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Anti-Black attitudes predict decreased concern about COVID-19 among Whites in the U.S. and Brazil☆

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ABSTRACT

Rationale: From the earliest days of the COVID-19 pandemic, public health officials and news organizations reported pervasive racial disparities in the infection, morbidity, and mortality of the virus. In both the U.S. and Brazil, Black, Native, and mixed-race individuals were more negatively impacted by COVID-19 than White people. Simultaneously, significant social factions downplayed the threat and insisted on living "normally". We examined how these two factors coexisted.
Objective: We sought to establish whether Whites' anti-Black attitudes predicted their concern about the pandemic and tendency to behave in ways that exacerbated the pandemic.
Methods: and Results: In five studies, conducted in two countries (total $N = 3425$), we found that anti-Black attitudes (above and beyond political orientation, White racial identification, and perceptions of racial disparities) were associated with less concern about COVID-19, lower adoption of health and social distancing behaviors, and greater interest in returning to normalcy.
Discussion: We discuss how efforts to combat anti-Blackness may improve the health of the general population.

1. Introduction

As COVID-19 began to take hold in the U.S., White supremacists discussed strategies to spread the illness in non-White neighborhoods (Sheth, 2020). Similarly, in Brazil, there have been institutional efforts to spread the virus among Indigenous, Black, and mixed-race populations (CEPEDISA/FSP/USP & Conectas Direitos Humanos, 2021). How then did "everyday" White people respond to learning that COVID-19 was disproportionately affecting racial minorities?

Because news about COVID-19 was almost immediately tied to racial disparity information, we explore the possibility that racial attitudes predicted responses to the disease. Specifically, we propose that greater anti-Black attitudes, as operationalized by modern racism (McConahay, 1986), are associated with lower concern about COVID-19, less social distancing, and fewer health-maintenance behaviors for White Americans and White Brazilians. Thus, seemingly race-neutral personal decisions (such as whether to wear a mask, stay home, or become vaccinated), may actually be guided by anti-Blackness.

1.1. Racism drives health disparities

Racism and social disparities are significant issues in the U.S. and Brazil that contribute to health disparities. In the U.S., the American Heart Association released a call to action arguing that racism is a fundamental driver of health disparities (Churchwell et al., 2020). Similarly, the American Public Health Association and the Centers for Disease Control and Prevention (CDC) have described racism as a public health crisis (APHA, 2021; CDC, 2021). Numerous reviews highlight divergent health outcomes for Black and White Americans even after controlling for socioeconomic factors and insurance (e.g., Williams,

☆ Details of each individual study including study materials and stimuli, correlation tables, data, code, and links to preregistered hypotheses, analyses, and exclusion criteria have been made available on OSF: https://osf.io/34a7y/?view_only=5c025b1f11904744b5f924b57d816c64.

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1999; Williams & Mohammad, 2013). Similarly, in Brazil, White people outlive Black people even when controlling for socioeconomic differences (Chiavegatto Filho et al., 2014). Thus, it is not simply the case that Black people are inclined to work in more hazardous conditions, have lower income, wealth, or education; scholars and practitioners increasingly recognize that racism itself contributes to disparate health outcomes.

Given the pervasive national and international trends related to health differences, it is no wonder that, as the COVID-19 pandemic spread, racial disparities also emerged. The CDC reported that racial/ethnic minorities in the U.S. were more prone to illness, hospitalization, and death resulting from COVID-19 than their White counterparts (CDC, 2020; Johnson et al., 2021), even after adjusting for patient sociodemographic and clinical characteristics (Asch et al., 2021). Although life expectancy decreased across the board in the U.S. in 2020, the drop was more pronounced among Black and Latinx populations than among White populations (see Bosman et al., 2021).

Likewise, the COVID-19 pandemic has highlighted racial disparities and unequal access to healthcare in Brazil (Baqui et al., 2020; Peres et al., 2021). Across all Brazilian regions, there are higher COVID-19 fatality rates in Black populations relative to the White populations (Martins-Filho et al., 2021). Black and mixed-race people are less often admitted to the ICU and in-hospital mortality is higher for them than it is for White people (even though White people are more likely to be hospitalized (da Conceição Silva, 2020)).

Like other health disparities, racism likely contributes to racial differences in COVID-19 outcomes — beyond preexisting health, occupation, and insurance differences. Racial minorities, and Black people in particular, have suffered from COVID-19 more than White people have (Rogers et al., 2020), and racism is one probable cause (Brown, 2020; Khazanchi et al., 2020).

We know that at least some racial disparities are associated with structural racism (e.g., patient race predicts admission to particular hospitals and thus mortality (Asch et al., 2021)), but racial disparities are also driven by *interpersonal* racism, racist practices, and from doctor's biased behavior. White doctors, for example, endorse false beliefs about biological race differences such as the belief that the Black body is stronger than the White body, and these beliefs contribute to less accurate pain treatment for Black pain sufferers (Hoffman et al., 2016).

Although healthcare professionals' biases can impact health, how might this process manifest at a larger scale? It is critical to understand how individuals' self-reported behavior might shape community health and to thus understand predictors of individuals' health behaviors that contribute to disease spread.

1.2. Social factors affect health behaviors and concern about COVID-19

Political orientation is a clear predictor of concern about COVID-19 and subsequent adoption of health behaviors. In both the U.S. and Brazil, the presidents at the start of the pandemic (Trump and Bolsonaro) explicitly downplayed the threat of disease initially (Hamblin, 2020; Lasco, 2020; Taylor, 2021). Their conservative governments and base followed suit and contributed to a partisan divide. For example, political conservatives in the U.S. reported less worry about catching COVID-19 (Calvillo et al., 2020) and were less inclined to physically distance themselves from others to stop its spread than liberals (Gollwitzer et al., 2022). Similarly, the Brazilian president lashed out at local leaders who implemented lockdowns (Friedman, 2020). The politicization of health has shaped preventive health measure adoption, with stronger adherence among left-wing than right-wing partisans (e.g., Farias and Pilati, 2020; Van Bavel et al., 2020). Although it is possible that conservatives were simply following their leaders (see Adorno et al., 1950), it is also possible that *racial attitudes* — which covary with political orientation (see Whitley and Kite, 2006 for review) — can help explain partisan differences.

