



# Synergistic and additive effects of social dominance orientation and right-wing authoritarianism on attitudes toward socially stigmatized groups

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## Abstract

Research has consistently linked social dominance orientation (SDO) and right-wing authoritarianism (RWA) to numerous forms of prejudice, but little research has examined how these personality and ideological variables interact in their associations with various attitudinal outcomes. The present study explored the interactions of SDO and RWA in predicting a wide range of social attitudes (i.e., modern racism, modern sexism, traditional gender role beliefs) and feeling thermometers toward racial/ethnic minorities, women, and other socially stigmatized groups in a cross-sectional survey of 1244 U.S. college students ( $M_{\text{age}} = 21.54$ ;  $SD = 5.17$ ). Moderation analyses found significant independent associations of SDO, RWA, or both with all attitudinal or ideological outcome variables. We found a hypothesized synergistic interaction of SDO x RWA in predicting attitudes toward women scores, but the results did not support other hypothesized SDO x RWA interactions. Findings provide further support of the Dual Process Model and suggest that SDO and RWA may employ largely independent pathways in predicting attitudes toward marginalized groups.

**Keywords** Social dominance orientation · Right-wing authoritarianism · Attitudes · Racism · Sexism · Prejudice

## Introduction

Although many forms of explicit prejudice have decreased steadily over the past decades (Bobo et al., 2012; Pew Research Center, 2012; Swim et al., 1995), racism, xenophobia, nationalism, sexism, and heterosexism continue to manifest in interpersonal and institutional discrimination (Cerezo & Ramirez, 2020; Devakumar et al., 2020; Mata-Greve & Torres, 2020; Panaitiu et al., 2020; Schmitt et al., 2014; Speakman & Funk, 2020; Valentín-Cortés et al., 2020). Given the substantial negative consequences of prejudice and discrimination to targeted group members' mental (Blume et al., 2012; Hatzenbuehler et al., 2009; Farber et al., 2020; Meyer, 2003; Pavalko et al., 2003) and physical health (Pavalko et al., 2003; Williams & Mohammed, 2009), a large

body of research has rightfully sought to identify variables predictive of prejudicial attitudes. Two variables—social dominance orientation (SDO; Pratto et al., 1994) and right-wing authoritarianism (RWA; Altemeyer, 1981)—consistently arise as potent positive predictors of multitudinous forms and dimensions of prejudice (e.g., Asbrock et al., 2010; Duckitt & Sibley, 2007; Ekehammar et al., 2004).

Recently, social and psychological scientists (Choma & Hanoch, 2017; Holt & Sweitzer, 2020; Linden, 2017; Pettigrew, 2017; Womick et al., 2019) have turned their attention to the influences of authoritarian inclinations and the preference for the enforcement of stark social power hierarchies on attitudes and behaviors. Authoritarian leaders around the globe (Kasparov & Halvorssen, 2017; MacWilliams, 2020; Manchester, 2018; Norris & Inglehart, 2019) have risen to positions of power, seemingly unhindered by—or resulting in part from—their support for the continued suppression of socially marginalized groups (Gettleman et al., 2019; Londoño & Casado, 2020; Thrush & Haberman, 2017). Within the United States, the impassioned debate in the summer of 2020 surrounding calls to defund and restructure hierarchy-perpetuating institutions including law enforcement in the wake of the killing of George Floyd by Derek Chauvin and decades of police brutality against people of color,

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particularly Black, Indigenous, Hispanic, and Latinx people, has called considerable focus to the influences of prejudice, power, and social beliefs in shaping institutions and interpersonal relations (Andrew, 2020; Austin, 2020; Demby, 2020; Gagliano, 2020; Kaba, 2020; Madani, 2020). As the public continues to grapple with these sociopolitical issues, it is imperative that researchers investigate the ways in which the personality and ideological underpinnings of support for authoritarian leaders and intergroup dynamics characterized by dominance, privilege, and oppression predict attitudes toward and beliefs about stigmatized social groups.

Scholars have proposed models to characterize the developmental processes by which SDO and RWA predict negative attitudes (e.g., Duckitt, 2001). Although some research has attempted to investigate the interactive effects of SDO and RWA on attitudinal outcomes (Sibley et al., 2006), little research has employed moderation models to explore interactions between SDO and RWA in predicting attitudes toward derogated groups. The present study explored whether SDO and RWA act independently (i.e., main effects) or interact synergistically in predicting attitudes toward racial and ethnic minorities, women, and marginalized or otherwise socially stigmatized groups in a racially and ethnically diverse sample of college students.

## Social Dominance Orientation and Attitudes

Social dominance theory (SDT; Pratto et al., 1994; Sidanius & Pratto, 1999) proposes that human societies tend to exhibit social hierarchies whereby some groups hold an excess of positive social value (i.e., social and political power, wealth, opportunities) whereas others are plagued by a disproportionate degree of negative social value (i.e., low social and political power, poverty, legal sanctions). Under SDT, stark group disparities in social value are not the results of inherent intergroup value; rather, three processes manufacture and maintain social hierarchies: individual discrimination, institutional discrimination, and behavioral asymmetry. SDT posits that people employ “legitimizing myths” (Pratto et al., 1994, p. 741) such as racism, xenophobia, nationalism, sexism, and meritocracy to justify the proximal processes responsible for producing social hierarchies and, by extension, social hierarchies themselves. Social dominance orientation refers to the social attitudinal and ideological variance in support for, or opposition to, such legitimizing myths and social hierarchies.

