



You can win but I can't lose: Bias against high-status groups increases their zero-sum beliefs about discrimination



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HIGHLIGHTS

- High-status groups endorse zero-sum beliefs (ZSBs) more than low-status groups.
- High-status groups' ZSBs increase when they perceive increasing bias.
- ZSBs correspond with efforts to improve high-status groups' outcomes.
- ZSBs correspond with efforts to worsen low-status groups' outcomes.

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ABSTRACT

What leads people to espouse zero-sum beliefs (ZSBs) – the perspective that gains for one social group come at the cost of another group – and what are the consequences of those beliefs? We hypothesized that high-status groups (Whites and men) would be more likely than low-status groups (Blacks and women) to endorse ZSBs, particularly in response to increasing perceptions of discrimination against their own groups. We found that high-status groups endorsed ZSBs more when they contemplated increasing bias against their group than when they contemplated decreasing bias against their low-status counterparts. Furthermore, we demonstrated that greater ZSB endorsement corresponded with efforts to decrease outgroups' ability to compete in society and efforts to increase the ingroup's ability to compete. We discuss how this pattern may perpetuate social inequality.

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Introduction

High- and low-status groups often have differing perceptions about the nature of the social hierarchy. In the domain of race relations, for example, White Americans tend to perceive that the US has made greater progress toward racial equality than do Black Americans (Eibach & Ehrlinger, 2006; Eibach & Keegan, 2006). Similarly, men and women in the U.S. differ in their perceptions of the degree to which gender relations have improved over time. For example, a survey conducted in 1999 revealed that half of men believed that the income gap between genders had decreased, compared to less than a third (31%) of women

(Sniderman & Brady, 1999). A recent survey of 18–32 year olds revealed that a full three-quarters of women believe that more changes are needed to achieve gender equality in the workplace, while only about half of men (57%) agree (Pew Research, 2013). In addition to disagreement about how much bias exists, groups may differ in the extent to which discrimination against their group is seen as dependent on the amount of discrimination experienced by other groups (discrimination zero-sum beliefs).

It is important to understand how groups might differ in their endorsement of zero-sum beliefs (ZSBs): the perception that gains for one group necessarily involve losses for other groups and vice versa. ZSBs evoke a competitive approach to intergroup relations—a sort of tug-of-war scenario between different groups. ZSBs theoretically lead to a desire to improve the ingroup's ability to compete in society and to a desire to decrease the outgroup's ability to succeed (Esses, Jackson, & Armstrong, 1998). Perspectives on status inequality also affect beliefs about where social efforts should be focused

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(e.g. Kaiser, Drury, Spalding, Cheryan, & O'Brien, 2009). Thus, ZSBs may ultimately make people less inclined to dedicate resources to remedy social inequity and may perpetuate group disparities. Despite the importance of ZSBs, little is known about what causes these beliefs and how they relate to perceived bias. The current research examines whether groups differ in ZSB endorsement and what drives ZSBs.

Group differences in zero-sum beliefs

Previous researchers contend that high-status groups tend to perceive intergroup relations as following a zero-sum pattern whereas low-status groups do not. For example, Norton and Sommers (2011) argue that Whites (and not Blacks) perceive discrimination as a zero-sum relationship; White respondents reported that discrimination against Black people has decreased significantly over the past few decades, but that discrimination against White people has simultaneously increased to the point that White people now experience more discrimination than Black people. Black respondents did not show the same zero-sum pattern; they perceived a moderate decrease in anti-Black bias but did not report perceiving an increase in anti-White bias (Norton & Sommers, 2011). Similarly, others have shown that men tend to perceive a zero-sum relationship in gender bias experienced by men and women, but that women do not (Bosson, Vandello, Michniewicz, & Lenas, 2012; Kehn & Ruthig, 2013). Specifically, while both sexes agree that discrimination against women has been decreasing over time, only men see this change as corresponding to greater bias against men (Bosson et al., 2012; Kehn & Ruthig, 2013).

Although this pattern among Whites and men is hypothetically a function of zero-sum beliefs, those beliefs have not been measured directly. Furthermore, the assumption that gains for low-status groups are seen as a loss for high-status groups remains untested. It is possible that increasing bias against high-status groups decreases perceived bias against low-status groups (the opposite causal pattern). In the present research, we begin by investigating whether ZSBs moderate changes in perceptions of bias against men and women over the past five decades (Study 1). In the studies that follow, we measure endorsement of ZSBs to determine whether high-status groups endorse ZSBs more than low status groups. Furthermore, we experimentally test whether ZSB endorsement is shaped by perceptions of increasing (or decreasing) bias against one's own group, compared to changes in bias experienced by an outgroup (Studies 2a–4b).

How group status and perceived bias may affect zero-sum beliefs

There are several reasons why members of high- and low-status groups may differ in their ZSB endorsement. One reason is that high-status group members are more likely to believe that status differences in society are legitimate. For example, high-status individuals tend to be higher than low-status individuals in social dominance orientation: preference for group-based social inequality (Sidanius & Pratto, 1999; Sidanius, Pratto, & Bobo, 1994). Social dominance orientation is closely related to the view that gains for one group involve losses for another group. For example, Canadians high in social dominance orientation believe that Canadian immigrants take resources away from Canadian-born nationals, indicating a zero-sum belief about the relationship between immigrants and non-immigrants (Esses, Dovidio, Jackson, & Armstrong, 2001). High-status groups also have more to lose from changing status relations, are therefore likely to perceive greater intergroup competition, and to endorse ZSBs more than low-status groups. Thus, we hypothesize that high-status groups will endorse ZSBs to a greater extent than low-status groups, and will consequently be more inclined to perceive that group discrimination follows a zero-sum pattern.

Among high-status individuals, perceiving greater bias against the ingroup may also increase ZSB endorsement. Perceiving discrimination likely increases perceived resource stress, and group competition increases zero-sum beliefs. For example, when individuals were primed to perceive a difficult economic climate and learned about immigrants' success, they reported that immigrants make it more difficult for non-immigrants to find jobs (Esses et al., 2001). Because both competition and changing outgroup status were simultaneously manipulated, it is unclear which factor actually drove ZSBs. Nevertheless, the evidence suggests that perceiving group discrimination will likely increase perceived intergroup competition and lead to greater ZSBs for high-status individuals.

Asymmetrical relationship between gains and losses

Importantly, we do not expect perceived bias to follow a symmetrical zero-sum pattern, in which gains for one group are seen as losses for another group and the opposite pattern is equally endorsed. Instead, we believe that framing plays an important role. There are several instances in which responses to similar social phenomena vary depending on how they are described (e.g. Lowery, Knowles, & Unzueta, 2007; Lowery, Unzueta, Knowles, & Goff, 2006; Powell, Branscombe, & Schmitt, 2005). For example, when racial disparities were framed in terms of White advantage versus Black disadvantage, White people have more egalitarian responses (Powell et al., 2005). Similarly, Whites' support for affirmative action policies are better predicted by their perceptions of how those policies affect their own group than how policies impact outgroups (Lowery et al., 2006; O'Brien, Garcia, Crandall, & Kordys, 2010). Therefore, we expect groups to be more focused on outcomes experienced by their own group than those experienced by the outgroup.

Similarly, we expect individuals to be more affected by their own losses than by an outgroup's gains. This prediction is also consistent with work demonstrating that losses are weighed more heavily than equivalent gains (i.e., prospect theory: Kahneman & Tversky, 1979). For example, one reason Whites perceive greater racial progress than Blacks is because Whites tend to perceive racial progress as a *loss* for Whites whereas Blacks perceive it as a *gain* for Blacks (Eibach & Keegan, 2006). Thus, we expect an asymmetrical relationship in reactions to ingroup versus outgroup outcomes and to losses versus gains. Specifically, individuals' ZSBs will be more strongly affected by perceived discrimination against their own group than changes in bias against an outgroup.

Hypotheses

First, we hypothesize that members of high-status groups will endorse ZSBs more strongly than members of low-status groups. Furthermore, ZSBs will moderate perceptions of bias against different social groups, such that stronger ZSB endorsement will lead high-status group members to perceive increasing bias against the ingroup and decreasing bias against the outgroup.

Second, we expect that for members of high-status groups, perceiving increasing bias against their ingroup will increase ZSB endorsement, but perceiving decreasing bias against the outgroup will have no effect on ZSB endorsement, because the former should increase perceived group competition more than the latter. This prediction is also consistent with work demonstrating that ingroup outcomes carry more weight than outgroup outcomes for predicting attitudes (e.g. Lowery et al., 2006).

In contrast, members of low-status groups will not report higher zero-sum beliefs as a result of perceiving increasing bias against their own group, as compared to a control condition. In other words, low-status groups' ZSBs should be unaffected by manipulating perceived bias. Bias against low-status groups may be perceived

as more prototypical or normative than bias against high-status groups (Inman & Baron, 1996) and thus, may not change perceived intergroup competition.

Finally, we predict that heightened zero-sum beliefs for high-status group members will increase support for policies that benefit the ingroup and decrease support for policies that benefit the outgroup. Given that ZSBs are associated with the perception that groups must compete with one another, greater ZSBs should lead to efforts to improve the ingroup's competitiveness and decrease the outgroup's competitiveness. This prediction is consistent with Esses and colleagues' Instrumental Model of Group Conflict (Esses et al., 2001). According to the model, perceived resource scarcity increases perceived competition between social groups and subsequently leads to efforts to increase the ingroup's ability to succeed in society (Esses et al., 2001).

