were excluded.

Pretest measures. Prior to coming to the laboratory, all women completed a three-item measure of SJBs: (a) "Differences in status between groups in society are fair"; (b) "Differences in status between groups in society are the result of injustice" (reverse scored); and (c) "It is unfair that certain groups in society have less than other groups" (reverse scored). In order to create the most reliable scale, one item, "Certain members of certain groups complain too much about differences that exist in society" was dropped. These items were adapted from Levin, Sidanius, Rabinowitz, and Federico (1998) and used in prior research to measure SJBs (e.g., O'Brien & Major, 2005). Items were rated on a 7-point scale ranging from 0 (*strongly disagree*) to 6 (*strongly agree*) and were combined into a composite measure of SJB endorsement ($\alpha = .70$).

Confederates. Six White female research assistants served as confederates. All were trained to act in a neutral manner throughout the experiment and were unaware of participants' condition assignment and level of SJB endorsement.

Procedure.

Arrival. Participants arrived individually at the laboratory to participate in a study on interactions among coworkers. Upon arrival, they briefly encountered another participant, the confederate, waiting outside and were then escorted to different rooms. Participants completed a demographic form and several attitude questionnaires, including a four-item questionnaire assessing attitudes toward diversity issues that was created for the present study. Participants indicated their agreement with each item on a 7-point scale ranging from 0 (*not at all*) to 6 (*very much*). Next, the experimenter applied the physiological sensors needed to measure CV responses and then recorded participants' baseline CV responses for 5 min while the participants sat quietly.

Manipulation. The participant was then told that because it was important for coworkers to get to know each other prior to interacting, she could read her partner's completed attitude questionnaires. The partner's answers on the diversity items served as the prejudice manipulation. In the prejudiced condition, the confederate strongly agreed with all four items, and in the unprejudiced condition she strongly disagreed with them. The items were (a) "In my opinion, there is too much attention being paid these days to increasing ethnic diversity in universities"; (b) "Ethnic minorities often do not have to work as hard as Whites to get ahead"; (c) "I think stereotypes about ethnic minorities are often true"; and (d) "Discrimination against ethnic minorities is no longer a problem in the United States." Participants were given 3 min to read their partner's answers.

Interaction. Next, the participant was assigned to give a short speech on "what I am like as a work partner" and given 2 min to prepare. Then, the confederate was brought into the room and seated at a table across from the participant, but behind a barrier so that they could not see each other. The experimenter left the room and then instructed the participant, via intercom, to begin her speech and to speak for 3 min. After the speech, the experimenter

returned to the room and removed the barrier so that the participant and confederate could now see each other.

The experimenter then gave instructions for the task, describing it as a "cooperative memory game" that the participant and confederate would take turns performing. The task was intended to be an active, rather than a passive, task that was engaging for participants. The participant performed first, while her partner presented a series of words and sentences on paper. The participant's task was to remember the words while counting the number of vowels in the sentences. Participants said their responses out loud while the partner recorded how many words the participant correctly recalled. They then switched roles so that the participant recorded the partner's responses; the confederate used a predetermined set of responses that mimicked average performance. The key dependent variables were participants' CV responses during the first minute of participant performance, when uncertainty is at its peak (Blascovich et al., 2001).

Upon task completion, the experimenter escorted the confederate from the room, gave the participant the manipulation check items, and then sensitively and fully debriefed her.

Measures.

Physiological measures. CV measures were used to assess threat during the interactive task. According to the biopsychosocial model of challenge and threat (Blascovich & Mendes, 2000), challenge states are dominated by activation of the sympathetic adrenal medullary axis, which enhances cardiac performance such as cardiac output (CO), but induces small vascular changes. This results in overall decreased systemic vascular resistance, which is measured as total peripheral resistance (TPR). In contrast, in threat states, vascular responses dominate relative to cardiac responses, causing vasoconstriction and resulting in increased systemic resistance (i.e., increases in TPR). Thus, the challenge response functions to increase blood flow (greater CO) to skeletal muscles and dilate arteries to accommodate it (lower TPR), with the net effect of oxygenated blood reaching the periphery faster, whereas the threat response results in a constriction of arteries (higher TPR).

Cardiac and hemodynamic measures were recorded noninvasively following guidelines established by the Society for Psychophysiological Research (e.g., Sherwood et al., 1990). A Biopac Impedance Cardiograph (Model NICO100C) and a Biopac Electrocardiograph amplifier (Model ECG100C) provided continuous measures of cardiac performance. Impedance cardiographic (ZKG) recordings were obtained using a tetrapolar aluminum/mylar tape electrode system, and electrocardiographic (ECG) recordings were obtained using a Standard Lead II configuration. A Vasotrac (Model APM205A) blood pressure monitor, using tonometric technology, estimated blood pressure changes from the radial artery of the nondominant arm approximately every 15 heart beats. Acknowledge (Biopac; Goleta, CA) was used to record the signals and Mindware Systems (Lafeyette, OH) to edit and ensemble the CV data.

Challenge and threat states were measured using CV reactivity (i.e., changes from baseline) in CO and TPR, as well as heart rate (HR) and left ventricle contractility (VC). VC is calculated as the inverse of preejection period change (i.e., change in preejection period $\times -1$). TPR is derived from blood pressure and CO using the formula: (mean arterial pressure/CO) $\times$ 80 (Sherwood et al., 1990). Both challenge and threat states are associated with elevated HR and VC levels, relative to a resting baseline. HR and VC are used to index task engagement (Obrist, 1981). Higher TPR and lower CO indicate the experience of threat, relative to challenge.

For ease of analyses and discussion, we focus here on a single threat-challenge index that combines TPR and CO responses because they are related measures of the same underlying activation (see below for our calculations of this index; Blascovich, Seery, Mugridge, Norris, & Wiesbuch, 2004). The threat-challenge index allows us to assess participants' patterns of CV responses in a single analysis. Because higher values on the threat-challenge index indicate greater threat, relative to challenge, we refer to this as a measure of threat.

Manipulation check. Following task completion, participants were asked to rate their partner's level of racism on a 7-point scale ranging from 1 (*not at all racist*) to 7 (*racist*).

Results

Participant attrition. Following standard procedures and to maintain a more complete data set for analyses, we omitted participants who were missing all of their CV data because of recording difficulties. Our final data set consisted of 41 participants (20 in the prejudiced condition, 21 in the unprejudiced condition).