Racial health disparities were regularly featured in early reporting on the pandemic, so knowledge of them may have also affected attitudes toward COVID-19. The World Health Organization (WHO) declared a global pandemic on March 11, 2020 (Cucinotta and Vanelli, 2020), and the CDC reported racial disparities that month (see Turner et al., 2020). Popular news outlets began reporting about racial disparities just weeks later (e.g., in the U.S. (Eligon et al., 2020; Kaur, 2020) and Brazil (see Caldwell and Araújo, 2020; Mena, 2020)). Further, there is evidence that people tend to associate illness with particular groups (e.g., Darling-Hammond et al., 2020), and those associations may shape responses to disease (e.g., Esparza, 2020). Thus, it is likely that early on, people began to associate COVID-19 with racial minorities.

Perhaps knowing that people of color (POC) were more likely to become infected and have worse health outcomes gave White people the license to downplay the severity of COVID-19. Many White people may have thought themselves less susceptible. Others, perhaps concerned about racial demographic shifts (Craig et al., 2018), may have viewed the pandemic as an opportunity to decrease the POC population — particularly if they had negative attitudes toward Black people.

1.3. Current research

Studies 1–3 examined how modern racism predicted COVID-19 attitudes in U.S. samples. Study 4 attempted to manipulate both racial disparity information and racial attitudes in the U.S. to determine the *causal* role of racism. We also report Study 5, which examined how racism predicts COVID-19 attitudes and support for policies that contribute to structural health inequality in Brazil (e.g., support for defunding public health initiatives).

The original goal of Studies 1–2 was to examine the role of racial disparity information on COVID-19 attitudes. We either measured or attempted to manipulate racial disparity information to examine its effect. We predicted (as Skinner-Dorkenoo et al. (2022) did) that greater disparity awareness would be associated with Whites' lower concern about COVID-19, but we did not find support for predictions for the most part. Our manipulations were effective (based on manipulation checks), but we did not find significant movement on most outcomes of interest, so we shifted focus to predictions related to racial bias. Across studies, we predicted that (above and beyond political ideology) greater racism would be associated with less concern about the severity of COVID-19, greater denial of health disparities, and less support for healthcare infrastructure. Essentially, we predicted that individuals' racism would be associated with behaviors likely to exacerbate the pandemic.

Throughout our investigation, we utilized the modern racism scale (McConahay, 1986) to assess anti-Blackness. Modern racism is conceptualized as a form of prejudice that is often expressed indirectly and thus differs from so-called "old fashioned racism", which is overt and explicit. The modern racism scale is ideal to assess racial antipathy in individuals motivated to appear non-prejudiced. Furthermore, the measure has been validated in both U.S. (McConahay, 1986) and Brazilian (Santos et al., 2006) contexts.

Extant research suggests that racist attitudes are related to COVID-19 incidence at the county level. For example, racial demographics and racial attitudes (implicit and explicit) positively correlate with COVID-19 incidence (Cunningham and Wigfall, 2020). Specifically, virus rates in the U.S. are highest in high-density Black counties with relatively high racism (even when controlling for a myriad of county demographic characteristics). Aggregated implicit attitudes theoretically reflect bias embedded in structures and systems (Payne et al., 2017). Thus, this evidence suggests that more racist environments lead to worse health, but how? It could be the case that racist environments shape disparate treatment (e.g., hospital admissions; Asch et al., 2021) through a passive process. In contrast, as we suggest, individual racism may predict individual *choices* and *behaviors* that also accentuate disease. We also suggest and test that Whites' racial attitudes predict self-reported behavior. Given self-reported COVID-19 behavior corresponds to actual actions (Gollwitzer et al., 2020), lax attitudes reported in this research may give

rise to greater COVID-19 incidence.

2. Studies 1–4: mega-analysis

We conducted four studies to examine predictors of concern about COVID-19. All studies tested whether racism predicted decreased concern about COVID-19. Three of these studies attempted to manipulate perceptions of COVID-19 racial disparities. We tested whether White Americans would report less concern about COVID-19 after learning that Black and Hispanic Americans are more likely to be infected by and die from COVID-19 than Whites. Even though methods for the studies varied slightly, they included a control condition and a condition that increased the salience of race disparities. To economize the length of this article, we combine data from Studies 1–4 and report a mega-analysis, in which raw data are pooled across studies (see Curran and Hussong, 2009). Details of each individual study including study materials and stimuli, correlation tables, data, code, and links to preregistered hypotheses, analyses, and exclusion criteria have been made available on OSF (Miller et al., 2022).

3. Methods

3.1. Participants

S1 Sample. We recruited 204 participants through Prime Panels. Prime Panel samples are more diverse than those from Amazon Mechanical Turk (Chandler et al., 2019). We removed data from 17 participants who did not report being exclusively White, four who were born outside the U.S, and seven participants who missed at least one of three attention checks (e.g., "Please choose Strongly Disagree"). We report data for 176 White participants born in the U.S. (55.1% women, 43.2% men, *M* age = 39.51, *SD* = 12.58). The data were collected on May 8, 2020.

S2 Sample. We recruited 302 participants through Prime Panels. We removed data from 21 participants who did not report being exclusively White, nine who were born outside the U.S., 14 who missed at least one of three attention checks, and three participants who missed a reading comprehension check. We report data for 255 White participants born in the U.S. (57.3% women, 42.4% men, *M* age = 38.86, *SD* = 13.10). The data were collected on May 12–14, 2020.

S3 Sample. We recruited 1293 participants through Prime Panels. We removed data from 72 participants who did not report being exclusively White, 60 who were born outside the U.S., 77 who missed an attention check, and then 106 participants who missed a True-False comprehension check. We report data for 978 White participants born in the U.S. (63.1% women, 36.6% men, *M* age = 53.46, *SD* = 16.21). The data were collected on June 13, 2020.

