



Does unfairness feel different if it can be linked to group membership? Cognitive, affective, behavioral and physiological implications of discrimination and unfairness[☆]



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HIGHLIGHTS

- We compared fair/unfair treatment among Whites/Latinos in inter/intragroup contexts.
- Unfair treatment has different implications depending on group context.
- Ethnicity & system-legitimizing beliefs (SJBs) interact to predict responses to discrimination.
- Ethnicity & SJBs do not predict responses to unfair, group-irrelevant treatment.
- Post-discrimination, low-SJBs show cardiovascular challenge; high-SJBs show threat.

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ABSTRACT

We assessed whether unfair treatment leads to different attributional, emotional, behavioral, and cardiovascular responses depending on whether or not the treatment is group-based. Latino and White men ($N = 209$) were treated fairly or unfairly by an ingroup or outgroup member. As expected, attributions to discrimination were the greatest among those treated unfairly in an intergroup context. Moreover, among those treated unfairly in an intergroup context, Latinos who did not endorse the protestant work ethic (PWE) responded with more anger, had higher attributions to discrimination, and punished the offender more, compared to Whites and high-PWE Latinos. Cardiovascular responses to unfair intergroup treatment did not differ by ethnicity: unfair intergroup treatment was less threatening (more challenging) when low (vs. high) in PWE. Results suggest that for low-status group members responding to unfair intergroup treatment (i.e., discrimination), identifying the treatment as discriminatory and becoming angry may be more cardiovascularly-adaptive than not. Implications are discussed.

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Introduction

Both unfairness and discrimination are highly aversive—they lead not only to anger, anxiety, and a sense of injustice, but also to acute stress and poor health outcomes (Jackson, Kubzansky, & Wright, 2006; Lind & Tyler, 1988; Pascoe & Smart Richman, 2009). Yet the phenomenological experience of discrimination may differ substantially from the experience of plain unfairness—even when the outcomes are objectively equivalent. In this study, we compare the psychological, behavioral, and physiological consequences of unambiguously unfair

(vs. fair) treatment that occurs in an *intergroup* context versus an *intragroup* context. We hypothesize that when unfair treatment comes from an outgroup (vs. ingroup) member, it is more likely to be attributed to discrimination, result in anger, lead to punishment of the offender, and prompt a challenge/approach (vs. threat/inhibitory) pattern of cardiovascular reactivity. Additionally, we hypothesize that ethnic group status and beliefs about system fairness further moderate responses to unfair treatment in intergroup (but not intragroup) contexts. Specifically, we expect that unfair intergroup treatment produces the most anger, discrimination attributions, punishment of the offender, and cardiovascular challenge when experienced by a low status group member who believes the status system is unfair.

Perceived unfairness, discrimination and stress

Both unfair treatment and discrimination cause negative emotions and poor health (De Vogli, Ferrie, Chandola, Kivimäki, & Marmot,

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2007; Jackson et al., 2006; Pascoe & Smart Richman, 2009; Schmitt, Branscombe, Postmes, & Garcia, 2014). Yet does unfairness that occurs in intergroup contexts have *different* psychological and physiological effects than unfairness that occurs in intragroup contexts?

Some authors theorize that group-based unfairness may have more deleterious consequences than group-irrelevant unfairness because discrimination has additional implications for one's group and one's sense of rights and opportunities (Jackson et al., 2006; Williams & Mohammed, 2009). Consistent with this idea, research among Black Americans found that exposure to both anger-inducing and racist stimuli resulted in elevated diastolic and systolic blood pressure (relative to exposure to neutral stimuli). Yet only those who faced racist stimuli maintained elevated diastolic blood pressure during recovery (Fang & Myers, 2001). Other theoretical perspectives, however, suggest that when poor outcomes are seen as group-based, individuals may discount their own role in producing those outcomes, thus protecting their self-esteem (Crocker & Major, 1989; Major, Quinton, & Schmader, 2003). As such, group-based unfairness may be *less* threatening than group-irrelevant unfairness. Consistent with this, research on adolescents found that poor treatment attributed to group membership (race) was unrelated to cardiovascular function, whereas unfairness attributed to non-group factors (physical attractiveness) predicted elevated ambulatory blood pressure (Matthews, Salomon, Kenyon, & Zhou, 2005). Also consistent with this theorizing, Mendes, Major, McCoy, and Blascovich (2008) found that people who were rejected by a different-race peer showed a pattern of cardiovascular reactivity (CVR) characteristic of approach motivation or *challenge*, whereas those rejected by a same-race peer showed a CVR pattern of characteristic of inhibitional motivation or *threat*. This work suggests that unfairness may be most threatening when it cannot be attributed to discrimination.

We hypothesize that while unfair treatment in both intragroup and intergroup contexts may have negative emotional and physiological consequences, responses to unfair treatment may vary *phenomenologically* depending on the group context of the treatment. Specifically, we hypothesize that unfair treatment that occurs in an intergroup context is more likely to be attributed to discrimination, more likely to lead to anger, and more likely to cause a challenge CVR pattern than unfair treatment that is not seen as due to group membership. Challenge CVR patterns tend to be associated with approach-oriented behavior and emotions, whereas threat CVR patterns are more likely to be associated with avoidant or inhibitional emotions/behavior (Herrald & Tomaka, 2002). As such, while both group-based and group-irrelevant unfair treatment may be aversive, the emotional, attributional, behavioral, and cardiovascular implications may differ in systematic ways.