Manipulation check. Our manipulation was successful. Women in the prejudiced condition rated their partners as significantly more racist ($M = 3.90$, $SD = 1.52$) than women in the unprejudiced condition ($M = 1.29$, $SD = 0.72$), $t(26.78) = -6.99$, $p < .001$, equal variances not assumed.

Preliminary analyses. Before testing our primary predictions, we performed a series of preliminary analyses. First, we calculated mean HR, VC, CO, and TPR values for the first minute of the interactive task and corrected for univariate outliers. Second, we confirmed the equivalence of experimental conditions at the last minute of baseline.[1] Third, we calculated CV reactivity scores by subtracting the average value of each participant's CV response during the last minute of baseline from the average value of their CV response during the first minute of the task. Fourth, we established that participants were engaged during the first minute of the interactive task by conducting one-sample *t* tests that confirmed that both HR and VC reactivity were significantly greater than zero (Mendes, Reis, Seery, & Blascovich, 2003). Fifth, we calculated the threat-challenge index by standardizing CO and TPR reactivity, assigning a negative value to CO scores and combining these standardized scores. Higher values indicate greater levels of threat relative to challenge.

Primary analyses. To test our main predictions, we conducted hierarchical moderated regression analyses predicting average scores on the threat-challenge index during the first minute of the task. On the first step, we entered participants' average VC from the last minute of baseline (mean centered) to control for individual differences in baseline VC, and participants' average VC and HR responses during the first minute of the task (mean centered; Mendes et al., 2003; Tomaka et al., 1999). We entered SJBs (mean centered) and condition (0 = unprejudiced; 1 =

[1] A multivariate test of HR, VC, CO, and TPR during the fifth minute of baseline showed marginal differences by condition, $F(4, 36) = 2.30$, $p = .08$. Because participants in the prejudiced condition had higher baseline VC than those in the unprejudiced condition, $F(1, 39) = 6.89$, $p = .01$, we use baseline VC as a covariate in all subsequent analyses.

prejudiced) on the second step, and their interaction on the third step. The covariates were significant predictors, $F_{step1}(3, 37) = 8.54$, $p < .001$, $\Delta R^2 = .41$, but the main effects of condition and SJBs were not, $F_{step2}(2, 35) = 0.52$, $p = .60$, $\Delta R^2 = .02$. Notably, the hypothesized crossover interaction was significant, $F(1, 34) = 5.50$, $p = .02$, $\Delta R^2 = .08$ (see Figure 1).[2]

We conducted simple slope tests to examine our specific predictions (see Aiken & West, 1991). These revealed that, as expected, Latinas who strongly endorsed SJBs were more threatened when interacting with a White peer who they believed was prejudiced against minorities than one who they believed was not prejudiced, although the difference was only marginally significant ($\beta = .375$, $p = .06$). Latinas who strongly rejected SJBs, in contrast, did not differ in threat responses when interacting with a prejudiced versus an unprejudiced partner, although the slope was in the predicted direction ($\beta = -.238$, $p = .24$). Further analyses revealed that Latinas in the unprejudiced condition were less threatened the more strongly they endorsed SJBs ($\beta = -.390$, $p = .04$); in contrast, those in the prejudiced condition did not differ in their experience of threat as a function of their endorsement of SJBs ($\beta = .216$, $p = .25$).

Discussion

Study 1 provides support for our hypothesis that stigmatized people's reactions to interacting with prejudiced others are shaped by their beliefs about system fairness. The predicted crossover interaction between SJBs and prejudice level of partner was significant for CV responses during the interactive task. We predicted that members of stigmatized groups would feel more threatened, as indexed by CV reactivity, when interacting with a nonstigmatized partner whose attitudes disconfirmed their worldview than when interacting with one whose attitudes confirmed their worldview. Results partially confirmed these predictions. Latinas who strongly endorsed SJBs tended ($p < .06$) to be more threatened when interacting with a White peer who they believed to be prejudiced than one they believed to be unprejudiced. Contrary to predictions, Latinas who strongly rejected SJBs were not less threatened by interacting with a prejudiced partner than an unprejudiced one, although the slope was in this direction.

Although the overall pattern of results matched our predictions, we believe that the relatively weak simple effects observed in this study may have been due to the impoverished nature of the interaction. Participants and confederates could not see each other during the preliminary phase of the experiment, and very little in the way of interaction took place during the actual task. The confederate did not speak to the participant, but merely showed the participant cards and scored her recall performance, so there was no opportunity for the confederate to explicitly evaluate or discriminate against the participant. Furthermore, the participant knew that she would subsequently score the confederate's performance; thus, there was no power difference between them. Therefore, we conducted a second study to test our predictions in a more evaluative intergroup interaction. We also extended our analysis to examine women's reactions to a sexist partner rather than Latina's reactions to a racist partner.

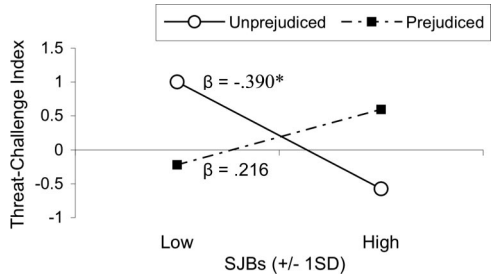

Figure 1. Study 1 threat-challenge index during the first minute of the cognitive task. Condition (unprejudiced = 0, prejudiced = 1) × SJBs (continuous, mean-centered) interaction. Graphed at ±1 *SD* from SJBs mean. Higher values indicate threat relative to challenge. SJB = system-justifying beliefs. * $p < .05$.

Study 2

People's experiences during intergroup interactions are shaped not only by the perceived prejudice level of their partner and their own worldviews but also by their partner's treatment of them. In some interactions, such as that explored in Study 1, people do not know what their partner thinks of them. In this case, a partner's prejudice serves as a cue to how fairly one might be treated and can be consistent or inconsistent with one's implicit expectancies. Sometimes, however, people interact with others who do give them explicit, evaluative feedback. When this feedback is negative, one's self-image is threatened. In this type of interaction, the perceived prejudice level of the evaluator can not only disconfirm or confirm a person's worldview, it can also serve as a cue to the *reasons behind* the negative treatment. Members of stigmatized groups interacting with a partner who is clearly prejudiced can easily attribute negative feedback to their partner's prejudice rather than to themselves (e.g., their own lack of ability). When interacting with an unprejudiced partner or a partner whose attitudes they do not know, in contrast, they may experience attributional ambiguity about the cause of negative feedback. Factors that reduce uncertainty decrease the perceived demands of a situation and should, therefore, reduce the extent to which it is threatening (Blascovich & Mendes, 2000). This leads to the prediction that when interacting with a partner who evaluates them negatively, members of stigmatized groups will be less threatened if the partner is unambiguously prejudiced than if his or her views are unclear or unprejudiced (Crocker & Major, 1989).