Study overview

Study 1 examined whether ZSBs moderate changes in men's and women's perceptions of gender bias across time—a notion that has been proposed but not directly tested in previous work (Bosson et al., 2012; Kehn & Ruthig, 2013). In Studies 2a and 2b, we manipulated apparent bias against men and women to determine whether perceptions of bias against each group differentially affected ZSB endorsement. We used political orientation, status-legitimizing beliefs and social dominance orientation as covariates to isolate the effect of perceived discrimination on ZSB endorsement. Study 3a tested whether one man's claim of gender bias (in the absence of explicit widespread group bias) increased men's ZSB endorsement. Study 3b examined whether women's ZSB endorsement would be unaffected by an ingroup member's claim of gender bias. Study 4a and 4b replicated these findings in the domain of race. Study 4a also assessed the intergroup consequences of ZSBs by examining Whites' support for efforts to increase their group's ability to compete in society and decrease racial minorities' competitiveness.

Study 1

In Study 1, we examined beliefs about discrimination faced by men and women across several decades, and directly measured gender zero-sum beliefs. We expected ZSBs to moderate male and female participants' perceptions of the changing relationship between bias against men and women over time. Specifically, we expected a four-way interaction between participant gender, target sex, ZSB endorsement and time.

Method

Participants

Participants were 181 individuals who completed the study through Amazon's Mechanical Turk (MTurk). We aimed to collect data from approximately 200 participants (to be consistent with Bosson et al., 2012), but several participants enrolled in the study without completing measures. After removing non-respondents, those who failed attention checks, as well as three individuals who did not report their gender, 159 participants remained. Approximately half of participants were male (54.7%) and most (91%) reported being White. Participants' ages ranged from 18 to 70 ($M = 37.75$, $SD = 13.12$).

Procedure and measures

Participants first reported the degree to which they believed that women and then men (on a separate screen) were victims of gender discrimination in every decade between the 1950s and 2000s (using a 1–10 scale, anchored at *not at all* and *very much*; see Bosson et al.,

2012; Kehn & Ruthig, 2013; Norton & Sommers, 2011). Next, participants completed ZSB measures.

Zero-sum beliefs. Individuals completed a survey assessing endorsement of gender-specific ZSBs using six items, the first three of which were adapted from Barker and colleagues (Barker et al., 2011) and the rest of which were adapted from Esses et al. (1998): “When women work they are taking jobs away from men,” “When women get rights they are taking rights away from men,” “Rights for women mean that men lose out,” “As women face less sexism, men end up facing more sexism,” “Less discrimination against women means more discrimination against men,” and “Efforts to reduce discrimination against women have led to increased discrimination against men.” These items were rated on a 1–7 scale (anchored at *strongly disagree* and *strongly agree*; range: 1 to 6.33; $\alpha = .91$; $M = 2.54$, $SD = 1.33$).

Finally, participants completed demographic measures and were paid \$0.50.

Results and discussion

Consistent with hypotheses, we found that men endorsed ZSBs more ($M = 2.99$, $SD = 1.31$) than women ($M = 1.99$, $SD = 1.13$), $t(157) = 5.07$, $p < .001$, $d = .82$.

Do ZSBs moderate perceptions of bias?

To determine whether participants' zero-sum beliefs affected their responses on the decade measure, we examined whether men and women high and low in ZSBs differed in their perceptions of bias against men and women. In order to test the four-way interaction and to utilize continuous ZSBs as a predictor in a repeated-measures analysis, we used Van Breukelen and Van Dijk's (2007) recommended analysis (see Plaks, Malahy, Sedlins, & Shoda, 2012). Specifically, we ran a repeated-measure analysis of covariance (ANCOVA) with decade and target sex as within-participant variables, ZSBs (continuous, centered) as the covariate, and participant gender as the between-participant variable.¹ This analysis revealed the predicted four-way interaction between decade, target sex, participant gender and ZSB endorsement, $F(10, 750) = 7.69$, $p < .001$, $\eta_p^2 = .09$, suggesting that ZSBs play a different role in perceived bias for male and female participants. To probe the four-way interaction, we created a variable that examined the upper and lower quartiles of ZSBs (Gelman & Park, 2009). We then examined the three-way interaction between decade, target sex and ZSBs using repeated-measures ANOVA separately for male and female participants.²

Male participants. Among men there was a three-way interaction between ZSB endorsement, target sex and decade, $F(5, 750) = 11.42$, $p < .0001$, $\eta_p^2 = .07$. This pattern is displayed in Figs. 1a and b.

We conducted paired sample t-tests within each decade to examine the relationship between perceptions of anti-female and anti-male bias. We set the p -level for significance to .001 to correct for the number of comparisons (see Kehn & Ruthig, 2013). Male participants low in ZSBs perceived greater amounts of anti-female bias than anti-male bias for every decade 1950–2000 ($ps < .0001$). Male participants who strongly

¹ In replication of previous work (Bosson et al., 2012; Kehn & Ruthig, 2013) we found a significant three-way interaction between participant gender, target sex and decade, $F(5, 750) = 4.01$, $p = .001$, $\eta_p^2 = .03$. Follow-up analyses revealed that female participants perceived greater amounts of anti-female bias than anti-male bias for every decade through the 2000's ($ps < .0001$). In contrast, male participants perceived greater anti-female than anti-male bias between the 1950's and the 1990's ($ps < .0001$), but beginning in the 2000's, men perceived that anti-male bias was as severe as anti-female bias, $t(86) = .38$, $p = .71$.

² These analyses utilized the appropriate error term from the 4-way interaction. Results were similar when utilizing a median split (e.g. Bosson et al., 2012).

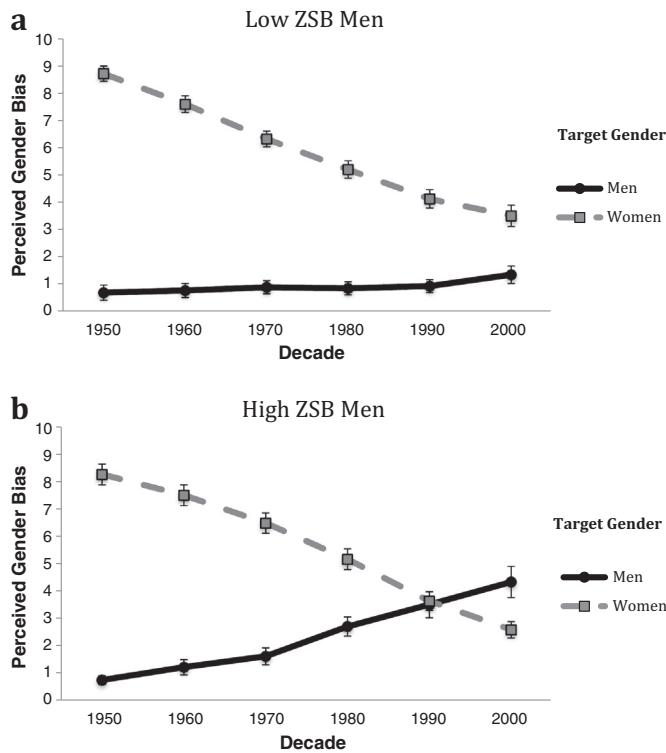


Fig. 1. a. Male participants' perceptions of anti-male and anti-female bias in each decade displayed for men low (lower quartile) in ZSB endorsement (Study 1). b. Male participants' perceptions of anti-male and anti-female bias in each decade displayed for men high (upper quartile) in ZSB endorsement (Study 1).

endorsed ZSBs perceived greater anti-female than anti-male bias between the 1950s and the 1980s ($p < .0001$). Beginning in the 1990s, they did not perceive a difference between gender bias experienced by males and females, $t(22) = 0.20, p = .84$. The pattern of means reversed in the 2000s such that male ZSB endorsers perceived *greater* amounts of anti-male bias than anti-female bias, $t(22) = -2.55, p = .02$, although this difference was not statistically significant according to our criteria.

Female participants. Among women, there was a three-way interaction between ZSB endorsement, target sex and decade, $F(5,750) = 3.73, p = .002, \eta_p^2 = .02$. See Figs. 2a and b.

We conducted paired sample t-tests within each decade to examine the relationship between perceptions of anti-female and anti-male bias. Female participants low in ZSBs perceived greater amounts of anti-female bias than anti-male bias for every decade 1950–2000 ($p < .0001$). Female participants who strongly endorsed ZSBs perceived greater anti-female than anti-male bias between the 1950s and the 1980s ($p < .0001$). Beginning in the 1990's, women who strongly endorsed gender ZSBs did not perceive a difference between gender bias experienced by men and women ($p_{1990} > .04, p_{2000} = .95$).