Research has consistently linked social dominance orientation to various forms of prejudice. Those who are higher in SDO tend to also demonstrate higher levels of prejudice toward racial and ethnic minorities (Altemeyer, 2004; Levin et al., 2012; Poteat & Spanierman, 2012; Pratto et al., 1994; Troian et al., 2018), religious minorities (Altemeyer, 2004; Tartaglia et al., 2019; Troian et al., 2018), sexual

(Altemeyer, 2004; Metin-Orta, 2019; Poteat et al., 2007; Poteat & Mereish; Pratto et al., 1994) and gender minorities (Loo, 2016), and immigrants (Araújo et al., 2019; Cohrs & Stelzl, 2010; Levin et al., 2012). Further, people who are higher in SDO tend to report higher endorsement of sexist beliefs (Altemeyer, 2004; Austin & Jackson, 2019; Christopher et al., 2013; Pratto et al., 1994) and generalized prejudice (Duckitt & Sibley, 2007; Ekehammar et al., 2004; Levin et al., 2012; McFarland, 2010; Troian et al., 2018). SDO is additionally associated with support for policies with hierarchy perpetuating outcomes, such as punitive judicial policies (Pratto et al., 1994; Sidanius et al., 2006) and stop-and-frisk (Saunders et al., 2016), and opposition to policies that have equalizing effects, such as women’s rights (Heaven, 1999; Pratto et al., 1994), sexual minority rights (Pratto et al., 1994), race-based affirmative action (Pratto et al., 1994; Taillandier-Schmitt & Maisonneuve, 2019), and pro-environmental policies (Meleady et al., 2019; Pratto et al., 1994). Men tend to be higher in SDO than women (Poteat & Mereish, 2012; Pratto et al., 1994), and some evidence shows that SDO explains a substantial proportion of the higher levels of prejudice among men (Whitley, 1999). Additionally, those with higher levels of SDO are more politically conservative and more likely to work in hierarchical fields such as business, law enforcement, or politics as compared to those with lower levels of SDO (Pratto et al., 1994).

## Right-Wing Authoritarianism and Attitudes

Following the rise of fascism in prior decades, Adorno et al. (1950) introduced the F Scale to assess a personality-level predisposition to fascism, or authoritarianism. Altemeyer improved on the F Scale in developing a more psychometrically sound measure of right-wing authoritarianism (RWA; Altemeyer, 1981). RWA refers to the covariation of three clusters of traits: authoritarian submission (i.e., deference to socially established authorities), authoritarian aggression (i.e., hostility toward those viewed as deviant or insubordinate to authorities), and conventionalism (i.e., preference for maintaining the status quo and tradition over social change). According to this definition, an individual must display all three elements to a high degree to be considered highly right-wing authoritarian.

Findings from research into attitudes and beliefs associated with RWA largely parallel those on SDO. RWA has been positively linked to racial and ethnic prejudice (Altemeyer, 1981, 2004; Poteat & Spanierman, 2012), prejudice against religious minorities (Altemeyer, 2004; Tartaglia et al., 2019) immigrants (Araújo et al., 2019; Cohrs & Stelzl, 2010), sexual (Altemeyer, 2004; Crawford et al., 2016; Pratto et al., 1994) and gender minorities (Loo, 2016), sexism (Altemeyer, 2004; Austin & Jackson, 2019; Christopher et al., 2013; Manoussaki & Veitch, 2015; Patev et al., 2019), and generalized prejudice

(Duckitt & Sibley, 2007; Ekehammar et al., 2004; McFarland, 2010). People who score high in RWA also tend to more strongly support stop-and-frisk (Saunders et al., 2016), stigmatize abortion (Patev et al., 2019), endorse rape mythology (Manoussaki & Veitch, 2015) and oppose rights and protections for sexual minorities (Altemeyer, 1988; Pratto et al., 1994). Further, the results of an online experiment in an Italian sample indicate that RWA is associated with victim blaming for street harassment, particularly among victims who are sexualized (Spaccatini et al., 2019). Similar to people who rank high in SDO, those who are high in RWA are more likely to be politically conservative (Altemeyer, 1988). Unlike SDO, however, gender differences in RWA are not well-supported (Altemeyer, 2004, 2006; Manoussaki & Veitch, 2015).

### Development and Interactions of Social Dominance Orientation and Right-Wing Authoritarianism

RWA correlates weakly to moderately with SDO, and discriminant validity of the constructs has been well-established (Dallago et al., 2008; Pratto et al., 1994). Though SDO and RWA have largely been linked to similar affective and cognitive outcomes, the two traits may have unique developmental origins and exert their effects on attitudes and beliefs through separate pathways. The Dual Process Model (Duckitt, 2001; Duckitt & Sibley, 2007, 2010a, 2010b; Sibley & Duckitt, 2013) proposes two distinct socialization, personality, and social worldview pathways that contribute to the development of SDO and RWA, which in turn predict ingroup preference and outgroup prejudice. Specifically, people who are relatively low in openness to experience, high in conscientiousness, and perceive outgroups as threatening may develop a view of the world as a dangerous place and subsequently form a highly authoritarian disposition. For these individuals, the perception of outgroups as dangerous to the ingroup motivates their prejudicial attitudes. In contrast, an orientation toward social dominance is formed among people who are low in agreeableness and perceive outgroups as unequal or posing unwelcome competition through the development of a competitive worldview. Thus, a competitive drive to dominate over other groups stimulates prejudice for those high in SDO.