Group status and perceived status legitimacy

In addition to exploring whether group context affects responses to unfair treatment, we suggest that two additional factors may moderate responses to unfair intergroup treatment: (1) the relative group status of the person treated unfairly, and (2) the extent to which group status differences are perceived as legitimate (Jost & Hunyady, 2005). Surprisingly little research has compared how members of high- versus low-status groups respond when exposed to the exact same forms of unfair treatment in intergroup contexts. Some researchers argue that the effects of discriminatory treatment will be more negative for low- rather than high-status group members, in part because unfair treatment is more easily legitimized when it occurs from high status groups to low status groups (e.g., Schmitt & Branscombe, 2002). Others posit that the effects of discriminatory treatment will be more negative for high-status groups because it is perceived as a greater threat to status (Jackson et al., 2006).

A third possibility is that the effect of group status on responses to discrimination depends on beliefs about the fairness of the status hierarchy. System-legitimizing beliefs, such as the view that success is due to hard work, have been found to moderate how members of

lower-status groups (women, ethnic minorities) explain and respond to rejection in intergroup contexts. Specifically, the more low-status groups endorse system-legitimizing beliefs, the less likely they are to attribute rejection by a (higher status) outgroup member to discrimination, and the more threatened they are by perceptions of discrimination (Major, Kaiser, O'Brien, & McCoy, 2007; Townsend, Major, Sawyer, & Mendes, 2010). Based on the above research, we hypothesized that when treated unfairly by a higher-status outgroup member, lower-status individuals who believe the system is unfair (vs. fair) would be more likely to attribute their treatment to discrimination, be angry, punish the offender, and show a challenge pattern of CVR. We predicted that those who believe the system is fair would show a threat pattern of CVR in response to unfair treatment by higher-status outgroup members.

We did not make strong predictions for the impact of system-legitimizing beliefs on responses to group-based unfairness among high status group members. Prior research has found high status groups who endorse (vs. reject) that system-legitimizing beliefs are more likely to attribute rejection by a lower status minority group to discrimination (Major et al., 2002), to derogate ethnic minority discrimination claimants (Kaiser, Dyrenforth, & Hagiwara, 2006), and to perceive high levels of anti-White discrimination (Wilkins & Kaiser, 2014). As such, in unfair, intergroup contexts, high-status group members who endorse system-legitimizing beliefs may have higher discrimination attributions and more anger than their high-status counterparts who do not endorse those beliefs. However, there is also good evidence that people are threatened by experiences that violate their expectations or worldview and challenged by experiences that confirm them (Mendes et al., 2008; Townsend et al., 2010). From this perspective, high-status individuals who strongly believe the system is fair may be threatened by discriminatory treatment and show a threat pattern of CVR in response.

Overview

The primary question this research addressed was whether unfair treatment that occurs in intergroup contexts—and is thus potentially group-based—is perceived and experienced differently than unfair treatment that occurs in intragroup contexts. We also examined group status and endorsement of system-legitimizing ideologies as moderators of responses to unfair treatment in intergroup contexts. We hypothesized that the less members of low status groups endorse status-legitimizing beliefs, the more likely they would be to label group-based unfairness as discrimination, react with anger, punish the perpetrator of the unfair treatment, and display a challenge/activational pattern of CVR. We did not have strong predictions for high status groups.

Method

Design

The study design was a 2 (Group Context: Intragroup vs. Intergroup) \times 2 (Fairness Condition: Fair vs. Unfair) \times 2 (Group Status: High or Low) \times Continuous (System-Legitimizing Beliefs) between-subject factorial. Group status was operationalized using existing ethnic groups: Latinos (lower-status) and non-Hispanic Whites (higher-status). System-legitimizing beliefs were operationalized with a measure of Protestant Work Ethic (PWE) used in past research (e.g., Dover, Major, & Kaiser, 2014; Levin, Sidanius, Rabinowitz, & Federico, 1998).

Participants

209 male university students ($M_{\text{age}} = 19.60$) completed the study in exchange for either course credit or \$25; 90 self-identified as Latino, and 119 self-identified as White. We restricted participation to only one gender in order to minimize variance, given the large number of other

factors considered. All participants completed a four-item measure of PWE (Levin et al., 1998) on an online survey prior to participation (e.g., “If people work hard, they almost always get what they want;” $\alpha = .59$). Responses ranged from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*).

Procedure

Participants arrived at the lab individually and were attached to the physiological recording equipment (see below) after providing consent. Participants were photographed with a digital camera as part of the cover story, and 5 min of baseline data were recorded.

After baseline, participants learned that they would be working with two other students (who did not actually exist) in a study of workgroups. They would be communicating with each other via intercom and computer. Participants learned that they and one other participant were randomly selected to be “workers” whereas the other participant would be the “manager.” The manager would award points to each worker as he saw fit directly after the workers performed several jobs. In order to ensure that the workers were sufficiently motivated, participants were told that each point could be used as an entry into a monetary raffle. Participants then performed Job 1 (a pattern detection task).