In sum, evidence from Study 1 demonstrates that men endorse ZSBs more than women. Furthermore, ZSBs moderate male and female participants' perceived bias against men and women over time. Participants who weakly endorsed ZSBs perceived that women experienced more discrimination than men during all decades between the 1950s and the present. In contrast, those who strongly endorsed ZSBs were more inclined to perceive that men and women have experienced equal levels of discrimination in recent decades. Men who strongly endorse ZSBs perceived that men were *more* likely than women to experience sexism in the 2000s. Thus, it appears as though men are more inclined to perceive gender bias as being zero-sum, but that

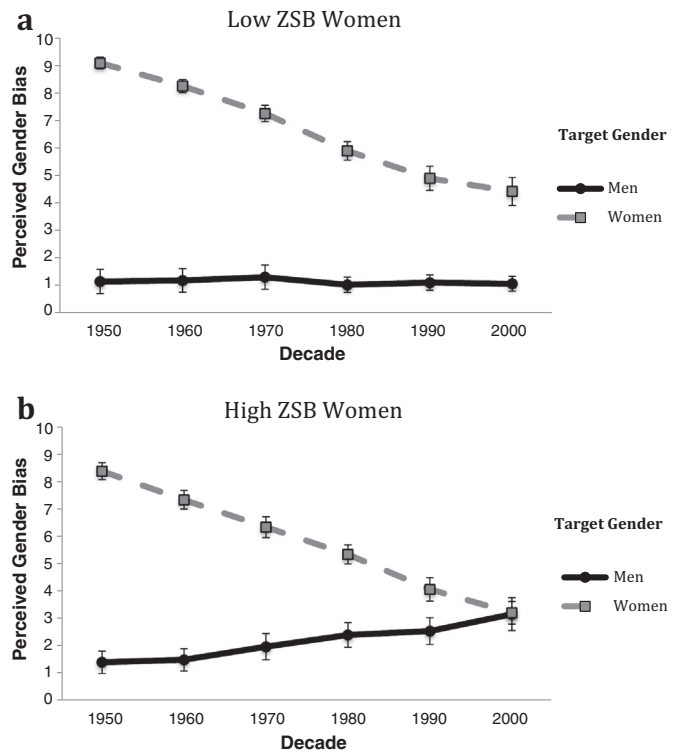


Fig. 2. a. Female participants' perceptions of anti-male and anti-female bias in each decade displayed for women low (lower quartile) in ZSB endorsement (Study 1). b. Female participants' perceptions of anti-male and anti-female bias in each decade displayed for women high (upper quartile) in ZSB endorsement (Study 1).

some individuals of both sexes perceive the relationship between discrimination against men and women as being zero-sum. This suggests that ZSBs are a reliable predictor of perceived gender bias.

Although we describe individuals as strongly and weakly endorsing ZSBs, it is important to note that these comparisons are relative. In other words, some individuals endorsed ZSBs more than others, but overall, the mean was quite low (below the scale mid-point). We use these terms for simplicity and to be consistent with previous researchers (i.e. Esses et al., 1998).

Study 1 provides an important extension of previous work on changing perceptions of gender (Bosson et al., 2012; Kehn & Ruthig, 2013) and racial discrimination (Norton & Sommers, 2011) by demonstrating that changes in perceived bias correspond to endorsement of ZSBs. Given that the results of Study 1 are correlational, we cannot determine whether perceiving less discrimination against women *increases* perceptions of discrimination against men, whether perceiving increasing discrimination against men *decreases* perceived bias against women, or whether both factors are affected by a third variable. We designed another study to help address these limitations.

Study 2a

Study 2a provided an alternative method for assessing whether participants perceive gender bias as zero-sum by manipulating *and* measuring perceptions of bias against men and women to examine their effect on ZSBs. According to a zero-sum perspective, any changes in perceived bias against one group should shift perceived bias against the other group in the opposite direction. Specifically, reading about increasing discrimination against men should be equivalent to reading about decreasing discrimination against women. Both manipulations should theoretically increase perceptions of anti-male bias and decrease perceptions of anti-female bias.

Based on our predictions about asymmetrical ZSBs, we did not expect these manipulations to work equivalently. We hypothesized that men's ZSBs would be higher after being primed with increasing anti-male bias than when perceiving decreasing anti-female bias, given individuals' tendency to weigh losses more heavily than gains (Kahneman & Tversky, 1979) and particular concern with ingroup outcomes (Lowery et al., 2006). We did not expect women's ZSBs to fluctuate based on these manipulations because their sense of intergroup competition would be unaffected.

Method

Participants

Participants were 212 individuals (58.7% male; age: $M = 32.41$, $SD = 10.69$; race: 74.5% White, 9% Latino, 7.5% Black, 7.5% Asian, 2% Native American, 0.5% other) recruited through MTurk in exchange for \$0.75. We aimed to analyze data from a total of 200 participants and over-sampled with the expectation that some would fail attention checks. The final analyses included a total of 199 participants.

Procedure

Participants were told they were taking part in a study examining reactions to news articles and perceptions of society. Individuals were randomly assigned to read one of three articles, which manipulated perceptions of bias against different groups. The *anti-male discrimination* article described increasing discrimination against men. The *decreasing anti-female bias* condition described decreasing bias against women (see Appendix A). These materials were worded so one group served as both the current and past reference point, rather than switching between sexes (i.e. we described the increasing number of women admitted to colleges and universities, rather than comparing male and female admissions). The *control* article described discrimination against a non-competitive outgroup: Canadian Inuit (see McCoy & Major, 2007 for use of this control). After answering questions about the news articles, participants reported their endorsement of zero-sum beliefs, perceptions of bias against women and men, their political orientation, endorsement of status legitimizing beliefs (SLBs) and then completed demographic measures (in that order). All items were measured on a 1 to 7 scale anchored at *strongly disagree* and *strongly agree*.

Status legitimizing belief endorsement (SLBs) and political ideology were included as covariates in order to isolate the influence of perceived discrimination on ZSB endorsement. SLBs and political ideology are related to perceived bias (Bosson et al., 2012; Major et al., 2002; Wilkins & Kaiser, 2014). For example, SLBs predict high- and low-status individuals' tendency to attribute negative outcomes to discrimination (Major et al., 2002) and Whites' perceptions of anti-White bias (Wilkins & Kaiser, 2014). Similarly, Bosson et al. (2012) found that political ideology moderated participants' perceptions of bias against men and women over time. Specifically, political conservatives were more inclined to perceive gender bias as being zero-sum than liberals. Controlling for beliefs about society and political orientation allowed us to more clearly examine how manipulating bias against different groups affects ZSBs.

Measures

Unless specifically cited, we developed the measures described below.

Zero-sum beliefs. The same scale described in Study 1 was used (range: 1 to 6.83; $\alpha = .90$; $M = 2.56$, $SD = 1.27$).

Perceived anti-female bias. Three items assessed perceptions of anti-female bias: "Women are victims of sexism," "Women's advancement in society is restricted as a result of gender discrimination," and "Discrimination against women is not a significant problem" (reverse scored) (range: 1 to 7; $\alpha = .78$; $M = 4.68$, $SD = 1.32$).

Perceived anti-male bias. Items assessing anti-male bias included: "Men are victims of sexism," "Discrimination against men hurts their opportunities in society," and "Men are unlikely to be victims of sexism" (reverse scored) (range: 1 to 7; $\alpha = .77$; $M = 3.95$, $SD = 1.38$).

Status legitimizing beliefs. The 12-item status legitimizing belief (SLB) scale (Levin, Sidanius, Rabinowitz, & Federico, 1998; see also Wilkins & Kaiser, 2014) measured beliefs about the perceived fairness of society (e.g., "America is a just society where differences in status between groups reflect actual group differences," "America is an open society where individuals of any group can achieve higher status," and "If people work hard they almost always get what they want."). These items were averaged together to form the SLB composite (O'Brien & Major, 2005; range: 1 to 6.25; $\alpha = .91$, $M = 3.43$, $SD = 1.05$).

Political ideology. Participants indicated their political ideology by answering the following question: "When it comes to politics, do you usually consider yourself to be liberal, conservative or moderate?" (range: 0 to 6; $M = 2.21$, $SD = 1.56$; 0 = *liberal*, 3 = *moderate*, 6 = *conservative*).

Results and discussion

Manipulation checks

To examine whether the articles effectively manipulated both male and female participants' perceptions of bias against men and women, we conducted 2 (Participant Gender: male or female) \times 3 (Condition: anti-male discrimination, decreasing anti-female bias, or control) ANOVAs on perceptions of bias. First we examined perceptions of bias against women. There was a main effect of gender such that female participants ($M = 5.03$, $SE = 0.14$) perceived more anti-female bias than male participants ($M = 4.46$, $SE = 0.12$), $F(1,193) = 9.29$, $p < .01$; $\eta_p^2 = .05$. A main effect of article condition revealed that participants perceived less bias against women in the *decreasing anti-female bias* condition ($M = 4.34$, $SE = 0.16$) than either the *anti-male discrimination* ($M = 4.81$, $SE = 0.16$; $p = .03$) or *control* conditions ($M = 5.08$, $SE = 0.17$; $p < .01$), $F(2,193) = 5.49$, $p < .01$; $\eta_p^2 = .05$.³ There were no significant differences between the *anti-male discrimination* and *control* conditions, $p = .24$. There was also no interaction between gender and condition, suggesting that male and female participants were equally affected by the article manipulation, $F(2,193) = 0.48$, $p = .62$; $\eta_p^2 = .01$.

Next, we examined perceptions of anti-male bias. There was a main effect of gender such that men ($M = 4.20$, $SE = 0.12$) perceived more discrimination against men than women did ($M = 3.56$, $SE = 0.15$), $F(1,192) = 10.83$, $p < .01$; $\eta_p^2 = .05$. There was also a main effect of article condition, $F(2,192) = 5.15$, $p < .01$; $\eta_p^2 = .05$, such that participants perceived more anti-male bias in the *anti-male discrimination* condition ($M = 4.37$, $SE = 0.17$) than in the *decreasing anti-female bias* ($M = 3.57$, $SE = 0.16$; $p < .01$) or *control* conditions ($M = 3.77$, $SE = 0.17$; $p = .03$). No differences emerged between the *decreasing anti-female bias* and the *control* condition, $p = .40$. There was no interaction between gender and article condition, $F(2,192) = 0.21$, $p = .81$; $\eta_p^2 = .002$.

Thus, the three articles successfully manipulated participants' perceptions of gender bias. Importantly, these results also suggest that the relationship between perceptions of bias against men and women does not work in a symmetrical zero-sum manner for either men or women. Perceptions of anti-male bias increased (relative to control) only when participants read about increasing discrimination against

³ All post-hoc tests utilized the Least Significant Differences correction.

