Report

The costs of caring: Gender identification increases threat following exposure to sexism

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ABSTRACT

The current research examined whether group identification moderates the extent to which perceived ingroup discrimination is threatening, as indexed by physiological and self-report measures. Women read and gave a speech summarizing an article describing sexism as prevalent or rare. They then completed a distraction task and sat for a recovery period. Cardiovascular reactivity (CVR) was used to index threat experienced on an automatic level and self-reported anxiety was used to index threat experienced on a controlled level. Regardless of group identification, participants in the prevalent sexism (vs. rare sexism) condition exhibited a pattern of CVR consistent with threat during the speech and reported greater anxiety post-speech. During recovery, however, highly identified participants in the prevalent sexism condition exhibited a sustained threat pattern of CVR and reported higher anxiety post-recovery compared to low identifiers. High group identification may heighten the psychological and physiological burden of discrimination.

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In 1998 Lilly Ledbetter sued Goodyear Tire Company for gender discrimination after discovering she had been paid less than her male colleagues of the same rank for 20 years. Ledbetter's suit led to a Supreme Court case (Ledbetter, 2007) as well as passage of the Lilly Ledbetter Fair Pay Act (S. 181, 2009). Millions of women learned about Ledbetter's experience. Millions more hear about or witness other instances of discrimination regularly. What are the consequences of perceiving discrimination against one's group?

Many scholars argue that perceiving one's ingroup to be a target of discrimination is stressful and can lead to poor psychological and physical health (Krieger, 2003). Ethnic minorities and women who perceive more discrimination are at higher risk than those who perceive little discrimination for negative psychological and physical health outcomes including anxiety, depression, heart disease, and cancer (Contrada et al., 2001; Harrell, Hall, & Taliaferro, 2003; Paradies, 2006 ; Klonoff, Landrine, & Campbell, 2000; Williams & Mohammed, 2009).

Group identification as a moderator of responses to discrimination

People differ markedly, however, in how they react to discrimination (Major, McCoy, Kaiser, & Quinton, 2003). One factor that may moderate the extent to which discrimination is experienced as a threat is group identification. Group identification is often defined as the extent to which people include the ingroup as a central part of their self-concept (Luhtanen & Crocker, 1992; McCoy & Major, 2003; Smith & Henry, 1996; Tropp & Wright, 2001). Some scholars propose that high group identification acts as a resource that buffers individuals against threat associated with discrimination (e.g., Branscombe, Schmitt, & Harvey, 1999). In contrast, other scholars propose that high group identification *intensifies* threat in response to discrimination, based on the reasoning that for highly identified people a threat to the group is experienced as a threat to the personal self (McCoy & Major, 2003).

Most studies examining this issue have been correlational and their findings are inconsistent (Brondolo, ver Halen, Pencille, Beatty, & Contrada, 2009). Some find that perceived discrimination is related to diminished wellbeing (i.e. lower self-esteem, greater anxiety) among low group identifiers, but is uncorrelated with wellbeing for high identifiers (Branscombe et al., 1999; Fischer & Shaw, 1999; Mossakowski, 2003; Sellers, Caldwell, Schmeelk-Cone, & Zimmerman, 2003). Others find only a direct positive relationship between identification and wellbeing (Phinney, 1992; Sellers, Copeland-Linder, Martin, & Lewis, 2006; Utsey, Chae, Brown, & Kelly, 2002). And yet others find that high identifiers experience decreased wellbeing the more they perceive discrimination (Eccleston & Major, 2006; Noh, Beiser, Kaspar, Hov, & Rummens, 1999).

We believe that these inconsistencies may be due to limitations inherent in correlational designs. Because correlational studies measure, rather than manipulate, perceived discrimination, there

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is likely to be substantial variation in what people experience and report as discrimination. It may be inappropriate to compare the outcomes of high and low identifiers because their perceptions of discrimination, particularly in ambiguous situations, differ substantially (Operario & Fiske, 2001). In addition, although high identification may be positively associated with wellbeing in neutral contexts, correlational research cannot test whether this relationship changes when discrimination is directly encountered.