Duckitt and Sibley (2007) proposed that SDO and RWA not only develop from unique causal pathways and affect attitudes independently, but the two social attitudinal and ideological variables also lead to prejudice toward different socially marginalized groups. They found SDO to negatively predict attitudes toward groups perceived as derogated and lower on the social hierarchy (e.g., unattractive people, people with intellectual disabilities, and unemployed people), RWA to predict prejudice toward perceived dangerous groups that do not submit to established authorities (e.g., terrorists, drug

dealers, and violent criminals), and both SDO and RWA to predict attitudes toward groups viewed as dissident, or perceived to pose threats to established social norms (e.g., protesters, feminists, and atheists). Indeed, evidence supports the notion that SDO and RWA predict attitudes differentially on the basis of perceptions of a given outgroup as posing threats to hierarchies vs. authorities (Asbrock et al., 2010; Cantal et al., 2015; Cohrs & Stelzl, 2010; Duckitt & Sibley, 2007, 2010b; Thomsen et al., 2008) and predict different dimensions of prejudice (Austin & Jackson, 2019). Specifically, research has demonstrated that competitiveness mediates the association of SDO and feelings toward derogated groups, threat mediates the association of RWA on attitudes toward dangerous or deviant groups, and both threat and competitiveness mediate the associations of SDO and RWA on feelings toward a dissident group (Duckitt, 2006). Further, the results of a series of studies by Sibley et al. (2007) collectively support the DPM in indicating that SDO and RWA are associated with different dimensions of sexism in men participants. Whereas SDO predicted increased hostile sexism, RWA was associated with higher benevolent sexism. In sum, even for the groups toward which SDO and RWA both predict negative attitudes, the prejudice may stem from unique pathways.

Some research has investigated whether SDO and RWA interact with other personality and attitudinal predictors in their associations with prejudicial outcomes. For example, adherence to traditional gender roles interacted synergistically with SDO in predicting heterosexist prejudice in a Turkish sample (Metin-Orta, 2019). Additionally, a secondary data analysis of the 1992 National Election Study found that the association of RWA on attitudes was negative among participants low in humanitarianism-egalitarianism, yet participants who scored high in humanitarianism-egalitarianism demonstrated relatively favorable attitudes toward immigrants regardless of RWA level (Oyamot et al., 2006). Further, a series of studies by Kossowska et al. (2008) found anger and RWA, and SDO and fear, to interact synergistically in predicting Polish participants' prejudice toward Roma people, a group that is perceived as simultaneously low-status and threatening to Polish social conventions. These findings indicate that emotional predispositions may interact with SDO and RWA in predicting ethnic prejudice.

Research investigating the effects of SDO and RWA on social attitudes has primarily examined the associations between SDO, RWA, and attitudes independently from one another (e.g., Araújo et al., 2019; Cohrs & Stelzl, 2010; Duckitt & Sibley, 2007). Although some evidence shows that SDO and RWA interact in predicting conservatism, with high levels of either variable associated with increased conservatism yet the lowest levels of conservatism found among those low in both SDO and RWA (Wilson & Sibley, 2013), a meta-analysis found SDO and RWA to exert additive rather than interactive effects on various

dimensions of prejudice (Sibley et al., 2006). However, some evidence suggests that SDO and RWA may interact synergistically to predict attitudes. In a survey of college students and first- or second-degree relatives, Altemeyer (2004) found that participants high in both SDO and RWA demonstrated significantly more prejudiced attitudes toward racial and ethnic minorities, women, and sexual minorities as compared to those who were high in SDO but not RWA, high in RWA but not SDO, or neither. These “double highs” also scored higher than other participants in their belief in an anti-Semitic conspiracy. Not only are SDO and RWA consistently two of the strongest predictors of prejudice (e.g., Asbrock et al., 2010; Duckitt & Sibley, 2007; Ekehammar et al., 2004), but people who are high in both SDO and RWA may be especially prone to stereotypical thinking and negative attitudes (Altemeyer, 2004).

## The Present Study

Our exploratory study investigates the interplay of SDO and RWA in predicting social attitudes and beliefs. The present study consisted of secondary analysis of questionnaire data from a diverse sample of 1244 college students across two locations in the United States to probe the associations of SDO, RWA, and their interaction on numerous social attitudinal and cognitive outcomes. We took a novel approach of employing moderation analyses to examine the independent and synergistic associations of SDO and RWA with a wide array of measures. By including an expansive collection of attitudinal outcomes in our models, we aim to advance the literature on the associations among SDO and RWA on social attitudes and beliefs. Building off of Altemeyer’s (2004) research and the DPM (Asbrock et al., 2010; Duckitt, 2001; Duckitt & Sibley, 2010a, 2010b; Sibley & Duckitt, 2013), we hypothesized that we would find independent associations of SDO and attitudes toward derogated groups (i.e., modern racism, feelings toward women, Black people, Latinos, documented immigrants, unemployed people). Considering evidence that SDO is associated with antagonistic attitudes broadly (Whitley, 1999; Whitley & Lee, 2000), we also expected SDO to demonstrate an independent association with feelings toward men. We predicted that RWA would associate independently with attitudes toward perceived dangerous groups (i.e., feelings toward drug dealers and undocumented immigrants). Finally, we hypothesized that SDO and RWA would interact synergistically in their associations to attitudes toward dissident groups (i.e., old-fashioned sexism, modern sexism, feelings toward feminists and atheists).

## Method

### Participants and Procedure

Participants were recruited in 2015 from the psychology department research participant pools at a large, racially and ethnically diverse U.S. southwestern university and a large, racially and ethnically diverse U.S. southeastern university to participate in an online study. The institutional review boards at each university approved the study. All participants provided informed consent prior to beginning the study and received research credit for their participation. A total of 1277 students participated, of which 1244 provided information for SDO, RWA, racial and ethnic identity, and gender identity and were included in the analytic sample. The majority of participants identified as women ( $n = 857$ ; 68.9%) with a minority identifying as men ( $n = 387$ ; 31.1%), and the average age among the total sample was 21.54 years ( $SD = 5.17$ ). Most participants identified as racial/ethnic minorities ( $n = 732$ ; 58.8%), with 41.2% ( $n = 512$ ) identifying as non-Hispanic White, 21.6% ( $n = 269$ ) as Black or African American, 13% ( $n = 162$ ) as Hispanic or Latino, 4.7% ( $n = 58$ ) as Asian, 2.5% ( $n = 31$ ) as American Indian or Alaska Native, 0.9% ( $n = 11$ ) as Native Hawaiian or Pacific Islander, 4.6% ( $n = 57$ ) identifying with a racial or ethnic identity not listed, and 11.6% ( $n = 144$ ) identifying as more than one race or ethnicity. Most participants ( $n = 1063$ ; 86%) identified as exclusively heterosexual; a minority identified as either exclusively homosexual ( $n = 33$ ; 2.7%) or neither exclusively heterosexual nor homosexual ( $n = 140$ ; 11.3%).

