

Does Racial Identity Moderate Psychological Effects of Racial Discrimination? Converging
Results from Experimental and Survey Data

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CRedit statement: Gobrial and Lui conceived the research questions and designs. Gobrial led data analysis, manuscript writing, and revision. Gobrial was instrumental in data collection and management of research staff. Lui led data curation, provided funding and supervision, and contributed equally to manuscript writing and revision.

Positionality Statement: Gobrial is an Egyptian American and White mixed-heritage graduate student in clinical psychology under the supervision of Lui. Lui is an East Asian American clinical psychologist with research expertise on ethnic minority mental health, racism and discrimination, psychology research with virtual reality technology, and open science.

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Abstract

Psychological distress that stems from racial discrimination experiences may depend on how strongly individuals identify with their race. Existing findings across survey research and a small body of experimental research are equivocal on whether and how racial identity factors exacerbate or buffer the negative psychological effects of racial discrimination. This study included experimental and survey data to characterize the moderating roles of racial identity centrality, private regard, and public regard in the associations between racial discrimination and psychological distress. Participants were 240 young adults of color ($M_{age}=23.27$; 50.8% women; 37.5% Asian American, 35.4% Hispanic/Latino, 15.8% Black/African American). Findings generally converged across experimental and survey methods. Simulated and measured racial discrimination predicted psychological distress outcomes, but racial identity factors did not moderate these associations. Considerations for these null results and future research directions are discussed.

Keywords: experiment, negative affect, racism, racial identity, virtual reality

Does Racial Identity Moderate Psychological Effects of Racial Discrimination? Converging Results from Experimental and Survey Data

Ethnoracial mental health disparities can be attributed to racial inequities and disproportionate stress experienced by people of color (Vines et al., 2017). Particularly, racial discrimination is one form of stressor theorized to cause psychological distress, and other negative health outcomes (Williams et al., 2019). Understanding who may be more or less impacted by racial discrimination given their racial identity is an important step toward designing clinical interventions to promote mental health among people of color. The degree to which people are negatively impacted by racial discrimination experiences may vary as a function of personal attributes, such as individual differences in racial identity. Research on racial discrimination and racial identity largely has relied on survey designs and correlational analyses (see examples, Cobb et al., 2019; French & Chavez, 2010; Rivas-Drake et al., 2008; Sellers et al., 2006); these studies do not allow researchers to make conclusions about the causal effects of racial discrimination and moderating roles of racial identity in these effects. Namely, it is challenging to conclude whether interactions between racial discrimination and racial identity are because of true moderation by racial identity in the psychological effects of racial discrimination, or because racial identity influences how individuals recall and report of racial discrimination experiences in surveys. This study was aimed to examine possible moderation by racial identity in the associations between racial discrimination and psychological distress, using experimental and survey data with the same set of research participants in the United States.

Racial Discrimination Is Theorized to Cause Psychological Distress

According to the acute racism reactions model and biopsychosocial stress model, racial discrimination elicits immediate stress reactions and causes chronic stress 10/18/2024 1:28:00

PM. The transactional model of stress and coping (Lazarus & Folkman, 1984) and the reserve capacity model (Gallo & Matthews, 2003) help explain these theorized effects further. When individuals are exposed to threatening events such as racial discrimination and when psychological burden of these events exceeds their resources to cope, racial discrimination can exert adverse effects on mental health (Berjot & Gillet, 2011; A. Ong et al., 2009; Vines et al., 2017). Examples of everyday racial discrimination include being treated with less respect than other people, being called names or insulted, and receiving poorer service than others because of people's ethnoracial backgrounds (Williams et al., 1997). Research has demonstrated robust associations between racial discrimination and various psychological outcomes such as stress, negative affect, mood disorders, anxiety disorders, and substance use disorders among people of color from diverse ethnoracial backgrounds compared to their White counterparts (Brondolo et al., 2008; Lee & Ahn, 2011, 2012, 2013; Lewis et al., 2015; Ong et al., 2009; Paradies et al., 2015; Pascoe & Richman, 2009; Vines et al., 2017; Williams et al., 2019).

Most of these existing findings are derived from survey studies that rely on retrospective, self-reports of racial discrimination experiences (see Lewis et al., 2015; Neblett, 2019 for review). These studies preclude researchers from making causal conclusions about the effects of racial discrimination on psychological distress for several reasons. First, existing self-report discrimination measures ask participants to recall their discriminations over varying time periods including over the last day, month, and year. Individuals may not accurately remember instances of racial discrimination that have occurred over long time frames (Neblett, 2019). Second, similarly to other self-report survey research, measured racial discrimination may be fraught with recall and reporting biases. Individuals across personal attributes and lived experiences may over-report or under-report experiences of racial discrimination because of vigilance bias (i.e.,

interpreting events to be discriminatory) or minimization biases (i.e., not registering discriminatory events as such; Kaiser & Major, 2006). Without standardization of racial discrimination stimuli presented to individuals, and ensuring that racial discrimination events occur before the experiences and reports of psychological distress, researchers cannot rule out alternative factors that explain the associations between observed racial discrimination and psychological distress.

Independent of how racial discrimination is operationalized across experimental or survey research, existing studies also show considerable heterogeneity in the strength of the associations between racial discrimination and psychological distress across individuals (see reviews, Lee & Ahn, 2011, 2012, 2013; Lewis et al., 2015; Paradies et al., 2015; Pascoe & Richman, 2009; Vines et al., 2017; Williams et al., 2019). Personal attributes such as individuals' positive feelings about their racial group likely influence people of color's mental health and the psychological effects of racial discrimination.

Racial Identity Is Theorized to Influence Psychological Distress and to Moderate Effects of Racial Discrimination

One key set of personal attributes associated with psychological outcomes and effects of racial discrimination has to do with racial identity. Racial identity characterizes how people conceptualize their social position as a member of their racial group (Cross Jr., 1991; Sellers et al., 1998). For many people of color, racial identity is very important to their overall sense of self (Tamir, 2022). Research has shown that racial identity can promote resilience among individuals in stressful environments (Butler-Barnes et al., 2018). Racial identity also can shape how individuals appraise and cope with racial discrimination. For example, people of color who identify more strongly with their racial group have been shown to attribute ambiguous events to

be related to race than those who do not identify as strongly with their racial group (Operario & Fiske, 2001; Shelton & Sellers, 2000).

Racial identity has been conceived to comprise multiple components, thus how it is associated with psychological distress alone, and how it interacts with racial discrimination experiences in predicting psychological distress likely vary by dimensions of the construct. Three stable dimensions of racial identity have been examined in existing research: centrality, private regard, and public regard (Sellers et al., 1998).¹ Centrality refers to the extent to which an individual's race is a core part of their self-concept. Private regard refers to an individual's positive or negative evaluative judgment about their own membership in a racial group. Public regard refers to people's positive or negative perception of how others evaluate their racial group.

Social identity and self-categorization theories help conceptualize how these different dimensions of racial identity relate to people's mental health, and protect against or exacerbate the negative psychological effects of racial discrimination (Tajfel & Turner, 2004; Turner et al., 1987). On the one hand, social identity theory posits that people generally are motivated to maintain a positive self-view in general and when faced with stress (Tajfel & Turner, 1984). Thus, individuals who have a stronger sense of racial centrality and more positive private regard may enjoy better mental health, and are better equipped to cope with threats to their identity such as racial discrimination. On the other hand, self-categorization theory posits that racial discrimination can function as contextual clues that heighten people's awareness of systemic

¹ Sellers' 1998 model proposes other dimensions of racial identity including salience, nationalist ideology, oppressed minority ideology, assimilationist ideology, and humanist ideology. However, the centrality and regard (e.g., public and private) dimensions have been identified as the key dimensions in understanding experiences and psychological consequences of discrimination (Sellers et al., 2006) and have been the most frequently studied in the existing literature using this model.

disadvantages and oppression facing their racial group, thus greater racial centrality and more negative public regard may intensify stress reactions to racial discrimination experiences (Turner et al., 1987). So far, there have not been consistent empirical results on these theorized associations linking racial discrimination, racial identity, and psychological outcomes.