Worldview verification theory, however, suggests that only members of stigmatized groups who reject SJBs may find it less threatening to interact with a negative evaluator who is clearly prejudiced than one who is not. For them, the ability to attribute negative feedback to prejudice not only reduces self-blame and uncertainty but also is consistent with their worldview. For members of low-status groups who endorse SJBs, in contrast, the ability to attribute negative feedback to a prejudiced evaluator might reduce uncertainty about their own role in causing the evaluation and protect their self-image, but it also increases perceived de-

[2] We also analyzed TPR and CO separately. Results were consistent with the single threat-challenge index. The interaction was marginal predicting CO, $F_{interaction}(1, 36) = 3.42$, $p = .07$, $\Delta R^2 = .06$, and significant predicting TPR, $F_{interaction}(1, 36) = 4.76$, $p = .04$, $\Delta R^2 = .07$.

mands by violating their worldview. Thus, people who believe the system is fair may be just as threatened by interacting with a negative evaluator who is clearly prejudiced than one who is not.

In Study 2, we tested these hypotheses by examining threat reactions among women while they interacted with a male interviewer who had previously given them negative feedback for sexist or merit-based reasons. Following a procedure used by Major, Gramzow, and colleagues (2002), White females were led to believe they were participating in an experiment with two White male participants who were actually confederates. Women were informed that one of the men would act as an interviewer and would select either them or the other man to work with him in a desirable position later in the experiment. Women then completed a fictitious leadership scale, after which they introduced themselves to the "other participants" via video. All then heard the first male participant—the interviewer—evaluate them negatively compared with the other male participant and provide either a merit-based or sexist explanation for his evaluation. Subsequently, women prepared for and then completed an "interview" with the first male interviewer that involved (a) giving a speech about themselves to illustrate their desirability as a teammate and (b) completing a cognitive task that he scored. We predicted that women who rejected SJBs would be less threatened prior to, during, and after interacting with a partner who gave them sexist-based negative feedback than one who gave them merit-based negative feedback. In contrast, we predicted that participants who endorsed SJBs would be as threatened interacting with a sexist evaluator as one who gave them merit-based negative feedback.

Several features of this interaction differ from the interaction in Study 1. First, it was explicitly evaluative (i.e., an interview). Second, the interviewer had clear power over the participant to either select her or reject her for a desirable position. Third, just prior to interacting with him, all participants learned that the interviewer had evaluated them negatively compared with another male participant. Fourth, the domain in which the woman was evaluated negatively was a masculine domain—leadership, thus making the possibility of negative stereotyping and discrimination more salient (O'Brien, Kinias, & Major, 2008). In summary, we created an interactive situation that might activate concerns about being a target of gender discrimination.

We also switched from examining responses to racism to examining responses to sexism. Although racism and sexism arguably differ in many ways (Sidanius & Veniegas, 2000), our prior research indicates that SJBs exert a similar moderating influence on Latino Americans' reactions to racism and White women's reactions to sexism (e.g., Major, Gramzow, et al., 2002; Major, Kaiser, et al., 2007). Examining how worldviews shape cardiovascular responses during a potentially sexist interaction increases the generalizability of the predicted effects.

We also expanded our dependent variables. First, we obtained another nonconscious measure of threat—behavioral anxiety. We asked the confederate to rate how anxious the participant appeared to be, based on her behavior during the interview. We predicted that responses on this measure would parallel those observed for physiological markers of threat. Second, we measured participants' conscious experience of threat, indexed with self-reported threat emotions and feelings of vigilance. We included a self-report measure of vigilance in addition to threat because prior research suggests that the experience of threat is often accompanied by heightened vigilance (e.g., Kaiser, Vick, & Major, 2006; Mendes, Major, McCoy, & Blascovich, 2008; Schmader et al., 2008).

Finally, we attempted to rule out an alternative explanation for our results, namely, that they result from individual differences in stigma consciousness rather than from SJBs. *Stigma consciousness* is defined as the extent to which a person chronically expects to be stereotyped and treated on the basis of a group characteristic (Pinel, 1999). In a prior sample of 602 women, we observed a modest negative correlation between endorsement of SJBs and stigma consciousness for gender ($r = -.237$, $p < .001$). This suggests the possibility that members of low-status groups who reject SJBs chronically expect to be a target of negative stereotypes more than those who endorse SJBs and that these stereotype expectations may account for effects attributed to SJBs. To explore this possibility, all participants in Study 2 completed a measure of stigma consciousness, worded for gender, prior to the experiment.

Method

Setting and participants. White female undergraduates ($N = 65$) participated for course credit or pay. The experiment took place in the same setting as Study 1.

Pretest measures. Prior to the experiment, all women completed a six-item measure of SJBs. This scale was composed of the three items from Study 1 assessing belief in the legitimacy of the status quo and three additional items assessing belief in individual mobility, which was also adapted from Levin and colleagues (1998) and has been used in previous work (e.g., Major, Gramzow, et al., 2002). The three additional items were (a) "Our society is an open society where all individuals can achieve higher status"; (b) "Advancement in our society is possible for all individuals"; and (c) "Individual members of certain groups are often unable to advance in our society" (reverse scored). Participants rated these items on a 7-point scale ranging from 0 (*strongly disagree*) to 6 (*strongly agree*). Scores on these six items were combined to form a composite measure ($\alpha = .72$).

Participants also completed a five-item version of the Stigma Consciousness Scale (Pinel, 1999) phrased in terms of gender ($\alpha = .78$). The items were "Stereotypes about my gender have not affected me personally" (reverse scored); "I almost never think about the fact that I am a member of my gender group when I interact with others" (reverse scored); "My being a member of my gender group does not influence how people act with me" (reverse scored); "I worry that my behaviors will be viewed as stereotypical of my gender"; and "My gender influences how others act with me." Participants answered on a 7-point scale ranging from 0 (*strongly disagree*) to 6 (*strongly agree*).

Confederates. Five White men served as confederates. All were trained to act neutrally throughout the experiment and were unaware of participants' condition assignment and SJB endorsement level.

Procedure.

Arrival. Women were scheduled individually to participate in a study of effective interviewing. When they arrived at the lab, they encountered one of the confederates, ostensibly also waiting for the experiment. Two experimenters greeted the participant and confederate by name and asked for a third person to reinforce the cover story that there were three participants. After commenting

that the third person must be late, the experimenters asked the participant and confederate to participate in a rigged drawing to determine their roles later in the experiment.