Experimental designs are necessary to test how identification moderates reactions to differing levels of perceived discrimination. McCoy and Major (2003) conducted one of the few studies to experimentally manipulate discrimination. They exposed Latino participants to evidence that discrimination against their ethnic group was either pervasive or rare. Compared to those low in ethnic identification, Latinos who were highly identified reported decreased self-esteem, increased depressed emotions, and greater feelings of threat if they read that discrimination was pervasive. If they read that discrimination was rare, in contrast, high identifiers tended to report somewhat higher wellbeing. Thus, experimental research supports the perspective that high identification increases threat in response to discrimination.

Regardless of perspective, most of the above studies share the assumption that identification moderates the extent to which discrimination is experienced as *threatening*. Threat has been defined as a maladaptive psychological state that occurs when a person *unconsciously or consciously* appraises the demands of the situation as exceeding his or her coping resources. Threat can be contrasted with challenge, which is an adaptive psychological state that occurs when resources are unconsciously or consciously perceived as meeting or exceeding demands (Blascovich & Mendes, 2000; Blascovich & Tomaka, 1996). Although threat and challenge can operate on an automatic, unconscious level, prior investigations of how identification influences responses to discrimination have focused exclusively on the controlled, conscious aspect of threat by using self-report measures (e.g., McCoy & Major, 2003).

In our view, because threat is a complex state consisting of automatic and controlled components, it is insufficient to rely solely on self-report measures of threat which mainly index controlled processes. This perspective is consistent with dual process models of cognition which propose that human thought consists of two divergent systems; an automatic, affective, unconscious system and a controlled, rational, conscious system (Epstein, 1994; Smith & DeCoster, 2000; Wilson, Lindsey, & Schooler, 2000). Divergent automatic and controlled processes have been demonstrated for a wide array of constructs, including self-esteem (Spalding & Hardin, 1999), stereotypes (Banaji & Hardin, 1996), and anxiety (Egloff, Wilhem, Neubauer, Mauss, & Gross, 2002). Furthermore, automatic and controlled processes are often unrelated and predict different behaviors (e.g., Dovidio, Kawakami, & Gaertner, 2002).

Examining threat at both an automatic and controlled level may provide new insights into people's reactions to discrimination. Someone who is experiencing threat at a more unconscious or automatic level, for example, may show nonverbal indicators of avoidance and anxiety, whereas someone who is experiencing threat at a more conscious or controlled level may engage in deliberate actions to cope with discriminatory situations. In addition, examining threat on an automatic level may uncover responses that people are unwilling to report on controllable self-report measures. For example, individuals may be reluctant to report that they are bothered by discrimination and inflate their wellbeing so as not to appear weak or as if they are complaining (Kaiser & Miller, 2001).

In the current research we used CV measures to index the automatic component of threat and self-report measures of anxiety to index the controlled component of threat. Only one other study to our knowledge has attempted to examine how identification moderates threat in response to discrimination using CV measures

(Clark, Cobb, Hopkins, & Smith, 2006). Because highly identified African Americans in this study displayed elevated CV levels in response to both neutral and discrimination stimuli, however, results were inconclusive as to whether identification increases threat in response to discrimination.

Biopsychosocial model of challenge and threat

The psychological states of threat and challenge can be indexed via specific patterns of cardiovascular reactivity (CVR) displayed while an individual is engaged in a self relevant task (Blascovich & Mendes, 2000; Blascovich & Tomaka, 1996). When task engaged, people show increased heart rate and ventricular contractility (the force with which the left ventricle contracts). When people appraise a situation as challenging, the sympathetic-adrenomedullary axis (SAM) is activated, leading to increased cardiac output (CO; liters of blood pumped out of the heart per minute) and decreased total peripheral resistance (TPR; total constriction of the arterioles). When people appraise a situation as threatening, in contrast, the HPA (hypothalamic–pituitary adrenal cortical) axis is also activated, releasing cortisol. Compared to CVR during challenge, CVR during threat is characterized by little or no increase in CO and increases in TPR. Thus, the challenge pattern is regarded as a more adaptive physiological response.