Mixed Evidence on How Racial Identity Moderates Associations Between Racial Discrimination and Psychological Distress

Survey studies—most of which have been derived from cross-sectional data—have yielded a wide range of effect sizes in the moderating associations of *racial discrimination x racial identity* with psychological distress. Some of these findings fall in different effect directions, casting doubt on whether and how racial identity moderates the associations between racial discrimination experiences and psychological distress. Some studies suggest that centrality (Caldwell et al., 2004; Cobb et al., 2019), private regard (Lui, 2020; Rivas-Drake et al., 2008), and public regard (Seaton & Iida, 2019) reduce the associations between racial discrimination and psychological distress. By contrast, other studies suggest that centrality (Burrow & Ong, 2010; Lui, 2020) and public regard (Caldwell et al., 2004; Sellers et al., 2006; Sellers & Shelton, 2003) strengthen the associations between racial discrimination and psychological distress. There also are investigations that show null results on the moderating roles of all three dimensions of racial identity (French & Chavez, 2010; Huynh & Fuligni, 2010). Furthermore, meta-analytic results aggregating effect sizes from 18 survey studies failed to show statistically significant moderations by centrality, private regard, and public regard in the associations between racial discrimination and psychological outcomes (Yip et al., 2019).

A small body of experimental studies have shown some consistent results associating *racial discrimination x racial identity* with psychological outcomes. Using vignettes and video

clips to simulate experiences with racial discrimination, two studies showed that higher levels of racial private regard reduced autonomic stress responses and momentary alcohol craving (Desalu et al., 2021; Neblett & Roberts, 2013). Both experimental investigations also showed that higher levels of racial centrality exacerbated the effects of racial discrimination on autonomic stress responses and alcohol craving, but results from these investigations did not converge on findings related to public regard (Desalu et al., 2021; Neblett & Roberts, 2013).

Observed Moderation by Racial Identity May be Obscured in Survey Studies of Racial Discrimination and Psychological Distress

Mixed results on the moderating roles of racial identity in the associations between racial discrimination and psychological distress may be driven by variations in methodological designs in existing studies. Experimental studies tend to expose individuals to simulated or imagined racial discrimination and measure psychological responses as they occur. By contrast, existing survey studies do not examine racial discrimination as people experience it. Researchers have tended to ask individuals to report racial discrimination experienced over the lifetime (Rivas-Drake et al., 2008), the past year (Caldwell et al., 2004; Sellers et al., 2006; Sellers & Shelton, 2003), the past six months (Lui, 2020), and the previous day (Burrow & Ong, 2010). Very few investigations have examined the psychological effects of racial discrimination in real time (see Desalu et al., 2021; Neblett & Roberts, 2013 for examples). How people appraise and report their racial discrimination experiences may vary in real time as compared to their recall of their past experiences. These differences may be driven by personal attributes such as racial identity. For example, people with higher levels of racial identity centrality have been shown to report more daily encounters of racial discrimination (Burrow & Ong, 2010). Perhaps, people who are more connected to their racial group membership are also more vigilant about and aware of racial

discrimination events when they occur. Results from the same study by Burrow and Ong (2010) also showed higher levels of racial private regard to be associated with fewer number of racial discrimination events each day. Perhaps, people who feel good about their racial group can deploy psychological resources to cope with racial discrimination. To examine whether racial identity exacerbates or buffers the causal effects of racial discrimination on psychological distress, it is important that racial identity does not also influence how people recall and report past racial discrimination experiences. Experimental research allows researchers to expose participants to standardized racial discrimination stimuli without relying on participants to recall and report past experiences. This helps enhance the internal validity of empirical results on not only the psychological effects of racial discrimination, but also moderation by racial identity in their associations.

The Present Study

The goal of our present study was to examine whether and how racial identity moderated the causal associations between racial discrimination and psychological distress. Considering existing mixed results across experimental and survey studies on the moderating roles of racial identity on the associations between racial discrimination and psychological distress, we evaluated the moderations using experimental and survey data collected from the same set of research participants. Given the relative advantage of experimental research to survey research in determining causality, we simulated life-like racial discrimination experiences in a between-groups experiment and measured people of color's self-reported stress and negative affect in real time. Consistent with most existing studies, we measured past racial discrimination experiences over the lifespan and general perceived stress in a set of cross-sectional surveys. Racial identity centrality, private regard, and public regard were tested as moderators in the associations

between simulated and measured racial discrimination experiences and psychological distress outcomes.

First, we expected both experimental and survey data to show associations between racial discrimination experiences and psychological distress. Specifically, we hypothesized that participants assigned to experience simulated racial discrimination would report greater stress and negative affect than participants in the non-discrimination control condition (H1). We also hypothesized that individuals who reported greater frequency of lifetime racial discrimination would report greater perceived stress (H2).

Second, we expected racial identity to moderate the associations between racial discrimination experiences and psychological distress. Based on theories and prior empirical results, we hypothesized that centrality would intensify the effects of simulated racial discrimination experiences on stress and negative affect (H3), and the observed associations between measured lifetime racial discrimination and perceived stress (H4). We also hypothesized that private regard would buffer the causal effects of simulated racial discrimination on stress and negative affect (H5), and the observed associations between measured lifetime racial discrimination and perceived stress (H6). Finally, we posed a nondirectional hypothesis that public regard would moderate the experimental effects of racial discrimination on stress and negative affect (H7), and the observed associations between racial discrimination and perceived stress (H8).

Our present data were mainly drawn from a registered report study designed to examine the effects of simulated racial discrimination experiences on stress and alcohol craving in a sample of young adults of color (Lui et al., 2023). The registered report study was a between-groups experiment in which 184 research participants were assigned to experience varying levels

of racial discrimination or non-discriminatory daily hassles simulated using virtual reality technologies. We sampled an additional 54 research participants assigned to the non-discriminatory daily hassles condition for the present study using the same study procedures as in the registered report study. Virtual reality allows researchers to create immersive environments that generate life-like experiences and genuine psychological responses (Lui et al., 2021; Rosa & Breidt, 2018). Stress and negative affect were measured through self-reports in real time whereas survey data on lifetime racial discrimination and general perceived stress were collected during the same study visit that the experiment occurred.

Transparency and Openness

We report the use of a priori power analyses in determining the sample size, all data exclusions, all experimental simulations, and relevant measures in the study. We follow APA Style Journal Article Reporting Standards for quantitative research (JARS-Quant) and on race, ethnicity, and culture (JARS-REC). Analysis plan using experimental data were preregistered (https://osf.io/hzyb6/?view_only=0fb019a153b34ab99f81ee6df13c0e58). Analysis plan using survey data was not preregistered. Experimental results using the initial sample size were reported in a manuscript used to satisfy the first author's master's thesis requirements (https://scholar.smu.edu/hum_sci_psychology_etds/40/) and included in the supplemental materials. Deviations from the preregistration (namely, rationale for additional data collection) are described. Data are not publicly available. All analysis codes and nonproprietary survey materials are available in Open Science Framework (https://osf.io/fbc7x/?view_only=8f154836dca64d2da17707247dd01369). Data cleaning and preliminary analyses were performed using SPSS v28.0 and hypothesis-testing analyses were performed using Mplus v8.8.