### Measures

For all measures unless otherwise specified, total scores were calculated by averaging responses to all items after reverse scoring any responses when necessary such that higher scores reflect higher levels of each construct.

### Social Dominance Orientation

The Social Dominance Orientation scale constructed by Pratto et al. (1994) measures a general preference for hierarchical social structures reflecting the perceived inherent superiority of some groups over others. Participants responded to the 14 items on a 7-point Likert scale (1 = “very negative”, 7 = “very positive”). Examples of items include, “In getting what you want, it is sometimes necessary to use force against other groups,” “Inferior groups should stay in their place,” and “We should do what we can to equalize conditions for different groups” (reverse scored). The SDO scale has shown adequate reliability in past studies of college students ( $\alpha = .80$  to  $.89$ ; Kim & Berry, 2015; Pratto et al., 1994) as well as in the present sample ( $\alpha = .93$ ).

## Right-Wing Authoritarianism

The Right-Wing Authoritarianism Scale (Altemeyer, 2006) consists of 22 items scored on a 9-point Likert scale (1 = “very strongly disagree”, 9 = “very strongly agree”). Although the RWA scale captures the three elements of RWA (authoritarian submission, authoritarian aggression, and conventionalism; Altemeyer, 1981, 2006), the items assess a single factor of authoritarianism rather than three subscales as several of the items were designed to capture more than one facet of RWA simultaneously. Participants responded to such items as, “Our country desperately needs a mighty leader who will do what has to be done to destroy the radical new ways and sinfulness that are ruining us,” “It is always better to trust the judgment of the proper authorities in government and religion than to listen to the noisy rabble-rousers in our society who are trying to create doubt in people’s minds,” and “There are many radical, immoral people in our country today, who are trying to ruin it for their own godless purposes, whom the authorities should put out of action.” The RWA Scale has previously shown good internal consistency ( $\alpha = .95$ ; Womick et al., 2019), including among college students in prior research ( $\alpha = .94$ ; Altemeyer, 2006) and the present sample ( $\alpha = .92$ ).

## Modern Racism Scale

McConahay’s (1986) Modern Racism Scale (MRS) is a measure of beliefs about Black Americans, specifically regarding beliefs about Black anti-racist activists and attributions for extant racial socioeconomic disparities. The 15 items were rated on a 5-point Likert scale (1 = “strongly disagree”, 5 = “strongly agree”). Sample items included, “It is easy to understand the anger of Black people in America” (reverse scored), “Blacks should not push themselves where they are not wanted,” and “Over the past few years, Blacks have gotten more economically than they deserve.” MRS has demonstrated good internal consistency in previous studies of college students ( $\alpha = .83$ ; Poteat & Spanierman, 2012) in addition to the present sample ( $\alpha = .90$ ).

## Attitudes toward Women

The 15 item Attitudes toward Women Scale (AWS; Whatley, 2008) is an abbreviated form of Spence and Helmreich’s (1972) measure of old-fashioned sexism and traditional gender role beliefs. Items were rated on a 7-point scale (1 = “strongly disagree”, 7 = “strongly agree”). Sample items include, “Women should worry less about their rights and more about becoming good wives and mothers,” “Sons in a family should be given more encouragement to go to college than daughters,” and “There are many jobs in which men should be given preference over women in being hired or promoted.” AWS has shown good internal consistency in past research on college students ( $\alpha = .89$ ; Whatley, 2008) and the present sample ( $\alpha = .87$ ).

## Modern Sexism Scale

The Modern Sexism Scale (MSS; Swim et al., 1995) is an 8-item measure of beliefs about the presence of widespread, institutional sexism and the degree to which respondents feel dismissively about continued experiences of discrimination against women. Participants indicated on a 7-point scale (1 = “strongly disagree,” 7 = “strongly agree”) their agreement to items such as, “Discrimination against women is no longer a problem in the United States,” “Society has reached the point where women and men have equal opportunities for achievement,” and “Over the past few years, the government and news media have been showing more concern about the treatment of women than is warranted by women’s actual experiences.” MSS has demonstrated adequate internal consistency among college students ( $\alpha = .84$ ; Swim et al., 1995), including in the present sample ( $\alpha = .80$ ).

## Feeling Thermometers

Feeling thermometers were used to assess participants’ feelings of relative coldness and warmth toward various groups. Participants were asked, “On a scale from 0 to 100, how cold or warm do you feel toward” each group, including Black people, Latinos, men, women, legal immigrants, illegal immigrants (referred to in this article as documented immigrants and undocumented immigrants, respectively), drug dealers, people who are unemployed, feminists, and atheists.

## Data Analysis

Descriptive statistics were conducted with SPSS version 27, and moderation analyses were conducted with the PROCESS 3.4 macro for SPSS (Hayes, 2017). We first conducted moderation analyses (Model 1 in PROCESS) to test the synergistic associations of SDO and RWA on all dependent attitudinal measures, controlling for racial and ethnic (dichotomized as racial and ethnic minorities, non-Hispanic Whites) and gender identities (women, men). Variables were standardized prior to analyses to facilitate interpretation. Statistical significance was determined by 99% bootstrapped confidence intervals (based on 10,000 bootstrapped samples) that do not contain zero, and interactions were probed at low (1 SD below the mean), medium (average levels) and high levels (1 SD above the mean) of the moderator.