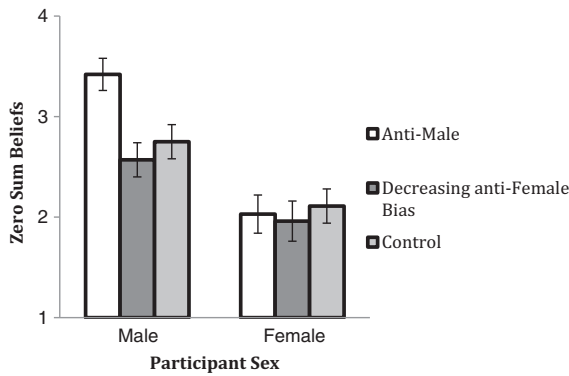


Fig. 3. Male and female participants' ZSB endorsement by condition (Study 2a).

men, but not when they read about decreasing discrimination against women.⁴

Endorsement of zero-sum beliefs

To examine how the articles shaped zero-sum belief endorsement, a 2 (Participant Gender: male or female) \times 3 (Condition: anti-male discrimination, decreasing anti-female bias, or control) ANCOVA was conducted controlling for political orientation and SLBs. Political orientation ($F(1,191) = 30.02, p < .001, \eta_p^2 = .14$) and SLBs ($F(1,191) = 4.12, p = .04, \eta_p^2 = .02$) were significant covariates.⁵ There were significant main effects of participant gender ($F(1, 191) = 34.90, p < .001, \eta_p^2 = .15$) and article condition ($F(2, 191) = 3.31, p = .04, \eta_p^2 = .03$). The main effects were qualified by a significant interaction, $F(2,191) = 3.03, p = .05, \eta_p^2 = .03$.

To probe the interaction, we examined the effect of article condition separately for male ($F(2,191) = 7.58, p < .001, \eta_p^2 = .07$) and female participants ($F(2,191) = 0.14, p = .87, \eta_p^2 = .001$). Male participants endorsed greater zero-sum beliefs in the *anti-male discrimination* condition ($M = 3.42, SE = 0.16$) than in the *decreasing anti-female bias* ($M = 2.57, SE = 0.19, p < .01$) or *control* ($M = 2.75, SE = 0.17, p < .001$) conditions. There was no significant difference between male participants' endorsement of ZSBs in the *decreasing anti-female bias* and *control* conditions, $p = .43$. There were no condition differences among female participants (*anti-male*: $M = 2.03, SE = 0.20$; *decreasing anti-female bias*: $M = 1.96, SE = 0.19$; *control*: $M = 2.11, SE = 0.21$; $ps > .59$). See Fig. 3.

Thus, for male participants, reading about decreasing bias against women was not equivalent to reading about increasing bias against men. In particular, men's endorsement of ZSBs was heightened when they were primed with increasing discrimination against men. Women's ZSBs were lower than men's, replicating Study 1, and were not reactive to changing perceptions of bias against men and women. This suggests that increasing perceptions of anti-male bias may be one reason men are more inclined than women to display zero-sum perceptions of gender bias. Improving conditions for women were not enough to shift ZSBs for men – perhaps because women's improved status is insufficient to increase perceived group competition.

Study 2b

ZSBs are theoretically symmetrical such that losses for one group imply gains for another group and vice versa, but the ZSB items used in Studies 1 and 2a were all worded in a way that implied that gains

for the low-status group would hurt the high-status group. We conducted Study 2b to determine whether men would respond similarly to a scale including ZSB items worded in the opposite way: losses for low-status groups imply that high-status groups benefit.

We were also interested in establishing whether manipulating perceptions of bias against men would affect beliefs about the relationship between groups in general, rather than specifically affecting perceptions of *gender* competition. It is possible, for example, that priming anti-male bias would make men perceive that the world is a more competitive place in which different groups must contend for finite resources.

We used SLBs and political orientation as covariates in Study 2a because both are related to perceptions of bias against Whites and men (Bosson et al., 2012; Major et al., 2002; Wilkins & Kaiser, 2014). Given the relationship between social dominance orientation (SDO; Pratto, Sidanius, Stallworth, & Malle, 1994) and perceived intergroup competition (Esses et al., 1998), it was important to determine in Study 2b how SDO relates to ZSBs and to our primary findings. We predicted that SDO would work similarly to SLBs given their similar function; SLBs assess perceptions that the existing social hierarchy is legitimate and SDO is a measure of preference for hierarchy.

Finally, Study 2b included several other measures to clarify the divergent validity of ZSBs. These measures included ambivalent sexism (Glick & Fiske, 1996) and perceived gender progress.

Method

Participants

Participants were 162 men⁶ (age: $M = 32.41, SD = 10.69$; race: 80.8% White, 6.4% Latino, 4.0% Black, 7.2% Asian, 1.6% other; self-reported income ($N = 120$): $M = \$47,128.73, SD = 29,623.00$) recruited through MTurk in exchange for \$0.75. After removing those who failed attention checks, 125 participants remained.

Procedure

Participants experienced the same manipulation described in Study 2a and then completed the measures described below.

Measures

All items were measured on a 1 to 7 scale anchored at *strongly disagree* and *strongly agree* unless otherwise indicated.

Participants completed the same measures for perceived anti-female bias (range: 1 to 7; $\alpha = .82, M = 4.56, SD = 1.32$), anti-male bias (range: 1 to 6.67; $\alpha = .82, M = 4.05, SD = 1.28$), SLBs (range: 1 to 6.17; $\alpha = .92, M = 3.48, SD = 1.08$), and political orientation (range: 0 to 6; $M = 2.40, SD = 1.57$; 0 = *liberal*, 3 = *moderate*, 6 = *conservative*) described in Study 2a.

Gender zero-sum beliefs. We added four items to our original ZSB measure (used in Studies 1 and 2a). These items were phrased such that women's negative outcomes corresponded to positive outcomes for men: "Paying less attention to women's issues would improve the situation for most men;" "More bias against women automatically means less bias against men;" "Men's success necessarily comes at the expense of women;" "Providing opportunities for men leads to increased discrimination against women" (range for scale: 1 to 5.60; $\alpha = .89; M = 2.67, SD = 0.96$).

⁶ Only male participants were included because, across studies, only high-status individuals displayed differences by condition.

In this study, we aimed to analyze data from a total of approximately 150 participants (50 per cell). We collected data from more with the anticipation that a number would fail manipulation checks and thus be excluded from analyses.

⁴ See supplemental materials for correlations between all measures for Studies 2a, 3a, 3b, and 4b.

⁵ The pattern of means remained the same when the covariates were excluded.

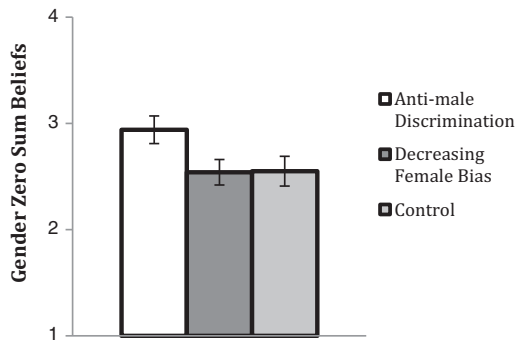


Fig. 4. Male participants' gender ZSBs by condition (Study 2b).

Global zero-sum beliefs. A four-item scale examined global zero-sum beliefs: general beliefs that gains for one group come at the cost of another. These items included: “When one group gets ahead, the others are held back;” “Progress for one group does not have to come at the expense of another” (reverse scored); “Gains for one group, mean another group loses;” “Decreased bias toward one group, naturally means another group will experience more bias” (range: 1 to 6.50; $\alpha = .86$; $M = 2.65$, $SD = 1.14$). These items were used to assess general beliefs about the relationship between groups – without specifically implicating gender.

Perceived gender progress. The five-item scale used to measure perceived gender progress was adapted from Wilkins and Kaiser's (2014) measure of perceived racial progress: e.g. “Women in the US are better off now (financially, politically, etc.) than they ever have been;” “In the last 50–70 years, great progress has been made towards gender equality in the U.S.” (range: 4 to 7; $\alpha = .67$; $M = 5.72$, $SD = .70$).

Ambivalent sexism. Participants completed the 22-item ambivalent sexism inventory (ASI; Glick & Fiske, 1996), which is comprised of two subscales designed to measure participants' Benevolent Sexism (e.g. “Women should be cherished and protected by men”) and Hostile Sexism (e.g. “Women seek special favors under guise of equality;” range: 1.09 to 6.91; $\alpha = .94$, $M = 3.73$, $SD = 1.27$).

Social dominance orientation. Participants completed a 16-item measure of social dominance orientation (SDO; Pratto, Sidanius, Stallworth, & Malle, 1994) which assesses individuals' preference for inequality between different groups: e.g. “Some groups of people are simply inferior to other groups;” “In getting what you want, it is sometimes necessary to use force against other groups” (range: 1 to 6.06; $\alpha = .95$, $M = 2.55$, $SD = 1.19$).

Table 1
Correlations among variables (Study 2b).

Variables	1	2	3	4	5	6	7	8
1) Gender ZSBs	–							
2) SLBs	.39**	–						
3) SDO	.50**	.56**	–					
4) PGP	–.09	.04	–.03	–				
5) AS	.48**	.46**	.39**	.11	–			
6) Global ZSBs	.77**	.39**	.42**	–.12	.44**	–		
7) Anti-male bias	.34**	.11	.16	.12	.18*	.24**	–	
8) Anti-female bias	–.32**	–.61**	–.44**	–.13	–.40**	–.24**	–.05	–
9) Political orientation	.39**	.47	.50	.09	.37**	.24**	.23**	–.45**

Note: Gender ZSBs = gender zero-sum beliefs; SLBs = status legitimizing beliefs; SDO = social dominance orientation; PGP = perceived gender progress; AS = ambivalent sexism; Global ZSBs = global zero-sum beliefs.