Method

Participants

Participants were 240 young adults aged 18-30 ($M=23.27$, $SD=3.58$) who identified as persons of color. They identified as Asian/Asian American (37.5%), Hispanic/Latino/Spanish American (35.4%), Black/African American (15.8%), and Native American and/or multiracial (11.3%). Participants reported gender identities as follows: men (45.8%), women (50.8%), transgender (0.8%), and nonbinary/genderfluid individuals (2.5%). Most participants (76.3%) reported to be heterosexual, 11.7% bisexual, 4.2% gay, 2.9% pansexual, 3.3% queer, 1.3% asexual, and 0.4% lesbian. The sample comprised 56.7% full-time undergraduate students and 43.3% community adults. Participants completed the study either in person in Dallas, Texas (55.8%) or Seattle, Washington (23.3%), or remotely from across the United States (20.8%). Participants were eligible to participate in the study if they consumed alcohol at least once in the past month. Exclusion criteria included international or foreign exchange student status, and reports of motion sickness or epilepsy.

Study Design, Procedures, and Materials

The study protocol was approved by the institutional review boards at Southern Methodist University and University of Washington. Procedures in the parent study are reported in a published registered report (Lui et al., 2023). The parent study was a between-groups experiment in which participants were assigned to receive either daily hassles unrelated to race/racism in the control condition, or one of three forms of everyday racial discrimination in the experimental condition. Racial discrimination experiences ranged from microinvalidation, to microinsult, to blatant discrimination. We used virtual reality technologies to simulate daily hassles and racial discrimination experiences. Our study protocol took about 60 minutes. During

the study session, participants provided informed consent, completed two VR simulations and associated measures for the dependent variables, and responded to a set of survey questionnaires about their typical experiences and individual difference characteristics.

Both VR simulations depicted a house party at which each participant interacted freely with an avatar. The avatar was controlled by a research actor, who used a semi-structured script to carry on conversations with the participant to simulate either racial discrimination experiences or daily hassles. The first simulation was designed to familiarize each participant with the VR technologies and immersive environment. In this simulation, participant engaged in a casual, non-stressful conversation with a White female avatar. The second simulation was designed to induce stress associated with either everyday racial discrimination or daily hassles. Survey data were collected following VR simulations. Survey questionnaires included assessments of lifetime experiences with racial discrimination, general perceived stress, and racial identity. All participants received either \$30 or research credits as incentives for their time.

Initial data collection took place during 2021-2022 in Dallas, Texas. We recruited participants from the local communities and a college setting through social media ad campaigns, flyers, mass emails to students of color at a local university, and the psychology subject pool. We used a stratified randomization strategy for participant assignment to either the control condition or one of the racial discrimination conditions. As described in Lui et al., 2023, participants completed the study procedures either in person or remotely.

Additional data collection took place in 2023 in Seattle, Washington, to increase the sample size in the control condition. The parent study compared three varying levels of intensity of discrimination experiences against the non-discriminatory daily hassles control condition, and found that the three discrimination conditions were not statistically different from each other

(Lui et al., 2023). For the present study, we combined the three discrimination conditions into one broad discrimination condition to represent a wide range of discrimination experiences. Because the parent study evenly divided participants between the four study conditions (i.e., three levels of discrimination and non-discriminatory daily hassles), for the purposes of the present study, we would have had a sample that had many more participants in the discrimination condition than the control condition when we combined the discrimination conditions. Thus, for the present study, we recruited an additional 54 participants to result in a more even distribution of participants between the discrimination and non-discrimination daily hassles conditions for the present study. We used social media postings, flyers, and the psychology subject pool at a local university to recruit full-time undergraduate students and community adults. Participants completed the study in person and were assigned to receive daily hassles unrelated to race/racism during the experimental VR simulation.

Experimental Simulation and Equipment, and Assessment of Dependent Variables

Simulated Racial Discrimination Experiences and Daily Hassles. The experimental simulations took place in a virtual environment depicting a scene of a back porch at a house party. The content of the discrimination conditions were based on vignettes that have been validated to represent varying severity levels of everyday racial discrimination experiences including microinvalidations, microinsults, and blatant discrimination (Lui et al., 2020). The content of the semi-structured scripts were constructed as defined by Sue's taxonomy (Sue et al., 2007). The microinvalidation condition consisted of assumptions including foreigner in own land, color blindness, myth of meritocracy, and denial of individual racism. The microinsult condition consisted of themes including ascription of intelligence, second class citizenship, pathologizing cultural values or communication styles, and assumption of criminal status that

varied slightly based on the self-reported race of the participant. The blatant discrimination condition consisted of name-calling, avoidant behavior (e.g., looking away), and purposefully discriminatory actions directed toward the participant's race. The non-discrimination control condition consisted of stressful conversation topics unrelated to the racial background of the participant, and included discussions around finances, final exams, and employment.

Stress Rating. Our first dependent variable was self-reported stress rated immediately following the experimental simulation of racial discrimination or daily hassles. Participants also rated their stress levels immediately before the VR simulation, using a handheld controller. A visual analog of a stress meter was displayed at the bottom of the screen. Stress levels ranged from 0 (*not at all*) to 100 (*extremely stressed*). This measure of stress has been used in previous research, which has demonstrated adequate construct validity and reliability (Muaremi et al., 2013).

Positive and Negative Affect Schedule (Watson et al., 1988). Our second dependent variable was negative affect reported immediately following the experimental simulation. We used negative affect items from the Positive and Negative Affect Scale. Participants rated the degree to which they experienced negative feelings such as anger and sadness on a scale from 1 (*not at all*) to 5 (*very much*). Participants also rated negative affect right before the experimental simulation. The Positive and Negative Affect Scale has shown adequate internal consistency reliability and construct validity across ethnoracial groups (Brondolo et al., 2008; Merz et al., 2013). Scale scores demonstrated adequate internal consistency reliability in the present sample (Cronbach's $\alpha=.81$ and $.85$ for pre-simulation and post-simulation, respectively).

Survey Questionnaires Assessing Lifetime Racial Discrimination, General Perceived Stress, and Racial Identity

Lifetime Racial Discrimination. We used the Everyday Discrimination Scale (EDS; D. R. Williams et al., 1997) and the Major Experiences of Discrimination Scale (MDS; D. R. Williams et al., 2008) to capture the frequency by which participants encounter racial discrimination in their day-to-day life. The EDS and MDS together cover a broad range of everyday and blatant discrimination experiences. The EDS contained 10 items (e.g., “You receive poorer service than other people at restaurants or stores because of your race or ancestry”) whereas the MDS contained 9 items (e.g., “Have you ever been unfairly prevented from moving into a neighborhood because the landlord or realtor refused to sell or rent you a house or apartment because of your race or ancestry”). All items were rated on a scale from 1 (*never*) to 4 (*often*). These scale scores have shown reliability and criterion-related validity among people of color (Bastos et al., 2010; Kim et al., 2014). We conducted a principal axis factoring analyses in SPSS and found support for a unifactorial structure underlying the present data (40.65% explained by the first extracted factor (eigenvalue=7.72). The present scores assessing lifetime experiences with racial discrimination showed adequate internal consistency reliability (Cronbach’s alpha=.92). We calculated a mean scale score such that higher scores indicated more frequent racial discrimination experiences.

Perceived Stress Scale (Cohen et al., 1983). We used the 10-item Perceived Stress Scale (PSS-10) to assess general stress experienced over the last month. Items (e.g., “In the last month, how often have you found that you could not cope with all of the things that you had to do”) were rated on scale from 1 (*never*) to 5 (*very often*). The PSS-10 has been reliably used across ethnoracial groups (Baik et al., 2019; Chen et al., 2019; Makhubela, 2022), and demonstrated adequate internal consistency reliability in the present sample (Cronbach’s alpha=.88).