Group context manipulation

After Job 1, participants saw a photograph of their face and photographs of the other two ostensible participants (one designated as “manager” and one as the other “worker”) on a computer screen. In the *intragroup condition* both other photographs were men of the participant’s same ethnicity. In the *intergroup condition* both photographs were men of the *other* ethnicity (i.e., Latino participants saw two White male faces; White participants saw two Latino faces). In this same display, participants learned that both they and the other worker had scored 8 out of 10 on Job 1. Participants then heard the experimenter instruct the manager over the intercom to divide 10 points between the two workers as he saw fit.

Fairness manipulation

One minute later, participants randomly assigned to the *fair condition* saw that the manager awarded both workers five points. Participants assigned to the *unfair condition* saw that the other worker received seven points while they received only three. Participants then answered items assessing their current emotions and their attributions for their treatment (see below).

Job 2 was a three-minute speech about why the participant would make a good employee. This served as a motivated performance task necessary to assess cardiovascular indices of challenge and threat (Blascovich, 2008). Experimenters informed participants that the manager would use Job 2 performance to divide a second set of points between the two workers. Participants delivered the speech (ostensibly while being watched via a video camera by the manager) while their physiological responses were recorded. Following the speech, participants completed a filler task, allocated points to the manager, and completed manipulation checks. Participants were then fully debriefed about all deceptions as well as the purpose of the study and compensated for their time.

Dependent measures

Attributions

Participants indicated (on 1–7 scales) the extent to which their point allocation was due to three discrimination-related factors: (1) racial discrimination, (2) their background characteristics, and (3) favoritism ($\alpha = .82$). They also indicated the extent to which their point allocation was due to their own performance compared to the other employee’s performance (deservingness). To index the extent to which participants attributed their feedback to discrimination rather than their own

performance, we computed their final attribution score by subtracting their perceived deservingness from their discrimination attributions (see Major et al., 2003).²

Emotions

Participants indicated how much they were currently feeling several emotions on 1–7 scales. Anger was indexed by averaging the three emotions related to outward anger (wronged, offended, angry at someone else; $\alpha = .91$). Other negative emotions were also combined into a composite (ashamed, disappointed, angry at myself; $\alpha = .53$). We wanted to focus only on anger directed toward someone else and control for any overlap with other negative emotions. We thus controlled for negative emotions in our analysis of anger.³

Point allocation

At the study’s conclusion, participants learned that because only the workers earned points to enter the lottery, each worker would have the chance to allocate points to the manager. They then indicated how many they wished to allocate to the manager (0–20).

CVR

We recorded cardiac and hemodynamic measures noninvasively following guidelines established by the Society for Psychophysiological Research (e.g., Sherwood et al., 1990). Specifications are available in the supplementary materials.

Following established practices (Mendes, Reis, Seery, & Blascovich, 2003), we measured challenge and threat states using changes from baseline (reactivity) of cardiac output (CO) and total peripheral resistance (TPR). According to the biopsychosocial model of challenge and threat (Blascovich, 2008; Blascovich & Mendes, 2010), challenge states are associated with increased CO and decreased TPR (relative to baseline); threat states result in increased TPR and decreased (or similar) CO from baseline. For ease of analysis and discussion, we computed a single threat/challenge index for each minute of the speech by standardizing TPR and CO reactivity and then subtracting standardized CO reactivity from standardized TPR reactivity (see Blascovich, Seery, Mugridge, Norris, & Weisbuch, 2004).⁴ Higher values indicate greater threat relative to challenge.

Manipulation checks

Participants responded to a single item assessing the fairness of the point allocation (“The number of points I received on job one was fair”) on a 1 (*Strongly Disagree*) to 7 (*Strongly Agree*) scale. Participants also indicated the ethnicity of the other two ostensible co-workers at the end of the study.

Results

Manipulation checks

Seven participants mis-identified the ethnicity of the manager/worker and were excluded from all analyses. As such, the final sample

² This relative measure is necessary to capture the true extent to which individuals are attributing their treatment to discrimination and not to other factors. This is discussed extensively elsewhere (e.g., Crocker & Major, 1989; Williams, Neighbors, & Jackson, 2003). Discrimination attributions and attributions to deservingness are negatively correlated ($r = -.50$; $p < .001$). The interaction pattern is the same using personal deservingness as a covariate rather than the difference score. However, it is not statistically significant at $p < .05$.

³ We included this covariate in order to remove potential variance due to other negative emotions that likely co-vary with anger when receiving unfair treatment (they are positively correlated: $r = .45$; $p < .001$). We believe this inclusion is warranted due to the overlap among the negative emotions despite the distinctiveness of the constructs as they relate to our theoretical model. Without the covariate, the 4-way interaction is marginally significant ($p = .08$) and the pattern is similar.

⁴ The pattern of results is the same when using either the threat/challenge index or when analyzing CO and TPR separately (see supplementary materials).

consisted of 202 participants (85 Latinos, 117 Whites). A one-way ANOVA on the fairness manipulation check with fairness condition as the sole factor revealed that the fairness manipulation was highly successful, $F(1,200) = 655.93, p < .0001, d = 3.62$. Participants in the fair condition felt they had been treated very fairly ($M = 6.23, SE = .11$) whereas those in the unfair condition thought they had been treated very unfairly ($M = 2.07, SE = 0.11$).