CVR patterns of challenge and threat are usually assessed while individuals are actively engaged with tasks. However, CVR measurements made during recovery periods are also psychologically meaningful (Allen, Blascovich, & Mendes, 2002; Linden, Earle, Gerin, & Christenfeld, 1997). Elevated CVR once a stressor is no longer present may reflect cognitive rumination about the stressor which extends the stressor period (Brosschot, Gerin, & Thayer, 2006; Glynn, Christenfeld, & Gerin, 2002).

Overview of experiment and predictions

The current research examined how group identification moderated self-report and CVR indicators of threat in response to discrimination. We asked female participants, pretested for gender identification, to read an article describing sexism as either prevalent or rare and then to give a videotaped speech summarizing the article. Participants then completed a distracter task (to divert their focus away from the stressor) and subsequently sat for a rest period. We measured CV activity during baseline, speech, distracter task, and recovery. The speech task assessed CVR while participants were active and task engaged, and the rest period assessed CVR during recovery.

Our primary hypothesis was that highly identified women, relative to those less identified, would experience greater threat when exposed to evidence that sexism was pervasive vs. rare. We reasoned that this would occur because high identifiers, compared to low identifiers, would find the experience of ingroup members to be more *self relevant* and thus consider discrimination to be a greater *demand* likely to hinder their ability to achieve their life goals. We expected these effects for identification to be larger in the recovery period, when participants had the opportunity to reflect upon discrimination, than during the speech. We expected this for two reasons. First, the strong situational demands of focusing on blatant discrimination while giving a speech are likely to overwhelm individual differences (Operario & Fiske, 2001; Snyder & Ickes, 1985). When the demands of the situation are reduced during recovery, in contrast, highly identified women should exhibit greater threat than low identifiers because the stressor may persist longer for high identifiers. Second, during the speech, participants may be preoccupied with performing and less focused on the information about sexism.

We also examined the relationship between CVR and self-reported anxiety following discrimination. Although we predicted the same patterns of results for both CVR and self-report, we predicted that the two measures would be uncorrelated because they capture different components of threat.

Method

Participants and design

Seventy-three European–American female students (age: $M = 19.07$ years, $SD = 1.26$) at the University of California, Santa Barbara participated for course credit. Participants completed a measure of gender identification several weeks prior to the experiment. During the experiment, we randomly assigned them to read and orally summarize an article describing prevalent or rare sexism.

Procedure

Arrival and baseline. Participants arrived individually and learned the purpose of the study was to assess communication and cognitive skills. A European–American or Asian–American female experimenter applied physiological sensors and transducers to the participant and left her alone for 5 minutes to assess baseline CV activity.

Speech about sexism article. The participant learned that she would give a speech summarizing an article and "randomly" selected a number to determine the topic. Participants were always given a fictional article describing a survey about sexism given to University of California students and alumni. Half of the participants (prevalent sexism condition) read that women faced pervasive sexism (e.g. Women earned 75% of what men earned; between 80% and 85% of males held sexist attitudes). The remainder (rare sexism condition) read that women faced little sexism (e.g. Women earned the same as men; only 7% of males held sexist attitudes). The participant read the article for 3 minutes and prepared a speech for 2 minutes. To ensure that all participants spoke about the same information, they were told to only summarize the article and were given a brief list of topics from the article to cover.

To increase motivation, the experimenter turned on a camera and disclosed that the speech would later be evaluated by judges. The participant gave a 3 minute speech during which CV data were recorded. If the participant stopped speaking the experimenter prompted her to continue over an intercom. After the speech, the participant completed a self-report measure of anxiety.