The participant and confederate were then escorted to separate rooms, where participants completed the CV screening form, which was used to screen out anyone who had a pacemaker, was pregnant, or was taking medications that could influence the CV system. They also completed a 14-item fictitious "leadership ability" scale that asked them to imagine that they were a manager at a local company overseeing 15 employees and to answer questions about their management style. Physiological sensors needed to record CV responses were then applied, and 5 min of baseline CV responses were recorded while the participant sat quietly.

Introduction. Next, the study was introduced over an intercom that ostensibly could be heard by all three participants. Participants heard that on the basis of the earlier drawing, two of them would be assigned to be applicants, whereas the third would be the interviewer. The interviewer would choose one of the two applicants to be his or her partner during the second phase of the study, and the two would have a chance to win a $50 prize. The participant was always designated as Participant B.

Participants were then asked to introduce themselves via video, stating their first name, year in school, major, and hobbies. The participant watched the two confederates' introductions first. These were pretaped and showed the individual alone in an experimental room and connected to CV recording equipment. The first video was of the confederate the participant encountered in the hallway, the second was of the bogus third participant, also a White man, who had ostensibly been late. The participant then introduced herself.

After the introductions, participants learned that the man who they had met in the hall would be the interviewer, and they and the other man would be the applicants. The experimenter then explained that she had scored the applicants' leadership questionnaires "using a scoring system developed by the Stanford Graduate School of Business" and would give the results to the interviewer to review and use in his upcoming decision.

Manipulation. After 2 min, participants heard the experimenter ask the interviewer to state his initial impression of the two applicants over the intercom. Participants in both conditions heard the interviewer say: "I'd have to say that at this point I would pick Participant A over B. I think I will have a better chance of winning the prize if I work with him." In the merit rejection condition, the interviewer went on to give the following reason for rejecting the participant: ". . . it says here that Participant B got a lower score on the leadership questionnaire . . ." In the sexist rejection condition, the interviewer gave this reason: ". . . like most girls, Participant B is probably too emotional and won't be a strong partner . . ."

Preparation and speech task. Following the feedback manipulation, the two applicants were told that during their interview, they would be required to talk about themselves, their work background and experiences, and their talents and skills for 5 min. They were instructed to try to convince the interviewer to select them by explaining why they would be the best teammate. Participants were then given 2 min to prepare, during which we recorded their CV responses. After this, participants completed a measure of their conscious experience of threat, reporting the degree to which they felt threat and vigilance emotions (as described in the Measures section).

The experimenter then brought the confederate into the room and seated him at a table across from the participant. To maintain the cover story, the experimenter explained that the participant would be interviewed first, while the second applicant completed additional questionnaires and that their roles would be reversed once her interview was complete. All confederates were trained to act neutrally during the participant's speech. The experimenter then left the room and instructed the participant, via intercom, to speak for 5 min. If she stopped speaking before the end of the 5 min, the experimenter prompted her to continue. CV responses were recorded throughout the speech.

Interactive task. After the speech and as the second phase of the interview, participants were asked to complete a 5-min backward digit span task in the presence of the confederate. Participants heard a prerecorded voice recite a list of 19 sets of two-digit numbers (4–6 numbers per set) and were asked to repeat the numbers in reverse order immediately following each set.

Postinterview period and manipulation checks. Upon task completion, the confederate was escorted from the room. The participant then sat quietly for 5 min while we recorded her CV responses. During this time, she still believed the interviewer had yet to make his selection decision. After 5 min, the participant was given the manipulation checks, disconnected from the CV recording equipment, probed for suspicion, and sensitively and fully debriefed.

Measures.

Physiological measures. Cardiac and hemodynamic measures were recorded using equipment and methods identical to those used in Study 1. CV responses were recorded during the 5-min baseline, 3-min preparation, 5-min speech, 5-min interactive task, and 5-min postinterview period. As in Study 1, the threat-challenge index was used as the measure of relative threat versus challenge responses.

Behavioral measure of anxiety. Immediately upon leaving the room after completion of the interactive task, the confederate, who was still unaware of participants' condition and the study hypotheses, rated how nervous the participant appeared during the speech and task portions of the study on an 7-point scale ranging from 1 (*not at all nervous*) to 7 (*extremely nervous*).

Self-reported emotions. Feelings of threat and vigilance were assessed with emotion terms adapted from the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988). Participants completed this measure after they heard the confederate give the merit or sexist feedback, but prior to his entry into the room for the interview. The four threat emotions were distressed, anxious, nervous, and awkward ($\alpha = .84$). The three vigilance emotions were active, attentive, and alert ($\alpha = .77$). Participants indicated how much they were feeling each emotion "right now" ranging from 1 (*very slightly or not at all*) to 5 (*extremely*). Threat and vigilance emotions were unrelated ($r < .01$).

Manipulation checks. Women were asked to rate the degree to which they thought the interviewer's upcoming decision would be influenced by (a) their own gender, (b) the interviewer's prejudiced beliefs, and (c) the interviewer's sexist beliefs, each on a 5-point scale ranging from 1 (*not at all important*) to 5 (*extremely important*). These were averaged to create a composite measure of expectations of sexism ($\alpha = .81$). They also rated the extent to which the upcoming decision would be influenced by their an-

swers on the leadership questionnaire. Finally, women rated how sexist they thought the interviewer was on an 7-point scale ranging from 1 (*not at all sexist*) to 7 (*sexist*).

Results

Participant attrition. During debriefing, two participants in the merit condition reported being suspicious that one or both of our confederates were not naïve participants; they were omitted from analyses. As in Study 1, we omitted participants who were missing all of their CV data because of recording difficulties. Our final data set thus included 52 participants (29 in the sexist condition, 23 in the merit condition). Because various time points in the CV data were unscorable due to faulty sensors, loss of signals, or noisy signals, the sample size varies slightly across analyses.