Main analyses

Analytic plan

We performed a series of moderated linear regression analyses for each of our main dependent variables (attributions, anger, point allocation, and CVR). All categorical variables were dummy-coded; PWE and any continuous covariates were mean-centered. We regressed each of the dependent measures on Group Context (Intragroup 0, Intergroup 1), Fairness Condition (Fair 0, Unfair 1), Ethnicity (Latino 0, White 1), and PWE ($M = 3.81, SD = 0.89$). We entered subsequent two-, three-, and four-way interaction terms (cross-products) hierarchically. We followed up significant interactions with tests of conditional interactions and simple slopes (Aiken & West, 1991).

Attributions

Discrimination attributions were higher when treated unfairly (vs. fairly), $t(197) = 23.57, \beta = .86, p < .001, r_{\text{partial}} = .86$, when in intergroup (vs. intragroup) contexts, $t(197) = 2.27, \beta = .08, p = .024, r_{\text{partial}} = .16$, and among Latinos (vs. Whites), $t(197) = -2.64, \beta = -.10, p = .009, r_{\text{partial}} = -.19$. These main effects were qualified by a significant 4-way interaction, $t(197) = 2.04, \beta = .08, p = .043, r_{\text{partial}} = .15$ (Table 1, left panel). This interaction was driven by Latinos treated unfairly in an intergroup context (Fig. 1).

Consistent with our hypotheses, discrimination attributions were higher when treated unfairly in an intergroup versus intragroup context, $t(197) = 2.83, \beta = .15, p = .005, r_{\text{partial}} = .21$. However, this simple effect was moderated by a marginally-significant conditional Context \times Ethnicity \times PWE interaction, $t(197) = 1.82, \beta = .10, p = .071, r_{\text{partial}} = .13$. Specifically, Ethnicity and PWE interacted to predict attributions in the unfair, intergroup condition, $t(197) = 2.80, \beta = .23, p = .006, r_{\text{partial}} = .20$, but not in the unfair intragroup condition, $t(197) = .34, \beta = .03, p = .736, r_{\text{partial}} = .03$. Higher PWE was associated with lower attribution levels among

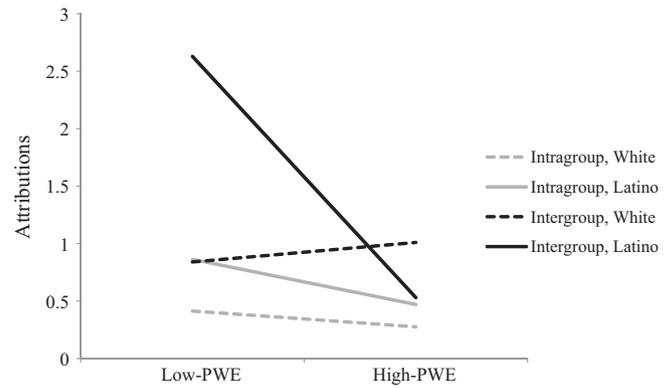


Fig. 1. Group Context \times Ethnicity \times PWE interaction predicting attributions (attributions to discrimination–attributions to deservingness) in the Unfair condition only. Predicted values are graphed at $\pm 1SD$ of PWE.

Latinos facing unfair intergroup treatment, $t(197) = -3.22, \beta = -.43, p = .002, r_{\text{partial}} = -.23$, whereas PWE did not predict attributions for Whites facing unfair intergroup treatment, $t(197) = .31, \beta = .03, p = .726, r_{\text{partial}} = .03$.

Looking at the interaction another way, when Latinos were treated unfairly, PWE and Context interacted to predict attributions, $t(197) = -1.95, \beta = -.18, p = .053, r_{\text{partial}} = -.14$, with low-PWE Latinos having higher attributions to discrimination following intergroup (vs. intragroup) unfair treatment, $t(197) = 2.91, \beta = .36, p = .004, r_{\text{partial}} = .21$. High-PWE Latinos, on the other hand, had similar attributions regardless of group context, $t(197) = .11, \beta = .01, p = .92, r_{\text{partial}} = .01$. Among Whites treated unfairly, attributions were marginally higher in intergroup than intragroup contexts, $t(197) = 1.70, \beta = .12, p = .091, r_{\text{partial}} = .13$. However, PWE did not predict or interact with Context to predict attributions among Whites treated unfairly ($ps > .65$).

Within the fair conditions, Whites ($\hat{Y} = -3.68$) had lower attribution levels than Latinos ($\hat{Y} = -3.06$), $t(197) = -2.40, \beta = -.13, p = .017, r_{\text{partial}} = -.18$. However, both of those predicted values were substantially below zero (i.e., attributions to deservingness were higher than attributions to discrimination). No other conditional main

Table 1
Regression results for 4-way interactions on attributions, anger, and point allocation.