## Results

Bivariate correlations and descriptive statistics are presented in Table 1, and the results of the moderation models are displayed in Table 2. Among the moderation analyses, SDO had significant independent positive associations with modern

**Table 1** Bivariate correlations among study variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	M	SD
1. SDO	–														2.52	1.14
2. RWA	.39***	–													3.85	1.37
3. MRS	.48***	.39***	–												2.44	0.74
4. AWS	.47***	.65***	.41***	–											2.86	0.94
5. MSS	.36***	.46***	.47***	.65***	–										3.24	0.94
6. FT: Blacks	-.32***	-.14***	-.38***	-.21***	-.15***	–									77.12	27.24
7. FT: Latinos	-.33***	-.16***	-.24***	-.22***	-.13***	.70***	–								74.96	28.81
8. FT: Men	-.15***	-.10***	-.11***	-.18***	-.08**	.57***	.56***	–							78.56	26.70
9. FT: Women	-.21***	-.14***	-.14***	-.24***	-.16***	.59***	.59***	.61***	–						85.04	24.25
10. FT: documented immigrants	-.27***	-.17***	-.17***	-.23***	-.15***	.59***	.59***	.62***	.56***	–					76.25	29.10
11. FT: undocumented immigrants	-.26***	-.18***	-.28***	-.15***	-.12***	.41***	.41***	.43***	.43***	.43***	–				44.59	34.07
12. FT: drug dealers	-.02	-.11***	-.11***	.04	.05	.19***	.16***	.29***	.29***	.35***	.16***	–			23.62	29.39
13. FT: unemployed	-.31***	-.21***	-.31***	-.20***	-.18***	.50***	.48***	.10***	.37***	.16***	.31***	.31***	–		55.03	31.45
14. FT: feminists	-.32***	-.33***	-.27***	-.34***	-.31***	.45***	.46***	.45**	.44***	.44***	.40***	.45***	.45***	–	60.29	33.65
15. FT: Atheists	-.20***	-.49***	-.17***	-.31***	-.19***	.34***	.41***	.33***	.29**	.40***	.36***	.28***	.41***	.41***	52.83	36.68

\*\*\**p* < .05, \*\**p* < .01, \**p* < .001. SDO Social Dominance Orientation, RWA Right-Wing Authoritarianism, MRS Modern Racism Scale, AWS Attitudes toward Women Scale, MSS Modern Sexism Scale, FT feeling thermometer

**Table 2** Summary of effects of social dominance orientation, right-wing authoritarianism, and their interaction on attitudinal outcomes

Modern racism scale					
Model information: $n = 1244$ ; $R^2 = .35$	$\beta$	$SE$	$t$	$p$	99% CI
Social dominance orientation (SDO)***	.36	.03	14.18	<.001	.30, .43
Right-wing authoritarianism (RWA)***	.27	.03	10.68	<.001	.21, .34
SDO $\times$ RWA	-.03	.02	-1.19	.234	-.09, .03
Effect of SDO at low (1 SD below mean) RWA***	.39	.04	10.66	<.001	.29, .48
Effect of SDO at average RWA***	.36	.03	14.18	<.001	.30, .43
Effect of SDO at high (1 SD above mean) RWA***	.33	.03	10.40	<.001	.25, .42
Attitudes toward women scale					
Model information: $n = 1242$ ; $R^2 = .51$	$\beta$	$SE$	$t$	$p$	99% CI
Social dominance orientation (SDO)***	.22	.02	9.84	<.001	.16, .27
Right-wing authoritarianism (RWA)***	.55	.02	25.12	<.001	.50, .61
SDO $\times$ RWA**	.06	.02	3.18	.002	.01, .11
Effect of SDO at low (1 SD below mean) RWA***	.15	.03	4.86	<.001	.07, .23
Effect of SDO at average RWA***	.22	.02	9.83	<.001	.16, .27
Effect of SDO at high (1 SD above mean) RWA***	.28	.03	10.08	<.001	.21, .35
Modern sexism scale					
Model information: $n = 1238$ ; $R^2 = .29$	$\beta$	$SE$	$t$	$p$	99% CI
Social dominance orientation (SDO)***	.19	.03	7.15	<.001	.12, .26
Right-wing authoritarianism (RWA)***	.37	.03	14.05	<.001	.31, .44
SDO $\times$ RWA	-.03	.02	-1.25	.211	-.09, .03
Effect of SDO at low (1 SD below mean) RWA***	.22	.04	5.79	<.001	.12, .32
Effect of SDO at average RWA***	.19	.03	7.15	<.001	.12, .26
Effect of SDO at high (1 SD above mean) RWA***	.16	.03	4.77	<.001	.07, .25
Feeling thermometer: blacks					
Model information: $n = 1233$ ; $R^2 = .11$	$\beta$	$SE$	$t$	$p$	99% CI
Social dominance orientation (SDO)***	-.30	.03	-10.22	<.001	-.38, -.23
Right-wing authoritarianism (RWA)	-.03	.03	-0.92	.358	-.10, .05
SDO $\times$ RWA	-.01	.03	-0.48	.634	-.08, .06
Effect of SDO at low (1 SD below mean) RWA***	-.29	.04	-6.83	<.001	-.40, -.18
Effect of SDO at average RWA***	-.30	.03	-10.21	<.001	-.38, -.23
Effect of SDO at high (1 SD above mean) RWA***	-.32	.04	-8.47	<.001	-.41, -.22
Feeling thermometer: Latinos					
Model information: $n = 1234$ ; $R^2 = .11$	$\beta$	$SE$	$t$	$p$	99% CI
Social dominance orientation (SDO)***	-.31	.03	-10.27	<.001	-.38, -.23
Right-Wing Authoritarianism (RWA)	-.05	.03	-1.67	.095	-.13, .03
SDO $\times$ RWA	-.01	.03	-0.54	.592	-.08, .06
Effect of SDO at low (1 SD below mean) RWA***	-.29	.04	-6.83	<.001	-.40, -.18
Effect of SDO at average RWA***	-.31	.03	-10.27	<.001	-.38, -.23
Effect of SDO at high (1 SD above mean) RWA***	-.32	.04	-8.56	<.001	-.42, -.22
Feeling thermometer: Men					
Model information: $n = 1232$ ; $R^2 = .04$	$\beta$	$SE$	$t$	$p$	99% CI
Social dominance orientation (SDO)***	-.14	.03	-4.49	<.001	-.22, -.06
Right-wing authoritarianism (RWA)	-.03	.03	-0.90	.369	-.11, .05
SDO $\times$ RWA	.02	.03	0.60	.546	-.06, .09
Effect of SDO at low (1 SD below mean) RWA***	-.16	.04	-3.51	<.001	-.27, -.04
Effect of SDO at average RWA***	-.14	.03	-4.49	<.001	-.22, -.06
Effect of SDO at high (1 SD above mean) RWA**	-.12	.04	-3.13	.002	-.22, -.02
Feeling thermometer: Women					
Model information: $n = 1229$ ; $R^2 = .06$	$\beta$	$SE$	$t$	$p$	99% CI