Manipulation checks. The manipulation of sexism was successful. Women in the sexist condition ($M = 3.81$, $SD = 1.08$) reported that prejudice would be a more important determinant of the interviewer's decision than did women in the merit condition ($M = 3.04$, $SD = 0.98$), $t(50) = -2.65$, $p = .01$, and also rated the interviewer as significantly more sexist ($M = 5.52$, $SD = 1.35$) than did women in the merit condition ($M = 2.91$, $SD = 1.20$), $t(50) = -7.24$, $p < .001$. Nonetheless, it is interesting to note that participants in the merit-based rejection condition appeared to consider the possibility that sexism might underlie a potential rejection (i.e., the mean was 3.04 on a 1–5 scale). This is not surprising given that the women received a negative evaluation from a man who indicated that he would likely choose another man instead of them. We discuss the implications of this later. Finally, women in the sexist condition were somewhat less likely to think their scores on the leadership questionnaire would impact the interviewer's decision, although difference was not significant (sexist, $M = 4.00$, $SD = 1.00$, and merit, $M = 4.30$, $SD = 0.63$), $t(50) = 1.27$, $p = .21$.

CV dependent variables.

Scoring and analyses. We used the same scoring and analytic procedures as in Study 1. A multivariate test of baseline HR, VC, CO, and TPR responses revealed no significant differences between conditions during the last minute of baseline, $F(4, 46) = 1.35$, $p = .27$. We then calculated CV reactivity values by subtracting each participant's CV responses during the last minute of baseline from her average responses during the first minute of the preparation, speech, interactive task, and postinterview periods. We then established that women in both conditions were significantly task engaged (i.e., HR and VC were significantly greater than zero during the first minute in all periods). Following this, we calculated the threat-challenge index in the same way as Study 1; higher values indicate greater threat.

Threat versus challenge responses. To test our primary predictions, we conducted a series of hierarchical moderated regression analyses, as described above, predicting participants' average scores on the threat-challenge index for the first minute of the preparation, speech, cognitive task, and postinterview periods separately. We entered SJBs (mean centered) and condition (0 = merit; 1 = sexist) on the second step and the SJB × Condition interaction on the third step. We conducted simple slope tests to examine all significant interactions following procedures specified by Aiken and West (1991). Details of analyses are reported in Table 1.

We found the predicted pattern of results across each time period, showing that participants' fairness beliefs moderated their experiences of threat during distinct tasks—preparing for the interview, giving a short speech, performing a cognitive task, and even after the interaction while anticipating the confederate's decision. At each time period, the predicted interaction was significant, $F_{preparation}(1, 38) = 7.13$, $p = .01$, $\Delta R^2 = .11$; $F_{speech}(1, 39) = 4.56$, $p = .04$, $\Delta R^2 = .09$; $F_{task}(1, 41) = 7.00$, $p = .01$, $\Delta R^2 = .11$; and $F_{postinterview}(1, 36) = 7.20$, $p = .01$, $\Delta R^2 = .14$. In Figure 2, we plot the results for the first minute of the cognitive task period to be consistent with Study 1. The pattern was identical for the other three time periods.

Simple slope tests examining each of these interactions also yielded the same pattern of results for each study phase. Comparisons of

Table 1
Summary of Moderated Regression Analyses

	Step 1 (VC and HR)			Step 1 or 2 (condition and SJBs)							Step 2 or 3 (Condition × SJBs)		
	Overall step			Overall step			Condition		SJBs		Overall step		
Variable	R^2	*df*	*F*	ΔR^2	*df*	*F*	β	*t*	β	*t*	ΔR^2	*df*	*F*
CV reactivity													
TCI preparation	.245	2, 41	6.65**	.066	2, 39	1.87	−.249	−1.71†	.207	1.46	.109	1, 38	7.12*
TCI speech	.127	2, 42	3.06†	.040	2, 40	0.95	−.192	−1.22	.151	0.99	.087	1, 39	4.56*
TCI task	.251	2, 44	7.39**	.014	2, 42	0.40	−.105	−0.75	.097	0.69	.107	1, 41	7.00*
TCI postinteraction	.093	2, 39	1.99	.083	2, 37	1.86	−.164	−0.97	.291	1.86†	.137	1, 36	7.20*
Emotions													
Threat				.021	2, 47	0.50	.016	0.11	.139	0.94	.006	1, 46	0.27
Vigilance				.058	2, 47	0.24	.127	0.87	.176	1.20	.169	1, 46	10.05**
Behavioral anxiety				.046	2, 48	1.16	−.161	−1.11	.186	1.28	.087	1, 47	4.71*

Note. Results of moderated regressions, with VC and HR mean centered on Step 1 (for CV reactivity analysis only), condition (merit = 0, sexist = 1), and mean-centered SJBs on Step 2 (or 1) and their interaction on Step 3 (or 2). VC = ventricular contractility; HR = heart rate; SJBs = system-justifying beliefs; CV = cardiovascular; TCI = threat-challenge index.
† $p \leq .10$. * $p < .05$. ** $p < .01$.

women at one standard deviation above and below the mean of SJBs showed that, as predicted, women who strongly rejected SJBs were significantly less threatened following a sexist rejection than a merit rejection during preparation, $\beta_{preparation} = -.610$, $p = .003$; speech, $\beta_{speech} = -.464$, $p = .02$; the cognitive task, $\beta_{task} = -.419$, $p = .02$; and after the interview, $\beta_{postinterview} = -.543$, $p = .01$. In contrast, women who strongly endorsed SJBs showed the same level of threat following a sexist or a merit rejection, $\beta_{preparation} = .108$, $p = .58$; $\beta_{speech} = .208$, $p = .39$; $\beta_{task} = .325$, $p = .13$; and $\beta_{postinterview} = .285$, $p = .22$. Furthermore, the more women endorsed SJBs, the more threatened they were in the sexist condition, $\beta_{preparation} = .525$, $p = .005$; $\beta_{speech} = .398$, $p = .04$; $\beta_{task} = .354$, $p = .04$; and $\beta_{postinterview} = .604$, $p = .002$. However, endorsement of SJBs was unrelated to threat among participants in the merit condition, $\beta_{preparation} = -.184$, $p = .36$; $\beta_{speech} = -.266$, $p = .28$; $\beta_{task} = -.383$, $p = .10$; and $\beta_{postinterview} = -.213$, $p = .37$.[3]

Although participants' CV responses across each phase of the study are correlated, the consistency of our results suggests that participants' experiences of threat were not an artifact of the specific task they were completing at the time. For example, that we observed the same pattern of results during the preparation period as during the speech and cognitive task illustrates that our CV effects during these latter periods are not artifacts of speaking or differences in speech cadence.