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

Results and discussion

Endorsement of gender zero-sum beliefs

To examine whether article condition affected participants' gender ZSB endorsement, we conducted an ANCOVA (controlling for political orientation, SDO, and SLBs). SDO was the only significant covariate ($F(1,117) = 13.36$, $p < .01$, $\eta_p^2 = .10$; political orientation: $F(1,117) = 2.42$, $p = .12$, $\eta_p^2 = .02$; SLBs: $F(1,117) = 1.36$, $p = .25$, $\eta_p^2 = .01$). As expected, there was a significant effect of article condition, ($F(2,117) = 3.11$, $p = .04$, $\eta_p^2 = .05$), such that participants in the anti-male discrimination condition ($M = 2.94$, $SE = 0.13$) endorsed ZSBs more than participants in either the control ($M = 2.55$, $SE = 0.14$, $p = .04$) or the decreasing female bias ($M = 2.54$, $SE = 0.12$, $p = .02$) conditions. There were no significant differences between the control and decreasing female bias conditions, $p = .96$. See Fig. 4. Thus, Study 2a results were replicated even when controlling for SDO.

Importantly, the results of Study 2a were replicated when using the modified measure of ZSBs, in which items were worded symmetrically to imply both that women's gains come at men's expense and that women's losses are men's gains. Therefore results were not simply a function of particularly worded items.

Endorsement of global zero-sum beliefs

To examine whether article condition affected participants' global ZSB endorsement, we conducted an ANCOVA (controlling for political orientation, SDO, and SLBs). SDO was a significant covariate ($F(1,117) = 8.69$, $p < .01$, $\eta_p^2 = .07$) as were SLBs ($F(1,117) = 4.92$, $p = .02$, $\eta_p^2 = .04$). Political orientation was not a significant covariate ($F(1,117) = 0.28$, $p = .59$, $\eta_p^2 = .002$). There was no significant effect of article condition on endorsement of global zero-sum beliefs ($F(2,117) = 1.44$, $p = .24$, $\eta_p^2 = .02$). This suggests that only group-specific ZSBs, not global ZSBs, increase when high-status individuals perceive greater discrimination against their group. In other words, it is not that individuals perceive more competition between groups in general; they perceive a zero-sum relationship between their own group and potentially competing outgroups.

Divergent validity of ZSB measure

The gender ZSB measure was positively correlated with several of the other measures: SDO: $r(125) = .50$, $p < .001$, SLBs: $r(125) = .39$, $p < .001$, perceptions of anti-male bias: $r(125) = .34$, $p < .001$, and ambivalent sexism: $r(125) = .48$, $p < .001$, see Table 1. This pattern is important because it demonstrates overlap while simultaneously showing that the measures are distinct.

Interestingly, women's advancement (gender progress) was not significantly related gender ZSBs, $r(124) = -.09$, $p = .35$. This pattern provides further evidence that men's gender ZSBs do not increase as a function of their perception of women's social status, but rather as a function of perceptions of men's status.

Study 3a

In Study 3a we were interested in examining whether men's ZSBs would increase after encountering one man's claim of anti-male bias (as opposed to reading about widespread discrimination against men). This provided a more conservative test of our hypothesis that ZSBs increase when men are primed to perceive bias against their group since the bias was described as one particular instance rather than as generalized.

Method

Participants and procedure

One hundred ninety seven participants (52.5% male; age: $M = 34.27$, $SD = 11.84$; race: 80.4% White, 4.5% Latino, 6.7% Black, 7.3% Asian, 1.1% other) completed the study through MTurk in exchange for \$0.75. Two hundred were recruited, but 3 individuals enrolled in the study without completing measures. After removing those who failed attention checks, 179 participants remained.

Participants were asked to form an impression of a purported participant in a previous study on "career success" (see Wilkins, Wellman, & Kaiser, 2013; Wilkins, Wellman, & Schad, under review). All participants read about a man who failed to receive a promotion at work. Participants were assigned to one of two experimental conditions, which manipulated the target's attributions for losing a recent promotion. Specifically, the target indicated that he had failed to receive a promotion at work and that a female coworker had been promoted instead of him. In the *discrimination claim* condition, the target wrote: "all this stuff about gender equality is just discrimination against men." In the *control* condition, the target wrote that he was unsure as to why he did not receive the promotion saying: "I guess it was more competitive than I thought." Participants then completed measures assessing their ZSBs, political orientation, and demographics.⁷

Measures

Study 3a utilized a three-item subset of the ZSB measure⁸: "When women work they are taking jobs away from men," "When women get rights they are taking rights away from men," "Rights for women mean that men lose out," (range: 1 to 7; $\alpha = .90$; $M = 2.60$, $SD = 1.33$). Political orientation was measured on a 0–6 scale (range: 0 to 6; $M = 2.30$, $SD = 1.57$).

Results and discussion

To examine how encountering a claim of anti-male discrimination affected male and female participants' endorsement of ZSBs, a 2 (Participant gender: male, female) \times 2 (Claim condition: claim, control) ANCOVA was conducted controlling for political orientation. Political orientation was a significant covariate $F(1,174) = 7.29$, $p < .01$, $\eta_p^2 = .04$. There were significant main effects of both gender ($F(1,174) = 7.84$, $p < .01$, $\eta_p^2 = .04$) and claim condition ($F(1,174) = 7.01$, $p < .01$, $\eta_p^2 = .04$). As expected, these effects were qualified by a significant interaction between gender and claim condition, $F(1,174) = 3.86$, $p = .05$, $\eta_p^2 = .02$. Male participants in the *claim condition* ($M = 3.27$, $SE = 0.18$) endorsed greater ZSBs than male participants in the *control condition* ($M = 2.40$, $SE = 0.19$), $F(1,174) = 11.19$, $p < .001$, $\eta_p^2 = .06$. There were no significant differences between conditions for female participants (claim: $M = 2.37$, $SE = 0.20$; control: $M = 2.24$, $SE = 0.18$), $F(1,125) = 0.22$, $p = .64$, $\eta_p^2 = .001$. See Fig. 5.

⁷ SLBs were inadvertently excluded from this study. When political orientation was not included as a covariate, the pattern of means was the same.

⁸ This study was part of a longer study (examining reactions to claimants of anti-male sexism). Only three ZSB items were included in order to shorten the length of measures.

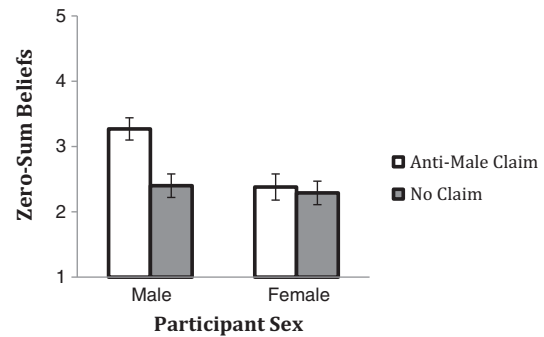


Fig. 5. Male and female participants' ZSB endorsement by condition (Study 3a).

Study 3a replicated the pattern found in Studies 2a and 2b by demonstrating that women's ZSB endorsement was unaffected by perceptions of bias against men. In contrast, men were more inclined to perceive a zero-sum pattern between the sexes after reading one man's claim of anti-male sexism. Thus, it appears that it is not necessary for men to perceive pervasive bias against their group, but rather a single exemplar is sufficient to increase their endorsement of zero-sum beliefs.

Study 3b

Study 3b was designed to assess whether low-status groups exhibit greater endorsement of ZSBs in response to perceiving increasing amounts of bias against their group. Specifically, we examined whether priming women with a claim of anti-female bias would increase their ZSBs. We also examined men's reactions to these claims. We hypothesized that if effects were driven by perceiving discrimination against one's group, women, but not men, would exhibit greater ZSB endorsement following a claim (relative to no claim). However, if only high-status groups' ZSBs increase in reaction to ingroup bias, women should not display differences in ZSBs based on condition.

Methods were similar to Study 3a but the claimant was female rather than male. Three hundred participants were recruited through MTurk (of which 288 completed measures) in exchange for \$1. After removing those that failed attention checks, 247 remained (53.5% male; age: $M = 35.97$, $SD = 13.31$; race: 78.5% White, 4.3% Latino, 6.6% Black, 8.6% Asian, 2.0% other). Study 3b utilized the ZSB measure from Study 1 (range: 0 to 5.83; $\alpha = .91$; $M = 1.51$, $SD = 1.21$). Political orientation (range: 1 to 7; $M = 2.44$, $SD = 1.65$) and SLB measures (range: 0 to 6; $\alpha = .92$; $M = 2.46$, $SD = 1.15$) were the same as those used in Study 2a.