**Table 2** (continued)

Social dominance orientation (SDO)***	−.18	.03	−5.71	<.001	−.26, −.10
Right-wing authoritarianism (RWA)*	−.07	.03	−2.12	.035	−.14, .01
SDO× RWA	−.01	.03	−0.24	.810	−.08, .07
Effect of SDO at low (1 SD below mean) RWA***	−.17	.04	−3.83	<.001	−.28, −.06
Effect of SDO at average RWA***	−.18	.03	−5.71	<.001	−.26, −.10
Effect of SDO at high (1 SD above mean) RWA***	−.18	.04	−4.72	<.001	−.28, −.08
Feeling thermometer: documented immigrants					
Model information: $n = 1231$ ; $R^2 = .08$	$\beta$	<i>SE</i>	<i>t</i>	<i>p</i>	99% CI
Social dominance orientation (SDO)***	−.25	.03	−8.18	<.001	−.33, −.17
Right-Wing Authoritarianism (RWA)*	−.07	.03	−2.25	.025	−.15, .01
SDO× RWA	−.00	.03	−0.11	.910	−.07, .07
Effect of SDO at low (1 SD below mean) RWA***	−.25	.04	−5.64	<.001	−.36, −.13
Effect of SDO at average RWA***	−.25	.03	−8.18	<.001	−.33, −.17
Effect of SDO at high (1 SD above mean) RWA***	−.25	.04	−6.59	<.001	−.35, −.15
Feeling thermometer: undocumented immigrants					
Model information: $n = 1231$ ; $R^2 = .12$	$\beta$	<i>SE</i>	<i>t</i>	<i>p</i>	99% CI
Social dominance orientation (SDO)***	−.23	.03	−7.67	<.001	−.30, −.15
Right-Wing Authoritarianism (RWA)***	−.11	.03	−3.79	<.001	−.19, −.04
SDO× RWA*	.06	.03	2.12	.034	−.01, .13
Effect of SDO at low (1 SD below mean) RWA***	−.28	.04	−6.70	<.001	−.39, −.18
Effect of SDO at average RWA***	−.23	.03	−7.68	<.001	−.30, −.15
Effect of SDO at high (1 SD above mean) RWA***	−.17	.04	−4.58	<.001	−.27, −.07
Feeling thermometer: drug dealers					
Model information: $n = 1235$ ; $R^2 = .04$	$\beta$	<i>SE</i>	<i>t</i>	<i>p</i>	99% CI
Social dominance orientation (SDO)	.01	.03	0.28	.778	−.07, .09
Right-wing authoritarianism (RWA)***	−.12	.03	−3.99	<.001	−.20, −.04
SDO× RWA**	.08	.03	2.81	.005	.01, .15
Effect of SDO at low (1 SD below mean) RWA	−.07	.04	−1.58	.115	−.18, .04
Effect of SDO at average RWA	.01	.03	0.28	.781	−.07, .09
Effect of SDO at high (1 SD above mean) RWA*	.09	.04	2.24	.025	−.01, .19
Feeling thermometer: unemployed					
Model information: $n = 1233$ ; $R^2 = .11$	$\beta$	<i>SE</i>	<i>t</i>	<i>p</i>	99% CI
Social dominance orientation (SDO)***	−.27	.03	−9.20	<.001	−.35, −.20
Right-wing authoritarianism (RWA)***	−.11	.03	−3.78	<.001	−.19, −.04
SDO× RWA	.01	.03	0.19	.851	−.06, .07
Effect of SDO at low (1 SD below mean) RWA***	−.28	.04	−6.54	<.001	−.39, −.17
Effect of SDO at average RWA***	−.27	.03	−9.20	<.001	−.35, −.20
Effect of SDO at high (1 SD above mean) RWA***	−.27	.04	−7.18	<.001	−.37, −.17
Feeling thermometer: Feminists					
Model information: $n = 1229$ ; $R^2 = .19$	$\beta$	<i>SE</i>	<i>t</i>	<i>p</i>	99% CI
Social dominance orientation (SDO)***	−.20	.03	−6.83	<.001	−.27, −.12
Right-wing authoritarianism (RWA)***	−.24	.03	−8.39	<.001	−.31, −.17
SDO× RWA	−.01	.03	−0.37	.711	−.08, .06
Effect of SDO at low (1 SD below mean) RWA***	−.19	.04	−4.53	<.001	−.29, −.08
Effect of SDO at average RWA***	−.20	.03	−6.83	<.001	−.27, −.12
Effect of SDO at high (1 SD above mean) RWA***	−.20	.04	−5.70	<.001	−.30, −.11
Feeling thermometer: Atheists					
Model information: $n = 1231$ ; $R^2 = .26$	$\beta$	<i>SE</i>	<i>t</i>	<i>p</i>	99% CI
Social dominance orientation (SDO)	−.02	.03	−0.64	.521	−.09, .05
Right-wing authoritarianism (RWA)***	−.47	.03	−17.37	<.001	−.54, −.40
SDO× RWA	.00	.02	0.11	.909	−.06, .07
Effect of SDO at low (1 SD below mean) RWA	−.02	.04	−0.52	.603	−.12, .08
Effect of SDO at average RWA	−.02	.03	−0.64	.521	−.09, .05
Effect of SDO at high (1 SD above mean) RWA	−.01	.03	−0.43	.668	−.10, .07