S4 Sample. We recruited 1804 participants through Prime Panels. We removed data from 102 participants who did not report being exclusively White, 19 who were living outside the U.S., and 199 participants who missed attention or comprehension checks. We report data for 1484 White participants living in the U.S. (60.2% women, 38.5% men, *M* age = 49.44, *SD* = 16.88). The data were collected on January 19, 2021.

We combined data from these four studies for the purpose of the mega-analysis (i.e., we pooled the raw data of these studies for these analyses). Below, we report data for a total of 2893 White, U.S. participants (60.6% women, *M* age = 49.08, *SD* = 16.78).

3.2. Individual study procedures

S1 Procedure. Participants completed the measures described below and reported demographic characteristics.

S2 Procedure. Participants were randomly assigned to one of three conditions. In all conditions, participants read a short passage about disparities in COVID-19 cases and deaths. In the *racial disparities* condition, participants read about how Hispanic and especially Black Americans are overrepresented in COVID-19 cases and death counts. Participants assigned to the *structural racial disparities* condition read that these disparities are caused by systemic and structural racism like housing segregation and overrepresentation in essential occupations. In the *control* condition, participants read about COVID-19 *age disparities*: that older Americans are more likely to be hospitalized and are more likely to die from COVID-19 than younger people. Participants completed a True-False comprehension check and then completed measures described below for this and the following two experiments.

S3 Procedure. Participants were randomly assigned to one of three conditions. The *structural racial disparities* condition featured an article similar to the one in Study 2. Participants in the *control* condition viewed an article about how COVID-19 spreads and differs from the flu. In the *Whites dying* condition, participants read an article emphasizing that even though White Americans are underrepresented in COVID-19 cases and deaths, White Americans still make up a plurality of cases and related death counts. All conditions emphasized the severity of COVID-19, but only the experimental conditions decomposed this severity by race.

S4 Procedure. Participants were first randomly assigned to either read about the increasing racial and ethnic diversity of the United States in the *increasing diversity* condition (Craig and Richeson, 2014b) or about fluctuations in the moving rate in America in the *control change* condition (adapted from Craig and Richeson, 2014b). Participants were then randomly assigned to read an article designed to manipulate salience of disparities: *structural racial disparities* condition or the *control* condition (similar to those in Study 3). Thus, we utilized a 2 (Diversity: *increasing diversity* vs. *control change*) x 2 (Racial Disparities: *structural racial disparities* vs. *control*) design.

3.3. Measures

All measures were assessed on a 1 (*Strongly Disagree*) to 7 (*Strongly Agree*) scale and were nearly identical in each study unless otherwise noted. Missing data were infrequent. All variables had less than 1% of missingness.

Perceptions of **racial disparities** were measured with six items (e.g., "COVID-19 is disproportionately affecting African Americans"). The measure served as a predictor in all studies and a manipulation check in Studies 2–4. **Modern racism** (*M* = 3.00, *SD* = 1.46) was measured with eight items (McConahay, 1986) (e.g., "Discrimination against Blacks is no longer a problem in the United States."). We also measured **White racial identification (ID)** (*M* = 3.20, *SD* = 1.46) with the centrality subscale of the Collective Self-Esteem Scale (Luhtanen and Crocker, 1992) (e.g., "Being White is an important reflection of who I am") because we thought it might covary with modern racism and should be included as a control.

Political orientation (*M* = 4.01, *SD* = 1.83) was assessed by "When it comes to politics, do you usually consider yourself to be liberal, conservative, or moderate?" in Studies 1–2 and "In general, do you think of yourself as _____?" in Studies 3–4. These items were anchored at 1 (*Very Liberal*) and 7 (*Very Conservative*). We were interested in the unique effect of racial attitudes above and beyond political orientation given the established relationship between conservatism and concern about COVID-19 (see above). Thus, we used political orientation as a covariate in non-experimental analyses.

We assessed concern about COVID-19 with many measures: **COVID-19 severity** was measured with seven items (e.g., "COVID-19 is a serious issue that needs to be addressed") in all studies. **Desire to return to normalcy** was measured with six items (e.g., "Even though people may die, we can't keep living in fear; we need to live our lives") in Studies 3–4. **Desire to reopen the economy** was measured with four items (e.g., "Regardless of COVID-19, the economy needs to open immediately") in the first two studies (early in the pandemic).

Intentions to engage in preventive **health behaviors** were measured

with four items (e.g., "Besides for essential reasons like grocery shopping or going to work, how often have you been leaving your home") in Study 1 and six items (e.g., "If you go out in the next 14-days, how frequently will you stay six-feet apart from others?") in Studies 3–4, both anchored at 1 (*Not at all*) and 7 (*Very Frequently*). Because one item in Studies 3–4 was a count variable, items were standardized before aggregation and the aggregate of the Study 1 measure was standardized before it was included in the mega-analysis dataset. Consistent with preregistered exclusion criteria, analyses involving health behaviors excluded 116 participants in Study 4 who reported having already received a vaccine and 84 who reported they currently have or previously had COVID-19.

We measured **vaccination intentions** in Study 4 with a single item: "I plan to get a COVID-19 Vaccine when I am allowed to"). Consistent with preregistered exclusion criteria, analyses involving vaccination intentions excluded 116 participants in Study 4 who reported having already received a vaccine.

We measured **vaccine concern** with a single item in Study 4: "I'm not confident that the COVID-19 vaccines are safe yet"). We also measured support for **mandatory vaccinations** in Study 4 with one item: "When a vaccine is made available, it should be mandatory for all Americans to get vaccinated for COVID-19".

We also assessed perceptions that it is smart to avoid Black people to stay safe from COVID-19 in Study 4. Perceived **pragmatism of avoiding Black people** was measured with five items (e.g., "People who are concerned about their health should avoid areas that are majority Black"). We added this measure to assess whether the racial disparity manipulation would provide Whites an outlet to express anti-Black bias by using their health as justification (see Crandall and Eshleman, 2003).