Predictor	Attributions				Anger				Points Allocated			
	B	SE	t	r _{partial}	B	SE	t	r _{partial}	B	SE	t	r _{partial}
Covariates	-	-	-	-	0.80	0.11	7.07***	.45	-	-	-	-
Step 1												
Fairness condition	4.21	0.18	23.57***	.86	2.02	0.17	12.13***	.66	-6.08	1.09	-5.57***	-.38
Ethnicity	-0.48	0.18	-2.64**	-.19	-0.39	0.16	-2.41*	-.17	0.03	1.10	0.03	.002
Group context	0.40	0.18	2.27*	.16	0.06	0.16	0.40	.03	-0.54	1.09	-0.50	-.04
PWE	-0.02	0.10	-0.20	-.01	-0.10	0.10	-1.04	-.07	0.10	0.62	0.16	.01
Step 2												
Fairness * Eth	0.12	0.36	0.32	.02	-0.57	0.33	-1.77	-.13	1.21	2.22	0.55	.04
Fairness * Context	0.48	0.36	1.32	.10	0.28	0.33	0.86	.06	2.67	2.34	1.19	.09
Fairness * PWE	-0.39	0.21	-1.88†	-.13	-0.37	0.19	-1.98	-.14	2.57	1.28	2.00*	.15
Ethnicity * Context	-0.32	0.36	-0.88	-.06	-0.32	0.32	-1.00	-.07	-1.38	2.22	-0.62	-.05
Ethnicity * PWE	0.30	0.21	1.42	.10	-0.04	0.19	-0.23	.02	-1.12	1.31	-0.86	-.06
Context * PWE	-0.13	0.21	-0.61	-.05	0.08	0.19	0.43	.03	0.49	1.30	0.38	.03
Step 3												
Fairness * Eth * Context	0.13	0.74	0.17	.01	-0.65	0.67	-0.97	-.07	1.38	4.58	0.30	.02
Fairness * Eth * PWE	0.75	0.45	1.64	.12	0.36	0.41	0.87	.06	-2.52	2.80	-0.89	-.07
Fairness * Context * PWE	-0.08	0.44	-0.18	-.01	0.06	0.39	0.14	.01	-1.16	2.72	-0.43	-.03
Eth * Context * PWE	0.26	0.46	0.56	.04	0.58	0.42	1.39	.10	0.85	2.84	0.30	.02
Step 4												
4-Way interaction	1.86	0.91	2.04*	.15	1.62	0.82	1.97*	.14	-12.53	5.64	-2.22*	-.16

Note. Dichotomous variables are dummy coded (Fairness: Fair = 0, Unfair = 1; Status: Latino = 0, White = 1; Context: Intragroup = 0, Intergroup = 1). PWE and continuous covariates are mean-centered. All interaction terms are cross-products. B values are unstandardized. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

effects or interactions between Context, Ethnicity, and PWE predicted attributions in the fair condition ($ps > .27$).

Emotions

Non-anger related negative emotions were positively associated with anger, $t(199) = .547, \beta = .27, p < .001, r_{\text{partial}} = .45$. Participants treated unfairly were significantly angrier than participants treated fairly, $t(199) = 12.13, \beta = .61, p < .0001, r_{\text{partial}} = .66$, and Latinos were significantly angrier than Whites $t(199) = -2.41, \beta = -.12, p = .017, r_{\text{partial}} = -.17$. Additionally, a significant Fairness \times PWE interaction, $t(199) = -1.98, \beta = -.10, p = .049, r_{\text{partial}} = -.14$, that was qualified by a significant 4-way interaction, $t(199) = 1.97, \beta = .10, p = .050, r_{\text{partial}} = .14$ (Table 1, middle panel). This interaction follows a similar pattern as attributions, in which low-PWE Latinos treated unfairly by an outgroup member reported the most anger (see Fig. 2).

Within the unfair condition, participants tended to be angrier following intergroup (vs. intragroup) unfair treatment, $t(199) = 1.47, \beta = .10, p = .142, r_{\text{partial}} = .11$, and Context also interacted with Ethnicity and PWE to predict anger, $t(199) = 2.37, \beta = .23, p = .019, r_{\text{partial}} = .17$. Follow-up analyses again revealed that ethnicity and PWE interacted to predict anger in the unfair, intergroup condition, $t(199) = 1.97, \beta = .21, p = .050, r_{\text{partial}} = .14$, but not in the unfair intragroup condition, $t(199) = -1.4, \beta = -.14, p = .18, r_{\text{partial}} = -.10$. Higher PWE was associated with less anger among Latinos facing unfair intergroup treatment, $t(199) = -2.44, \beta = -.43, p = .016, r_{\text{partial}} = -.18$, whereas PWE did not predict anger for Whites facing unfair intergroup treatment, $t(199) = -.02, \beta = -.003, p = .981, r_{\text{partial}} = -.002$.

Looking at the interaction another way, when Latinos were treated unfairly, PWE and Context interacted marginally to predict anger, $t(199) = -1.76, \beta = -.21, p = .080, r_{\text{partial}} = -.13$. Again, low-PWE Latinos were angrier following intergroup (vs. intragroup) unfair treatment, $t(199) = 2.37, \beta = .23, p = .019, r_{\text{partial}} = .19$. High-PWE Latinos were similarly angry following unfair treatment regardless of Context, $t(199) = .08, \beta = .01, p = .936, r_{\text{partial}} = .01$. Among Whites treated unfairly, Context, PWE, and their interaction did not significantly predict anger ($ps > .10$). Additionally, when treated fairly, there were no significant simple or interactive effects of Context, Ethnicity, or PWE ($ps > .50$).