Distraction task. Next, the participant spent 5 minutes on the distraction task while CV data and performance were recorded. This involved listening to strings of numbers and reciting them in the reverse order. For example, if the participant heard the string "3, 61, 21", the correct response would be "21, 61, 3".

Recovery period. The participant was then instructed to relax, during which 5 minutes of CV data were recorded. These data served as the critical recovery period. Finally, the participant completed self-report measures (anxiety and manipulation checks) and was debriefed.

Measures

Physiological measures. Noninvasive recording of cardiac and hemodynamic measures followed guidelines by the Society for Psychophysiological Research (e.g., Sherwood et al., 1990) and used equipment in accordance with hospital and commercial safety standards. Physiological signals were measured using a Biopac impedance cardiograph (Model NICO100C), a Vasotrac (Model APM205A) noninvasive blood pressure monitor, and a Biopac electrocardiograph amplifier (Model ECG100C).

Electrocardiographic (ECG) and impedance cardiographic recordings supplied continuous measures of cardiac performance. Employing a tetrapolar aluminum/mylar tape electrode system, impedance cardiography provides basal transthoracic impedance (Z0) and the first derivative of basal impedance (dZ/dt). Two pairs of mylar tape were fastened around the neck and torso with electrodes. A 400 μA AC 50 kHz current was passed through the outside electrodes and basal impedance was measured from the inside electrodes. The ECG recordings were attained using a modified lead II configuration (lower left torso and upper right torso with impedance cardiography providing an internal ground). Continual noninvasive recordings of blood pressure using tonometric technology was obtained from the radial artery of the nondominant hand using a Vasotrac blood pressure monitor. Data were integrated with an MP150 and displayed and stored with Acknowledge software (Goleta, CA). We used Mindware software to edit artifacts and ensemble and score the data.

Gender identification. The measure of gender identification was embedded in a set of online questionnaires completed several weeks before the experiment and consisted of the four-item Importance to Identity subscale of the Collective Self-Esteem Scale (CSE), ($\alpha = .82$; Luhtanen & Crocker, 1992). Sample items are "Being a woman is an important reflection of who I am"; "Overall, being a woman has very little to do with how I feel about myself" (reverse-scored). Items were measured on 7-point scales with endpoints of 0 (*not at all*) to 6 (*extremely*).[1]

Self-reported anxiety. After the speech, participants reported the extent to which they felt anxious and uneasy at that moment on 7-point scales from 1 (*not at all*) to 7 (*extremely*). A composite was created using the two items ($r = .85$, $p < .000$). We only assessed two emotions at that time to prevent a long break in the procedures. After recovery, participants reported the extent to which they felt ten anxiety emotions; anxious, fear, overwhelmed, worried, nervous, uneasy, uncertain, uncomfortable, confused, conflicted ($\alpha = .92$). Items were measured on 5-point scales with endpoints of 1 (*not at all*) to 5 (*extremely*).[2]

External speech evaluations. Seven independent coders rated the quality of participants' speeches ($\alpha = .83$) on a 7-point scale from 0 (*very poor*) to 6 (*very good*). Coders also recorded the number of facts from the article that the participant summarized ($\alpha = .94$). Finally, coders recorded statements made that were not directly from the article. Participants were assigned a score of one if they made statements that were not from the article and a score of zero if they made no extra statements.

Distraction task performance. Performance on the distraction task was determined by summing the amount of number strings the participant correctly recited in the reverse order.

Speech experience. Participants answered an open-ended question which asked if they had acting or public speaking experience. Participants who reported that they had no experience or had only given class presentations were assigned a score of zero. Participants who reported that they had speaking experiences beyond typical class presentations (acting, public speaking class, leadership) were assigned a score of one.