4. Results and discussion

All analyses were conducted with version 4.13 of R (R Core Team, 2022). Analyses were not conducted using multiple imputation; significance and directionality of results discussed in text are unchanged when using multiple imputation (see Miller et al., 2022 for multiple imputation code). Pooling data from multiple studies provides the opportunity to account for study-level variation when analyzing the select variables measured in multiple studies (such as by including random effects or by including variables indicating the time the study was conducted). Yet, differences in effects (and means) across studies were negligible, and accordingly, effects did not significantly differ as a function of time. To avoid the resulting convergence failures and to maximize consistency, we opt not to report multilevel models (see Miller et al., 2022 for multilevel modeling code).

4.1. Condition differences: does manipulating perceptions of racial disparities affect COVID-19 attitudes for White Americans?

We report results of Welch's *t*-tests comparing participants assigned to the *structural racial disparities* conditions and those assigned to the *control* conditions on attitudes toward COVID-19 in Table 1. Because Study 1 did not manipulate perceptions of COVID-19 racial disparities, data from Study 1 are not included in this analysis.

Participants in the *structural racial disparities* condition perceived more racial disparities than those in the *control* condition: evidence of a successful manipulation. Further, participants primed with *structural racial disparities* reported thinking it wiser to avoid Black people (relative to the *control*). These results are consistent with our hypotheses and suggest that perceiving racial disparities may allow White people to justify racist behavior (see Crandall and Eshleman, 2003). Thus, reports of how Black people are disproportionately burdened by the pandemic may inadvertently harm Black people by increasing White people's desire to avoid Black people. We observed no condition effects on any of the other outcomes.

4.2. Linear regressions: predictors of COVID-19 concern for White Americans

We conducted several linear regressions with measures assessing concern about COVID-19 as separate outcomes as well as perceived racial disparities. Modern racism, perceived COVID-19 racial disparities, political orientation, and White racial ID were predictors. Each predictor was measured in all studies, and we preregistered their inclusion in Study 4 (See Table 2.)

Consistent with previous research, political orientation predicted decreased concern about COVID-19 and decreased perceptions of COVID-19 racial disparities. Political conservatism was associated with decreased perceptions of COVID-19 severity, fewer intentions of engaging in preventive health behaviors and of becoming vaccinated, decreased support for mandatory vaccinations, and increased desires to return to normalcy and reopen the economy. Curiously, higher conservatism predicted *less* concern with avoiding Black people.

Consistent with our hypotheses, modern racism was associated with decreased concern about COVID-19 and with perceiving fewer and less severe COVID-19 racial disparities. Modern racism predicted decreased perceptions of COVID-19 severity, fewer intentions of engaging in preventive health behaviors, and was associated with increased concern about vaccine safety, pragmatism of avoiding Black people, and with desires to reopen the economy and return to normalcy. Moreover, compared to the other predictors, modern racism emerged as the strongest predictor of most outcomes (i.e., its standardized coefficient had the largest magnitude). Thus, not only does modern racism predict concern about COVID-19 even while controlling for other factors, it is often *more* predictive.

Despite finding no experimental evidence that perceived racial disparities *affect* concern about COVID-19, the continuous measure of racial disparities was positively associated with concern. Perceived racial disparities were positively associated with perceived COVID-19 severity, intentions to engage in preventive health behaviors and to get a vaccine, and increased support for mandatory vaccinations and

Table 1
Mega-Analysis Independent Sample t-Tests: Examining Whether COVID-19 Attitudes Differ *by Condition.*

Outcome	Structural Racial Disparities *M* (*SD*)	Control *M* (*SD*)	Mean Difference	95% Mean Difference CI	*t*	*p*	*df*
Severity (S2–S4)	5.45 (1.42)	5.49 (1.42)	−0.05	−0.16, 0.07	−0.82	.411	2344.77
Desire to Return to Normalcy (S3–S4)	3.73 (1.78)	3.78 (1.83)	−0.05	−0.20, 0.10	−0.66	.512	2177.88
Health Behaviors (S3–S4)	0.00 (0.98)	0.01 (1.02)	−0.01	−0.10, 0.08	−0.17	.868	1977.92
Vaccination Intentions (S4)	4.98 (2.30)	4.82 (2.31)	0.16	−0.08, 0.41	1.30	.193	1364.07
Vaccine Concern (S4)	4.02 (2.14)	4.16 (2.2)	−0.13	−0.36, 0.09	−1.19	.234	1479.97
Mandatory Vaccinations (S4)	4.07 (2.26)	4.03 (2.37)	0.04	−0.19, 0.28	0.37	.712	1480.30
Desire to Reopen the Economy (S2)	3.14 (1.78)	3.47 (1.7)	−0.33	−0.86, 0.19	−1.26	.211	169.24
Pragmatism of Avoiding Black People (S4)	2.80 (1.49)	2.38 (1.28)	0.42	0.28, 0.56	5.85	**<.001**	1439.64
Racial Disparities (S2–S4)	5.00 (1.22)	4.47 (1.34)	0.53	0.43, 0.64	10.14	**< .001**	2348.45

Note. S2, S3, and S4 indicate studies that measured the outcome. Significant *p*-values are in **boldface**.

Table 2
Mega-Analysis Linear Regressions: Identifying Predictors of COVID-19 Attitudes.