To examine how encountering a claim of anti-female discrimination affected male and female participants' endorsement of ZSBs, we conducted a 2 (participant gender: male vs. female) \times 2 (claim condition: claim vs. no claim) ANCOVA controlling for political orientation and SLBs. Political orientation was a significant covariate, $F(1,241) = 28.36$, $p < .01$, $\eta_p^2 = .11$ but SLBs were not, $F(1,241) = 1.43$, $p = .23$, $\eta_p^2 = .01$. There was a significant main effect of participant gender, $F(1,241) = 10.90$, $p < .01$, $\eta_p^2 = .04$, such that men ($M = 1.74$, $SE = 0.10$) endorsed ZSBs more than women ($M = 1.28$, $SE = 0.10$), but there was no effect of claim condition, $F(1,241) = 2.33$, $p = .13$, $\eta_p^2 = .01$. There was also no significant interaction between gender and claim condition, $F(1,241) = 0.54$, $p = .46$, $\eta_p^2 = .002$.⁹

Thus, Study 3b, revealed that, unlike men, women's ZSB endorsement does not increase as a result of being primed with bias against

⁹ We also included a 3-item measure of ZSBs phrased for women (e.g. "Less discrimination against men means more discrimination against women;" $\alpha = .89$; $M = 2.32$, $SD = 1.24$). We modified ZSBs in this way to provide a more conservative test of hypotheses. We reasoned that women might be more inclined to endorse ZSBs if they were worded in a way that implied that women were disadvantaged relative to men (rather than men being disadvantaged as a result of women – as in Studies 1 and 2a).

their group. This suggests that our effects may be limited to high-status groups. To test generalizability to another high-status group, we next examined whether Whites' endorsement of ZSBs would be affected by perceiving increased anti-White bias.

Study 4a

The purpose of Study 4a was to test whether Whites' ZSB endorsement would increase as a result of being primed to perceive greater discrimination against Whites. We hypothesized that Whites who perceived greater anti-White bias would endorse racial ZSBs more than those perceiving decreasing discrimination against Blacks or discrimination against a control group.

Study 4a extended the study of ZSBs to examine the intergroup implications of ZSB endorsement. Given [Esses et al. \(1998\)](#) argument that ZSBs correspond to a desire to improve ingroup and decrease outgroup competitiveness, we also examined how manipulating perceptions of bias affected support for policies that benefit Blacks and Whites. Specifically, we tested whether Whites who read about increasing anti-White bias would indicate *less* support for affirmative action policies that benefit racial minorities and *greater* support for policies that benefit Whites. We also examined the relationship between ZSBs and support for these policies.

Method

Participants and procedure

We recruited 150 White Americans¹⁰ (53.6% female; age: $M = 39.41$, $SD = 14.01$; 50 participants per cell) through MTurk in exchange for \$0.75. After removing individuals who failed attention checks, 138 participants remained.

Participants were recruited for a study examining reactions to news articles and perceptions of society. Individuals were randomly assigned to read either an article describing *anti-White discrimination*, *decreasing Black discrimination*, or a *control* (Study 2a, Inuit) article. The *anti-White discrimination* article described increasing discrimination against Whites, and the *decreasing Black discrimination* article described decreasing bias against Blacks (see [Appendix B](#)). After answering questions about the news articles, participants reported their perceptions of anti-White bias, perceptions of anti-Black bias, endorsement of zero-sum beliefs, support for affirmative action policies that benefit racial minorities, support of policies that benefit Whites, SLB endorsement, political orientation, and attitudes towards Whites and Blacks (in that order). Attitudes toward Blacks and Whites were assessed in order to examine potential overlap between zero-sum beliefs and intergroup bias.

Measures

All items are measured on a 0 to 6 scale anchored at *strongly disagree* and *strongly agree* unless otherwise indicated.

Anti-White bias. A six-item measure was used to examine perceptions of anti-White bias (e.g. "Prejudice and discrimination against Whites is on the rise." "Reverse racism (where racial minorities are favored over Whites) is pervasive." "Whites do not experience racism." (reverse scored)) (range: 0 to 6; $\alpha = .89$; $M = 3.31$, $SD = 1.43$; see [Wilkins & Kaiser, 2014](#)).

Anti-Black bias. A three-item measure was used to examine perceptions of anti-Black bias ("Blacks experience prejudice and discrimination,"

"Blacks are systematically discriminated against," and "Racism against Blacks is pervasive,") (range: 0 to 6; $\alpha = .83$; $M = 3.89$, $SD = 1.30$).

Zero-sum beliefs. A six-item ZSB measure was used to examine racial zero-sum beliefs ("Blacks take jobs away from Whites," "When racial minorities get rights, they are taking rights away from Whites," "Rights for Blacks mean Whites lose out," "As Blacks face less racism, Whites end up facing more racism," "Less discrimination against minorities means more discrimination against Whites," and "Efforts to reduce discrimination against minorities have led to increased discrimination against Whites,") (range: 0 to 6; $\alpha = .96$; $M = 2.00$, $SD = 1.71$).

Support for affirmative action policies. A three-item measure of support for affirmative action policies was used ("Affirmative action programs are still needed today to address racial inequality," "Businesses should increase their efforts to promote racial diversity in the workplace," and "Affirmative action programs to promote diversity in higher education are no longer necessary to protect racial minority applicants" (reverse scored)) (range: 0 to 6; $\alpha = .80$; $M = 3.20$, $SD = 1.59$).

Support for pro-White policies. Participants completed a three-item measure of support for policies to address anti-White discrimination ("Efforts should be made to address instances of anti-White bias," "Policy makers should examine the possibility that affirmative action policies are leading to discrimination against Whites," and "The idea of programs to protect Whites from racial discrimination seem ridiculous to me" (reverse scored) (range: 0 to 6; $\alpha = .81$; $M = 3.36$, $SD = 1.54$)).

Political ideology (range: 0 to 6; $M = 2.47$, $SD = 1.83$) and **status-legitimizing beliefs** (range: 0 to 6; $\alpha = .91$; $M = 2.44$, $SD = 1.83$) were the same measures used in Study 2a.

Feeling thermometers. Attitudes towards White and Blacks were assessed with a 100-point feeling thermometer (0 = *Cold*, 50 = *Neutral*, 100 = *Warm*) (White range: 30 to 100; $M = 80.47$, $SD = 17.98$; Black range: 3 to 100; $M = 69.18$, $SD = 22.51$).

Results and discussion

Manipulation check

In order to establish whether the articles effectively manipulated perceptions of bias against Blacks and Whites, we utilized one-way ANOVAs with article condition as the between-participants variable. There were significant differences between condition in perceptions of anti-White bias, $F(2,135) = 7.47$, $p = .001$; $\eta_p^2 = .10$. Participants perceived greater anti-White bias in the *anti-White discrimination* condition ($M = 3.96$, $SE = 0.21$) than the *Control* ($M = 2.89$, $SE = 0.19$, $p < .01$) and *decreasing Black discrimination* ($M = 3.18$, $SE = 0.21$, $p < .01$) conditions; the *control* condition did not significantly differ from the *decreasing Black discrimination* condition, $p = .29$.

There were also significant differences between conditions in perceptions of anti-Black bias, $F(2,135) = 5.84$, $p < .01$; $\eta_p^2 = .08$. Participants perceived significantly less bias against Blacks in the *decreasing Black discrimination* condition ($M = 3.36$, $SE = 0.19$) than in the *control* ($M = 4.22$, $SE = 0.19$, $p < .01$) and *anti-White discrimination* ($M = 4.03$, $SE = 0.19$, $p = .02$) conditions; the *control* condition did not differ from the *anti-White discrimination* condition, $p = .48$. Thus, the articles effectively manipulated participants' perceptions of discrimination against Whites and Blacks.

Importantly, and consistent with hypotheses, Whites' perceptions of anti-White bias only increased (relative to controls) when reading about increasing anti-White bias and not when reading about decreasing anti-Black bias.

Zero-sum belief endorsement

To examine whether perceiving anti-White bias versus decreasing Black discrimination affected White participants' ZSB endorsement,

¹⁰ Whites were selectively recruited by having prospective Mturk participants first complete a demographic survey to assess whether they qualified for the study. Only Whites were allowed to proceed to the primary study. Participants were not aware of the qualification criteria.

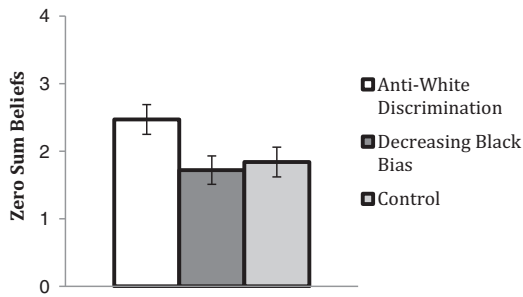


Fig. 6. Whites' ZSB endorsement by condition (Study 4a).

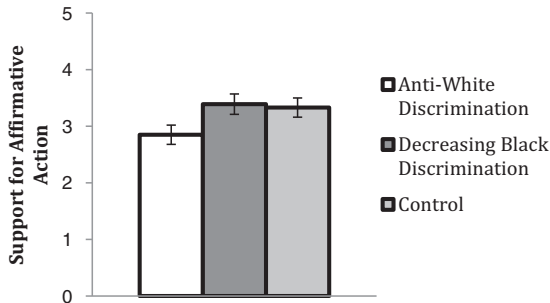


Fig. 7. Whites' support for affirmative action by condition (Study 4a).

we conducted an ANCOVA (controlling for political orientation and SLB-endorsement).¹¹ Political orientation ($F(1,133) = 3.24, p = .07, \eta_p^2 = .02$) was a marginal, and SLBs were a significant covariate ($F(1,133) = 19.32, p < .001, \eta_p^2 = .13$). As expected, there was a significant main effect of article condition, $F(2,133) = 3.43, p = .04, \eta_p^2 = .05$, such that Whites in the *anti-White discrimination* condition ($M = 2.47, SE = 0.22$) endorsed ZSBs more than participants in either the control ($M = 1.84, SE = 0.21, p = .04$) or the *decreasing Black discrimination* ($M = 1.72, SE = 0.22, p = .02$) conditions. There were no significant differences between the *control* and *decreasing Black discrimination* conditions, $p = .69$. Thus, among Whites, ZSBs increased (relative to control) only when perceiving greater anti-White bias, but not when perceiving decreasing anti-Black bias. See Fig. 6.