Manipulation checks. To evaluate the effectiveness of the manipulation, participants completed a one-item measure; "Women as a group face a good deal of sexism" on a 7-point scale from 1 (*not at all*) to 7 (*very much*). To assess whether participants believed the manipulation, they answered; "How accurate do you think the

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[1] The four-item private-regard subscale of the CSE (e.g., "I feel good about being a member of my gender group") did not moderate either CVR or self-reported anxiety.
[2] We also assessed self-reported anger emotions. No significant effects were observed.

information and data provided in the article is?" on a 7-point scale from 0 (*not at all*) to 6 (*very much*).

Results

Participant attrition

We omitted six participants who were missing all CV data to maintain a consistent data set. We also excluded six participants who believed the article was not accurate (indicated the lowest value on the accuracy item scale) (five in the rare condition and one in the prevalent condition). Our final data set consisted of 32 participants in the rare condition and 29 in the prevalent condition ($N = 61$).

Manipulation checks

Gender identification did not differ by condition. The perceived discrimination manipulation was successful, $t(59) = -4.16$, $p < .000$. Participants in the prevalent sexism condition ($M = 4.86$, $SE = .21$) reported that women face more sexism than participants in the rare condition ($M = 3.28$, $SE = .31$). There was no relationship between identification and perceptions of discrimination and no interaction between identification and condition on perceptions of discrimination, ruling out the possibility that the conditions were interpreted differently depending on identification level. Finally, there were no differences in participants' responses (CVR and self-report) by experimenter or experimenter race.

Correlation between self-report and CVR

CVR during the speech and recovery tasks were uncorrelated with anxiety reported after the speech and recovery tasks, ($rs = -.02$ to $-.04$), suggesting that these two measures captured distinct automatic and controlled components of threat.

Cardiovascular data

Analytic strategy. For each minute of CV data, we calculated mean values for HR, VC, CO, and TPR. We analyzed the CV data in five steps (Mendes, Blascovich, Major, & Seery, 2001). First, we examined baseline differences in CV by condition and identification level. Second, we examined changes in VC and HR from baseline to each experimental period to determine task engagement. Third, we computed CVR scores. Fourth, we combined the CO and TPR data into a unitary threat/challenge index. Fifth, we conducted hierarchical regression analyses to test our hypothesis regarding the influence of identification and condition on CVR. We entered condition (dummy coded; 0 = sexism rare, 1 = sexism prevalent) and gender identification (centered) on Step 1 and the identification by condition interaction term on Step 2. We also included speech experience as a covariate in Step 1 of these analyses to control for threat associated with the novelty of public speaking (rather than threat associated with perceived discrimination).

Baseline differences. A multivariate test on CV responses during the last minute of baseline established that there were no baseline differences by condition. In addition, there were no significant correlations between baseline CV responses and identification.

Task engagement. Univariate tests revealed that HR and VC reactivity were significantly greater than zero for each experimental phase (speech, distraction task, recovery), confirming that participants were task engaged ($ps < .000$–$.033$).

CV data reduction. We computed CVR scores by subtracting the last minute of the baseline period from each minute of the experimental phases. TPR and CO were used as the dependent variables.

For ease of discussion we computed a unitary threat/challenge index (Blascovich, Seery, Mugridge, Norris, & Weisbuch, 2004). TPR and CO reactivity scores from each minute of the study were standardized and CO was then subtracted from TPR. All minutes within a task period were averaged together to create one threat/challenge index for each task (speech, distraction, recovery). Higher values on the threat/challenge index reflect greater threat (higher TPR relative to CO).

Speech task CVR. We observed a marginal main effect for condition during the speech; participants in the sexism prevalent condition exhibited greater threat ($M = .50$, $SE = .34$) than participants in the rare condition ($M = -.45$, $SE = .33$) ($\beta = .24$, $p = .067$; $R^2 = .11$, $p = .078$). Neither the main effect for identification nor the interaction between condition and identification were significant (Table 1).