Behavioral measure of anxiety. We conducted a hierarchical moderated regression analysis on confederates' ratings of participants' nervousness, entering SJBs (mean centered) and condition (0 = merit; 1 = sexist) on the first step and the SJB × Condition interaction on the second step (see Table 1). Only the predicted SJB × Condition interaction was significant, $F(1, 47) = 4.71$, $p = .04$, $\Delta R^2 = .09$ (see Figure 3). Mirroring the CV reactivity pattern, women who strongly rejected SJBs were rated as significantly less nervous in the sexist condition than in the merit condition ($\beta = -.443$, $p = .02$). In contrast, women who strongly endorsed SJBs were rated as equally nervous in the two conditions ($\beta = .189$, $p = .38$). Examined another way, the more women endorsed SJBs, the more nervous they appeared in the sexist condition ($\beta = .414$, $p = .02$). However, endorsement of SJBs was unrelated to ratings of nervousness in the merit condition ($\beta = -.217$, $p = .36$).

Self-reported emotions. We used the same analytic strategy to separately analyze the composite threat emotions and vigilance emotions. We found no effects on self-reported threat emotions

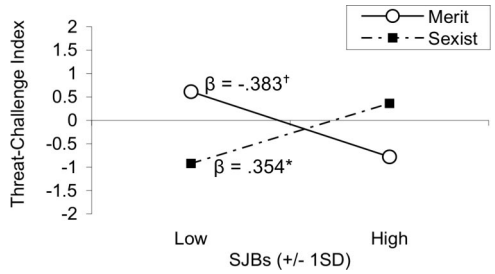

Figure 2. Study 2 threat-challenge index during the first minute of the cognitive task. Condition (merit = 0, sexist = 1) × SJBs (continuous, mean-centered) interaction. Graphed at ± 1 *SD* from SJBs mean. Higher values indicate threat relative to challenge. SJB = system-justifying beliefs. † $p \leq .10$. * $p < .05$.

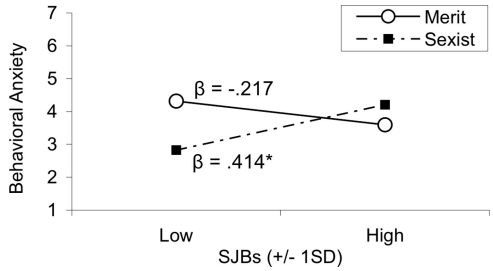

Figure 3. Level of behavioral anxiety as rated by confederate. Condition (merit = 0, sexist = 1) × SJBs (continuous, mean-centered) interaction. Graphed at ± 1 *SD* from SJBs mean. SJB = system-justifying beliefs. * $p < .05$.

(see Table 1). However, we did observe a significant interaction on vigilance emotions, $F(1, 46) = 10.05$, $p = .003$, $\Delta R^2 = .169$ (see Figure 4). Women who strongly rejected SJBs reported feeling equally vigilant in the sexist and merit conditions ($\beta = -.363$, $p = .14$). However, women who strongly endorsed SJBs reported feeling significantly more vigilant if they anticipated being rejected for sexist reasons than merit reasons ($\beta = .606$, $p = .004$). In addition, the more women endorsed SJBs, the more vigilant they reported being in the sexist condition ($\beta = .498$, $p = .005$), whereas endorsement of SJBs was unrelated to reported vigilance in the merit condition ($\beta = -.382$, $p = .09$). Although the pattern for self-reported vigilance corresponded somewhat to threat as measured by CV responses and nonverbal behavior, self-reported vigilance was uncorrelated with either the CV threat index or ratings of nonverbal anxiety (rs $< .18$, ps $> .24$). In contrast, the CV threat index during the speech and task and nonverbal anxiety were marginally or significantly correlated ($r_{speech} = .263$, $p = 09$; $r_{task} = .326$, $p = .03$), controlling for VC and HR.

Examining alternative moderators. In a final series of analyses, we explored the impact of gender stigma consciousness on all dependent variables. First, we examined the correlation between SJB endorsement and stigma consciousness. They were uncorrelated in this sample, $r(50) = .06$, $p = .70$. Second, we conducted a set of regression analyses identical to those reported above, but in which stigma consciousness was entered as the moderator variable in lieu of SJBs. These analyses revealed no significant main effects of stigma consciousness or any significant interactions between stigma consciousness and condition. Third, we reran the moderated regression analyses reported above using SJBs as a moderator, but controlling for stigma consciousness (mean centered) by entering it alone on the first step of the regression

[3] We also analyzed TPR and CO separately. Results were consistent with the threat-challenge index. For the preparation period, the interaction predicting CO did not reach significance, $F_{interaction}(1, 39) = 2.62$, $p = .11$, $\Delta R^2 = .04$; however, the interaction predicting TPR was highly significant, $F_{interaction}(1, 39) = 10.13$, $p = .003$, $\Delta R^2 = .16$. For the speech period, the interactions were marginal for both CO, $F_{interaction}(1, 40) = 3.81$, $p = .06$, $\Delta R^2 = .07$, and TPR, $F_{interaction}(1, 40) = 2.80$, $p = .10$, $\Delta R^2 = .06$. For the interactive task, the interactions were significant for both CO, $F_{interaction}(1, 42) = 5.74$, $p = .02$, $\Delta R^2 = .07$, and TPR, $F_{interaction}(1, 42) = 5.28$, $p = .03$, $\Delta R^2 = .10$. Lastly, during the postinterview period, the interactions were again significant for both CO, $F_{interaction}(1, 36) = 5.06$, $p = .03$, $\Delta R^2 = .10$, and TPR, $F_{interaction}(1, 36) = 7.76$, $p = .008$, $\Delta R^2 = .15$.

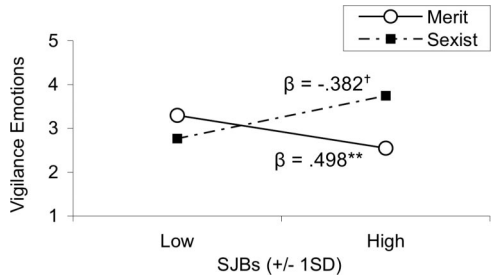

Figure 4. Preinteraction feelings of vigilance. Condition (merit = 0, sexist = 1) × SJBs (continuous, mean-centered) interaction. Graphed at ±1 *SD* from SJBs mean. SJB = system-justifying beliefs. † $p \leq .10$. * $p < .05$.

analyses (or with VC and HR for the analyses examining the threat-challenge index). Neither the pattern nor the significance level of any of the interactions or simple slopes changed. In summary, we found no evidence to support stigma consciousness as an alternative moderator or confounding variable.