Support for affirmative action

In order to examine whether manipulating perceptions of bias against Whites decreased support for policies that benefit racial minorities, we conducted an ANCOVA on the composite support for affirmative action measure. Political orientation ($F(1,133) = 0.06, p = .94, \eta_p^2 = .00$) was not a significant covariate, however SLBs were ($F(1,133) = 72.02, p < .001, \eta_p^2 = .35$).¹² There was a marginal main effect of condition, $F(1,133) = 2.81, p = .06, \eta_p^2 = .04$, such that participants in the *anti-White discrimination* condition ($M = 2.85, SE = 0.18$) indicated significantly less support for affirmative action policies than those in the *control* ($M = 3.33, SE = 0.17, p = .05$) or *decreasing Black discrimination* conditions ($M = 3.39, SE = 0.18, p = .03$). There were no significant differences between the *control* and *decreasing Black discrimination* condition, $p = .81$. See Fig. 7.

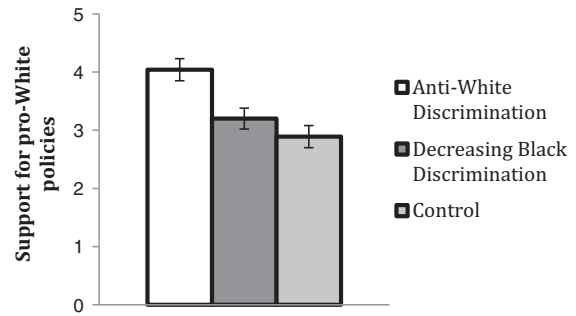


Fig. 8. Whites' support for policies that address anti-white bias by condition (Study 4a).

Support for pro-White policies

We used an ANCOVA to assess whether there were condition differences in support for pro-White policies. Political orientation ($F(1,133) = 3.96, p = .05, \eta_p^2 = .03$) and SLBs ($F(1,133) = 17.14, p < .001, \eta_p^2 = .11$) were both significant covariates.¹³ There was a significant main effect of condition, $F(1,133) = 9.62, p < .001, \eta_p^2 = .13$, such that participants in the *anti-White discrimination* condition ($M = 4.04, SE = 0.19$) indicated significantly greater support for pro-White policies than those in the control ($M = 3.20, SE = 0.18, p < .01$) or *decreasing Black discrimination* ($M = 2.89, SE = 0.19, p < .01$) conditions. There were no significant differences between the *control* and *decreasing Black discrimination* condition, $p = .24$. See Fig. 8.

Predictive validity of racial ZSB measure

We next examined the correlation between the composite variables. See Table 2. There was a negative correlation between perceived anti-White and anti-Black bias, $r(138) = -.25, p = .002$ suggesting that overall, Whites believe that there is a negative relationship between bias experienced by Blacks and Whites.

Evidence of asymmetry. In order to examine whether endorsement of zero-sum beliefs differentially predicted perceptions of anti-White and anti-Black bias, we examined the correlations. There was a strong positive correlation between ZSB-endorsement and perceptions of anti-White bias, $r(138) = .71, p < .001$ and a moderate negative correlation between ZSB-endorsement and perceptions of anti-Black bias, $r(138) = -.31, p < .001$. Importantly, the magnitude of the difference between these correlations was statistically significant, $t(135) = 4.52, p < .001$ (assessed using the method recommended by Cohen & Cohen, 1983). ZSBs more strongly predicted perceptions of bias against Whites than perceptions of bias against Blacks. This is consistent with our argument that ingroup outcomes are weighed more heavily than outgroup outcomes for predicting perceptions of bias among high status groups.

We were also interested in examining whether ZSBs differentially predicted endorsement of policies that affect group outcomes. Greater ZSB-endorsement was associated with *lower* support for affirmative action policies that benefit racial minorities, $r(138) = -.52, p < .001$. In contrast, greater ZSB-endorsement was associated with *greater* support for policies that benefit Whites, $r(138) = .71, p < .001$. The magnitude of the pro-White support was significantly greater than the magnitude of the minority support, $t(135) = 2.43, p = .02$.

In sum, Study 4a revealed that Whites' ZSB endorsement increased, support for affirmative action policies decreased, and support for policies that benefit Whites increased (relative to control), when they were primed with increasing anti-White bias.

¹¹ The pattern remained the same when covariates were excluded and when controlling for attitudes towards Blacks and Whites (as assessed by feeling thermometers).

¹² The pattern of means remained the same when the covariates were excluded.

¹³ The pattern of means remained the same when the covariates were excluded.

Table 2
Correlations among variables (Study 4a).

Variables	1	2	3	4	5	6	7	8	9
1. Anti-White bias	–								
2. Anti-Black bias	–.25**	–							
3. Zero sum beliefs	.71**	–.31**	–						
4. Support for affirmative action	–.58**	.48**	–.52**	–					
5. Support to address anti-White bias	.80**	–.30**	.71**	–.51**	–				
6. System legitimizing beliefs	.55**	–.59**	.51**	–.68**	.48**	–			
7. Political orientation	.43**	–.39**	.40**	–.39**	.39**	.59**	–		
8. Feelings towards Whites	.27**	–.04	.28**	–.07	.25**	.16	.08	–	
9. Feelings towards Blacks	–.09	.11	–.19*	.32**	–.09	–.16*	–.11	.51**	–

* $p < .05$.

** $p < .01$.

Study 4b

Study 4b assessed whether Blacks' ZSB endorsement fluctuates in response to perceiving increasing amounts of anti-Black bias. We primed Black participants with *increasing anti-Black bias* or discrimination against a *control* group (Inuit article from Study 2a). We aimed to collect data from 100 Black participants, but only 87 completed measures through MTurk in exchange for \$0.75. Eighty-one Blacks remained after removing those who failed attention checks (64.4% female; age: $M = 33.41$, $SD = 11.48$).¹⁴ Study 4b utilized the 6-item ZSB measure from Study 4a (range: 0 to 4.20; $\alpha = .91$; $M = .82$, $SD = 0.99$), and the political orientation (range: 0 to 6; $M = 2.05$, $SD = 1.52$) and SLB measures (range: 0 to 5.33; $\alpha = .89$; $M = 2.13$, $SD = 1.12$) described in Study 2a.

To examine how reading about increasing anti-Black bias affected participants' endorsement of ZSBs, we conducted an ANCOVA with bias condition (anti-Black vs. Inuit) as the between-participant variable, controlling for political orientation and SLBs. Political orientation was not a significant covariate, ($F(1,77) = 2.16$, $p = .15$, $\eta_p^2 = .03$) but SLBs were ($F(1,77) = 15.67$, $p < .001$, $\eta_p^2 = .17$). There was no condition effect ($F(1,77) = .06$, $p = .82$, $\eta_p^2 = .001$); Blacks in the anti-Black bias condition ($M = .80$, $SE = .13$) and the Inuit condition ($M = 0.85$, $SE = 0.16$) did not differ in ZSB endorsement.

Thus, Study 4b suggests that Blacks' ZSB endorsement does not increase as a result of being primed with bias against their group. This pattern is consistent with women's results from Study 3b. Together, these studies support our hypothesis that only high-status groups increase ZSB endorsement in response to perceiving increasing bias against their group.

In order to establish whether Whites endorsed ZSBs more than Blacks, we compared ZSB endorsement in the control conditions across Studies 4a and 4b. Blacks indicated lower ZSB endorsement ($M = 0.85$, $SE = 0.16$) than Whites ($M = 1.84$, $SE = 0.21$), $t(80) = 3.33$, $p < .001$, $d = .74$. This is consistent with gender differences in ZSB support found in Study 2a, and it provides additional empirical support for the hypothesis that high-status groups endorse ZSBs more than low-status groups.

General discussion

Across multiple studies, we directly examined differences in zero-sum beliefs between high- and low-status groups (i.e. men and Whites compared to women and Blacks). We found that high-status group members endorsed zero-sum beliefs about discrimination more than low-status group members. Furthermore, we showed that ZSB endorsement moderated perceptions of changing bias experienced by men and women over time. While previous researchers (Kehn & Ruthig, 2013;

Norton & Sommers, 2011) have argued that Whites and men perceive discrimination as following a zero-sum pattern (but that Blacks and women do not), the current research is the first to directly examine group differences in ZSB endorsement.

We established that zero-sum beliefs about bias do not follow a symmetrical pattern, in which losses for one group are equivalent to gains by another group. When we manipulated perceptions of discrimination against high-status groups and low-status groups, we found that ZSBs increased only when high-status individuals contemplated increasing bias against their own group and not when they perceived decreasing bias against a potentially competitive outgroup. Low-status groups' ZSB endorsement was unaffected by manipulating group bias—suggesting that high-status group members may be unique in experiencing greater ZSB endorsement in response to perceived discrimination. Thus, zero-sum beliefs are asymmetrical and ingroup outcomes are weighed more heavily than outgroup outcomes. These results are consistent with a growing body of literature demonstrating that ingroup consequences are processed differently than closely-related outgroup outcomes (e.g. Lowery et al., 2006; Powell et al., 2005).

In addition to determining what causes ZSBs, we also examined their meaning and consequences. Consistent with the Instrumental Model of Group Conflict (Esses et al., 1998), greater ZSB endorsement corresponded with efforts to increase ingroup competitiveness and to decrease outgroup competitiveness. Specifically, we found that ZSBs were associated with Whites' decreased support for affirmative action policies that benefit racial minorities and positively associated with support for policies that address anti-White bias. Thus, perceiving greater bias against men or Whites may be associated with favoring policies that ultimately hurt women and Blacks.

Limitations and future directions

Although our results were consistent across multiple groups (gender and race), and different manipulations of bias (at both group and individual levels), there are several limitations.