Point Allocation

Participants treated unfairly allocated fewer points to the manager than those treated fairly, $t(194) = -5.57, \beta = -.38, p < .001, r_{\text{partial}} = -.38$. Additionally, we observed a significant Fairness \times PWE interaction, $t(194) = 2.00, \beta = .14, p = .047, r_{\text{partial}} = .15$, that was qualified

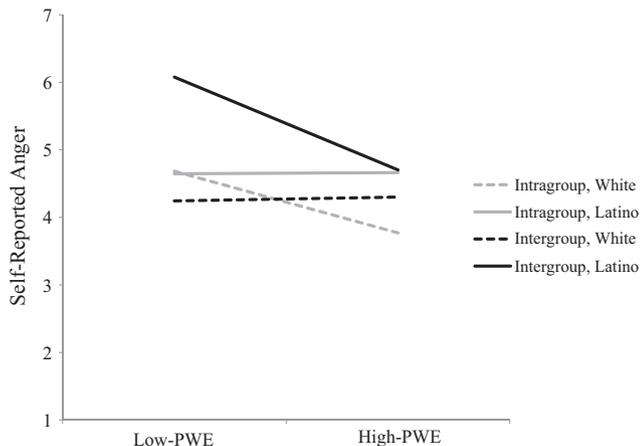


Fig. 2. Group Context \times Ethnicity \times PWE interaction predicting anger (controlling for negative self-directed emotions) in the Unfair condition only. Predicted values are graphed at ± 1 SD of PWE.

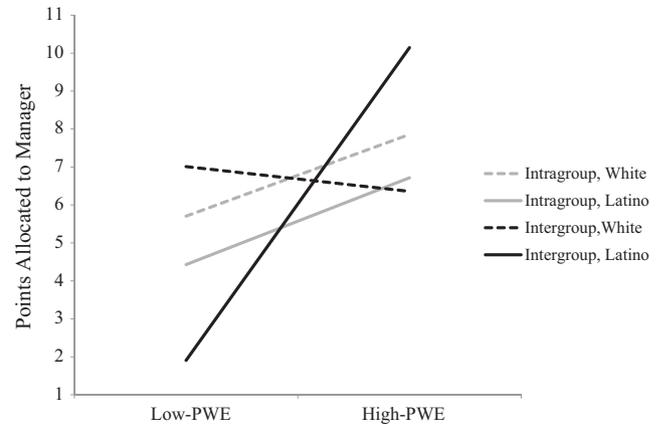


Fig. 3. Group Context \times Ethnicity \times PWE interaction predicting point allocation to manager in the Unfair condition only. Predicted values are graphed at ± 1 SD of PWE.

by a significant 4-way interaction, $t(194) = -2.22, \beta = -.16, p = .028, r_{\text{partial}} = -.16$ (Table 1, right panel). This interaction followed a similar pattern as attributions and anger, in which low-PWE Latinos treated unfairly by an outgroup member allocated the fewest points.

Unlike in the previous analyses, Context did not interact significantly with Ethnicity and PWE in the unfair condition, $t(194) = -1.29, \beta = -.13, p = .20, r_{\text{partial}} = -.10$. However, as before, we found that Ethnicity interacted with PWE marginally to predict points awarded in the unfair, intergroup condition, $t(194) = -1.81, \beta = -.27, p = .072, r_{\text{partial}} = -.13$, but not in the unfair, intragroup condition, $t(194) = -.03, \beta = -.004, p = .977, r_{\text{partial}} < .01$. When treated unfairly by outgroup manager, low-PWE Latinos allocated fewer points than high-PWE Latinos, $t(194) = 2.06, \beta = .51, p = .041, r_{\text{partial}} = .15$. PWE did not predict point allocation for Whites, $t(194) = -.23, \beta = -.05, p = .819, r_{\text{partial}} < .01$ (Fig. 3).

When treated fairly, there was an unexpected marginal 3-way interaction between Context, Ethnicity, and PWE, $t(194) = 1.83, \beta = .20, p = .069, r_{\text{partial}} = .14$. Further analyses revealed that low-PWE Whites treated fairly by an in-group member awarded the most points to the manager. However, this is not consistent with theory nor relevant to our study's purpose so we will not discuss it further here (see supplementary materials).

CVR

Following recommended procedures (Mendes et al., 2003), we first established that participants were psychologically engaged by confirming that both heart rate and ventricular contractility were higher during the speech than during baseline ($ps > .001$). We then subjected the averaged threat/challenge index from the second and third minutes of the speech to a moderated regression analysis, including baseline values of TPR and CO (mean-centered) as covariates (see Blascovich et al., 2004).⁵ Technical errors resulting in loss of data (machine malfunctions, excessive movement, etc.) are reflected in lower degrees of freedom than analysis of the self-report data.

Both baseline TPR ($t[118] = -3.04, \beta = -.50, p = .003, r_{\text{partial}} = -.27$) and baseline CO ($t[118] = -2.50, \beta = .41, p = .01, r_{\text{partial}} = -.23$) significantly predicted CVR. No other main effects or 2-way interactions significantly predicted CVR ($ps > .24$). However, the 3-way interaction between Fairness, Context, and PWE was significant,

⁵ Inspection of CVR responses during the speech revealed a significant loss of data during the first minute (over 30% had unusable data), as well as several values that were not physiologically plausible. This is likely to be due to the excess movement often seen during the first portion of stressful tasks. Additionally, the internal reliability of the index was degraded by the first minute of CVR data. Accordingly, we averaged CVR responses for the second and third minutes of the speech only.