Multidimensional Inventory of Black identity (Sellers, 1997). Centrality, private regard, and public regard dimensions of racial identity were measured using the Multidimensional Inventory of Black Identity (MIBI). MIBI was initially developed for use with African American/Black individuals, and has been modified for use with other groups of color (Yip et al., 2013). Scale scores have shown adequate internal consistency reliability and convergent validity for use across ethnoracial groups (Casey-Cannon et al., 2011; Yip et al., 2013). First, participants indicated their primary racial self-categorization (e.g., Asian American/Asian, African American/Black, Hispanic American/Latino). Then, they rated the degree to which they agreed with scale items in reference to their race. Items assessing centrality (8 items; e.g., “being ___ is an important part of my self-image”), private regard (7 items; e.g., “I feel that ___ have made major accomplishments and advancements”), and public regard (6 items; e.g., “Overall, ___ are considered good by others”) were rated on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). The three scale scores demonstrated adequate internal consistency reliability in the present sample (Cronbach’s α = .84, .79, and .87, respectively for centrality, private regard, and public regard).

Sample Size Determination

The parent study comprised data from 184 research participants; the planned sample size was determined by an a priori power analysis to detect the main effects of racial discrimination (Lui et al., 2023). For this study, we performed a separate set of analyses using G*Power v.3.1 to determine the statistical power in using $N=184$ to detect a moderation effect by racial identity variables in the associations between racial discrimination and psychological distress outcomes. We considered effect sizes from an experimental study using a similar design (Desalu et al., 2021); these published data suggested medium parameter estimates (r/β ranging from .34 to .36).

We also considered effect sizes from a meta-analysis of survey studies (Yip et al., 2019); these data suggested small parameter estimates (r/β ranging from .02 to .03).

Whereas our power analyses indicated that $N=184$ would be sufficient in detecting a medium moderation effect with the experimental data, the analyses assumed similar sample sizes in the racial discrimination condition and control condition (Memon et al., 2019). Thus, we recruited additional 54 research participants for the control condition. The added sample size was determined by time and available resources. The present sample included participants assigned to racial discrimination ($n=141$) and control ($n=99$) conditions. According to a sensitivity analysis with the current $N=240$, we would have 80% power to observe a smallest detectable moderation effect size of $r/\beta=.22$.

Data Analysis Plan

To test H1, we specified a multiple regression model examining differences in post-simulation stress by racial discrimination condition, controlling for pre-simulation stress. Another multiple regression model was specified for negative affect. To test H2, we specified a multiple regression model regressing self-reported perceived stress on measured lifetime racial discrimination. To test H3 through H8, we specified a hierarchical regression model for each outcome variable. In Step 1, we included racial discrimination and each of the racial identity variables as predictors. In Step 2, we computed interaction terms between simulated or measured racial discrimination variables and racial identity variables (e.g., *simulated racial discrimination x centrality*, *simulated racial discrimination x private regard*, *lifetime racial discrimination x centrality*, *lifetime racial discrimination x private regard*) and added the interaction term into the regression model. We used the Mplus default maximum likelihood estimator in regression analyses on post-simulation stress and measured perceived stress outcomes. Because of non-

normality in the residuals for post-simulation negative affect, we used the maximum likelihood estimator with robust standard errors.

Results

Preliminary Analyses

We tested for systematic differences in demographic characteristics between racial discrimination and control experimental conditions, using $N=184$ from the parent study. We found no statistically significant differences between the discrimination and control conditions on demographic characteristics (see supplemental materials). Because we recruited an additional 54 participants from Seattle, Washington, all of whom were assigned to the control condition, we included data collection location as a covariate in all hypothesis-testing analyses to account for any systematic differences between samples that could not be accounted for by random assignment.

Table 1 summarizes descriptive statistics on study variables retrieved from experimental and survey data and bivariate correlations among them. Higher levels of self-reported lifetime discrimination were linked to higher levels of self-reported perceived stress, and higher levels of stress and negative affect both before and after experimental manipulations of discrimination. Higher levels of centrality were associated with greater frequency of lifetime racial discrimination, general perceived stress, and post-simulation stress. Higher levels of racial identity private regard were related to lower levels of lifetime racial discrimination, general perceived stress, post-simulation stress, and post-simulation negative affect. Racial identity public regard was not associated with lifetime racial discrimination, general perceived stress, or post-simulation stress or negative affect ratings. Pre-simulation ratings of stress and negative

affect were robustly associated with post-simulation ratings; therefore, pre-simulation ratings of the relevant outcome variable were included as covariates in all analyses.

Hypothesis-Testing Analyses

Effects of simulated racial discrimination on stress and negative affect (H1) and associations between measured racial discrimination and perceived stress (H2). Table 2 summarizes results testing H1 and H2. Both H1 and H2 were supported, and results from experimental and survey data converged. Controlling for data collection location and pre-simulation scores in the respective dependent variable, experimental data showed that participants in the racial discrimination condition reported higher levels of post-simulation stress ($\beta=.36, p < .001$) and negative affect ($\beta=.27, p < .001$) than participants in the control condition. Survey data showed that more frequent lifetime racial discrimination experiences were associated with higher levels of general perceived stress ($\beta=.40, p < .001$), even when controlling for data collection location.

Moderating role of centrality on the effects of simulated racial discrimination on stress and negative affect (H3) and on the associations between measured racial discrimination and perceived stress (H4). Table 3 summarizes results from hierarchical regression models testing H3 and H4. In Step 1, the main effects of the racial discrimination condition and centrality were examined. Relative to the control condition, participants assigned to the racial discrimination condition reported higher levels of post-simulation stress ($\beta=0.40, p < .001$) and post-simulation negative affect ($\beta=.30, p < .001$), over and above other predictors in the model. Higher levels of centrality were associated with greater post-simulation stress ($\beta=0.20, p < .001$) and post-simulation negative affect ($\beta=.19, p < .001$). Survey data showed that more frequent lifetime racial discrimination experiences were associated with greater

perceived stress ($\beta=.06, p < .001$). Unlike results from the experimental data, however, centrality did not predict measured perceived stress ($\beta=.12, p < .273$). In Step 2, *racial discrimination x centrality* did not predict post-simulation stress ($\beta=.30, p=.166$) and post-simulation negative affect ($\beta=.21, p=.217$) using experimental data, and measured perceived stress ($\beta=-.05, p=.846$) using survey data. Both sets of results using experimental and survey data showed that centrality did not moderate the associations between racial discrimination and psychological distress outcomes.

Moderating role of private regard on the effects of simulated racial discrimination on stress and negative affect (H5) and on the associations between measured racial discrimination and perceived stress (H6). Table 4 summarizes results on H5 and H6. Results regarding racial discrimination in this set of analyses were consistent as those reported previously. In Step 1, we found that higher levels of private regard were associated with greater post-simulation stress ($\beta=0.12, p=.039$) and post-simulation negative affect ($\beta=0.15, p=.001$) based on experimental data. These effect sizes were in the opposite direction as the bivariate correlations, indicating a suppressor effect. Private regard did not predict measured perceived stress based on survey data ($\beta=-0.12, p=.074$). When we included the interaction term *racial discrimination x private regard* in Step 2, both experimental and survey data yielded no support for a buffering role of private regard in terms of post-simulation stress ($\beta=0.62, p=.242$), post-simulation negative affect ($\beta=0.30, p=.431$), and measured perceived stress ($\beta=-0.16, p=.759$).