Discussion

Our second study provides further evidence that beliefs about system fairness moderate stigmatized people's experience of threat during intergroup interactions. The predicted cross-over interaction between participants' worldviews and prejudice condition was significant for CV reactivity during the preparation, speech, cognitive task, and postinterview periods as well as on a nonverbal measure of anxiety. As expected, women who believe the system is unfair were less threatened when interacting with a man who had previously rejected them for sexist reasons than when interacting with one who had rejected them for merit-based reasons. Women who believe the system is fair, in contrast, were equally threatened when interacting with a man who had rejected them for sexist reasons as one who had rejected them for merit reasons.

Self-report measures of threat did not mirror physiological and nonverbal indices. Participants did report feeling more vigilant in conditions in which they displayed more threat on nonconscious measures, but self-reported vigilance was not correlated with either physiological or nonverbal measures. There are several explanations for this lack of correspondence. As noted at the outset, self-report measures are often unsuccessful at indexing the psychological state of threat (e.g., Steele & Aronson, 1995) and often are unrelated to physiological reactivity (e.g., Matheson & Cole, 2004; Mendes et al., 2003). A lack of correspondence may also reflect the fact that worldviews operate implicitly to shape expectations. Prior research has shown that violations of implicit expectancies produce reliable behavioral effects in the absence of self-report effects (e.g., Dalton et al., 2010; Finkel et al., 2006; Proulx & Heine, 2008). To the extent that interaction expectancies associated with status ideologies operate implicitly, violations of expectancies are unlikely to be consciously perceived. It is also possible that the lack of correspondence is due to defensive responding on self-report measures or denial of discrimination due to fear of appearing to be a "whiner" (Kaiser & Miller, 2003). Finally, in Study 2 we found no evidence that individual differences in gender-based stigma consciousness could account for the observed moderating effects of status-justifying beliefs.

General Discussion

Although many theorists propose that members of stigmatized groups are threatened during interactions with others who are prejudiced against their group, little research has tested this directly. In the present research, we used physiological measures to examine threat reactions among members of stigmatized groups when interacting with members of nonstigmatized groups who were, or were not, prejudiced. Our primary hypothesis, derived from worldview verification theory, was that beliefs about the fairness of the status system would moderate threat responses. In particular, we predicted that for members of stigmatized groups who believe the status system is fair, interacting with a prejudiced relative to an unprejudiced partner would disconfirm their worldview and result in greater threat. In contrast, we predicted the reverse pattern for members of stigmatized groups who believe the system is unfair—interacting with a prejudiced relative to an unprejudiced partner would confirm their worldview and result in less threat.

The results of both experiments provided support for our primary hypothesis, showing that SJBs moderate threat responses among members of stigmatized groups during interactions with others who do, versus do not, express prejudice against their group. In Study 1, Latinas interacted with a White female partner who expressed prejudiced or unprejudiced attitudes toward ethnic minorities but did not convey an evaluation of the participant personally. As predicted, we observed a significant cross-over interaction on participants' CV responses. Latinas who strongly endorsed SJBs were more threatened ($p = .06$) when interacting with a prejudiced, relative to an unprejudiced, White peer. In contrast, Latinas who strongly rejected SJBs were slightly but not significantly less threatened when interacting with a prejudiced versus an unprejudiced partner.

In Study 2, women interacted with a man who had previously evaluated them negatively for either clearly prejudicial reasons or ostensibly merit-based reasons. Again, we observed the predicted crossover interaction between participants' endorsement of SJBs and the partner's prejudice level on their experience of threat. Women who strongly rejected SJBs were less threatened when interacting with a sexist partner than when interacting with one who had rejected them for merit-based reasons. In contrast, women who strongly endorsed SJBs were equally threatened when interacting with a partner who had rejected them for sexist or merit-based reasons. We observed this pattern on participants' CV responses measured just before, during, and after the interaction as well as on a nonconscious measure of behavioral anxiety.

The Interaction Context

Although both studies showed the predicted crossover interaction, the specific pattern of moderation differed between them. We believe these differences are meaningful reflections of the interaction contexts we examined. In Study 1, Latinas were led to *anticipate* prejudicial or nonprejudicial treatment, but they did not actually *experience* it. We suspect that for those who believe the system is fair, merely learning that someone holds prejudiced

attitudes toward their group is sufficient to disrupt their worldview. In contrast, for those who believe the system is unfair, simply learning that a partner holds unprejudiced attitudes may not be sufficient to demonstrate a real lack of prejudice and disconfirm their worldviews. These different appraisals may explain why differences between conditions were larger among Latinas who believed the system is fair than among those who believed the system is unfair.

The interaction context of Study 2 was quite different. Just prior to interacting with a male evaluator, all participants learned that he was likely to reject them in favor of another male participant and heard either a sexist or merit-based reason for this. Thus, women in the sexist condition were given an attribution for their potential rejection that was both external and unambiguous. In contrast, women in the merit condition were given an attribution that was internal and more ambiguous. Indeed, participants in this condition reported on one of the manipulation checks that they believed that sexism might occur (i.e., a mean rating of 3.04 on a 1–5 scale). We believe that these differences led to different levels of self-image threat and uncertainty across conditions. For those who believe the system is unfair, the sexist rejection reduced the appraised demands of the situation not only by confirming their implicit expectancies derived from their worldview (cf. Major, Kaiser, et al., 2007) but also by providing a clear and external attribution for their potential rejection that served to reduced uncertainty and buffer their self-esteem (cf. Crocker & Major, 1989). For women who believe the system is fair, in contrast, the self-protective and uncertainty reducing benefits of blaming a potential rejection on sexism were likely offset by the expectancy-disconfirming nature of the rejection. Moreover, for these women, although the merit-based rejection confirmed their worldviews, it did not provide a clear attribution and was also potentially threatening to their self-image.

Our studies also differed in the type of prejudice encountered—racism in Study 1 and sexism in Study 2. Consistent with our previous research (e.g., Major, Kaiser, et al., 2007), we found that endorsement of SJBs moderates Latino Americans' responses to racism and women's responses to sexism in similar ways. Given the differences between sexism and racism (Sidanius & Veniegas, 2000), examining worldview verification processes during interracial and intergender interactions demonstrates the pervasiveness of the phenomenon. In summary, the similarities and differences observed in our studies illustrate the value of considering the interpersonal context in which prejudice is encountered.