	Severity			Desire to Return to Normalcy			Health Behaviors		
Predictors	Estimates	CI	p	Estimates	CI	p	Estimates	CI	p
Intercept	5.76	5.51, 6.02	**<.001**	2.55	2.22, 2.89	**<.001**	−0.04	−0.26, 0.18	.736
Modern Racism	−0.31	−0.35, −0.27	**<.001**	0.43	0.38, 0.47	**<.001**	−0.15	−0.18, −0.12	**<.001**
Racial Disparities	0.17	0.13, 0.21	**<.001**	−0.19	−0.24, −0.14	**<.001**	0.11	0.08, 0.14	**<.001**
Political Orientation	−0.12	−0.15, −0.09	**<.001**	0.23	0.19, 0.27	**<.001**	−0.03	−0.05, −0.00	**.020**
White Racial ID	0.09	0.06, 0.12	**<.001**	−0.05	−0.09, −0.01	**.025**	0.03	0.01, 0.06	**.015**
Observations	2876			2446			2425		
R^2/R^2 adjusted	0.250/0.249			0.323/0.322			0.102/0.101		
	Vaccination Intentions			Vaccine Concern			Mandatory Vaccination		
Predictors	Estimates	CI	p	Estimates	CI	p	Estimates	CI	p
Intercept	2.91	2.27, 3.56	**<.001**	5.35	4.76, 5.94	**<.001**	2.79	2.17, 3.42	**<.001**
Modern Racism	−0.08	−0.17, 0.02	.112	0.27	0.19, 0.36	**<.001**	0.00	−0.09, 0.09	.928
Racial Disparities	0.51	0.42, 0.60	**<.001**	−0.39	−0.48, −0.31	**<.001**	0.34	0.25, 0.43	**<.001**
Political Orientation	−0.20	−0.28, −0.13	**<.001**	0.05	−0.01, 0.12	0.119	−0.30	−0.37, −0.23	**<.001**
White Racial ID	0.22	0.14, 0.30	**<.001**	−0.16	−0.24, −0.09	**<.001**	0.28	0.20, 0.35	**<.001**
Observations	1357			1471			1472		
R^2/R^2 adjusted	0.167/0.164			0.138/0.136			0.141/0.138		
	Pragmatism of Avoiding Black People			Desire to Reopen the Economy			Racial Disparities		
Predictors	Estimates	CI	p	Estimates	CI	p	Estimates	CI	p
Intercept	−0.68	−1.01, −0.34	**<.001**	2.42	1.63, 3.20	**<.001**	5.67	5.54, 5.81	**<.001**
Modern Racism	0.51	0.46, 0.56	**<.001**	0.43	0.30, 0.57	**<.001**	−0.28	−0.31, −0.24	**<.001**
Racial Disparities	0.30	0.26, 0.35	**<.001**	−0.24	−0.36, −0.12	**<.001**			
Political Orientation	−0.12	−0.15, −0.08	**<.001**	0.26	0.16, 0.35	**<.001**	−0.12	−0.14, −0.09	**<.001**
White Racial ID	0.23	0.19, 0.27	**<.001**	0.00	−0.09, 0.09	.966	0.09	0.06, 0.12	**<.001**
Observations	1473			430			2876		
R^2/R^2 adjusted	0.343/0.341			0.395/0.389			0.169/0.168		

Note. Significant *p*-values are in **boldface**.

were negatively related to the desire to return to normalcy, the desire to reopen the economy, and with vaccine concern.

Taken together, political orientation and modern racism predicted decreased concern about COVID-19. One caveat is that modern racism does not seem to be a robust predictor of attitudes and intentions regarding the COVID-19 vaccine.

5. Studies 1–4 mega-analysis summary

The mega-analysis revealed that White Americans' anti-Black racism predicts decreased concern about COVID-19. Yet, concern about COVID-19 did not fluctuate in response to reading about racial disparities. Next, we tested whether our results are unique to the U.S.

5.1. Sample 5: Brazil experiment

During a global pandemic, it is critical to understand how racial attitudes may affect health beyond the U.S., so we attempted to replicate the findings from Studies 1–4 with a Brazilian population. This effort also helps address critiques that the vast majority of behavioral science is based on western, educated, industrialized, rich, and democratic samples (Henrich et al., 2010).

Like the U.S., Brazil suffers from racial disparities, and the COVID-19 pandemic has amplified them. The countries share histories of European colonization, Native displacement, and African enslavement (Hamilton, 2001) and suffer COVID-19 racial disparities. Despite these similarities, racial categorization differs between the two countries (Chen et al., 2018), so empirical tests of whether the pattern holds in Brazilian populations are needed. We hypothesized that racism would similarly predict White Brazilians' decreased concern about COVID-19.

Study materials and stimuli, correlation tables, data, code, and links to preregistered hypotheses, analyses, and exclusion criteria have been made available on OSF (Miller et al., 2022).

5.2. Participants

TGM Research Panels recruited and paid 731 participants for this study from their online and mobile panel in Brazil (Online Panel in Brazil | Market Research and Online Surveys in Brazil, n.d.). We removed data from 155 participants who did not report being White, 3 who reported living outside Brazil, and 41 participants who missed an attention check. Below, we report data for 532 White Brazilians (50.8% women, 49.2% men, M age = 39.35, SD = 13.58, and median household income was between 4- and 5-times the minimum wage). The data were collected from February 10–12, 2021.

5.3. Procedure

Like Studies 2–4, participants were randomly assigned to either the *structural racial disparities* condition (featuring an article emphasizing COVID-19 racial disparities in Brazil and how structural racism contributes to these outcomes) or a *control* condition (describing COVID-19). After the article, participants completed a comprehension check and then completed measures described below.

We preregistered the removal of participants who missed the True-False comprehension check: "According to the text, structural inequalities led Black and Multiracial Brazilians to be more significantly impacted by COVID-19". Yet, doing so would have resulted in an additional loss of almost 20% of participants in the *structural racial disparities* condition. Because participants in the *control* condition missed their comprehension check at a far lower rate (less than 2%), we believe participants likely missed the racial disparities comprehension check for ideological reasons (e.g., wanting to downplay the severity of COVID-19 racial disparities). In support of this possibility, participants who missed the comprehension check were significantly more conservative and more racially biased ($M = 69.36$, $SD = 24.12$ and $M = 2.95$, $SD = 1.11$, respectively) than participants who correctly answered the check ($M = 56.32$, $SD = 24.36$ and $M = 2.60$, $SD = 1.09$, respectively), $t(280) = 3.59$, $p < .001$ and $t(267) = 2.09$, $p = .038$, respectively. Thus, removing participants for the comprehension check would have significantly changed the composition of our sample; thus, we opted to include them in analyses. Results are unchanged when excluding these participants unless otherwise noted.