Moderating role of public regard on the effects of simulated racial discrimination on stress and negative affect (H7) and on the associations between measured racial discrimination and perceived stress (H8). Table 5 summarizes results on hierarchical regression models testing H7 and H8. In Step 1, accounting for other predictors in the respective

model, public regard was not associated with either post-simulation stress ($\beta=-0.11$, $p=.052$) or post-simulation negative affect ($\beta=-0.05$, $p=.368$) using experimental data. By contrast, based on survey data, higher levels of public regard were associated with lower levels of perceived stress ($\beta=-0.20$, $p=.011$). Parameter estimates for *racial discrimination x public regard* interaction term showed that public regard did not moderate the effect of racial discrimination on post-simulation stress ($\beta=-0.27$, $p=.124$) and post-simulation negative affect ($\beta=-0.19$, $p=.495$), and did not moderate the association between lifetime racial discrimination and measured perceived stress ($\beta=-0.08$, $p=.666$).

Discussion

We examined the moderating roles of racial identity in the theorized effects of racial discrimination on psychological distress outcomes. Consistent with our first set of hypotheses, simulated and measured racial discrimination experiences were associated with higher levels of psychological distress. Contrary to our second set of hypotheses, racial identity centrality, private regard, and public regard did not moderate these associations. Given the existing equivocal findings on whether and how racial identity modifies the impact of racial discrimination on psychological outcomes—some of which may be attributed to diverse research methods (Neblett, 2023), a strength of our investigation is that we cross-validated these results using experimental and survey data with the same sample. Considering racial discrimination both simulated in a controlled environment and measured on a commonly used survey, our data show that racial identity does not interact with racial discrimination in its effect on psychological distress.

Racial Identity Is Associated with Psychological Distress Outcomes

Our observed bivariate correlations between racial identity variables and psychological distress outcomes align with assumptions that derive from social identity theories (Tajfel &

Turner, 2004), and generally are consistent with prior empirical findings (Desalu et al., 2021; Sellers et al., 2006). Across acute and general psychological distress outcomes, we find that greater distress corresponds to higher levels of centrality and lower levels of private regard. Psychological distress does not appear to be associated public regard, however. Considering the ubiquity of racism facing people of color in the United States, centering overall sense of self on their racial group membership may heighten psychological burden of structural disadvantages whereas feeling good about their race may promote feelings of belongingness and collective affirmation.

Reasons That Racial Identity Does Not Moderate Associations Between Racial Discrimination and Psychological Distress

Social identity theories have been used as guiding frameworks for conceptualizing whether and how racial identity moderates the psychological effects of racial discrimination. Empirical evidence to date has not supported these theorized interaction effects (Burrow & Ong, 2010; Desalu et al., 2021; French & Chavez, 2010; Huynh & Fuligni, 2010; Lui, 2020; Yip et al., 2019). Given the persistence and ubiquity of structural racism and insidious nature of everyday racial discrimination, racial discrimination experiences may be damaging to psychological functioning regardless of how people of color understand and internalize their social statuses. Possible protections against racial discrimination may occur at the interpersonal and societal levels as opposed to at the individual level (Pieterse & Carter, 2010).

Conclusions about the health-promoting and buffering effects of private regard bear distinct practical importance because culture-centered interventions have been developed to promote racial private regard to enhance psychological functioning and to reduce the harm of racial discrimination (e.g., Coard et al., 2004; White & Wanless, 2019). Prior confirmatory

findings may be false positives. As with most topical areas (Aert et al., 2019; Ferguson & Heene, 2012), published effect sizes documenting the moderation by racial identity likely are inflated because null results may be suppressed (see relevant discussion in Yip et al., 2019). As demonstrated in results from our sensitivity analysis, most studies likely require samples that are larger than what are represented in the literature (see discussion on power in moderation analyses in Vize et al., 2023). Because most research on this topic has relied on survey methods, it also is possible that private regard simultaneously influences how people recall global racial discrimination experiences and their psychological distress status. Retrospective reporting of all three variables may have conflated the moderation role of private regard in the associations between racial discrimination and psychological distress outcomes.

We also consider two alternative reasons for being unable to detect a potentially true buffering role of private regard, and potentially true moderating roles of centrality and public regard: restriction of range in our observed private regard scores and sensitive time scale for capturing moderating effects of racial identity. First, our participants reported high levels of private regard; observed sample mean score was close to 6 (*somewhat agree*) on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Limited variability in these scores may have constrained our ability to detect a moderation effect across experimental and survey data (see power discussion in Memon et al., 2019). Our recruitment strategies appeared to have resulted in a sample of young adults of color who felt positively about their racial group.

Second, our research methods may have missed the sensitive time periods when private regard and public regard protect the psychological harm of racial discrimination, and when centrality worsens the effects of racial discrimination. Namely, racial discrimination not only causes acute psychological distress, but also may cause rumination (Bernard et al., 2022; Borders

& Liang, 2011) that in turn leads to delayed distress and accumulated psychological burden. On the one hand, survey studies that reflect people's daily lived experiences show no moderation by any racial identity variables in the associations between same-day experiences with racial discrimination and same-day psychological outcomes (Burrow & Ong, 2010; Huynh & Fuligni, 2010). On the other hand, survey studies that contain repeated measurements of self-reported racial discrimination experiences over one year show that centrality and public regard exacerbate the associations between racial discrimination and externalizing problems (Caldwell et al., 2004). Whereas our experimental data help reflect the effects of simulated racial discrimination on momentary distress, our survey data help demonstrate shared variance between lifetime racial discrimination and global distress. These results do not capture how people may respond to racial discrimination over hours, days, and weeks.

Limitations of The Present Study

We consider several limitations in our study. First, in our experimental procedures, the avatar was presented as a White male. Even though simulated daily hassles did not involve interpersonal racial discrimination, financial, workplace, and/or educational challenges nevertheless might reflect structural disadvantages facing people of color. The White avatar coupled with participants' racial identity could have influenced post-simulation psychological distress ratings, therefore masking moderating effects by centrality, private regard, and/or public regard. Second, racial identity variables were measured after experimental simulations of stress. Despite centrality, private regard, and public regard being conceptualized as stable characteristics (Sellers et al., 1998), simulations of racial discrimination could have increased the salience of race, and affected individuals' self-reports on these racial identity factors. Third, we measured lifetime racial discrimination experiences and perceived stress concurrently. We were

unable to make causal conclusions about their associations. Fourth, our participants tended to feel positively about their racial group membership and reported relatively low levels of general stress. We also did not measure participants' household income or socioeconomic status. Current findings may not generalize to other segments of the population.

Future Research Directions

Converging results across experimental and survey data suggest that null findings on the moderating roles of racial identity factors are not driven by methodological differences. Still, our investigation reveals key directions in understanding how racial identity interact with racial discrimination in affecting people of color's psychological distress. First, future studies should use large sample sizes that ensure sufficient statistical power to detect the effect sizes of interest. Second, research samples should be comprised of individuals with a range of scores on racial identity factors. Third, this literature would benefit from research methods that aim to reflect how racial discrimination and racial identity affect people in their daily lives (Ong & Burrow, 2017). Specifically, (intensive) longitudinal surveys and experience sampling approaches can allow researchers to collect fine-grained data that capture when and under what contexts racial discrimination may affect psychological outcomes, and time scale that racial identity may modify these associations.