\*\*\*\*\*Note.  $p < .05$ ,  $p < .01$ ,  $p < .001$ . Significant effects were determined by a 99% percentile bootstrapped confidence interval (based on 10,000 bootstrapped samples) that does not contain zero. All analyses were performed controlling for racial and gender identity

racism and modern sexism. Additionally, SDO was significantly negatively associated with feelings toward Black people, Latinos, women, men, documented and undocumented immigrants, people who are unemployed, and feminists.

SDO was not significantly associated with feelings toward drug dealers or atheists.

As did SDO, RWA had significant independent positive associations with modern racism and modern sexism, and



significant negative associations with feelings toward undocumented immigrants, people who are unemployed, and feminists. Further, RWA was significantly negatively associated with feelings toward drug dealers and atheists. Contrary to SDO, RWA was not significantly associated with feelings toward Black people, Latinos, women, men, or documented immigrants.

### Interaction Effects

Contrary to our predictions, the 13 moderation models tested uncovered only one hypothesized significant interaction of SDO  $\times$  RWA. The association of SDO and endorsement of traditional gender roles as measured by AWS was stronger as levels of RWA increased (i.e., a synergistic effect). Specifically, we probed the synergistic interaction by comparing the association of SDO and old-fashioned sexism at low (1 SD below the mean), average, and high (1 SD above the mean) levels of RWA and found that the positive association strengthened at higher levels of RWA.

SDO and RWA additionally interacted in predicting feelings toward drug dealers. We first probed the interaction by comparing the association of SDO and feelings toward drug dealers at low (1 SD below the mean), average, and high (1 SD above the mean) levels of RWA but found the association of SDO was nonsignificant at those levels of RWA. We used the Johnson-Neyman procedure (Hayes & Matthes, 2009) to further probe the interaction and found that the association of SDO and feelings toward drug dealers was nonsignificant at and below 1.47 SD above the mean of RWA (95.47% of the sample); however, for those who scored in the highest 4.53% of RWA (1.68 to 3.29 SD above the mean), SDO was increasingly, positively associated with feelings toward drug dealers as RWA increased ( $\beta = .14$  to  $.27$ ).

### Discussion

Past research has shown repeatedly that SDO and RWA are two of the most reliable and powerful predictors of prejudice (Altemeyer, 1988; Duckitt & Sibley, 2010a; McFarland, 2010). Results from cross-sectional and longitudinal data indicate that SDO and RWA are independently associated with prejudice toward various socially marginalized groups (Altemeyer, 2004; Araújo et al., 2019; Cohrs & Stelzl, 2010; Loo, 2016; Pratto et al., 1994; Tartaglia et al., 2019). However, prior evidence also shows that SDO and RWA interact in their associations with social attitudes and beliefs, with those who score high on both constructs indicating higher prejudice as compared to others (Altemeyer, 2004). The present study used moderation analyses on secondary cross-sectional questionnaire data to probe synergistic and

independent associations of SDO and RWA on multiple affective and cognitive outcomes.

We found both SDO and RWA to be significantly and positively associated with measures of anti-Black racism and both old-fashioned and modern sexism, and negatively with feelings toward unemployed people, undocumented immigrants, and feminists. SDO was further independently associated with colder feelings toward Black people, Latinos, women, men, and documented immigrants, and RWA was negatively associated with feelings toward atheists and drug dealers. As we hypothesized, SDO and RWA interacted synergistically in predicting higher levels of old-fashioned sexism. We additionally found an unpredicted interaction of SDO and RWA on feelings toward drug dealers, finding that SDO was associated with more positive feelings toward drug dealers only at the highest levels of RWA.

Our findings largely supported our predictions that SDO would be independently associated with negative attitudes toward most groups, particularly derogated groups (i.e., feelings toward Black people, Latinos, women, men, documented immigrants, and unemployed people). Additionally, RWA was associated with feelings toward drug dealers and undocumented immigrants, perceived dangerous groups. As we anticipated, both SDO and RWA were associated with prejudice toward perceived dissident groups as indicated by higher modern sexism scores and lower feelings toward feminists. Further, the synergistic interaction of SDO and RWA on the attitudes toward women scale supported our hypothesis that endorsement of old-fashioned sexism would be strongest among those who are high in both right-wing authoritarianism and social dominance orientation. This finding provides additional evidence that “double highs” may demonstrate the highest levels of some forms of prejudice, as Altemeyer (2004) observed.