Distraction task CVR. There were no significant effects during the distraction task

Recovery period CVR. To ensure that elevated CVR during recovery reflected heightened reactivity during the recovery period itself rather than a higher starting point to recover from, we controlled for CV activity at the end of the distraction task by entering CV activity from the last minute of the distraction task as a covariate at Step 1. The predicted interaction between identification and condition was significant ($\beta = .42$, $p = .026$; $\Delta R^2 = .084$, $p = .026$). Among women in the prevalent sexism condition, there was a significant positive relationship between identification and threat ($\beta = .41$, $p = .028$). In the rare condition, this relationship was negative but not significant ($\beta = -.18$, $p = .32$). To further test our predictions, we computed the difference between the two simple regression lines at one standard deviation above (5.05) and below (2.70) the mean of identification. During recovery, high identifiers in the prevalent sexism condition exhibited more threat CVR than high identifiers in the rare condition ($\beta = .53$, $p = .005$), whereas women low in identification did not differ by condition ($\beta = -.081$, $p = .67$) (Table 1 and Fig. 1).

Self-report measures

We used the same analytic approach to examine the self-report and performance measures.

Post-speech anxiety. Only the condition main effect was significant for self-reported anxiety after the speech ($\beta = .26$, $p = .055$; $R^2 = .082$, $p = .18$). Women in the prevalent condition reported greater anxiety ($M = 3.55$, $SE = .28$) than women in the rare condition ($M = 2.76$, $SE = .27$) (Table 2).

Post-recovery anxiety. Only the interaction between identification and condition was significant for self-reported anxiety after recovery ($\beta = .38$, $p = .029$; $\Delta R^2 = .077$, $p = .029$). Identification and anxiety were positively and significantly related in the prevalent condition ($\beta = .43$, $p = .027$) and unrelated in the rare condition ($\beta = -.14$, $p = .42$). We computed the difference between the two

Table 1
Model summary of hierarchical regression analyses examining CV threat/challenge index during the speech task and the recovery period.

	T/C speech		T/C recovery	
	β	ΔR^2	β	ΔR^2
Step 1: Identification and condition		.11		.10
Identification	.10		.11	
Condition (rare vs. prevalent)	.24+		.24	
Step 2: Two-way interaction		.014		.084[*]
Identification × condition	.16		.42[*]	

Note: Standardized regression coefficients are reported from the step on which each variable was first entered.
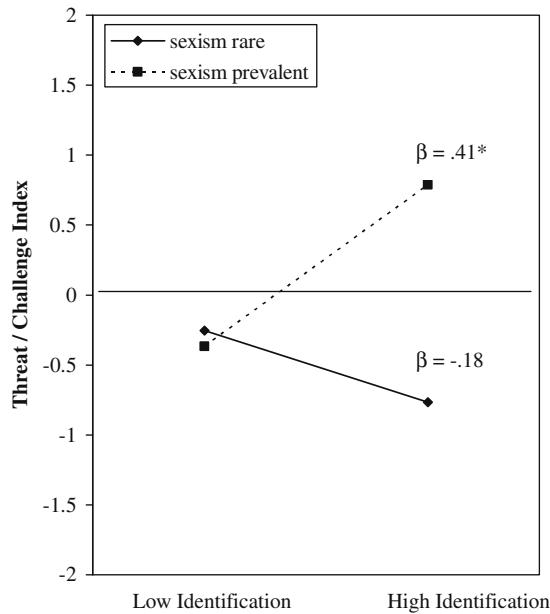[*] $p < .05$ + $< .07$.