The likely complex associations among racial discrimination, racial identity, and psychological distress may not be best examined using quantitative, variable-centered methods. Rather, qualitative research and quantitative, person-centered methods can be particularly beneficial in informing how people appraise and respond to racial discrimination, and how racial identity factors function as individual-level vulnerabilities or strengths. In-depth interviews and tools such as the UConn Racial/Ethnic Stress and Trauma Survey can be used to understand

people's experiences with racism and discrimination from various sources, racial identity development, and psychopathology symptoms associated with these racialized factors (Williams et al., 2018). Person-centered analyses can help researchers identify profiles of racial discrimination experiences and racial identity factors that make people resilient against psychological distress (e.g., Banks & Kohn-Wood, 2007). These scientific data can inform culturally responsive interventions that promote psychological functioning and reduce the negative effects of racial discrimination.

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Table 1

Bivariate Correlations Between Study Variables

Variable	<i>M (SD)</i>	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Simulated Racial Discrimination	--	--								
2. Measured Lifetime Racial Discrimination	1.59 (0.51)	.11	--							
3. Pre-Simulation Stress	18.50 (16.74)	-.02	.13	--						
4. Post-Simulation Stress	39.49 (27.81)	.32*	.26*	.43*	--					
5. Pre-Simulation Negative affect	1.43 (0.46)	.08	.28*	.19*	.38*	--				
6. Post-Simulation Negative affect	1.70 (0.65)	.29*	.35*	.31*	.64*	.58*	--			
7. Measured Perceived Stress	2.98 (0.70)	-.04	.39*	.25*	.24*	.29*	.35*	--		
8. Centrality	4.83 (1.31)	-.18*	.28*	.08	.13*	.00	.12	.20*	--	
9. Private Regard	4.16 (1.45)	-.17*	-.46*	-.06	-.17*	-.20*	-.19*	-.26*	-.13*	--
10. Public Regard	6.17 (0.83)	.04	.12	.01	.06	-.10	.06	-.10	.46*	-.06

Note. $N=240$ for all variables except pre-simulation stress ($N=234$), post-simulation stress ($N=234$), and post-simulation negative affect ($N=237$). Associations between simulated racial discrimination (0=control; 1=racial discrimination) and other variables were computed as point biserial correlations; all other correlations were computed as Pearson's correlations. Measured lifetime racial discrimination was coded on a scale of 1 (*never*) to 4 (*often*). Pre- and post-simulation stress were rated on a scale from 0 (*not at all*) to 100 (*extremely stressed*). Pre- and post-simulation negative affect were rated on a scale from 1 (*not at all*) to 5 (*very much*). Perceived stress was measured over the last month on a scale from 1 (*never*) to 5 (*very often*). Racial identity centrality, private regard, and public regard were rated on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*).

* $p < .05$

Table 2

Multiple Regression Models Predicting Psychological Distress Outcomes Using Experimental and Survey Data (H1-H2)

Predictor	Experimental						Survey		
	Post-Simulation Stress			Post-Simulation Negative Affect			Perceived Stress		
	<i>B</i> (<i>SE</i>)	β	<i>p</i>	<i>B</i> (<i>SE</i>)	β	<i>p</i>	<i>B</i> (<i>SE</i>)	β	<i>p</i>
Data Collection Location Dummy Variable 1 (0=Remote, 1=Dallas)	-6.52 (3.90)	-0.12	.094	-0.18 (0.09)	-0.14	.035	0.05 (0.11)	0.04	.637
Data Collection Location Dummy Variable 2 (0=Remote, 1=Seattle)	-0.74 (5.60)	-0.01	.895	-0.05 (0.10)	-0.03	.599	0.14 (0.13)	0.09	.261
Pre-Simulation Stress	0.72 (0.09)	0.43	< .001	--	--	--	--	--	--
Pre-Simulation Negative Affect	--	--	--	0.80 (0.10)	0.57	< .001	--	--	--
Racial Discrimination	20.52 (4.11)	0.36	< .001	0.36 (0.09)	0.27	< .001	0.54 (0.08)	0.40	< .001

Note. *N*=234 for experimental analysis predicting post-simulation stress. *N*=237 for experimental analysis predicting post-simulation negative affect. *N*=240 for survey analysis predicting perceived stress. Racial discrimination scored from 0 (*control*) to 1 (*racial discrimination*) from experimental data and from 1 (*never*) to 4 (*often*) from survey data. Pre- and post-simulation stress were rated on a scale of 0 (*not at all*) to 100 (*extremely stressed*). Pre- and post-simulation negative affect were rated on a scale of 1 (*not at all*) to 5 (*very much*). Perceived stress was measured over the last month on a scale of 1 (*never*) to 5 (*very often*).

Table 3

Hierarchical Multiple Regression Models Predicting Psychological Distress Outcomes Using Experimental and Survey Data (H3-H4)

Predictor	Experimental						Survey		
	Post-Simulation Stress			Post-Simulation Negative Affect			Perceived Stress		
	<i>B (SE)</i>	β	<i>p</i>	<i>B (SE)</i>	β	<i>p</i>	<i>B (SE)</i>	β	<i>p</i>
Step 1									
Data Collection Location Dummy Variable 1 (0=Remote, 1=Dallas)	-9.74 (3.90)	-0.17	.013	-0.26 (0.09)	-0.20	.003	0.02 (0.11)	0.08	.852
Data Collection Location Dummy Variable 2 (0=Remote, 1=Seattle)	-3.87 (5.53)	-0.06	.484	-0.13 (0.10)	-0.08	.206	0.30 (0.19)	0.12	.117
Pre-Simulation Stress	0.70 (0.09)	-0.42	< .001	--	--	--	--	--	--
Pre-Simulation Negative Affect	--	--	--	0.79 (0.10)	0.56	< .001	--	--	--
Racial Discrimination	22.29 (4.03)	0.40	< .001	0.39 (0.09)	0.30	< .001	0.51 (0.09)	0.06	< .001
Centrality	4.22 (1.19)	0.20	< .001	0.10 (0.03)	0.19	< .001	0.04 (0.04)	0.12	.273
Step 2									
Data Collection Location Dummy Variable 1 (0=Remote, 1=Dallas)	-9.93 (3.89)	-0.18	.011	-0.26 (0.09)	-0.20	.003	0.02 (0.11)	0.02	.842
Data Collection Location Dummy Variable 2 (0=Remote, 1=Seattle)	-3.52 (5.51)	-0.05	.524	-0.13 (0.10)	-0.08	.216	0.30 (0.19)	0.18	.114
Pre-Simulation Stress	0.69 (0.09)	0.41	< .001	--	--	--	--	--	--
Pre-Simulation Negative Affect	--	--	--	0.79 (0.10)	0.57	< .001	--	--	--
Racial Discrimination	6.08 (12.38)	0.11	.624	0.12 (0.21)	0.09	.551	0.55 (0.19)	0.40	.005
Centrality	2.09 (1.94)	0.10	.282	0.06 (0.03)	0.12	.028	0.05 (0.07)	0.17	.460
<i>Racial Discrimination x Centrality</i>	3.34 (2.41)	0.30	.166	0.06 (0.04)	0.21	.217	-0.01 (0.04)	-0.05	.846

Note. *N*=234 for experimental analyses predicting post-simulation stress. *N*=237 for experimental analyses predicting post-simulation negative affect. *N*=240 for survey analyses predicting perceived stress. In analyses with experimental data, racial discrimination was coded as 0=control, 1=racial discrimination. In analyses with survey data, lifetime racial discrimination was measured on a scale from 1 (*never*) to 4 (*often*). Pre- and post-simulation stress were rated on a scale of 0 (*not at all*) to 100 (*extremely stressed*). Pre- and post-simulation negative affect were rated on a scale of 1 (*not at all*) to 5 (*very much*). Perceived stress was measured over the last month on a scale of 1 (*never*) to 5 (*very often*). Centrality was rated on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*).