5.4. Measures

All measures described below were anchored at 1 (*Strongly Disagree*) and 7 (*Strongly Agree*) and were translated to Portuguese by Brazilian members of the research team. Many measures were similar to those used in Studies 1–4 but were adapted to be more applicable to Brazilian contexts.

Perceptions of **racial disparities** (Cronbach's $\alpha = 0.88$, 2.8% missing data) were assessed with five items (e.g., "COVID-19 affects Black and Multiracial Brazilians at higher rates than other people").

Modern racism ($M = 2.58$, $SD = 1.12$, $\alpha = 0.71$, 3.8% missing data) was measured with seven items (e.g., "Blacks are getting too demanding in their push for equal rights"). This scale has been translated and validated in Brazil (Santos et al., 2006).

We measured **White racial ID** ($M = 2.52$, $SD = 1.78$, $\alpha = 0.86$, 3.9% missing data) with two items (e.g., "In general, being White is an important part of my self-image").

Political orientation ($M = 57.74$, $SD = 26.09$, no missing data) was assessed with "In terms of politics, how do you identify?" anchored at 1 (*Fully Left*) and 100 (*Fully Right*).

Perceived **COVID-19 severity** ($\alpha = 0.82$, no missing data) was measured with nine items (e.g., "COVID-19 is a serious issue that needs to be addressed").

Desire to return to normalcy ($\alpha = 0.93$, 1.1% missing data) was measured with seven items (e.g., "Even though we may lose some people in the process, it's time for people in Brazil to return to business as usual").

We assessed intentions to engage in **health behaviors** ($\alpha = 0.75$, no missing data) with six items (e.g., "In the next 14-days, do you intend to go to fewer or more places than you did before COVID-19 came to Brazil (do not count grocery shopping, work, and going out for health purposes)?" anchored at 1 (*Much fewer*) to 7 (*Much more*) with 4 (*About the same*) serving as the midpoint. Consistent with preregistered exclusion criteria, analyses involving health behaviors excluded 25 participants who reported having already received the vaccine and 47 participants who currently have or previously had COVID-19.

Vaccination intentions (no missing data) were assessed with "When made available, I plan on getting a COVID-19 vaccine". Consistent with preregistered exclusion criteria, analyses involving vaccination intentions excluded 25 participants who reported having already received the vaccine. Support for **mandatory vaccinations** (3.2% missing data) was assessed with "When a vaccine is made available, it should be mandatory for all Brazilians to get vaccinated for COVID-19".

Support **for public healthcare** was assessed with four items, but reliability was poor ($\alpha = 0.31$, 3.4% missing data for each item), so we analyzed each item separately. **Privatization** support was assessed with "Healthcare in Brazil should be fully privatized", **increased public health investment** support with "The government should invest more in improving the public health system", **public health tax increase** support with "I would pay more in taxes to improve the public health system", and **emergency financial assistance** support with "The emergency financial assistance for COVID-19 should be extended".

6. Results and discussion

All analyses were conducted with version 4.13 of R (R Core Team, 2022). Analyses were not conducted using multiple imputation; significance and directionality of results discussed in text are unchanged when using multiple imputation unless otherwise noted (see Miller et al., 2022 for multiple imputation code).

6.1. Condition differences: does manipulating perceptions of racial disparities affect COVID-19 attitudes for White Brazilians?

We report results of Welch's *t*-tests with condition as the grouping variable and attitudes toward COVID-19 as separate outcomes in Table 3.

The manipulation check was successful. Perceived COVID-19 racial disparities were greater among participants in the *structural racial disparities* condition than those in the *control* condition. Interestingly, participants in the *structural racial disparities* condition reported fewer intentions to engage in preventive health behaviors than those in the *control* condition (this effect was not significant when using multiple imputation, $p = .075$, or when excluding participants who failed the article comprehension check, $p = .097$). Similarly, participants in the *structural racial disparities* condition also reported less support for investment in public health than those in the *control* condition (not significant when excluding participants who failed the article comprehension check, $p = .072$). There were no other significant condition differences on COVID-19 attitudes.

Thus, our original hypotheses, that perceiving racial disparities would decrease concern about COVID-19 for Whites, received some support with the Brazilian sample. However, seven of nine outcomes measuring concern about COVID-19 did not significantly differ by condition.

6.2. Linear regressions: predictors of COVID-19 concern for White Brazilians

We conducted linear regressions with the attitudes toward COVID-19 variables as separate outcomes as well as perceived racial disparities. Modern racism, perceived racial disparities, political orientation, and White racial ID were entered as predictors (See Table 4.).

Consistent with previous research and our mega-analysis results, political conservatism predicted decreased concern about COVID-19. Specifically, increased conservatism predicted decreased perceptions of COVID-19 severity, fewer COVID-19 racial disparities, decreased support for mandatory vaccinations, and decreased intentions to become vaccinated (this effect was nonsignificant when excluding participants who failed the article comprehension check, $p = .218$). Political orientation was positively associated with the desire to return to normalcy.

In line with predictions and mega-analysis results, modern racism

Table 3
Brazilian Sample Independent Sample t-Tests: Examining Whether COVID-19 Attitudes Differ by Condition.