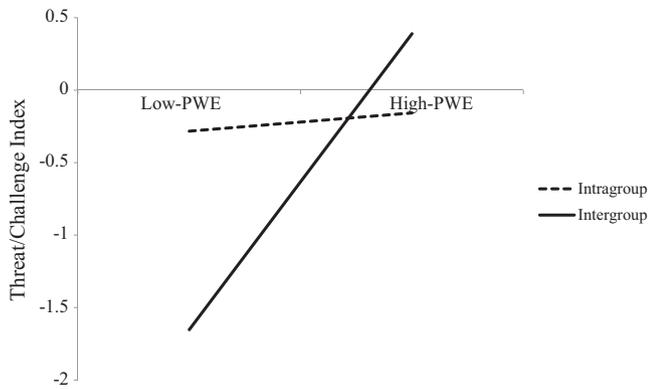


Fig. 4. Group Context \times PWE interaction (controlling for baseline CO and TPR) predicting CVR in the Unfair condition only. Higher values indicate more threat relative to challenge. Predicted values are graphed at $\pm 1SD$ of PWE.

$t(118) = 2.31, \beta = .26, p = .023, r_{\text{partial}} = .22$ (Table 2). Diverging from the pattern observed for self-reported indices, the 4-way interaction was not significant ($p > .79$), indicating that CVR responses did not depend on Ethnicity. The significant 3-way interaction was driven by the responses of participants treated unfairly in an intergroup context. Follow-up analyses within the unfair condition revealed a conditional effect of PWE, $t(118) = 2.20, \beta = .35, p = .030, r_{\text{partial}} = .21$, that was qualified by a conditional PWE \times Context interaction, $t(118) = 2.16, \beta = .35, p = .033, r_{\text{partial}} = .21$. Higher PWE was associated with greater threat among participants treated unfairly by an outgroup member, $t(118) = 2.68, \beta = .71, p = .009, r_{\text{partial}} = .26$, but not by an ingroup member, $t(118) = -.007, \beta = -.001, p = .95, r_{\text{partial}} = -.001$. Looking at this interaction differently, low-PWE participants were more challenged by intergroup (vs. intragroup) unfairness, $t(118) = -2.11, \beta = -.47, p = .037, r_{\text{partial}} = -.21$, whereas CVR of high-PWE participants did not differ depending on Context, $t(118) = 1.23, \beta = .26, p = .22, r_{\text{partial}} = .12$. There were no effects of Context, PWE, or their interaction in the fair condition ($ps > .24$) (Fig. 4).

Table 2
Regression results for 4-way interaction for CVR (with ethnicity in the model).

Predictor	B	SE	t	r_{partial}
Control variables				
Baseline TPR	-0.002	0.001	-3.04**	-.27
Baseline CO	-0.53	0.21	-2.50*	-.23
Step 1				
Fairness condition	-0.28	0.32	-0.84	-.08
Ethnicity	-0.06	0.32	-0.16	-.02
Group context	0.01	0.32	0.03	.003
PWE	0.18	0.19	0.93	.09
Step 2				
Fairness * eth	-0.02	0.66	0.003	.001
Fairness * group context	-0.60	0.67	-0.90	.09
Fairness * PWE	0.50	0.42	1.16	.11
Eth * group context	-0.03	0.65	-0.05	-.01
Eth * PWE	0.02	0.42	0.05	.004
Group context * PWE	0.28	0.44	0.62	.06
Step 3				
Fairness * eth * group-type	-1.25	1.34	-0.92	-.07
Fairness * eth * PWE	0.15	1.00	0.14	.01
Fairness * group context * PWE	2.24	0.96	2.31*	.22
Eth * group context * PWE	0.79	1.00	0.77	.08
Step 4				
4-Way interaction	-0.51	2.03	-0.26	-.03

Note. Dichotomous variables are dummy coded (Fairness: Fair = 0, Unfair = 1; Status: Latino = 0, White = 1; Context: Intragroup = 0, Intergroup = 1). Continuous variables (Baseline TPR, Baseline CO, PWE) are mean-centered. All interaction terms are cross-products. B values are unstandardized.

* $p < .05$.

** $p < .01$.

Discussion

This study is among the first to demonstrate that responses to clearly unfair treatment vary depending on group context. Participants treated unfairly in an intergroup context were more likely to blame their mistreatment on discrimination than those treated fairly or those treated unfairly in an intragroup context (see Major et al., 2002). Only Latinos low in PWE, however, responded to intergroup (vs. intragroup) unfairness with greater anger and punishment of the offender. Moreover, only responses to unfair intergroup treatment—and not unfair intragroup treatment—depended systematically on group-status and endorsement of system-legitimizing ideologies. Following discrimination, low-PWE Latinos expressed greater discrimination attributions, were angrier, and punished the offender more than high-PWE Latinos or Whites. Whites treated unfairly, on the other hand, were similarly angry and punished the offender similarly regardless of group context or PWE.

Whereas the self-report and behavioral responses to discrimination varied depending on ethnicity, cardiovascular responses did not. Regardless of ethnicity, high-PWE participants responded to intergroup unfairness with a pattern of threat, whereas low-PWE participants responded with challenge. Overall, this pattern indicates that discrimination is less threatening for those that already believe the status system is not fair, compared to those who believe the status system is fair (see Townsend et al., 2010). The lack of moderation by ethnicity, moreover, suggests that PWE (and not status) is the primary predictor of CVR responses to discrimination, and also that discrimination is experienced differently from general unfairness among Whites—even if they do not report it.