Table 4

Hierarchical Multiple Regression Models Predicting Psychological Distress Outcomes Using Experimental and Survey Data (H5-H6)

Predictor	Experimental						Survey		
	Post-Simulation Stress			Post-Simulation Negative Affect			Perceived Stress		
	<i>B (SE)</i>	β	<i>p</i>	<i>B (SE)</i>	β	<i>p</i>	<i>B (SE)</i>	β	<i>p</i>
Step 1									
Data Collection Location Dummy Variable 1 (0=Remote, 1=Dallas)	-7.95 (3.94)	-0.14	.044	-0.23 (0.09)	-0.18	.008	0.08 (0.11)	0.06	.462
Data Collection Location Dummy Variable 2 (0=Remote, 1=Seattle)	-2.37 (5.59)	-0.04	.672	-0.10 (0.10)	-0.07	.329	0.08 (0.13)	0.05	.516
Pre-Simulation Stress	0.69 (0.09)	0.42	< .001	--	--	--	--	--	--
Pre-Simulation Negative Affect	--	--	--	0.81 (0.10)	0.58	< .001	--	--	--
Racial Discrimination	21.25 (4.06)	0.38	< .001	0.37 (0.09)	0.28	< .001	0.57 (0.08)	0.42	< .001
Private Regard	4.52 (2.19)	0.12	.039	0.14 (0.04)	0.15	.001	-0.09 (0.05)	-0.12	.074
Step 2									
Data Collection Location Dummy Variable 1 (0=Remote, 1=Dallas)	-8.48 (3.96)	-0.15	.032	-0.24 (0.09)	-0.18	.008	0.08 (0.11)	0.06	.451
Data Collection Location Dummy Variable 2 (0=Remote, 1=Seattle)	-2.48 (5.58)	-0.04	.657	-0.10 (0.10)	-0.07	.324	0.09 (0.13)	0.05	.503
Pre-Simulation Stress	0.68 (0.09)	0.41	< .001	--	--	--	--	--	--
Pre-Simulation Negative Affect	--	--	--	0.81 (0.10)	0.58	< .001	--	--	--
Racial Discrimination	-13.14 (29.69)	-0.23	.658	-0.02 (0.48)	-0.01	.974	0.75 (0.60)	0.55	.210
Private Regard	0.67 (3.95)	0.02	.866	0.10 (0.05)	0.11	.064	-0.05 (0.14)	-0.06	.758
<i>Racial Discrimination x Private Regard</i>	5.54 (4.74)	0.62	.242	0.06 (0.08)	0.30	.431	-0.03 (0.09)	-0.16	.759

Note. *N*=232 for experimental analyses predicting post-simulation stress. *N*=235 for experimental analyses predicting post-simulation negative affect. *N*=240 for survey analyses predicting perceived stress. In analyses with experimental data, racial discrimination was coded as 0=control, 1=racial discrimination. In analyses with survey data, lifetime racial discrimination was measured on a scale from 1 (*never*) to 4 (*often*). Pre- and post-simulation stress were rated on a scale of 0 (*not at all*) to 100 (*extremely stressed*). Pre- and post-simulation negative affect were rated on a scale of 1 (*not at all*) to 5 (*very much*). Perceived stress was measured over the last month on a scale of 1 (*never*) to 5 (*very often*). Private regard was rated on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*).

Table 5

Hierarchical Multiple Regression Models Predicting Psychological Distress Outcomes Using Experimental and Survey Data (H7-H8)

Predictor	Experimental						Survey		
	Post-Simulation Stress			Post-Simulation Negative Affect			Perceived Stress		
	<i>B (SE)</i>	β	<i>p</i>	<i>B (SE)</i>	β	<i>p</i>	<i>B (SE)</i>	β	<i>p</i>
Step 1									
Data Collection Location Dummy Variable 1 (0=Remote, 1=Dallas)	-6.56 (3.87)	-0.12	.090	-0.18 (0.09)	-0.14	.034	0.05 (0.11)	0.04	.632
Data Collection Location Dummy Variable 2 (0=Remote, 1=Seattle)	1.34 (5.66)	0.02	.813	-0.03 (0.10)	-0.02	.769	0.32 (0.14)	0.19	.025
Pre-Simulation Stress	0.70 (0.09)	0.42	< .001	--	--	--	--	--	--
Pre-Simulation Negative Affect	--	--	--	0.78 (0.11)	0.56	< .001	--	--	--
Racial Discrimination	20.63 (4.07)	0.37	< .001	0.36 (0.09)	0.27	< .001	0.46 (0.09)	0.33	< .001
Public Regard	-2.10 (1.08)	-0.11	.052	-0.02 (0.03)	-0.05	.368	-0.08 (0.03)	-0.20	.011
Step 2									
Data Collection Location Dummy Variable 1 (0=Remote, 1=Dallas)	-7.00 (3.86)	-0.13	.069	-0.19 (0.09)	-0.14	.030	0.05 (0.11)	0.04	.621
Data Collection Location Dummy Variable 2 (0=Remote, 1=Seattle)	-0.79 (5.80)	-0.01	.892	-0.05 (0.10)	-0.04	.585	0.32 (0.14)	0.20	.024
Pre-Simulation Stress	0.69 (0.09)	0.41	< .001	--	--	--	--	--	--
Pre-Simulation Negative Affect	--	--	--	0.78 (0.10)	0.56	< .001	--	--	--
Racial Discrimination	33.94 (9.56)	0.60	< .001	0.49 (0.24)	0.38	.038	0.38 (0.20)	0.28	.057
Public Regard	-0.11 (1.69)	-0.01	.950	-0.00 (0.03)	-0.01	.925	-0.12 (0.09)	-0.28	.169
<i>Racial Discrimination x Public Regard</i>	-3.83 (2.20)	-0.27	.124	-0.04 (0.05)	-0.19	.495	0.02 (0.05)	0.08	.666

Note. *N*=234 for experimental analyses predicting post-simulation stress. *N*=237 for experimental analyses predicting post-simulation negative affect. *N*=240 for survey analyses predicting perceived stress. In analyses with experimental data, racial discrimination was coded as 0=control, 1=racial discrimination. In analyses with survey data, lifetime racial discrimination was measured on a scale from 1 (*never*) to 4 (*often*). Pre- and post-simulation stress were rated on a scale of 0 (*not at all*) to 100 (*extremely stressed*). Pre- and post-simulation negative affect were rated on a scale of 1 (*not at all*) to 5 (*very much*). Perceived stress was measured over the last month on a scale of 1 (*never*) to 5 (*very often*). Public regard was rated on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*).

Supplemental Materials

Preliminary analyses from the original preregistered sample size of $N = 184$

For transparency, we report preliminary analytic results testing differences across experimental conditions using participant data from the parent study (see Lui et al., 2023), as registered in the study plan archived in the Open Science Framework repository (https://osf.io/hzyb6/?view_only=0fb019a153b34ab99f81ee6df13c0e58). Differences in demographic characteristics and baseline stress ratings were examined between participants assigned to the discrimination conditions and control condition. Chi-square tests of independence showed that the discrimination group did not statistically significantly differ from the control group on ethnoracial background [$\chi^2(3,185) = 1.70, p = .637$]. Similarly, there were no differences between the discrimination group and the control group on gender [$\chi^2(3,185) = 4.57, p = .206$], participation method [$\chi^2(1,185) = 0.06, p = .808$], and student status [$\chi^2(1,185) = 0.53, p = .469$]. Independent samples t -tests showed that the control group did not statistically significantly differ from the experimental group on age, $t(183) = 0.36, p = .720$. There were no significant differences between the experimental and control group on stress ratings [$t(178) = 0.01, p = .304$] and negative affect [$t(183) = -0.21, p = .831$] measured before the experimental manipulations.