Whereas some of the moderation results supported our hypotheses, other findings were unexpected. First, we did not predict the associations of RWA and modern racism or feelings toward unemployed people. The positive association of RWA and anti-Black racism is perhaps unsurprising given prior research that has linked right-wing authoritarianism to racially prejudicial attitudes (Altemeyer, 1981, 2004; Poteat & Spanierman, 2012). Although speculative, we contend that conservatism may mediate the association of RWA on feelings toward unemployed people (Altemeyer, 1988) given conservative opposition to unemployment benefits (Cochrane & Tankersley, 2020). Second, the unpredicted association of SDO on feelings toward undocumented immigrants may be understood in light of findings that SDO is associated with negative attitudes toward immigrants generally (Araújo et al., 2019; Cohrs & Stelzl, 2010; Levin et al., 2012). Whereas RWA may predict negative feelings toward undocumented immigrants due to a perceived threat to immigration laws, the association of SDO on feelings toward undocumented

immigrants may instead stem from a lower societal status and relative vulnerability compared to immigrants living in the US with documentation and citizens. Third, the finding that SDO did not significantly predict feelings toward atheists also subverted our expectations but may reflect the high-power status of atheists and non-religious people in the United States (Hays, 2016). Fourth, the surprising positive association of SDO and feelings toward drug dealers at high levels of RWA further defied expectations. Whereas it may be the case that SDO is associated with warmer feelings toward drug dealers among those highest in RWA, it is possible that response bias may have influenced this result, and we stress the importance of replicating this finding prior to asserting its contribution to the literature.

Although our results overall did not support our predictions that SDO and RWA would interact synergistically in predicting prejudice toward perceived dissident groups (i.e., modern sexism scores, feelings toward feminists and atheists) or Altemeyer's (2004) findings that those high in both SDO and RWA report significantly more globally prejudicial attitudes than people high in one trait but not the other or neither trait, the DPM (Duckitt, 2001; Duckitt & Sibley, 2007, 2010a, 2010b; Sibley & Duckitt, 2013) illuminates potential explanations for our results. Our findings are largely consistent with the results from Duckitt and Sibley's (2007) study investigating the differential effects of SDO and RWA on attitudes toward derogated, dangerous, and dissident groups. Overall, our findings provide further evidence of additive—rather than interactive—associations of SDO and RWA on multitudinous attitudinal outcomes (Sibley et al., 2006) and widespread associations of SDO with negative attitudes broadly (Whitley, 1999; Whitley & Lee, 2000).

Several limitations of the present study are important to note. Primarily, causal attributions to the aforementioned findings are not possible as this study examined cross-sectional data. Future research that aims to draw causal conclusions about the associations of SDO and RWA on attitudes should employ longitudinal or experimental designs. Moreover, we examined a large number of interactions. To be conservative, we used 99% confidence intervals instead of 95% confidence intervals, lowering our alpha to .01 per analysis rather than the customary .05 given our large sample size. Nonetheless, future research is needed to replicate our findings to confirm that significant findings were not due to Type 1 error. Additionally, this study relied on self-report measures with high face validities. We were therefore unable to control for any impact of self-serving bias on respondents' willingness to report their authentic attitudes and beliefs about potentially sensitive subjects such as racial or sexist prejudice. Although our participants represented diverse racial and ethnic identities, we did not have the statistical power to examine differences in the relationships among SDO, RWA, and the outcome variables studied for participants of specific racial and

ethnic groups. Additionally, the temporal and situational setting is vital to contextualizing research investigating social attitudes and beliefs, and it is currently unknown whether our findings are limited in generalizability to American college students.

Despite these limitations, this study provides several important contributions to the literature on the associations between SDO, RWA, and various social affective and cognitive outcomes. The present study was comprehensive in analyzing the independent and interactive associations of SDO and RWA on a litany of social groups that have largely been assessed in isolation. Of particular value was the inclusion of multiple types of measures (i.e., scales and feeling thermometers), which assess different aspects of beliefs about and attitudes toward groups. Specifically, feeling thermometers are powerful indicators of affective orientations toward social groups, and a feeling thermometer capturing warmth felt toward Black people assesses a distinct construct compared to a score of modern racism. The large sample size provided ample statistical power to detect associations, thus offering confidence that null findings are not likely the result of an underpowered analytic sample. Additionally, the racial and ethnic diversity of our sample distinguishes this study in generalizability in a discipline dominated by research on majority non-Hispanic White samples. Future research should attempt to replicate and extend Altemeyer's (2004) findings by including yet unexamined social attitudinal and beliefs measures so that researchers may better understand the extent of and limits to (Sibley et al., 2006) the potential interaction of high levels of SDO and RWA. Furthermore, prior research that has found moderating influences of emotions (Kossowska et al., 2008) or personality traits (Metin-Orta, 2019; Oyamoto et al., 2006) suggests that other variables may attenuate the effects of a high orientation toward social dominance and/or authoritarianism on attitudinal outcomes. More work is needed to identify other exacerbating and buffering factors on the effects of SDO, RWA, and their interaction on prejudicial attitudes and negative beliefs as well as effective bias-reducing interventions tailored for people with various SDO and RWA profiles so that rigorous scientific methods may inform future education and training.

**Data Availability Statement** Data and analytic outputs are available at [osf.io/ytqzn](https://osf.io/ytqzn).

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## Compliance with Ethical Standards

**Ethical Approval** All procedures performed in our study were approved by the institutional review board at the participating university (blinded for review) and in accordance with the ethical standards of the 1964 Helsinki declaration and its later amendments.

**Informed Consent** Informed consent was obtained from all individual participants included in the present study.

**Conflict of Interest** The authors have no relevant financial or non-financial interests to disclose.

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