Theoretical Implications

This research has important implications for worldview verification (Major, Kaiser, et al., 2007) and system justification theories (Jost & Banaji, 1994). Recall that both theories predict greater threat among people who believe the status system is fair when interacting with a prejudiced relative to an unprejudiced partner. For people who believe that the system is unfair, however, system justification theory also predicts greater threat when interacting with a prejudiced relative to an unprejudiced partner, whereas worldview verification theory predicts less threat. Study 2 provided support for worldview verification predictions, showing that women who rejected SJBs were less threatened in the sexist condition than in the merit condition. Together with recent research (Eliezer et al., in press; Foster et al., 2006; Major, Kaiser, et al., 2007), these findings challenge the assumption that evidence that one has been unjustly treated is inherently threatening. When it is consistent with people's beliefs and protects their self-image, information that the system is unjust can be less threatening than information that the system is just.

Findings of this and related research also highlight the dilemma members of disadvantaged groups face with regard to whether to believe or disbelieve that the status system is fair and open to all who try. Embracing a worldview in which the attainment of higher status is fair has both benefits and costs. Benefits include increased willingness to invest in long-term goals (Laurin, Fitzsimons, & Kay, 2010) and reduced feelings of vulnerability to being a target of prejudice (Major, Kaiser, et al., 2007). Yet this worldview holds members of disadvantaged groups responsible for their low status in society and places them at risk for lower self-esteem and greater feelings of threat when they do perceive prejudice directed against themselves or their group (Foster et al., 2006; Major, Kaiser, et al., 2007).

Embracing a worldview in which status is regarded as unfairly accorded, however, also has costs and benefits. It can lead members of disadvantaged groups to anticipate and prepare for prejudice and discrimination, thereby lessening their sting when encountered. It can also provide a way of explaining poor outcomes that buffer personal and collective self-esteem from threat. These responses are adaptive in hostile environments in which prejudice and discrimination are commonplace (Barrett & Swim, 1998). However, commitment to this worldview can also have negative effects, such as leading individuals to expect or perceive prejudice where it does not exist and increasing their risk for experiencing threat and loss of self-esteem when expected prejudice does not materialize.

Discrimination and Health

The present research also contributes to a growing literature on the impact of perceived discrimination on health (e.g., Clark, Anderson, Clark, & Williams, 1999; Krieger, 2000; Williams & Mohammed, 2009). Although a number of studies have reported positive associations between perceived discrimination and self-reported mental and physical health problems, studies examining the effects of perceived discrimination on physiological responses are both less frequent and more mixed in their conclusions (for recent reviews, see Paradies, 2006 and Williams & Mohammed, 2009). Together with our previous work (Eliezer et al., in press), the present studies suggest that part of the reason for inconsistent findings may be individual differences in participants' worldviews.

Our research also improves on past work by focusing on specific patterns of CV reactivity in response to prejudice—cardiac reactivity and vascular reactivity. Although both patterns are associated with increases in blood pressure, these increases result from different processes. Vascular reactivity, the pattern that is associated with threat, is considered less adaptive than cardiac reactivity and has been linked to higher risk for the development of CV disease (Manuck, Kamarack, Kasporwicz, & Waldstein, 1993) and higher rates of hypertension among African Americans (Anderson, McNeilly, & Myers, 1993; see Blascovich, 2008, for a review). Because vascular reactivity is more pronounced following worldview disconfirmation than confirmation, repeatedly encountering

events that disconfirm one's worldview may place a person at risk for later health problems.

Our studies also improve upon previous research by assessing online reactions prior to as well as following the stressor (i.e., interaction). We found that participants who experienced threat during the interaction also experienced threat in anticipation of it and after it. The presence of heightened CV responses during these periods is important because the cumulative wear and tear on the body is exacerbated when the body's autonomic responses are activated even when the person is not actively engaged in the stressor (McEwen, 2000).

Limitations and Directions for Future Research

A number of questions, however, remain for future research. One important direction is to determine the boundary conditions under which the disconfirmation of SJBs engenders threat. Results of Study 2, for example, suggest that events that disconfirm a person's worldview may simultaneously satisfy other important needs such as for certainty and self-enhancement, thereby attenuating overall feelings of threat.

Another important direction is to examine mediators of the observed effects. We believe that status beliefs affect intergroup interactions by shaping people's implicit expectations for whether they will be treated fairly. In the present research, we did not assess expectations of being a target of discrimination just prior to the interactions because doing so would have primed thoughts of prejudice in both conditions and because we are not confident that participants would have accurately reported these expectancies due to their implicit nature. Future research should examine potential implicit and explicit mediators of the relationship between SJBs and the experience of threat in response to prejudice.

Future research should also examine causality. Although we theorized that beliefs about the fairness of the status system play a causal role in the processes observed here, we measured individual differences in endorsement of SJBs rather than manipulated them experimentally. Thus, it is possible that the effects observed may be the result of some other covarying factor. We examined stigma consciousness as one potential covarying factor and found no evidence that it could account for the effects observed. Our claim that SJBs play a causal role is bolstered by evidence that exposure to a meritocracy prime, relative to a neutral prime, increases the extent to which individuals engage in system-justifying attributions and group stereotyping (McCoy & Major, 2007). Future research should examine the effects of experimentally activating system-legitimizing and system-delegitimizing ideologies on individuals' experiences of threat in response to prejudice.

Future research should also explore the degree of self-relevance needed to engender worldview threat. Because the function of worldviews is to provide a sense of stability, predictability, and certainty *in one's own life* (Lerner & Miller, 1978), we assume that people are concerned about maintaining and defending worldviews that involve social systems relevant to the self. Thus, we hypothesized that people who endorse beliefs that justify the fairness of the American system are threatened by evidence of prejudice against their own group. An important question for future research is to examine whether fairness beliefs moderate people's responses to prejudice directed against groups other than their own, but that are within their society.

Conclusion

Results of this research illustrate that the psychological and physical impact of interacting with others who are perceived to be prejudiced against one's social group vary dramatically depending on one's beliefs about the fairness of the status system. Results extend our prior work in several important ways. First, they show that worldview verification processes influence the experience of threat in theoretically predicted ways during naturalistic, face-to-face interactions with members of outgroups. Second, they show that worldview verification processes can be detected with online, covert measures that are not subject to conscious distortion. Third, our findings suggest that disconfirmation of worldviews may have important downstream health consequences to the extent that chronically experiencing a threat pattern of CV responses is physiologically maladaptive. Fourth, our findings show that for some people in some situations, the absence of prejudice may be more threatening than its presence. Finally, this research highlights the predicament in which members of socially disadvantaged groups find themselves. Believing in a fair system in which anyone can get ahead enables them to appraise their world in less threatening ways but increases their vulnerability when they encounter prejudice. Rejecting the belief in a fair society lessens the sting when prejudice is encountered but can engender distrust and threat when trust is warranted.

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