Outcome	Structural Racial Disparities *M* (*SD*)	Control *M* (*SD*)	Mean Difference	95% Mean Difference CI	*t*	*p*	*df*
Severity	5.86 (1.11)	5.91 (1.00)	−0.05	−0.23, 0.13	−0.56	.578	529.97
Desire to Return to Normalcy	3.57 (1.70)	3.64 (1.69)	−0.07	−0.36, 0.22	−0.49	.623	518.16
Health Behaviors	5.92 (1.02)	6.10 (0.91)	−0.18	−0.35, 0.00	−1.97	**.049**	455.12
Vaccination Intentions	6.05 (1.74)	6.22 (1.67)	−0.16	−0.46, 0.14	−1.07	.285	500.87
Mandatory Vaccination	4.97 (2.41)	5.11 (2.41)	−0.14	−0.56, 0.27	−0.68	.499	507.90
Privatization Support	2.89 (2.15)	2.76 (2.14)	0.13	−0.24, 0.50	0.69	.490	507.31
Increased Public Health Investment Support	6.46 (1.09)	6.67 (0.84)	−0.21	−0.38, −0.04	−2.45	**.015**	498.70
Public Health Tax Increase Support	3.92 (2.17)	4.22 (2.30)	−0.30	−0.69, 0.09	−1.53	.126	499.13
Emergency Financial Assistance Support	5.87 (1.74)	6.00 (1.55)	−0.13	−0.41, 0.16	−0.89	.374	511.91
Racial Disparities	3.82 (1.73)	2.96 (1.67)	0.86	0.57, 1.16	5.78	**<.001**	512.71

Note. Significant *p*-values are in **boldface**.

was negatively associated with perceived COVID-19 severity, intentions to engage in preventive health behaviors and to become vaccinated, and with support for mandatory vaccinations, and was the strongest predictor (i.e., its standardized coefficient had the largest magnitude) of all but the latter. Modern racism was also positively associated with the desire to return to normalcy. Unlike the U.S. sample, modern racism did not significantly predict perceived COVID-19 racial disparities in Brazil. Another notable deviation is that modern racism more consistently predicted vaccination attitudes and intentions for Brazilians than Americans.

In addition to attitudes, this study assessed support for the public health system in order to understand policy implications of anti-Blackness. Non-White Brazilians are overrepresented among those who use the public health system (Alves and Timmins, 2001), so decreased support for public health may be driven by an understanding that racial minorities are more dependent on it. Consistent with this interpretation, modern racism predicted decreased support for public health, public health tax increases, and interest in extending emergency COVID-19 financial assistance. Furthermore, racism was associated with increased interest in privatizing the public health system. Modern racism was the strongest predictor of these outcomes besides support for financial assistance. Thus, anti-Blackness was associated with less support for structures necessary to maintain the health of the Brazilian population.

In sum, the Brazilian sample mostly replicated findings from the U.S. sample. For both countries, modern racism predicted decreased concern about COVID-19 (even while controlling for political orientation, White racial identification, and perceptions of racial disparities) and was often the most marked of the four predictors of COVID-19 attitudes.

7. General discussion

The global COVID-19 pandemic brought with it divergent health outcomes for White people and racial minorities in two societies stratified by race. These divergences received widespread media attention, and it is conceivable that this information reduced concern about COVID-19 for those who were less likely to suffer severe outcomes. The goal of this research was to examine the extent to which (1) information on racial health disparities and (2) modern racism predicted White Americans' and White Brazilians' responses to the pandemic. Consistent with original hypotheses, White Brazilians primed with racial disparities reported intending to engage in fewer COVID-19 preventive behaviors than those in a control condition. They also reported less support for public healthcare investment. Furthermore, White Americans who read about racial disparities reported being more inclined (than those in a control condition) to avoid Black people.

Nonetheless, manipulations of COVID-19 racial disparities rarely affected U.S. sample outcomes. Despite successful manipulation checks, participants' attitudes toward COVID-19, for the most part, did not vary based on the manipulation of racial disparities. Although it is possible that White people simply do not adjust their concern about COVID-19 in response to disparity information, these null effects could also indicate that we did not *meaningfully* increase perceived racial disparities. This may be because reports of COVID-19 disparities were ubiquitous when data were collected. In fact, participants in the *control* conditions from Studies 2–4 ($M = 4.47$, $SD = 1.34$) scored significantly higher on the racial disparities manipulation check than the neutral scale midpoint, $t(1208) = 12.26$, $p < .001$. In other words, White Americans, regardless of condition, appeared to recognize COVID-19 racial disparities. In contrast, Brazilian *control* condition participants perceived significantly *fewer* racial disparities ($M = 2.96$, $SD = 1.67$) than the neutral midpoint, $t(244) = -9.79$, $p < .001$, and outcomes differed by condition more often than with the U.S. sample. Future research can examine whether the feasibility of manipulating racial disparities varies over time and to what extent these results replicate later in the pandemic. We suspect that anti-Blackness will remain a significant predictor of COVID-19 attitudes regardless of the salience of health disparities because modern racism was a significant predictor of attitudes even after accounting for perceived racial disparities and for both samples with varying acknowledgment of disparities. Nonetheless, it would be interesting to replicate this work at another time, or by examining whether racism predicts behavior for other transmittable illnesses (especially those with less salient racial disparities).

Across Brazilian and American samples, White participants' modern racism consistently predicted *decreased* concern about COVID-19. Specifically, the more racist participants were, the more they reported wanting life to return to normal, the less severe they perceived COVID-19 to be, the fewer preventive behaviors they reported engaging, and for Brazilians, the lower vaccination intentions they had. Furthermore, across measures, modern racism was often the strongest of the four predictors of COVID-19 attitudes. In other words, greater anti-Blackness was associated with attitudes that likely exacerbated the pandemic.

Interestingly, greater modern racism was also associated with fewer perceived racial disparities in the U.S. (the relationship was not significant in Brazil). And, Brazilians higher in modern racism were more likely to deny racial disparities by failing a factual comprehension check for the *structural racial disparities* condition article. Thus, modern racism predicted lower perceived racial disparities, in addition to attitudes toward COVID-19.

7.1. Limitations and future directions

Perhaps the most significant limitation of this work is that we were unable to manipulate anti-Black attitudes to establish its causal role in predicting responses to the pandemic. We attempted to manipulate racism by highlighting demographic shifts in Study 4. Even though we used a manipulation that worsens racial attitudes (Craig and Richeson, 2014a), it did not shift modern racism scores. Future research can examine whether demographic shifts accentuate White people's racial bias on some measures and not others, or whether demographic shifts

Table 4
Brazilian Samples Linear Regressions: Identifying Predictors of COVID-19 Attitudes.