Theoretical and Practical Implications

This study makes several novel contributions to the literature. First, it illustrates the phenomenological difference between the experience of discrimination and the experience of unfairness that is not group-relevant. Only group-based unfair treatment (i.e., discrimination) had observable, predictable consequences for cardiovascular functioning—at least as measured here. One important implication of this is that there may be health consequences unique to experiences with discrimination. Thus, researchers interested in assessing the link between perceived discrimination and health must take care to operationalize discrimination not only by assessing perceptions of unfair treatment, but also by assessing whether unfair treatment was seen as due to group membership (see Williams, Yu, Jackson, & Anderson, 1997).

Second, this study is one of the few to assess whether high- and low-status group members respond similarly to discriminatory treatment. In our study, Whites and Latinos had similar cardiovascular responses to discriminatory treatment, yet they differed in self-report and behavioral responses. Among Latinos, the cardiovascular and self-report data align to suggest that low-status group members who reject (vs. endorse) status-legitimizing beliefs more readily see unfair intergroup treatment as discrimination, express more anger following discrimination, are more likely to punish the offender, and have more perceived resources to deal with the discriminatory treatment. It may be less threatening for low-PWE (vs. high-PWE) Latinos to face unfair treatment from Whites because it is consistent with their worldview (see Major et al., 2002). Low-PWE Latinos consider discrimination as relatively common, and are thus better able to quickly identify an external, non-personal reason for their negative treatment. For high-PWE Latinos, in contrast, their belief that the system is fair may prevent them from seeing themselves as targets of discrimination. Thus, they do not explain their poor treatment with discrimination attributions and are threatened by the negative treatment.

Although Whites did not differ in reported anger or punishment depending on PWE or the group context of the unfair treatment, the cardiovascular data suggests that for Whites who believe that high-status is earned through hard work, anti-White discrimination is

threatening—perhaps because it violates their view that Whites should receive the positive outcomes they deserve. Low-PWE Whites, in contrast, already believe the status system is illegitimate, and may thus have avoided worldview threat when facing anti-White discrimination. Exploratory analyses examining when anger and discrimination attributions predict CVR are reported in supplementary materials.

Third, these findings add nuance to our understanding of discrimination's adverse effect on health. Models of discrimination and health suggest that experiencing discrimination leads to a cascade of stress responses and negative affect that damages health. Logically, then, failing to see or acknowledge discrimination may buffer an individual from negative health consequences. However, our findings suggest the possibility that among low-status groups, acknowledging discrimination and becoming angry may be a more cardiovascularly-adaptive response to discrimination than ignoring discrimination, blaming it on the self, or being uncertain about why one was mistreated (Major et al., 2003; Operario & Fiske, 2001; Salvatore & Shelton, 2007).

Of course, there are a host of negative consequences associated with feeling discriminated against and angry (Miller, Smith, Turner, Guijarro, & Hallet, 1996). Gibbons et al. (2010), for example, found that Black youths who perceived discrimination (vs. did not) were angrier and more likely to use drugs (notably, an approach-oriented behavior). Moreover, discrimination attributions may lead to greater status rejection sensitivity (Mendoza-Denton, Downey, Purdie, Davis, & Pietrzak, 2002), vigilance in future intergroup interactions (Richeson & Shelton, 2007), and further interpersonal rejection (Kaiser & Miller, 2003; Pinel, 2002)—all of which have potential negative interpersonal and health consequences. As such, there is little doubt that repeated, cumulative experiences of discrimination adversely affect mental and physical health (Pascoe & Smart Richman, 2009; Schmitt et al., 2014). However, our data suggests that it may be more adaptive within a given situation for low-status groups to attribute to discrimination and become angry rather than not (see also Harrell, Hall, & Taliaferro, 2003).

Limitations & additional questions

Some limitations of this study should be noted. First, we used established groups—Latinos and non-Hispanic Whites—to operationalize group status. Because status was not manipulated, and because we only included one ethnic group to represent each status group, it is possible that group-specific variables as opposed to status itself influenced our findings. A second limitation is sample size—particularly for CVR data—which limited power. Unfortunately, loss of CVR data due to excessive movement or equipment malfunction is common. While large sample sizes are desirable, there are some circumstances where obtaining them is difficult. High impact studies based on minority samples are unfortunately rare in our field, in part because they are very difficult, time consuming, and expensive to collect. We believe that the clear need for this type of research, coupled with its difficulty of execution, offsets the potential limitations posed by a slightly smaller sample size. Furthermore, the broad inclusion of affective, cognitive, behavioral, and cardiovascular measures, as well as the remarkable consistency of findings across dependent measures strengthens confidence in the results.⁶

Our experiment was also cross-sectional and conducted in a laboratory with college students, which limits generalizability. Future research should address whether other types of discrimination experiences result in similar responses outside of the lab. Another important question for the future involves assessing whether the CVR differences seen in

the lab correspond to mental health, physical health, and behavior over time.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <http://dx.doi.org/10.1016/j.jesp.2014.09.003>.

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⁶ Post-hoc power analyses performed with effect sizes for all significant interactions indicated an average power of 77.6%. Whereas this value is lower than the 80% ideal, it is similar to (and often higher than) the calculated post-hoc power for several other experiments utilizing cardiovascular measures (e.g., Does, Derks, Ellemers, & Scheepers, 2012; Seery, Weisbuch, & Blascovich, 2009).

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