Differences in racial identity variables measured were explored between participants assigned to the discrimination conditions and control condition. Independent samples t -tests showed that the control group did not significantly differ from the experimental group on racial identity centrality, $t(183) = 1.63, p = .105$, public regard $t(183) = -0.36, p = .720$, or private regard $t(183) = 0.50, p = .619$.

Analyses were conducted to explore associations between demographic characteristics and outcome variables (i.e., post-simulation stress and negative affect) to determine whether it would be appropriate to control for any demographic variables in the planned analyses. Bivariate correlations showed that age was not statistically significantly associated with any of the study variables. One-way ANOVAs were used to examine post-simulation stress and negative affect scores by demographic and sample characteristics. Post-simulation stress ($F(3,177) = 2.09, p = .104$) and negative affect scores ($F(3,179) = 0.23, p = .878$) did not significantly differ by gender. There were no statistically significant differences in post-simulation stress ($F(1,179) = 1.56, p = .214$) and negative affect scores ($F(1,181) = 2.06, p = .153$) across participants who completed the study in person or remotely. Post-simulation stress ($F(3,177) = 0.84, p = .472$) and negative affect scores ($F(3,179) = 0.11, p = .956$) did not significantly differ by ethnicity. There were no statistically significant differences in Post-simulation stress ($F(1,179) = 0.43, p = .511$) and negative affect scores ($F(1,181) = 0.06, p = .805$) across participants who were college students or community adults. Post-simulation stress ($F(6,174) = 1.01, p = .421$) and negative affect scores ($F(6,176) = 1.49, p = .183$) did not differ by sexual orientation.

Tables below summarize results from the preregistered analyses with a sample size of $N = 184$

Table S1

Bivariate Correlations Between Study Variables

	<i>M (SD)</i>	1.	2.	3.	4.	5.	6.	7.
1. Centrality	4.71 (1.35)	--	-0.21 / -0.17	0.55* / 0.46*	-0.03 / 0.13	0.26 / 0.28**	0.16 / 0.01	0.22 / .20*
2. Public Regard	3.95 (1.44)	-0.18*	--	-0.15 / -0.06	-0.11 / -0.20*	-0.22 / -0.25*	-0.18 / -0.19*	-0.25 / -0.18*
3. Private Regard	6.16 (0.80)	0.47*	-0.07	--	-0.14 / 0.13	0.28 / 0.22*	0.08 / -0.09	0.24 / 0.12
4. Pre-Simulation Stress	17.37 (15.83)	0.08	-0.18*	0.08	--	0.45* / 0.49*	0.04 / 0.30*	0.19 / 0.39*
5. Post-Simulation Stress	41.32 (28.08)	0.21*	-0.22*	0.19*	0.48*	--	0.51* / 0.39*	.68* / .62*
6. Pre-Simulation Negative Affect	1.46 (0.49)	0.04	-0.18*	-0.05	0.23*	0.38*	--	.65* / .57*
7. Post-Simulation Negative Affect	1.76 (0.69)	0.17*	-0.19*	0.12	0.36*	0.65*	0.57*	--

Note. Below the diagonal correlations are for the full sample with $N=184$. Above the diagonal correlations are separated by control group and racial discrimination group (control group, $n = 43$ / discrimination group $n = 142$).

* $p < .05$

Table S2

Analysis of Covariance for Post-Simulation Stress/Negative Affect by Condition with Pre-Simulation Stress/Negative Affect as Covariates Using Experimental Data from the Parent Study Sample Size (N = 184)

Predictor	<i>F(df)</i>	η_p^2	<i>p</i>
Stress			
Intercept	63.60(1,181)	0.26	< .001
Pre-Simulation Stress (Covariate)	54.17(1,181)	0.23	< .001
Simulated Racial Discrimination	24.03(1,181)	0.12	< .001
Negative Affect			
Intercept	15.65 (1,183)	0.08	< .001
Pre-Simulation Negative Affect (Covariate)	92.48(1,183)	0.34	< .001
Simulated Racial Discrimination	13.99(1,183)	0.07	< .001

Note. Racial discrimination coded as 0 = control, 1 = racial discrimination

Table S3

Regressions Predicting Post-Simulation Stress and Negative Affect by Pre-Simulation Ratings, Discrimination, Centrality, and Discrimination x Centrality Using Experimental Data from the Parent Study Sample Size (N = 184)

Predictor	<i>B</i> (SE)	β	<i>p</i>
Stress			
Intercept	11.18 (3.89)	0.40	.004
Pre-Simulation Stress	0.77 (0.11)	0.43	< .001
Simulated Racial Discrimination	21.95 (4.02)	0.33	< .001
Centrality	3.86 (2.60)	0.19	.138
<i>Racial Discrimination x Centrality</i>	0.79 (2.96)	0.03	.791
Negative Affect			
Intercept	0.33 (0.14)	0.48	.018
Pre-Simulation Negative Affect	0.79 (0.11)	0.56	< .001
Simulated Racial Discrimination	0.38 (0.08)	0.23	< .001
Centrality	0.05 (0.04)	0.11	.178
<i>Racial Discrimination x Centrality</i>	0.04 (0.05)	0.07	.424

Note. Centrality was mean-centered. Racial discrimination coded as 0 = control, 1 = racial discrimination.

Table S4

Regressions Predicting Post-Simulation Stress and Negative Affect by Pre-Simulation Ratings, Discrimination, Private Regard, and Discrimination x Private Regard Using Experimental Data from the Parent Study Sample Size (N = 184)

Predictor	<i>B</i> (<i>SE</i>)	β	<i>p</i>
Stress			
Intercept	11.07 (3.88)	0.40	.004
Pre-Simulation Stress	0.79 (0.11)	0.45	< .001
Simulated Racial Discrimination	21.38 (4.00)	0.32	< .001
Private Regard	11.63 (6.00)	0.33	.052
<i>Racial Discrimination x Private Regard</i>	-6.22 (6.42)	-0.17	.333
Negative Affect			
Intercept	0.31 (0.13)	0.45	.022
Pre-Simulation Negative Affect	0.81 (0.11)	0.58	< .001
Simulated Racial Discrimination	0.37 (0.09)	0.23	< .001
Private Regard	0.19 (0.09)	0.22	.040
<i>Racial Discrimination x Private Regard</i>	-0.05 (0.10)	-0.06	.613

Note. Private regard was mean-centered. Racial discrimination coded as 0 = control, 1 = racial discrimination.

Table S5

Regressions Predicting Post-Simulation Stress and Negative Affect by Pre-Simulation Ratings, Discrimination, Public Regard, and Discrimination x Public Regard Using Experimental Data from the Parent Study Sample Size (N = 184)

Predictor	<i>B (SE)</i>	β	<i>p</i>
Stress			
Intercept	12.52 (3.87)	0.45	.001
Pre-Simulation Stress	0.76 (0.11)	0.43	<.001
Simulated Racial Discrimination	20.38 (4.01)	0.31	<.001
Public Regard	-1.84 (2.27)	-0.10	.417
<i>Racial Discrimination x Public Regard</i>	-1.50 (2.65)	-0.07	.573
Negative Affect			
Intercept	0.36 (0.15)	0.53	.015
Pre-Simulation Negative Affect	0.77 (0.12)	0.55	< .001
Simulated Racial Discrimination	0.36 (0.09)	0.22	< .001
Public Regard	-0.06 (0.05)	-0.12	.233
<i>Racial Discrimination x Public Regard</i>	0.02 (0.06)	0.03	.751

Note. Public regard was mean-centered. Racial discrimination coded as 0 = control, 1 = racial discrimination.