Fig. 1. The impact of condition (sexism prevalent vs. rare) and gender identification (plotted 1 *SD* above and below the mean) on threat/challenge index during recovery. *Note*: Higher values reflect greater threat *p < .05.
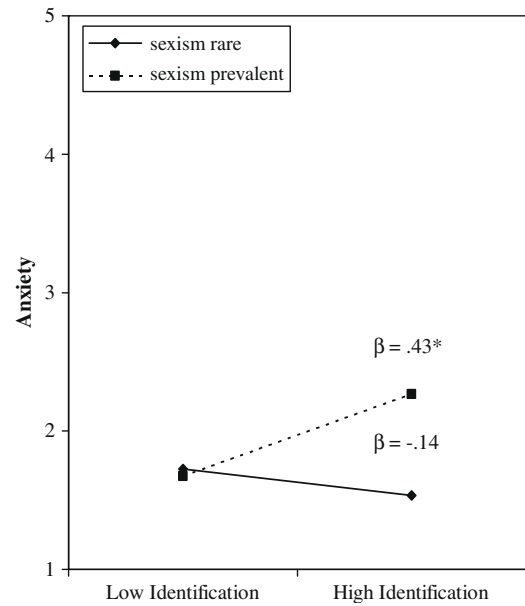

Fig. 2. The impact of condition (sexism prevalent vs. rare) and gender identification (plotted 1 *SD* above and below the mean) on anxiety reported after recovery. *p < .05.

Table 2
Model summary of hierarchical regression analyses examining anxiety after the speech and after recovery.

	Anxiety speech		Anxiety recovery	
	β	ΔR^2	β	ΔR^2
Step 1: Identification and condition		.082		.068
Identification	.040		.12	
Condition (rare vs. prevalent)	.26*		.21	
Step 2: Two-way interaction		.000		.077*
Identification × condition	.020		.38*	

Note: Standardized regression coefficients are reported from the step on which each variable was first entered.
* *p < .055.

simple regression lines at one standard deviation above and below the mean of identification. Highly identified women reported more anxiety if they had previously spoken about prevalent than rare sexism (β = .49, p = .008). Low identifiers did not differ by condition (β = −.076, p = .67) (Table 2 and Fig. 2).

Performance measures

External speech evaluation. It is possible that identification differentially influenced the content of participants' speeches. That is, compared to low identifiers, high identifiers may have given lower quality speeches, stated more information from the article, or described their own experiences more, any of which may have increased threat during recovery. However, our coders discerned no differences on any of these measures by condition, identification, or their interaction. This bolsters our argument that information about discrimination, rather than the way in which participants recited the information, contributed to the threat experienced by high identifiers during recovery.

Distraction task performance. Since the distraction task preceded recovery, it is also possible that poorer performance on the task by high identifiers might have heightened threat during recovery. However, there were no effects on performance for identification, condition, or their interaction.

Discussion

This research adds to a growing body of literature which demonstrates that perceiving one's ingroup to be a target of discrimination can be both psychologically and physiologically threatening. Furthermore, it extends this literature in an important way by demonstrating that identification moderates threat experienced on both an automatic and controlled level in response to perceived discrimination. Importantly, cardiovascular responses and self-reported measures of anxiety were not correlated, suggesting that they captured separate components of threat.

As expected, identification was found to moderate threat responses only during the recovery period. During the speech and immediately afterwards, women who had summarized an article documenting pervasive sexism showed a CVR pattern indicative of greater threat and reported greater anxiety than women who had summarized an article documenting rare sexism, irrespective of their level of gender identification. We suspect that the speech task created a "strong situation" for all participants that may have overwhelmed individual differences (Snyder & Ickes, 1985). That is, even for a person who does not strongly identify with an ingroup, having to talk publicly about discrimination against that ingroup is likely to be stressful. Furthermore, it is possible that during the speech participants may have focused more on the performance aspect of the task than on discrimination.

When participants had the opportunity to reflect on discrimination during recovery, in contrast, we observed the predicted moderating effects for group identification. Highly identified women who were shown evidence that sexism is pervasive continued to exhibit threat, as indexed by CVR and self-reported anxiety, compared to high identifiers who were shown evidence that sexism is rare, and also compared to low identifiers in both the prevalent and rare conditions. Low identifiers no longer showed physiological or affective responses that differed by condition during recovery; for them, the stressor appeared to be over.