Predictors	Severity			Desire to Return to Normalcy			Health Behaviors			Vaccination Intentions			Mandatory Vaccination		
	Estimates	*CI*	*p*	*Estimates*	*CI*	*p*	*Estimates*	*CI*	*p*	*Estimates*	*CI*	*p*	*Estimates*	*CI*	*p*
Intercept	7.20	6.90, 7.50	**<.001**	1.67	1.18, 2.16	**<.001**	6.67	6.34, 7.00	**<.001**	6.69	6.12, 7.25	**<.001**	6.31	5.54, 7.07	**<.001**
Modern Racism	−0.39	−0.47, −0.31	**<.001**	0.45	0.33, 0.58	**<.001**	−0.27	−0.36, −0.19	**<.001**	−0.35	−0.49, −0.21	**<.001**	−0.30	−0.50, −0.11	**.002**
Racial Disparities	0.06	0.01, 0.10	**.013**	−0.12	−0.19, −0.04	**.002**	0.05	−0.00, 0.10	.063	0.15	0.07, 0.24	**<.001**	0.18	0.07, 0.30	**.002**
Political Orientation	−0.01	−0.01, −0.01	**<.001**	0.02	0.02, 0.03	**<.001**	0.00	−0.00, 0.00	.951	−0.01	−0.01, −0.00	**.042**	−0.02	−0.03, −0.02	**<.001**
White Racial ID	0.04	−0.01, 0.09	.053	−0.03	−0.10, 0.04	.417	−0.04	−0.09, 0.01	.086	0.07	−0.01, 0.16	.094	0.13	0.02, 0.25	**.027**
Observations	511			511			453			500			511		
R^2/R^2 adjusted	0.275/0.269			0.297/0.292			0.127/0.119			0.110/0.103			0.156/0.149		

	Privatization Support			Increased Public Health Investment Support			Public Health Tax Increase Support			Emergency Financial Assistance Support			Racial Disparities		
Predictors	Estimates	CI	p	Estimates	CI	p	Estimates	CI	p	Estimates	CI	p	Estimates	CI	p
Intercept	1.06	0.37, 1.75	**.003**	7.37	7.05, 7.69	**<.001**	3.47	2.71, 4.23	**<.001**	7.21	6.67, 7.75	**<.001**	4.30	3.85, 4.74	**<.001**
Modern Racism	0.47	0.29, 0.64	**<.001**	−0.28	−0.36, −0.20	**<.001**	−0.06	−0.25, 0.13	.550	−0.26	−0.40, −0.12	**<.001**	−0.12	−0.27, 0.02	.099
Racial Disparities	−0.10	−0.20, 0.01	.068	−0.01	−0.05, 0.04	.778	0.19	0.07, 0.30	**.001**	−0.01	−0.09, 0.07	.827			
Political Orientation	0.01	0.01, 0.02	**.001**	−0.00	−0.01, −0.00	**.043**	−0.00	−0.01, 0.01	.965	−0.01	−0.02, −0.01	**<.001**	−0.01	−0.02, −0.01	**<.001**
White Racial ID	0.07	−0.03, 0.18	.166	0.06	0.01, 0.10	**.023**	0.05	−0.06, 0.17	.383	0.10	0.01, 0.18	**.021**	0.12	0.04, 0.21	**.006**
Observations	511			511			511			511			511		
R^2/R^2 adjusted	0.137/0.131			0.116/0.109			0.026/0.018			0.103/0.095			0.073/0.067		

Note. Significant p-values are in **boldface**.

are less concerning during a pandemic (especially when racial minorities are dying at disproportionate rates).

The initial goal of our research was to examine the consequences of perceiving racial disparities and to identify predictors of COVID-19 attitudes rather than to establish causality of modern racism. Although we included three covariates of modern racism in analyses to clarify the relationship between anti-Black attitudes and concern about COVID-19, our studies did not measure other correlates of modern racism such as just-world beliefs or resentment toward groups in general (see Carney and Enos, 2017). Despite not having experimental support for our primary mechanism, we nevertheless found consistent evidence of modern racism's importance in predicting outcomes across samples, populations, and time. It is meaningful that the same measure of anti-Blackness was the strongest predictor of COVID-19 attitudes in both the U.S. and Brazil and especially so given race is conceptualized differently in the two countries (Chen et al., 2018; Hamilton, 2001).

7.2. Implications and conclusions

White racists may exacerbate the pandemic by underestimating its severity, behaving in ways that enable disease spread, and by resisting efforts to eliminate structural causes of disparities. Although we would expect concern about COVID-19 to be highest where incidence is highest, our findings, that racists underestimate the pandemic's severity, are even more striking given that areas with more racism are actually *more* affected by the pandemic (Cunningham and Wigfall, 2020). Moreover, our research contextualizes this disparate county-level incidence by revealing individuals' racism predicts decreased COVID-19 concern and decreased intentions to engage in preventive behaviors.

Finally, this research suggests, as Shellae Versey et al. (2019) argue (see also Metzl, 2020), that racism (internalized racial oppression) is bad for *both* dominant (White) and non-dominant (non-White) groups. If anti-Blackness decreases healthy responses to a global pandemic, it means the health of society more broadly will suffer. Individuals' attitudes and choices shape the health of all; therefore, even if dominant groups do not consciously connect race disparity information with desire to spread disease, racism nevertheless predicts their behavior. It also means that efforts to combat bias will likely improve the health and lives of society overall.

Credit author statement

Chad A Miller: Methodology, Data curation and analysis, Project administration, Software, writing, editing, Clara L Wilkins: Conceptualization, Methodology, writing, Project administration, editing, Clara de Paula Couto: Methodology, Data curation and analysis, writing, editing, Jéssica Farias: Methodology, Data curation and analysis, writing, editing, Jaclyn A Lisnek: Conceptualization, Methodology, Software (for Studies 1 & 2), editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data and code is shared on https://osf.io/34a7y/?view_only=5c025b1f11904744b5f924b57d816c64.

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