We argued that ZSBs do not fluctuate in response to discrimination for low-status groups. We found the expected null effects in two studies, but cannot actually prove the null. However, given the small differences in means and very small effect sizes in Studies 3b and 4b, it is unlikely that we would find effects even with much larger samples. Furthermore, we found a significant interaction between perceived bias and participant gender in predicting ZSBs in Studies 2a and 3a, which provides evidence that relationship is different for men and women. Thus, although not conclusive, our results collectively suggest that ZSBs are more resistant to change among low-status individuals than high-status individuals.

Future research can identify the psychological process that determines why high- (and not low-status) groups respond to increasing bias against their group with greater ZSBs. We proposed that

¹⁴ We identified Black participants by including a screening questionnaire (as in Study 4a).

perceptions of intergroup competition are a probable factor, but we did not measure perceived competition. Similarly, the frequency of bias experienced by each group might account for our effects. Bias against low-status groups may be seen as chronic and consistent with their social position. Thus, priming low-status individuals to perceive more bias should not affect the extent to which they have to compete with other groups. In contrast, bias against high-status groups may be seen as more rare and as having stronger implications for their social position. Bias against high-status groups puts their social position at risk and thus, may directly increase perceived intergroup competition.

Implications

The perceived social landscape of the United States is changing. High-status groups, such as Whites, perceive more discrimination against their group now than ever before and believe that the bias they experience is more prevalent than bias experienced by low-status groups (Norton & Sommers, 2011). Anti-White bias is seen as severe enough for the Supreme Court to hear cases involving anti-White bias claims (e.g. Fisher v. University of Texas at Austin, 2013; Ricci v. DeStefano, 2009). Similarly, bias against men is gaining attention in the popular press (e.g. Coontz, 2012), with some arguing that women and men are in a zero-sum competition (Rosin, 2010; Wampole, 2012). Men are increasingly seeing themselves as disadvantaged and seeing women's position as improving (Bosson et al., 2012; Kehn & Ruthig, 2013).

Our work suggests that these shifting patterns have direct implications for intergroup relations. Despite the fact that Whites are better off than Blacks according to most metrics (e.g. Bertrand & Mullainathan, 2004; Knowles, Persico, & Todd, 2001; Pettit, 2012; also see Norton & Sommers, 2011) and men continue to make more money and occupy greater positions of power than women (Cohen, 2013), perceiving discrimination will increase high-status groups' ZSB endorsement. Thus, members of high-status groups will increasingly perceive that they are in direct competition with low-status groups to the extent to which they increasingly perceive bias against their group. Low-status groups, in contrast, will not necessarily believe they are in competition with high-status groups. Because ZSBs are associated with greater outgroup bias and ingroup favoritism, this research also suggests that increasing perceptions of bias toward high-status groups will strengthen support for policies that may ultimately perpetuate social inequality, such as pro-White policies or support for dismantling affirmative action. Furthermore, high-status groups' disproportionate power suggests that their support of inequality will likely have a significant impact on social policies. Society would benefit from identifying strategies that contribute to a more cooperative approach to intergroup relations in which zero-sum beliefs, and their negative consequences, are minimized.

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Appendix A. Increasing discrimination against men manipulation

Modern men experience the pressure of discrimination

The Quinnipiac Research Center distributed a survey to several thousand men across America asking them to report how much discrimination they feel they have faced. In 1955, only 4.3% of men reported experiencing gender-based discrimination in the US. This same survey

was redistributed in 2012 and yielded a drastically different result. Today, 53.9% of men report experiencing anti-male discrimination. Although striking, this perception may not be unfounded, as evidence of anti-male bias is emerging, most notably in the fields of education and employment.

Christina Sommers, a columnist for the New York Times, claims that discrimination against boys starts as early as kindergarten and affects men's educational trajectory. Both male and female teachers now factor good behavior into grades — and young boys are not traditionally known for their good behavior. Researchers analyzed data from more than 5800 students from kindergarten through fifth grade and found that boys (across all racial groups and in all major subject areas) received lower class grades than test scores alone would have predicted. Scholars attribute this gap between test scores and grades to “behavioral skills”: attentiveness, persistence, eagerness to learn, the ability to sit still and work independently. Boys tend to develop these skills in late childhood.

Low grades in early education can negatively affect boys throughout their schooling. As more and more boys are now labeled as low achievers, they tend to struggle in high school, and subsequently are less likely to be admitted to, or graduate from, college. The number of men being admitted to institutions of higher education has decreased over the past decade by 44%. Given the growing importance of education in a highly competitive global market, this process ultimately decreases men's opportunities for career success and leaves them vulnerable to job instability in the face of economic fluctuations. Thus, discrimination against men seems to be on the rise.

Decreasing discrimination against women manipulation

Modern women experience fewer pressures of discrimination

The Quinnipiac Research Center distributed a survey to several thousand women across America asking them to report how much discrimination they felt they have faced. In 1955, 87.1% of women reported experiencing gender-based discrimination in the US. This same survey was redistributed in 2012 and yielded a drastically different result. Today, only 11.3% of women report experiencing gender discrimination. Although striking, this perception may not be unfounded, as discrimination against women today seems to be a phenomenon of the past, most notably in the fields of education and employment.

Christina Sommers, a columnist for the New York Times, claims that decreased discrimination against girls starts as early as kindergarten and affects women's educational trajectory. Both male and female teachers now factor good behavior into grades — and young girls are traditionally known for their good behavior. Researchers analyzed data from more than 5800 students from kindergarten through fifth grade and found that girls (across all racial groups and in all major subject areas) received higher grades than test scores alone would have predicted. Scholars attribute this gap between test scores and grades to “behavioral skills”: attentiveness, persistence, eagerness to learn, and the ability to sit still and work independently. Girls tend to develop these skills very early on.

High grades in early education can positively affect girls throughout their schooling. As more and more girls are now labeled as high achievers, they tend to thrive in high school, and subsequently are more likely to be admitted to, and graduate from, college. The number of women being admitted to institutions of higher education has increased over the past decade by 44%. Given the growing importance of education in a highly competitive global market, this process ultimately decreases hurdles that women face for achieving career success and protects them against job instability in the face of economic fluctuations. Thus, discrimination against women seems to be declining.

Appendix B. Manipulation of anti-White bias

Anti-White bias is present and pervasive in the US

While both Whites and Blacks agree that significant progress has been made in the fight against anti-Black bias, Whites feel that this progress has come at their expense. Whites perceive greater amounts of anti-White bias now than they have in all previous decades. This perception may not be unfounded, as evidence of anti-White bias is emerging: particularly in the fields of education and employment.

Research by Harvard professor Michael Norton and co-author Samuel Sommers indicates that Whites believe that they are now more likely to be victims of racial discrimination than Blacks. These perceptions correspond to the real experiences of Whites in educational settings. Whites have been denied acceptance to institutions of higher education while less qualified minorities have been admitted, due in large part to affirmative action policies. The Supreme Court's ruling in the Grutter v. Bollinger case is evidence of such bias. Barbara Grutter was denied admission to the University of Michigan Law School, despite her 3.8 GPA and 161 LSAT score (out of 180). The Supreme Court ruled in favor of the University's admissions policy that uses race as a predominant factor in acceptance decisions, and Barbara Grutter was never admitted. Similarly, Abigail Fisher, a white applicant, is suing the University of Texas arguing that she was denied her 14th amendment right to equal protection because the university accepted minority applicants with less impressive credentials instead of her. The court essentially upheld the University's policy. These two cases exemplify situations in which Whites are disadvantaged in acceptances to universities. While these two legal cases have reached the Supreme Court, it is likely that there are a number of unreported instances of anti-White bias in educational domains.

In terms of employment, many large law firms engage in discrimination against whites, as general counsels of some major corporations have been known to only hire law firms that impose staffing quotas for minority attorneys. In 2005, Wal-Mart terminated a firm due to lack of minority hires, stating that the decision was "strictly because of their inability to grasp our diversity expectations." Another Supreme Court case, Ricci v. DeStefano, argues discrimination against Whites in promotion decisions. In this case, firefighters in New Haven, Connecticut, took an exam meant to identify individuals deserving a promotion. White firefighters outperformed racial minorities on the exam, and the city threw out the results. A number of Whites who passed the exam were denied promotion.

Thus, not only are Whites being undermined in competitive educational institutions, but there also is increasing evidence that anti-White bias is detrimentally affecting the success of Whites in the workplace.

Manipulation of anti-Black discrimination

Discrimination against African Americans on the decline

The Quinnipiac Research Center distributed a survey to several thousand African Americans across United States asking them to report how much discrimination they believe they face. In 1955, 92.0% of African Americans reported experiencing racial discrimination. This same survey was redistributed in 2013 and yielded a drastically different result. Today, only 21.3% of African Americans report experiencing racial discrimination. While striking, this perception is not unfounded, as discrimination against minorities has been declining over time.

Although African Americans have experienced significant discrimination during much of this nation's history, racial bias has substantially decreased. Overt, hostile acts of racial discrimination are far less common today than they were even 20 years ago. Laws like the Civil Rights Act of 1964 have drastically reduced the discrimination that African Americans experience in housing, work and education settings. Schools

and universities across the country have removed institutional policies that were discriminatory against Blacks.

During the last decade, we have seen further evidence that racial bias in on decline in the United States. The election of President Barack Obama, and other African American leaders demonstrates just how far we have come as a nation. Evidence suggests that discrimination against Blacks is steadily declining in the United States.

Appendix C. Supplementary data

Supplementary data to this article can be found online at <http://dx.doi.org/10.1016/j.jesp.2014.10.008>.

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