Elevated physiological reactivity during recovery following a stressor may be driven by continued thoughts about that stressor (Brosschot et al., 2006; Glynn et al., 2002). We speculate that the peril of discrimination may have remained on the minds of high

identifiers while low identifiers were able to turn their thoughts away from discrimination. High identifiers may have continued to ruminate about discrimination during recovery because they found negative information about their group to be self relevant. This may have increased high identifiers' perceptions of the demands they were likely to encounter in the future, thus continuing their threat appraisals even during a recovery period. Importantly, the persistence of threat appeared to occur on both an automatic and controlled level.

Our results during the recovery period cannot be accounted for by performance differences during the speech. High identifiers who spoke about discrimination did not perform worse, recite more facts about discrimination, or provide more information from their own knowledge than low identifiers. It seems to be the information about discrimination, and not the way that participants presented the information, that affected high identifiers' experience.

One might argue that if women were threatened during recovery due to thoughts about discrimination, parallel results should have been observed during the distraction task following the speech. However, the distraction task did not allow time for rumination; instead, participants focused their attention on memorizing numbers (Brosschot et al., 2006; Glynn et al., 2002). Identification only moderated responses when participants had the opportunity to think freely during recovery. Furthermore, given that recovery followed the distraction task, one might argue that participants ruminated about their task performance during recovery instead of discrimination. There was no evidence of this, however, as neither identification nor condition influenced performance or CVR during the distraction task.

Limitations and future research

One limitation of the current investigation is the speculative nature of our argument that threat during recovery reflected rumination about discrimination. Future research may expand our findings by asking participants to report on their thoughts during recovery and by using indirect measures of thought accessibility (Fazio & Olson, 2002) to capture automatic and controlled thought processes. A second limitation is the absence of a neutral comparison condition. Because participants either spoke about sexism as rare or prevalent, it cannot be determined whether pervasive sexism elevated threat or rare sexism decreased threat. A third limitation is that because group identification was measured, rather than manipulated, it is possible that a third variable which covaries with identification is the more appropriate moderator of the observed effects. Experimental manipulations of identification with real groups, however, are difficult to achieve and of uncertain significance (Ellemers, Spears, & Doosje, 2002; McCoy & Major, 2003).

Conclusions and implications

Although researchers often assume that discrimination poses a threat to the self and that group identification moderates this threat, research testing these assumptions has been limited. Our study is the first to demonstrate that group identification moderates automatic and controlled components of threat associated with perceiving pervasive discrimination against one's group. This is important because threat experienced on an automatic vs. controlled level may lead to divergent behaviors. For example, experiencing threat on an unconscious or automatic level may lead high identifiers to exhibit nonverbal behaviors associated with anxiety and withdrawal, whereas experiencing threat at a more conscious or controlled level may lead high identifiers to engage in active efforts to cope. Future research should further examine these possibilities.

Our research suggests that perceiving pervasive sexism may impose a psychological and physiological burden on women in general and especially on highly identified women. It is possible that this increased burden, if experienced chronically and excessively, may contribute to adverse health outcomes, such as hypertension and cardiovascular disease (Blascovich & Katkin, 1993; Ottaviani, Shapiro, Goldstein, & Mills 2007). The combination of an intense reaction to a stressor and a protracted elevation in reactivity after the stressor, as exhibited by high identifiers, is a profile of response especially predictive of negative health outcomes (McEwen, 2000). Furthermore, if high identifiers ruminate about discrimination, as our data suggest, they may be at greater risk for depression (Nolen-Hoeksema, 1991). Thus, this research supports the perspective that high identification increases psychological threat and decreases physical and psychological wellbeing in the face of discrimination.

We did not find evidence for the perspective that high group identification decreased threat in response to perceived ingroup discrimination. Our experimental situation, however, did not allow high identifiers to benefit from ingroup coping resources, such as ingroup social support. Furthermore, the responses of high identifiers in our study may not be entirely negative as ruminating about discrimination may motivate them to engage in constructive efforts to counteract prejudice and foster social change.

Acknowledgments

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